High Security Laboratory - Network Telescope

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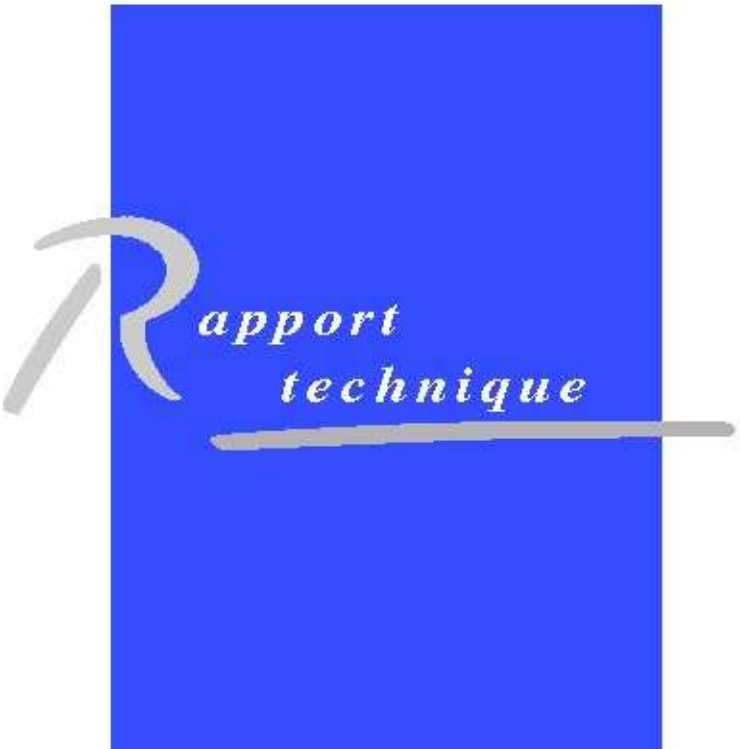

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Abstract:

Key-words: security, network, telescope, malware

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Laboratoire de Haute Sécurité en Informatique - Téléscope Réseau

Résumé :

Mots-clés : sécurité, réseau, téléscope, malware

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1 Introduction

The 2nd November of 1988, the worm *Morris* attacked successfully about 6 000 computers connected to the Internet. 15 years later, the 25th of January 2003 at 5:30 UTC, the *Slammer* worm paralyzed the Internet by exploiting an Operating System vulnerability discovered 6 months earlier. In no more than 10 minutes, this worm duplicated itself and infected 90% of the vulnerable computers. Nowadays, a well programed worm could possibly freeze the Internet in only a few seconds (*flashworms*). Reality meets fiction, as the scenario of the *Terminator 3* movie, where the *Skynet* system takes control of the defense networks by injecting a virus, is technically realistic today, our dependency to computers being each day more important and the systems interconnection being beyond human control.

Viruses, malwares and worms spreading over the Internet, cause billions euros of damages to our economy. They are a real threat for our society. Actual infrastructures, like communications or energy transport, highly depend on computer networks. A bug, especially due toe a malicious act, can keep us from benefiting from them. A viral attack, such as Slammer, forbids the access to the resources spreaded all over the Internet. For example, the supervision network of the nuclear power plant of Besse-Davis in Ohio was paralyzed for almost 24 hours after Slammer's attack. Other kind of attacks can change the aspect of a website, modify some informations, steal private data, or even worse, use our own systems to commit crimes, incriminating ourselves behind our awareness. If such an attack is not detected, a person using the altered information may take a false decision. The dramatic consequences that can result from that are easily understandable.

These threats examples show the trend reversal we are facing. After the big pirates and hackers invasions of the 2000s, malicious codes are keeping low profile to succeed in their wrongdoings, acting as spies in our systems. Viruses are weapons, and depending on who is controlling them, they can be deadly weapons. Thereby, the french newspaper *Le Monde* revealed the 5th of October 2007 that several countries, including the USA, Germany, France and New-Zealand, had announced that they suffered cyber-attacks coming from China.

While attacks are widespread, network data related to them is rarely available to academies for investigation. In this context, the MADYNES team, which develops research activities on security management, decided to build an infrastructure capable of collecting the necessary data to enable analysis and modeling of malicious systems from a network point of view. This infrastructure is now part of the LORIA High Security Laboratory.

2 LHSI

In this section we will present and motivate the High Security Laboratory (LHSI).

2.1 Requirements

A High Security Laboratory (LHSI) should permit to perform certain experiments under a legal umbrella, with the possibility to publish results and data. The experiments considered are the deployment of attack and defense systems against malicious programs (viruses, malwares...), the usage of viral technologies to develop new technologies, vulnerabilities detection, security audit, and systems certification.

Indeed, any design or deployment error can lead to an uncontrolled propagation, theoretically over the whole Internet, with important legal and operational consequences. We are aware that flashworms like viral propagation methods could paralyze the Internet in less than 10 seconds. therefore, the safety and security issues of the emissioned laboratory are critical.

The High Security Lab is composed of two distinct projects, closely related:

- A network telescope, which role is to collect malwares together with network traces in order to analyze them;
- Pro-active defense against known malwares.

In this report, we focus on the first sub-project, namely the network telescope.

2.2 Network Telescope

2.2.1 Objective and Functionalities

The objective of the telescope is the design, deployment and operation of a network telescope. The primary function of a network telescope is the capture, analysis and distribution of malware data, including both binaries and network related traces. In our project, the telescope is an epidemiological sensor for the detection of new viruses or malwares, and estimate the degree of infection of known threats. Therefore, the telescope will ensure the following three functionalities:

1. Large scale malicious code capture. To do so, we will use a platform that emulates vulnerabilities and captures the malwares who try to exploit these vulnerabilities. this emulation is perfectly controlled, as the malicious code is not able to gain control of the system. Such an environment can be based on a low-interaction Honeypot (such as Nepenthes). The captured code is analyzed to identify if it is a known malware or not. The capture of an unknown malicious code is essential for pro-active defenses;

2. Collect network traces. The second set of informations we are interested in is the network traffic of these malwares. This gives us information about the source of the attack, its behavior, the distribution and geographical repartition of infections. These data are complementary with the malicious code, as it gives information on their network behavior, and more precisely the mechanisms the malwares use to spread;

3. "In vitro" and "in vito" analysis of the malicious code. Malwares are still mysterious about how they deploy and spread themselves, their behavior and their interactions and communications with other malwares. We need to analyze both "in vitro" and "in vito" the collected malwares, and evaluate the vaccination and defense solutions against them. This actions is closely related with the pro-active defense sub-project outside the scope of MADYNES.

2.2.2 Telescope Architecture

As shown in figure 1, the network telescope is composed of 5 different components:

- An environment collecting malwares and network traces;
- An environment storing these malwares and traces;
- An environment to deal with the collected data. Each malware will be analyzed by known anti-virus and kept in a dedicated database. The traces will be anonymized and linked to the malwares they belong to via timestamps;
- An "in-vitro" analysis environment, which will make possible to deploy the malwares in a large scale platform and study its behavior. This environment will be physically separated and isolated, in order to permit a safe emulation of the malware;
- A dissemination infrastructure for the scientific community in order for them to access a subset of the collected data (traces, and under certain conditions the code itself).

This architecture has to be deployed by using Open Source softwares, and has to rely on virtualization in order to host several sensors and collectors on each server.

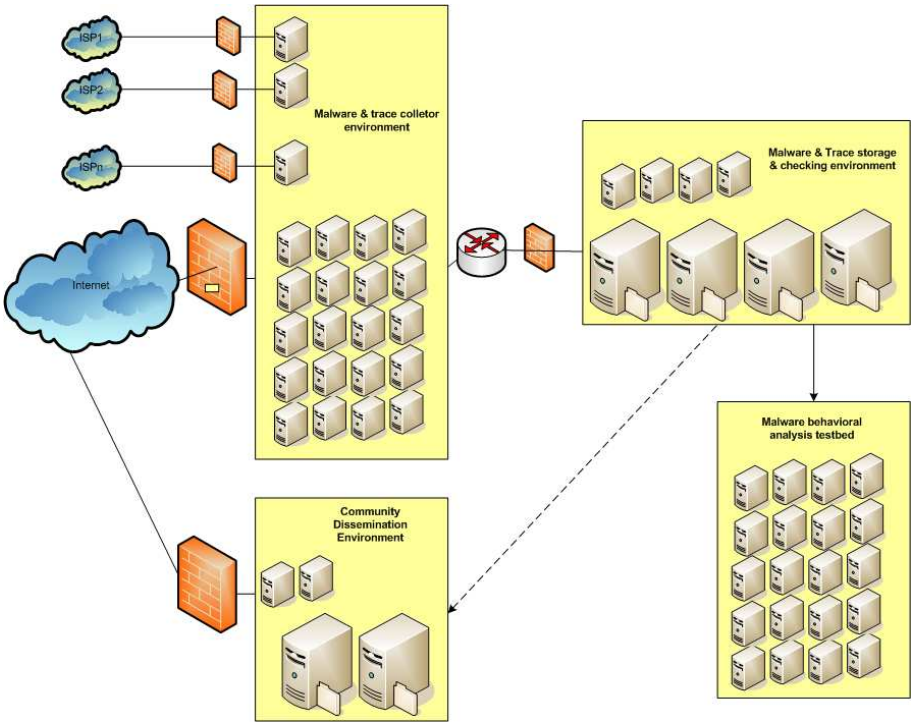


Figure 1: Architecture of the Network Telescope

3 Physical Infrastructure

In this chapter, we present more precisely the physical infrastructure deployed. We present the equipment and its physical implementation.

3.1 Material

In this section, we specify the equipment we chose and motivate our choices.

3.1.1 Specifications

Servers

For this kind of experiments, the CPU and its frequency was not the main factor for us. We were more concerned about heat production and electrical consumption. Actually, to run honeypots, we do not need much CPU or RAM. We estimated that 512 MB of RAM and two Virtual Machines (VM) per CPU core is a reasonable architecture. Thus, we opted for quad-core CPUs and 8 GB of RAM. In order to limit the heating and power consumption of our servers, we chose to select components with the label *Energy Smart*.

Our first choice was to pick Dell PowerEdge 1950 (PE1950) servers, because they only use one unit in racks. However, as we wanted at least 500 GB of hard disk, and as the PE 1950 can only accept up to two 2.5disk (up to 2x146 GB), we had to take Dell PowerEdge 2950 (PE2950) server, which uses two rack units, but can embed up to 8 disks. We filled it with six 146GB SAS 10K rpm hard drives. Moreover, these servers come with a *Perc 5/i SAS RAID card* and two network interfaces. For our experimentations, and in order to balance the network load between the different VMs, we wanted more than 2 network interfaces. Thus, we added a network card with two Gigabit network interfaces. To ensure reliability, we took a redundant power supply. Finally, we chose 5 years of on site warranty (Day+1), and put a floppy and DVD drive in each server, to ease the installation and diagnostic in case of problems.

In our market with Dell, these servers were identified in the 4th Category as the second configuration. The following table details the servers specification. The prices are those paid.

Designation	Quantity	Price
PowerEdge 2950 with redundant power supply	1	1 800 €
Bi processor Intel Xeon L5320 LV (1.86GHz)		
quad core 2x4Mo Energy Smart	1	410 €
8GB FB 667MHz (4x2GB dual rank DIMMs) Energy Smart		
No operating System		
Broadcom 2 Port TCP/IP Offload Engine (TOE) Not enabled		
3.5" 1.44MB Floppy Drive		
16x IDE CD/DVD	1	3,30 €
Riser with PCI Express support (2xPCIe x8 slots; 1xPCIe x4 slot)		
PE2950 Rapid/Versa Rails		
Perc E/i integrated SAS RAID x6 backplane		
2x146GB, SAS, 10K, 2.5inch, Internal	1	88 €
Additional Intel Pro 1000PT 2 Ports Gigabit	1	63,40 €
Additional 146GB, SAS, 10K, 2.5inch, Internal	4	726.40 €
Total		3 091,10 €
5 years on site (day+1) warranty		217,50 €
Total with warranty		3 308,60 €
Total with taxes		3 957.09 €

We ordered 13 such servers, which are dispatched as follows:

- 7 servers for the collect environment;
- 1 server for the storage environment;
- 5 servers for the analysis and test environment.

In order to store all the collected malwares and traces, we need a storage unit. We estimated that in a first phase of the project, a storage capacity of 3 to 4 To would be sufficient. We will adapt this capacity in the second phase of the project, and add a second storage unit for redundancy and data durability.

To meet these requirements, we chose a Dell PowerVault MD1000 unit, with the following specifications.

Designation	Quantity	Price
PowerVault MD 1000 SAS/SATA 3x 500 GB SATA II 7,2K rpm, 3,5 inch Internal Perc 5/e Card Rapid Rails External SAS connector cable 1m	1	2 100 €
Additional 500 GB SATA II 7,2K rpm, 3,5 inch	6	1 140 €
Total		3 240 €
5 years on site (day+1) warranty		298 €
Total with warranty		3 538 €
Total with taxes		4231,44 €

Initially, we only bought one unit. It uses 3 rack units. The Perc 5/e card that comes with the MD1000 is meant to be put in the PE2950 server which will operate it. One of the 6 500 GB hard drives is kept back as spare disk in case of failure of one of the 7 others. We plan to configure the MD1000 to use RAID 5, which gives us 3 To of storage capacity.

Network Components

In order to create the different networks and environments, we need several network components. The routers we need to connect to the network will be provided by the ISPs.

We need:

- one simple 24 ports switch at the output from the border router;
- one 24 ports switch with VLAN routing capabilities between the different collecting environment and the storage environment;
- one firewall to protect the storage environment;
- one simple 24 ports switch to connect the storage environment and the analysis environment.

We chose Cisco equipment. The following table describes the equipment we bought with our provider:

Designation	Quantity	Price
Catalyst 2960 24 10/100 + 2 1000BT LAN Base Image	2	1 036 €
MAJ soft + Exchange NBD / 3 years	2	60 €
Catalyst 3560 24 10/100/1000T + 4 SFP + IPB Image	1	1 916 €
MAJ soft + Exchange NBD / 3 years	1	278 €
ASA 5510 Security Plus Appl with SW, HA, 2GE + 3FE, 3 DES/AES	1	1 836€
MAJ soft + Exchange NBD / 3 years	1	826 €
2m CAT6 RJ45	25	48,50 €
3m CAT6 RJ45	25	64,25 €
10m CAT6 RJ45	2	13,88 €
Total without taxes		6 078,63 €
Total with taxes		7 270,04€

This command includes the network RJ45 cables that we needed to connect all the servers and network components. The Catalyst 3560 switch contains 4 optical connectors, which can be used to connect an optical fiber in case of relocation of the platform.

Racks and Related Components

In order to set up the platform, some racks and associated parts were necessary.

To begin with, as we will not operate the platform directly in the server room, we need to export the display. Originally, for security issues, to avoid any virus spreading from the telescope, we thought of using an analog export. But with such a solution, we are limited to 8 meters (theoretically 15 meters, but Dell is not selling any cable longer than 8 meters, as the quality with longer cables is not warranted). Therefore, we decided to go for a digital export via Ethernet on a dedicated RJ45 cable. This solution makes possible to export as far as RJ45 cables permit it, without the problem of signal degradation being as marked as with analog export. It also makes possible to have two sessions at the same time to operate the platform, which can be useful if several persons want to work on it at the same time. Concerning security issues, the data exported is only video information. The video signal coming out from the analog ouput from the servers is transcoded by the KVM switch and exported via Ethernet. There is no possible way any virus might spread over this RJ45 link, as the video switch act as a physical barrier. To operate the platform via this digital export, the client is mandatory a Windows machine with the proprietary client provided with the video switch.

If the platform is moved too far for an RJ45 cable to transport the video data, we will be able to use the fiber ports on the Cisco Catalyst 3560 switch to perform the export on a longer distance.

To meet these requirements and respect the public markets defined at INRIA, we chose the *KVM Digital switch 2161DS-2*. It makes possible to export the display of 16 servers over IP. Even if we do not have at the moment 16 servers in our platform, we ordered 16 cables to connect the servers to the switch, to avoid any trouble for further extensions.

The servers are meant to be integrated in racks. We had the choice between 42 and 24 units racks. Considering the number of devices we have to install, we chose to take *two 24 units racks* instead of one 42 units. This choice was also motivated by the fact that taking two racks permits to dish the weight out on the floor and not have all the weight concentrated in 1 m^2. Having two racks also gives us the opportunity to physically separate the collecting and storing/analysis environments, with minimum amount of cables going from one rack to the other one. Finally, as it is considered to move the platform for the second phase of the project, having two racks makes this move easier, as a 24 units rack is shorter (1,20 meters) and lighter than a 42 units rack (2 meters tall).

In order to connect all the devices to AC power supplies, we put Power Distribution Units (PDU) in the racks. As we have Energy Smart servers with redundant power supplies, we need low tension PDUs. the ones available in the market have 13 ports. Thus we took 2 for each rack for a total of *four Low Tension PDU 13 ports 16A 230V*. The PDUs come with a tri-phased connector to power supplies. As this kind of plug was not available in our building, we had to modify them so that they fit in our electrical infrastructure.

The following table shows the summary of this material:

Designation	Quantity	Price
KVM Digital switch 2161DS-2	1	1 974,40 €
Cable interface USB	16	691,20 €
24 units rack	2	1340 €
Low Tension PDU 13 ports 16A 230V	4	243,60 €
Total without taxes		4249,20 €
Total with taxes		5 082,04 €

Total

All these components have a total price of 68 025,70 € including taxes.

3.1.2 Characteristics

In this section, we will present the physical characteristics of each components as specified in their own documentation.

The size occupied by the equipment is delimited by the size of the 24 units racks. Such a rack has a width of 61cm, a depth of 100cm and a height of 120cm. That gives two times a floor surface of 0,6m^2. The weigh of such an empty rack is theoretically 108,9 Kg, even if it seems lighter in reality.

In the first rack, we have:

- 7 PE2950 servers
- 1 KVM switch
- 1 Cisco Catalyst 2960 switch

- 1 Cisco Catalyst 3560 switch
- 2 PDUs

Figure 2 shows the characteristics of this rack.

DELL™ Datacenter Capacity Planner Report

Rack

Name	Location	Height (U)	Weight (lbs)	Thermal (watts)	Amps @ 208V
Component Order		0	0.0	0.0	0.0
PowerEdge 2950 III - 2.5 in. drives	U1 - U2	2	63.9	339.9	1.63
PowerEdge 2950 III - 2.5 in. drives	U3 - U4	2	63.9	339.9	1.63
PowerEdge 2950 III - 2.5 in. drives	U5 - U6	2	63.9	339.9	1.63
PowerEdge 2950 III - 2.5 in. drives	U7 - U8	2	63.9	339.9	1.63
PowerEdge 2950 III - 2.5 in. drives	U9 - U10	2	63.9	339.9	1.63
PowerEdge 2950 III - 2.5 in. drives	U11 - U12	2	63.9	339.9	1.63
PowerEdge 2950 III - 2.5 in. drives	U13 - U14	2	63.9	339.9	1.63
PowerEdge 2161DS-2 digital KVM	15	1	8.0	27.0	0.13
16 amp, 230V PDU		0	3.4	0.0	0.0
Cisco 3560G-24TS	16	1	12.0	100.0	0.48
Cisco 2960-24TT-L	17	1	8.0	30.0	0.14
16 amp, 230V PDU		0	3.4	0.0	0.0
	Totals:	17	722.3	2536.4	12.19

Figure 2: First Rack Specifications

In the second rack, we have:

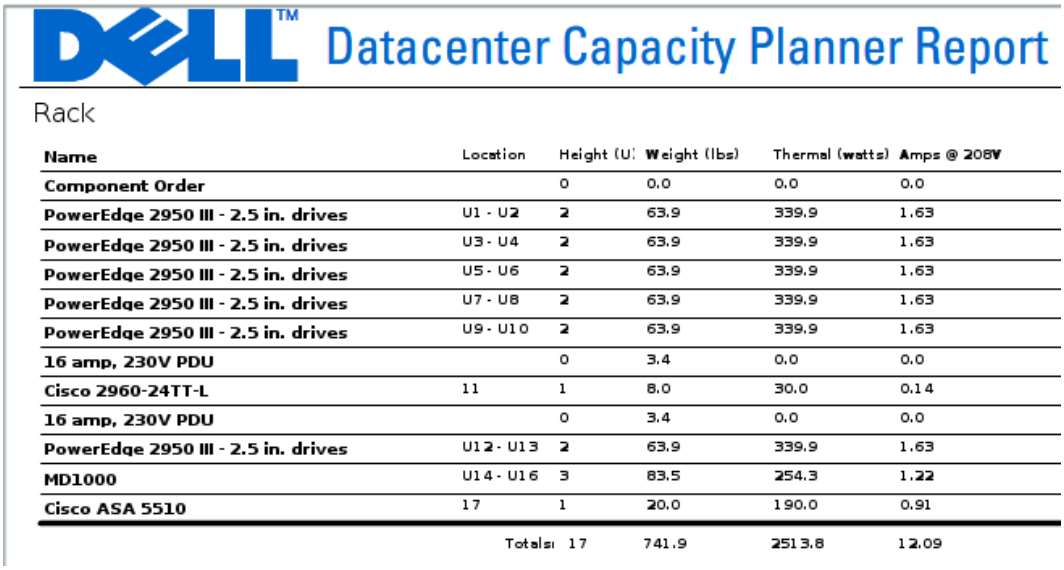
- 6 PE 2950 servers
- 1 MD1000 storage unit
- 1 Cisco Catalyst 2960 switch
- 2 PDUs

Figure 3 shows the characteristics of this rack.

This gives us one rack with 327,63 Kg and the second one with 336,52 Kg, for a total of 664,15 Kg. The thermal production of this material is 5 Kw/h for 24A for 208V electrical consumption.

3.2 Physical Implantation

In this section, we will present the physical implementation and the room in which the system is set.



Datacenter Capacity Planner Report

Rack

Name	Location	Height (U)	Weight (lbs)	Thermal (watts)	Amps @ 208V
Component Order		0	0.0	0.0	0.0
PowerEdge 2950 III - 2.5 in. drives	U1 - U2	2	63.9	339.9	1.63
PowerEdge 2950 III - 2.5 in. drives	U3 - U4	2	63.9	339.9	1.63
PowerEdge 2950 III - 2.5 in. drives	U5 - U6	2	63.9	339.9	1.63
PowerEdge 2950 III - 2.5 in. drives	U7 - U8	2	63.9	339.9	1.63
PowerEdge 2950 III - 2.5 in. drives	U9 - U10	2	63.9	339.9	1.63
16 amp, 230V PDU		0	3.4	0.0	0.0
Cisco 2960-24TT-L	11	1	8.0	30.0	0.14
16 amp, 230V PDU		0	3.4	0.0	0.0
PowerEdge 2950 III - 2.5 in. drives	U12 - U13	2	63.9	339.9	1.63
MD1000	U14 - U16	3	83.5	254.3	1.22
Cisco ASA 5510	17	1	20.0	190.0	0.91
	Totals:	17	741.9	2513.8	12.09

Figure 3: Second Rack Specifications

3.2.1 Servers Room

The servers room that was elected for the LHSI is Loria B111, which presents the advantage to be next to the MADYNES offices, already being assigned to our team. This room includes a telephonic distributor and all electrical connections required.

Like other rooms and offices, the B111 has an air conditioned system with a power of 2 Kw/h, which was not sufficient for the heat produced by our platform. An additional system of 5 Kw/h has been added to the room to meet our requirements.

To ensure the security of the room, all network plugs have been isolated from the Loria network, so that only LHSI networks are available in this room and only in this room. No connection is allowed between the Loria network and the IPs of the LHSI. The only way to access the servers and the platform, is to use the video export via the KVM switch, or to go physically in the room and branch a screen to a server. To ensure physical security, only dully authorized persons can access the room for operating the platform (Frederic Beck and Olivier Festor of the MADYNES team) or maintenance (1 card for the General Services for electricity and air conditioned maintenance, fire security). A biometric lock will be installed for the room, and cards will distributed only to the persons listed below. The biometric lock forbids people who have found or have been lent a card from accessing.

3.2.2 Racks and Weight Repartition

The floor is composed of a slab made of concrete and elevated floor. The elevated floor supports a charge of 800 Kg per m^2, but the stab has a limit between 300 and 400 Kg per m^2. to avoid troubles, the racks have been put on wood boards to evenly divide the weight on a larger area and on more posts (the ones elevating the floor).

For the same reason, the racks have been placed as shown in figure 4. Each one being side-by-side with a wall, to put the weight where the stab is the stronger.

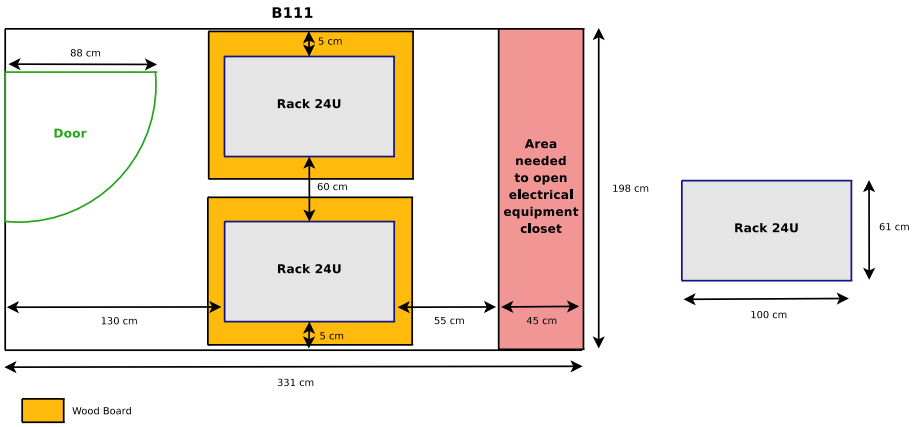


Figure 4: Physical Deployment in the Server Room

To export the display, we used two RJ45 cables of 10 meters each. The idea is to enable the access to the platform in two offices located next to the B111, namely the B113 and B115 offices. As shown in figure 5, the first cable is plugged in a network in the room B113, and the second one make a bridge between this same switch and the office B115.

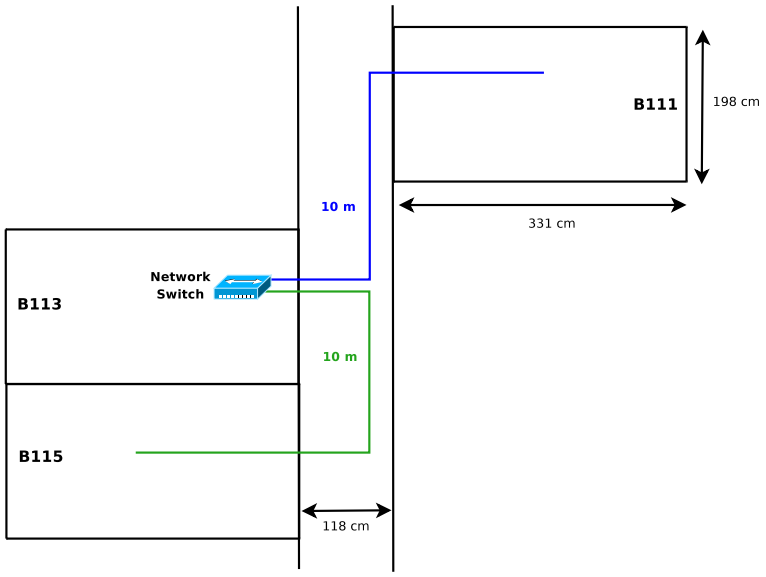


Figure 5: Video Export

4 Network Infrastructure

In this section, we will present the network infrastructure we deployed.

4.1 Network DSL Connections

The objective of the network telescope is to collect malwares and related information. We expect these data to be as realistic as possible. Using the university or INRIA network, both using Renater as ISP, would not provide the same results as users lambda would encounter at home, because the addresses are well known, and the traffic is highly filtered. The idea for the telescope was thus to get the same contract than home or professional users would.

We defined two scenarios:

- A compagny with a /24 network
- Several home users with generic DSL connections with 1 fixed public IP

To deploy these scenarios, we chose the following ISP and offers:

- 1 Home ADSL connection by Free [1]: Internet up to 25 Mb, 29,99 € per month.

[1] `http://adsl.free.fr`

- 1 Home ADSL connection by Neuf Telecom [2]: Internet Business ADSL Illimited up to 20 Mb, 14,90 € per month + 3 € per month for the modem.
- 1 Pro ADSL connection by Orange [3] equivalent to Home ADSL offers: Internet Pro 1 Mb, 1 address, 30.82 € per month + 49.33 € for buying the modem.
- 1 Pro SDSL connection by Orange with /24 network: Business Internet Solution 1 Mb, 256 addresses, 338 € per month + 457 € for the installation.

We will not give the public addresses that were assigned to the telescope, to avoid being put in blacklists by attackers. We are not interested in having high speed connections, we only need many public IP to run as many honeypots as possible.

At the moment, all connections are operational, except the Home ADSL from Neuf Telecom. The dedicated phone line has already been installed, and the inscription procedure is on its way.

4.2 Cabling

Figure 6 shows the network infrastructure deployed for the servers of the collecting environment.

On each server, 3 bridges are set:

bridge eth0 also named xenbr0, it is the bridge that Xen will use to provide public IPs to the VM running the Nepenthes honeypot

bridge eth1 also named xenbr1, it is the bridge that Xen will use to provide access to the private network for attacks logging and malware storage; it will be used by the VM running Nepenthes, the Nepenthes instance launch from Dom0 and the logging system for Argos honeypot instances

bridge eth2 also named br0, it is the bridge that Qemu will use to provide public IPs to the VM running the Argos honeypot

Each server will need at least 2 public IPs (one for xenbr0 and one for br0) plus 1 per VM running Nepenthes or Argos. These two bridges are connected to the Cisco Catalyst 2960 switch, which itself is connected to the router giving access to the Internet via the ISP network.

The bridge xenbr1 is used to access the storage network. The Argos logging system and the Nepenthes instance run from Xen Dom0 will access directly this bridge and do not need a dedicated IP, whereas each running instance of Nepenthes will have its own private IP address.

The network interface eth3 will not be bridged. It will be connected directly on ADSL modems to give access to the Home ADSL connections. As we have only 3 such contracts,

[2] `http://offres.neuf.fr/adsl_pro/adsl-pro-accueil/adsl-pro-offres-adsl-services-disponibles.html`
[3] `http://www.orange.fr/`

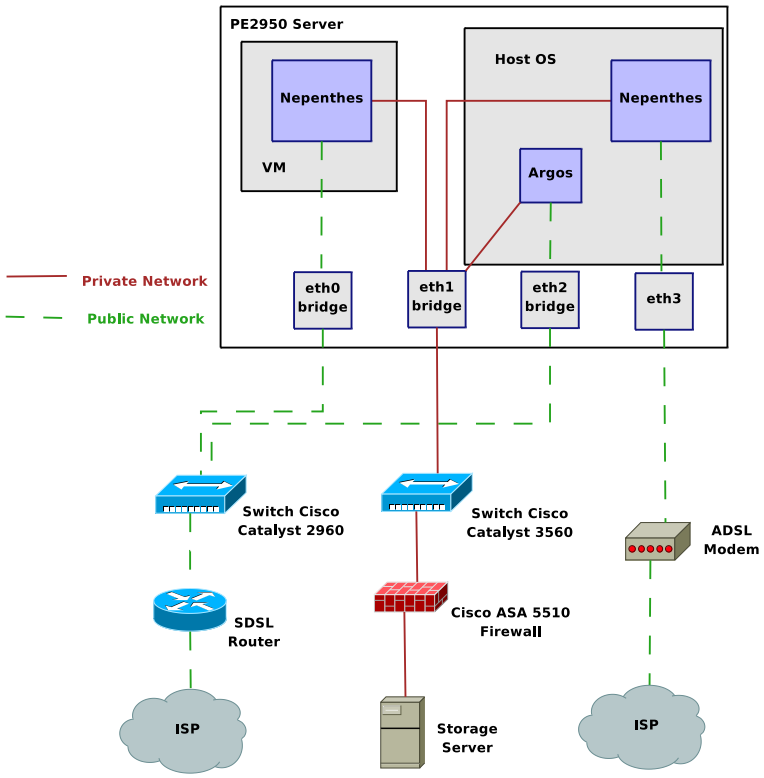


Figure 6: Network Infrastructure (Collecting Environment)

this interface will be used on only 3 servers. The honeypot for these connections will be instanciated directly from Xen Dom0, which is why the interface does not need to be bridged, the ISP only giving one public IP per connection.

Figure 7 shows the network infrastructure deployed for the servers of the analysis environment.

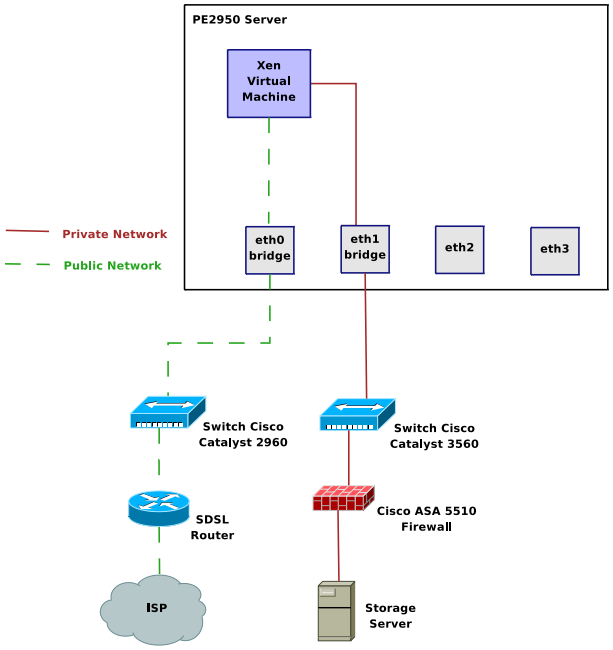


Figure 7: Network Infrastructure (Analysis environment)

In this environment, interfaces eth2 and eth3 are not used, unless they are explicitely required for dedicated analysis. In the same way that for the collecting environment, the xenbr0 bridge is used to connect the VM to the Internet, whereas xenbr1 is used to connect to the storing environment.

In this case, each server needs at least one public IP, and one per running VM.

13 PE2950 servers are connected. The cabling is expressed by using the convention <equipment name>-<physical interface>, the physical interface being expressed by following the constructors convent:

Cisco Catalyst 3560 - arcanine a network switch to connect the servers operating the collect environment to the logging server

- arcanine-24 - zubat-2

Cisco Catalyst 2960 - meowth a network switch to connect all servers from the platform to the Internet

- meowth-1 - SDSL router

Cisco Catalyst 2960 - zubat a network switch to connect the analysis environment servers to the logging server and the Internet

- Cisco ASA-SPD0 - zubat-1
- zubat-13 - meowth-11

Cisco ASA 5510 - arbok the firewall protecting the storage enrivonment from infection from the collecting or analysis environments

- Cisco ASA-SPD0 - arcanine-24

dialga the main logging and storage server, connected to the PowerVault MD1000 storage unit

- Gb1 - meowth-10
- Gb2 - Cisco ASA SPD1

pikachu used in the analysis environment

- Gb1 - zubat-2
- Gb2 - zubat-14

jigglypuff used in the analysis environment

- Gb1 - zubat-3
- Gb2 - zubat-15

mankey used in the analysis environment

- Gb1 - zubat-4
- Gb2 - zubat-16

geodude used in the analysis environment

- Gb1 - zubat-5
- Gb2 - zubat-17

nidoran used in the analysis environment

- Gb1 - zubat-6
- Gb2 - zubat-18

psyduck used in the collecting environment

- Gb1 - meowth-2
- Gb2 - arcanine-2

bulbasaur used in the collecting environment

- Gb1 - meowth-3
- Gb2 - arcanine-3

squirtle used in the collecting environment

- Gb1 - meowth-4
- Gb2 - arcanine-4

charmander used in the collecting environment

- Gb1 - meowth-5
- Gb2 - arcanine-5

onix used in the collecting environment

- Gb1 - meowth-6
- Gb2 - arcanine-6

togepi used in the collecting environment

- Gb1 - meowth-7
- Gb2 - arcanine-7

mew used in the collecting environment

- Gb1 - meowth-8
- Gb2 - arcanine-8

4.3 Logical Infrastructures

All hosts in the different environments have access to both the Internet, and a private network used for attacks logging:

- The collecting environment has access to the Internet in order to collect the malwares, and to the private network for logging issues;
- The storage environment has access to the Internet for reporting and software updates and to the private network to be accessible to the other environments;
- The analysis environment has access to the storage environment to retrieve the data to be analysed and to the Internet for the experiments.

Figure 8 gives an overview of the architecture deployed.

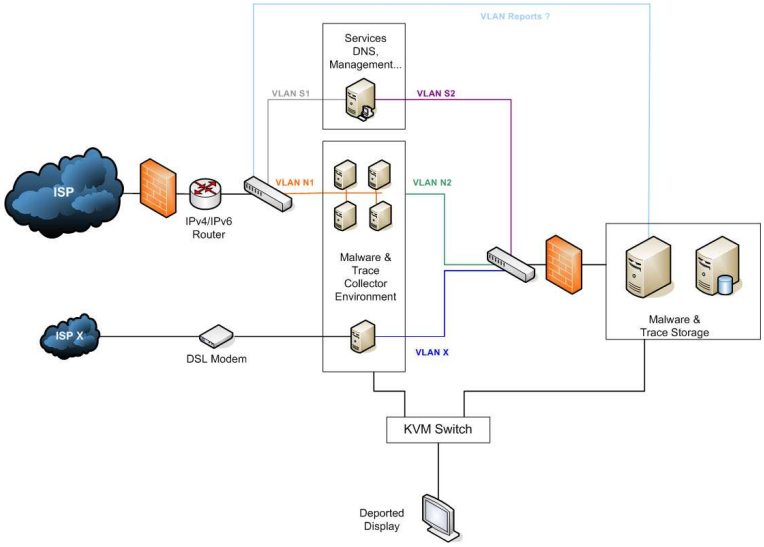


Figure 8: Network Architecture Overview

4.3.1 Private Network

To address this network, we decided to use a private addressing based on the network *10.1.0.0/16*. Each server is assigned a /24 network *10.1.X.Y/24* where X is the server Id and Y the VM/sensor ID, $Y = 1$ identifying the Dom0. We separated this network in two parts, to ease the definition of the access lists (ACL) protecting the storage environment:

10.1.0.0/17 Used for the analysis and the storage environment

10.1.128.0/17 Used for the collecting environment

The storage environment will be physically separated from the other ones via a dedicated port on a switch or firewall, and logically (one IP address or subnet reserved). The servers in the collecting environment have more rights to access the storage environment than the ones in the analysis one, as they have to log the attacks in the logging server and remotely copy the captured binaries, whereas the analysis environment may be executed by a virus which could infect the logging server if it is not well isolated.

This gives us the following addressing scheme:

dialga 10.1.1.0/24, the logging server will thus be identified by the address 10.1.1.1

pikachu 10.1.2.0/24

jigglypuff 10.1.3.0/24

mankey 10.1.4.0/24

geodude 10.1.5.0/24

nidoran 10.1.6.0/24

psyduck 10.1.128.0/24

bulbasaur 10.1.129.0/24

squirtle 10.1.130.0/24

charmander 10.1.131.0/24

onix 10.1.132.0/24

togepi 10.1.133.0/24

mew 10.1.134.0/24

We have kept the 7 to 127 identifiers reserved in case of an extension of the analysis environment

The subnet *10.1.255.0/24* is dedicated to the network components. We will create a virtual interface in each of them with an IP in this subnet. This interface will be used for remote connections to the device. The addressing plane for this subnet is:

Cisco 2960 collecting environment meowth with IP 10.1.255.2

Cisco 3560 collecting environment arcanine with IP 10.1.255.3

Cisco ASA 5510 arbok with IP 10.1.255.4

Cisco 2960 analysis environment zubat with IP 10.1.255.5

4.3.2 VLANs

In order to separate as much as possible the different environments, we user VLANs. Figure 9 shows the deployment of these VLANs in our infrastructure.

We used 4 different VLANs:

VLAN 180 used to give Internet access to the storage server in order to get sandboxing results and send reports

VLAN 183 used to separate the private and public networks

VLAN 184 used to give Internet access to the analysis environment

VLAN 185 used to give Internet access to the collect environment

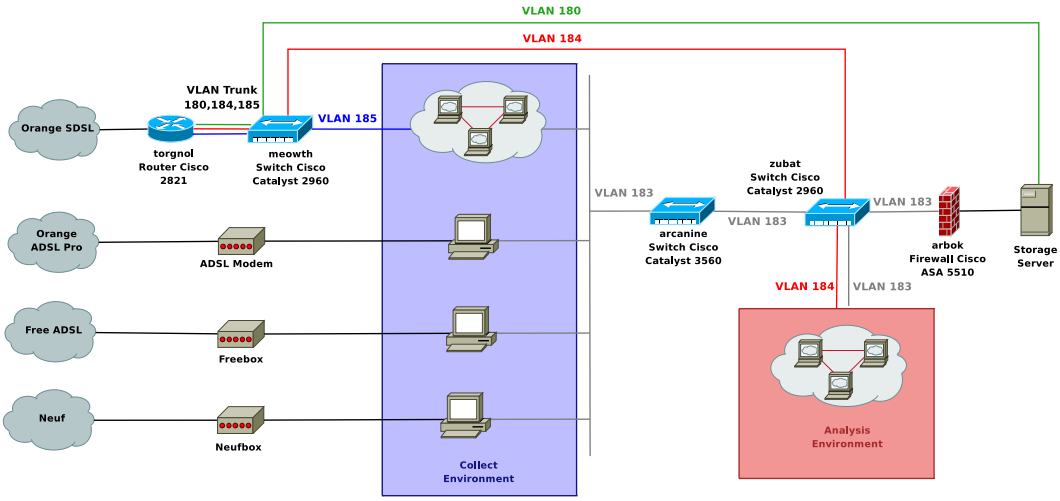


Figure 9: VLANs Deployment

We separate all environments to ensure that they do not interfer with each other. They are deployed on the switches as follows:

meowth
- VLAN 180 on port 10
- VLAN 184 on port 9
- VLAN 185 on all other ports
- A trunk on port 1 to the router

arcanine All ports on VLAN 183

zubat
- VLAN 183 on ports 1 to 12
- VLAN 184 on ports 13 to 24

Between the *meowth* switch and the *torgnol* router, we set up a VLAN trunk for VLANS 180, 184 and 185. The router has one virtual interface dedicated to each VLAN, and thus a dedicated subnet for each vlan. The router also takes care of the traffic routing for all these VLANs.

4.3.3 Firewalling

In our achitecture, firewalls enter in action at different levels.

Cisco ASA 5510 - arbok

First of all, we have the Cisco ASA 5510 hardware firewall. It protects the storage environment from the collect and analysis environments. Its default policy is to drop every packet which is not explicitely permitted. It works in transparent mode, as we don't have routing on our private network. Figure 10 shows the architecture and cabling of this firewall. The firewall interfaces are expressed as *SPDx* where x is the physical slot identifier.

Separation between the collect and analysis environments is ensured by the usage of VLANS. The rules applied on the firewall are shown in figure 11.

Local Firewall on Storage Server

To add more security and redundancy in the firewalling, we added a local firewall on the storage server. It has been set by using NetFilter/iptables. The script is automatically launched at startup, and is located at */etc/init.d/local_firewall.sh*. The default behavior is to drop all packet that do not match a rule to explicitely permit it. Usual protections at kernel level are also set in this script (Bogus ICMP error messages, ping broadcast, SYN cookies attack...). Finally, no packet is allowed to be forwarded by the storage server.

The applied rules are:

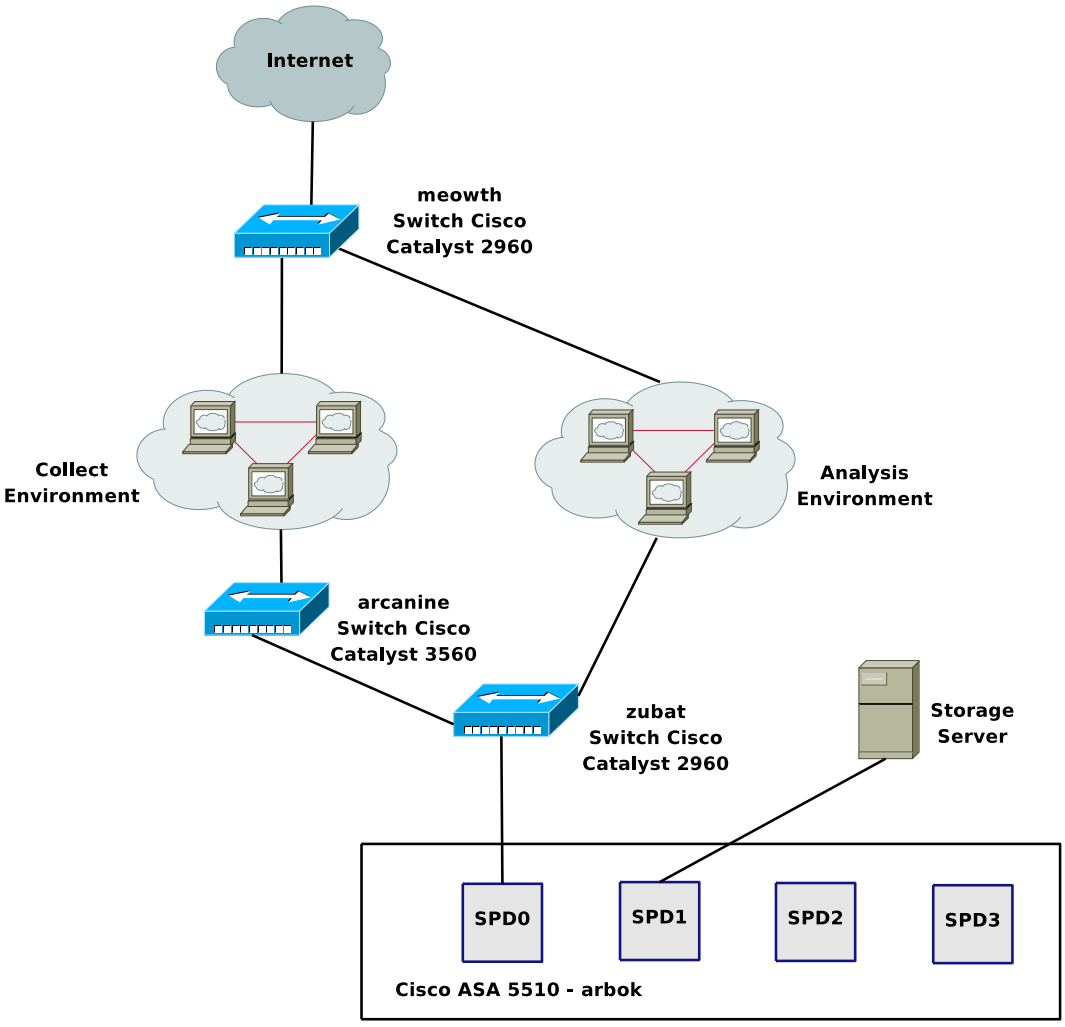


Figure 10: Transparent Firewall

#	Rule Enabled	Action	Source Host/Network	Destination Host/Network	Rule Applied To Traffic	Interface	Service
1	☑	✔	10.1.1.1	10.1.0.0/16	incoming	dialga	ip
1	☑	✔	10.1.0.0/16	10.1.1.1	incoming	collect	icmp
2	☑	✔	10.1.128.0/17	10.1.1.1	incoming	collect	Group:postgre...
3	☑	✔	10.1.128.0/17	10.1.1.1	incoming	collect	ssh/tcp
4	☑	✔	10.1.128.0/17	10.1.1.1	incoming	collect	domain/tcp
5	☑	✔	10.1.128.0/17	10.1.1.1	incoming	collect	domain/udp
6	☑	✔	10.1.129.1	10.1.1.1	incoming	collect	555/udp
7	☑	✔	10.1.128.1	10.1.1.1	incoming	collect	9556/udp
8	☑	✔	10.1.130.1	10.1.1.1	incoming	collect	9557/udp
9	☑	✔	10.1.131.1	10.1.1.1	incoming	collect	9558/udp
10	☑	✔	10.1.132.1	10.1.1.1	incoming	collect	9559/udp
11	☑	✔	10.1.133.1	10.1.1.1	incoming	collect	9560/udp
12	☑	✔	10.1.134.1	10.1.1.1	incoming	collect	9561/udp

Figure 11: Firewall Rules

```
root@dialga:~
% /etc/init.d/local_firewall.sh status
Chain INPUT (policy DROP)
target     prot opt source               destination
ACCEPT     all  --  anywhere             anywhere
ACCEPT     icmp --  anywhere             anywhere            icmp echo-reply
ACCEPT     icmp --  anywhere             anywhere            icmp echo-reply
ACCEPT     icmp --  anywhere             anywhere            icmp echo-request
ACCEPT     icmp --  anywhere             anywhere            icmp echo-request
ACCEPT     all  --  anywhere             anywhere            state RELATED,ESTABLISHED
ACCEPT     all  --  anywhere             anywhere            state RELATED,ESTABLISHED
ACCEPT     udp  --  10.1.128.0/17        dialga.lhsi.loria.fr udp spts:1024:65535 dpt:domain
                                                             state NEW
ACCEPT     tcp  --  10.1.128.0/17        dialga.lhsi.loria.fr tcp spts:1024:65535 dpt:domain
                                                             state NEW
ACCEPT     tcp  --  10.1.128.0/17        dialga.lhsi.loria.fr tcp spts:1024:65535 dpt:www
                                                             state NEW
ACCEPT     tcp  --  10.1.128.0/17        dialga.lhsi.loria.fr tcp spts:1024:65535 dpt:https
                                                             state NEW
ACCEPT     tcp  --  10.1.128.0/17        dialga.lhsi.loria.fr tcp spts:1024:65535 dpt:ssh
                                                             state NEW
```

```
ACCEPT     tcp  --  10.1.128.0/17       dialga.lhsi.loria.fr tcp spts:1024:65535 dpt:postgresql
                                                             state NEW
ACCEPT     udp  --  psyduck.lhsi.loria.fr  dialga.lhsi.loria.fr udp spts:1024:65535 dpt:9556
                                                             state NEW
ACCEPT     udp  --  bulbasaur.lhsi.loria.fr  dialga.lhsi.loria.fr udp spts:1024:65535 dpt:555
                                                             state NEW
ACCEPT     udp  --  squirtle.lhsi.loria.fr  dialga.lhsi.loria.fr udp spts:1024:65535 dpt:9557
                                                             state NEW
ACCEPT     udp  --  charmander.lhsi.loria.fr  dialga.lhsi.loria.fr udp spts:1024:65535 dpt:9558
                                                             state NEW
ACCEPT     udp  --  onix.lhsi.loria.fr   dialga.lhsi.loria.fr udp spts:1024:65535 dpt:9559
                                                             state NEW
ACCEPT     udp  --  togepi.lhsi.loria.fr  dialga.lhsi.loria.fr udp spts:1024:65535 dpt:9560
                                                             state NEW
ACCEPT     udp  --  mew.lhsi.loria.fr    dialga.lhsi.loria.fr udp spts:1024:65535 dpt:9561
                                                             state NEW
ACCEPT     tcp  --  hobbes.loria.fr      anywhere            tcp spts:1024:65535 dpt:ssh
                                                             state NEW
ACCEPT     tcp  --  hobbes.loria.fr      anywhere            tcp spts:1024:65535 dpt:www
                                                             state NEW
ACCEPT     tcp  --  icius.loria.fr       anywhere            tcp spts:1024:65535 dpt:ssh
                                                             state NEW
ACCEPT     tcp  --  icius.loria.fr       anywhere            tcp spts:1024:65535 dpt:www
                                                             state NEW

Chain FORWARD (policy DROP)
target     prot opt source               destination

Chain OUTPUT (policy ACCEPT)
target     prot opt source               destination
ACCEPT     all  --  anywhere             anywhere
Chain PREROUTING (policy ACCEPT)
target     prot opt source               destination

Chain POSTROUTING (policy ACCEPT)
target     prot opt source               destination

Chain OUTPUT (policy ACCEPT)
target     prot opt source               destination
Chain PREROUTING (policy ACCEPT)
target     prot opt source               destination
```

```
Chain INPUT (policy ACCEPT)
target     prot opt source               destination

Chain FORWARD (policy ACCEPT)
target     prot opt source               destination

Chain OUTPUT (policy ACCEPT)
target     prot opt source               destination

Chain POSTROUTING (policy ACCEPT)
target     prot opt source               destination
```

5 Hardware and Operating Systems

In this section, we will present the hardware configuration and operating systems (OS) installation on the PE2950 servers and the MD1000 storage unit.

5.1 PowerEdge 2950 storage and PowerVault MD1000

5.1.1 PE2950

BIOS

At boot, enter the BIOS by pressing *F2*. Set up the date and time to the local time. We enable Virtualization, even if we do not plan to use it at the moment on this host. As we only have SAS disks, we deactivated the SATA ports. The floppy drive has been removed from the boot sequence which only contains the IDE CDROM drive and the Hard Drives in this precise order.

Integrated RAID controller

At the boot, we enter the RAID controllers configuration utility by pressing *ctrl+r*, and choosing the Perc 6/i integrated RAID controller. We have 6 SAS disks of 146 GB each for a total raw capaciy of 876 GB. We create a RAID 5 volume with these 6 disks to obtain a capacity of 730 GB.

Operating System

We decided to install a Linux OS based on the Debian distribution. To do so, we used the Debian testing i386 (32 bits) CD image generated on May 5th, 2008.

We performed a "server-like" installation by putting each important directory of the hierarchy in a separate partition. As we have a lot of space only dedicated to the logging server (the data itself will be stored on the MD1000 unit), we decided to spend a lot of space in order to ensure that even in case of trouble, we will not make the OS crash. The partitions created are as follows:

```
Disk /dev/sda: 731GB
Sector size (logical/physical): 512B/512B
Partition Table: msdos

Number  Start   End     Size    Type      File system  Flags      Mounting point
 1      32,3kB  65,8MB  65,8MB  primary   fat16
 2      65,8MB  2221MB  2155MB  primary   fat32        boot, lba
 3      2221MB  12,2GB  10,0GB  primary   ext3                    /
 4      12,2GB  366GB   354GB   extended
 5      12,2GB  22,2GB  10,0GB  logical   ext3                    /var
 6      22,2GB  32,2GB  10,0GB  logical   ext3                    /usr
```

```
 7      32,2GB  52,2GB  20,0GB  logical   ext3                    /opt
 8      52,2GB  62,2GB  10,0GB  logical   ext3                    /tmp
 9      62,2GB  162GB   100GB   logical   ext3                    /home
10      162GB   166GB   3997MB  logical   linux-swap
11      166GB   366GB   200GB   logical   ext3                    /backup
```

The partition */backup* will be used to store copies of all the important data, namely the database without the binaries and all configuration files to not lose all the data in case the MD1000 crashes. After partitioning, we have 364.6 GB of free space left.

We followed the installation process by configuring the first Ethernet interface to use DHCP and selecting the Graphical Environment and Base System to be installed in tasksel.

Networking and Kernel

After the installation had succeed, the system was booting on a 2.6.24-1 kernel. However, this kernel does not support the integrated Ethernet controller. The *lspci* command tells us that it is a Broadcom Corporation NetXtreme II BCM5708 Gigabit Ethernet card. This card requires the module *bnx2* to work. However, due to non respect of the Debian requirements in terms of GNU software, this module was removed from the Debian version of the 2.6.24 kernel, which explains why it was not working.

A modified version of this driver has been added again in the 2.6.25 kernel, which we installed. Unfortunately, it was not working either, as the associated firmware for this card was not available.

Under the Debian unstable distribution, a new package has been added in the *non-free* section. It is called *firmware-bnx2*. It contains the Broadcom NetXtremeII 5706 firmware for the Linux kernel version 2.6.25. Thus, by installing the following packages, we can have the latest kernel version with the onboard Ethernet controller working.

```
root@dialga:~
% apt-get install linux-image-2.6.25-2-686-bigmem linux-headers-2.6.25-2-686-bigmem firmware-bnx2
```

Thus, we chose the 2.6.25 kernel. As we have 8 GB of RAM and a 32 bits OS, we chose the kernel variant with the PAE option (Physical Address Extension) enabled to support these 8 GB. As shown earlier, we have installed the kernel version *2.6.25-2-686-bigmem*. This kernel also recognizes the 2x4 cores of our two CPUs, as shown in the result of the command *linux_logo*:

```
root@dialga:~
% linux_logo


        _sudZUZ#Z#XZo=_         DDDD   EEEEEE BBBB   IIIIII  AAAA   NN   NN
     _jmZZ2!!~---~!!X##wa       DD DD  EE     BB BB    II   AA  AA  NNN  NN
   .<wdP~~            -!YZL,    DD  DD EEEEE  BBBBB    II   AAAAAA  NNNN NN
```

```
  .mX2'       _%aaa__     XZ[.   DD DD  EE     BB  BB   II   AA  AA  NN NNNN
  oZ[      _jdXY!~?S#wa   ]Xb;   DDDD   EEEEEE BBBBB  IIIIII AA  AA  NN   NN
 _#e'     .]X2(     ~Xw|  )XXc
.2Z`      ]X[.       xY|  ]oZ(   Linux Version 2.6.25-2-686-bigmem
.2#;      )3k;     _s!~   jXf`   Compiled #1 SMP Thu Jun 12 17:11:59 UTC 2008
 1Z>      -]Xb/    ~    __#2(    Eight 1,86GHz Intel Pentium Xeon Processors, 8GB RAM
 -Zo;       +!4ZwaaaauZZXY'      29788 Bogomips Total
  *#[,        ~-?!!!!!!-~       dialga
   XUb;.
    )YXL,,
      +3#bc,
        -)SSL,,
           ~~~~~
```

Securing

In order to minimize the attacks possible against the server, we deactivated all unused or potentially dangerous services:

- ident has been disabled in inetd.conf
- portmap has been removed from the system
- avahi-daemon has been removed from the system
- cupsys has been removed from the system

The only open ports are SSH for remote connection to the server, and HTTP for remote connection to the logging server WEB interface.

To ensure that the host has not been compromised, we installed a root kit detection tool, *rkhunter*. It is executed daily and sends email reports to the local root, which we redirected to the address *lhsi.reports@gmail.com* via an alias. To do so, the local MTA has been reconfigured to send emails as an Internet site.

5.1.2 MD1000

The MD1000 storage unit contains 9 SATA disks of 500 GB each for a total raw capacity of 4,5 TB. These disks are installed in the slots 06 to 14. To configure the RAID volume, we need to use the second RAID controller on the PE 2950 server.

To do so, we entered again the RAID configuration utility at boot, but this time we chose the second RAID controller, the Perc 6/e, which is connected via an SAS cable to the MD1000. The controller can handle different RAID levels:

RAID 0 Striped set without parity

RAID 1 Mirrored set without parity

RAID 5 Striped set with distributed parity

RAID 6 Striped set with dual parity

RAID 10 Mirrored sets in a striped set

RAID 50 Stripe across distributed parity RAID systems

RAID 60 Stripe across dual parity RAID systems

We aim at having at least 3 TB of disk space in our RAID volume, and have a minimum of security. The levels 0, 1, 10, 50 and 60 are thus directly eliminated. We have to choose between RAID 5 and RAID 6.

RAID 5 supports only 1 drive failure, and the capacity of one disk is lost for the parity. RAID 6 uses a dual parity system to prevent the failure of a second disk during the rebuilding of the volume after a failure. however, it uses two disks for the parity distribution, and introduces a significant delay in the writing operations compared to RAID 5 due to the dual parity calculation.

As our data sets are not vital, we opted for RAID 5. Nevertheless, we configured the disk with id 06 as a global hot-spare, which means that the RAID volume will be automatically rebuilt using this disk in case or failure. The RAID volume is thus composed of 8 drives for a capacity of 3,5 TB. After the volume initialisation (from 8 to 48 hours, will consume the same time in case of failure), 3,18 TB are available for the OS.

MD1000 partitioning

By default, the msdos partition table is used. This allows to create partitions of 1,3 TB maximum. We would have to create 3 partitions to use the whole disk. It could be interesting, as it would allow us to separe the nepenthes binaries/argos dumps, the network traces and the database. However, as it is hard to predict the capacity required by each of them, we prefer to use only one partition. The solution would be to create a LVM (Logical Volume Manager) with these 3 partitions. But as this adds more complexity to our architecture, we used the partition tool *GNU parted* instead of *cfdisk*.

This tool permits to use another partition table named *GUID Partition Table (GPT)*, which does not have the same limits than the msdos partition type, and allows to create a partition of 3 TB or more. To create our partition of 3,18 TB we proceeded as follows:

```
root@dialga:~
% parted /dev/sdb
GNU Parted 1.7.1
Using /dev/sdb
Welcome to GNU Parted! Type 'help' to view a list of commands.
(parted) mklabel gpt
(parted) mkpart
  Partition name? md1000
```

```
  File system type? reiserfs
  Start? 0
  End? 3497GB
(parted) p

Disk /dev/sdb: 3497GB
Sector size (logical/physical): 512B/512B
Partition Table: gpt

Number  Start   End     Size    File system  Name    Flags
 1      17,4kB  3497GB  3497GB  reiserfs     md1000

(parted)
```

We chose the *reiserfs* file system rather than *ext3* because, even if there are more tools available to manipulate ext3, it checks the file system every 30 mounts, which implie a long delay of start up in case of crash. Opting for reiserfs ensures a faster boot, and does not compromise data integrity.

After creating the filesystem, we have one reiserfs aprtition of 3,18 TB mounted as */data*. It will contain the database, nepenthes and argos binaries and the network traces.

To ensure a minimum of redundancy, the database will be replicated in the /backup partition on the logging server.

5.2 PowerEdge 2950 collect and anaslysis

The installation is the same than for the Operating System on the logging server.

5.3 KVM 2161DS-2 Switch

A KVM switch (with KVM being an abbreviation for Keyboard, Video or Visual Display Unit, Mouse) is a hardware device that allows a user to control multiple computers from a single keyboard, video monitor and mouse. We have a *KVM 2161DS-2* device connected to all our servers. This device exports the keyboard, video and mouse over an IP network. It allows two remote connections at the same time.

In this section, we present the configuration of this device.

5.3.1 Network

Even if the KVM switch acts as a physical barrier between the collect/analysis/storage environments and the network on which the video data is exported, we decided to separe this network from the Loria one, to avoid any possible mistake. We have a separated Ethernet cable going from the servers room to the office that will operate the platform.

We set up a private network using the prefix *192.168.1.0/24*. In this network, the switch has the address *192.168.1.1*. At the moment, only one computer is connected. Its name is *sloth* and has the IP *192.168.1.2*.

For sloth to access the KVM switch, we need to configure the network address in the switch. To do so, we connect a computer to the switch via a console cable (configuration 9600 bps 8N1 with no flow control). By following the menus, we can set the IP address of the switch and set the password for the administrator, the user *Admin* (case sensitive).

The KVM switch detects automatically the connected servers, and is now accessible via our private network.

5.3.2 Access and Configuration

The KVM switch can be accessed by 3 different ways:

- A Java Windows client
- A Java Linux client
- a WEB interface

The web interface is available via both operating systems. The java client authenticates the user into the switch and then launches this web interface.

When using the java client, we must first add the KVM switch thanks to its IP address into the database. We can then connect and rename the different servers to identify them with their hostnames and not a generated serial number. By selecting a server, a new java window is created with the exported display. As we have Xorg servers running on our servers, the quality of the exported display under Windows is poor. Thus, we will use the Linux Java client and the web interface. This solution gives a better result in terms of video quality and speed.

We added a user *madynes* with password dfg1DFG with user priviledges to access the servers without reconfiguring the switch.

To connect to the switch, use the Java Linux client and connect the switch with its address *192.168.1.1*, or use the WEB interface under Linux at the URL `http://192.168.1.1`, and identify ourself with the users Admin or madynes.

6 Softwares

In this section we will present the different softwares we installed in our infrastrusture.

6.1 Logging Server

6.1.1 Overview

The logging server we used is part of the Surfnet SurfIDS [4] project. SURFids is an open source Distributed Intrusion Detection System based on passive sensors. The goal is to provide an early warning system which lets system administrators correlate known and unknown exploits to attacks directed towards their networks. Figure 12 shows the architecture of this project.

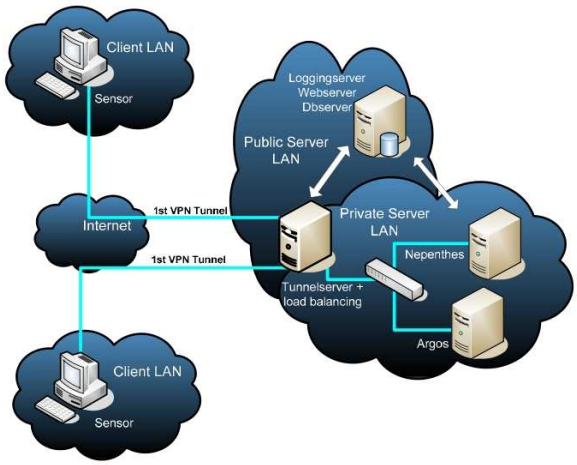


Figure 12: Surfnet IDS Architecture

This approach is composed of:

- The logging server working with a web and database server to store and display information about the captured malwares
- Sensors acting as transparent bridges between the client network and the tunnel/honeypot server
- The tunnel/honeypot server which creates tunnels to the sensors to operate them and collect the reports, that it redirects to the logging server

[4] `http://ids.surfnet.nl`

- Third party honeypots such as nepenthes or argos which have been modified to log into the logging server

In our infrastructure, we are only interested in the logging server and its interaction with third party honeypots.

6.1.2 SurfIDS Logserver

The logging server consists of 2 parts, the database and a webinterface. The database is used to store the analysis information from the honeypots. This information is presented to the users by a webinterface. The webinterface is used to keep track of the logging, but also the sensor status information. A secondary function of this server is the ability to send mails in response to the logging that is received.

Several features of the webinterface are:

- Attack information
- Downloaded binary information
- Logging export to the Intrusion Detection Message Exchange Format (IDMEF) [1]
- Remote control for the sensors
- Traffic monitor
- Advanced search engine for textual and graphical logging

Installation

In this section, we present the installation procedure for SurfIDS Logserver by basing ourselves on the tutorial available at `http://ids.surfnet.nl/wiki/doku.php?id=docs:2.00:log_server:install`

First we will need to install the necessary packages. Note that it uses an old version (8.1) of the postgresql database server (current is 8.3). Compatibility with the latest version is not ensured yet, which is why we use this old one.

```
apt-get install postgresql-8.1 libclass-dbi-pg-perl perl php4 libapache2-mod-php4 \
  libfreetype6 libpq4 php4-common php4-gd php4-pgsql apache2 libphp-phplot        \
  libmime-lite-perl libgnupg-perl libmail-pop3client-perl libio-socket-ssl-perl   \
  sudo libapache2-mod-auth-pgsql libmime-perl subversion
```

Then, we need to tune the postgresql installation in order to move the database on the /data partition on the storage unit:

```
root@dialga:/var/lib/postgresql/8.1
% mkdir -p /data/postgresql
root@dialga:/var/lib/postgresql/8.1
% /etc/init.d/postgresql-8.1 stop
Stopping PostgreSQL 8.1 database server: main.
root@dialga:/var/lib/postgresql/8.1
% mv main/ /data/postgresql/
root@dialga:/var/lib/postgresql/8.1
% ln -s /data/postgresql/main/ /var/lib/postgresql/8.1
root@dialga:/var/lib/postgresql/8.1
% ll
total 0
lrwxrwxrwx 1 root root 22 mai 13 14:06 main -> /data/postgresql/main/
root@dialga:/var/lib/postgresql/8.1
% /etc/init.d/postgresql-8.1 start
Starting PostgreSQL 8.1 database server: main.
```

Next we get the source of the SURF IDS package from SVN.

```
root@dialga:~
% mkdir -p surfIDS/logserver
root@dialga:~
% svn checkout http://svn.ids.surfnet.nl/surfids/2.0/logserver/branches \
    surfIDS/logserver
```

We launch the installation

```
root@dialga:~
% cd surfIDS/logserver/
root@dialga:~/surfIDS/logserver
% ./install_log.pl
Creating /etc/surfnetids/:                                    [OK]
Creating /opt/surfnetids/:                                    [OK]
Copying surfnetids files:                                     [OK]
Adding crontab rule for getsandbox.pl:                        [info]
Adding crontab rule for mailreporter.pl:                      [info]
Restarting cron:                                              [OK]
Setting up apache2 configuration:                             [OK]
Enabling SURFids site for apache2:                            [OK]
Enabling Auth_PGSQL for apache2:                  [Failed (error: 256)]
```

The apache module auth_pgsql is not present even if we installed it. This is due to a trailer in the module name on the system. We must create the appropriate link manually and relaunch the installation:

```
e
root@dialga:~/surfIDS/logserver
% ln -s /etc/apache2/mods-available/000_auth_pgsql.load \
    /etc/apache2/mods-enabled/auth_pgsql.load
root@dialga:~/surfIDS/logserver
% ./install_log.pl
SURFnet IDS logging server already installed:                    [info]
Overwrite old installation? [y/n]: y
Copying surfnetids files:                                        [OK]
Restarting cron:                                                 [OK]
Creating backup of surfnetids-log-apache.conf:                   [OK]
Setting up apache2 configuration:                                [OK]
Enabling SURFids site for apache2:                               [OK]
Enabling Auth_PGSQL for apache2:                                 [OK]
Restarting the apache2 server:                                   [OK]
```

The installation will create a fresh database, as we don't have a database and the required users yet. We will use the default options:

```
Do you want to install or upgrade the database? [install/upgrade]: install
Enter the connecting database user [postgres]:
Enter the IP address of the database host [localhost]:
Enter the connection port of the database host [5432]:
Enter the name of the database [idsserver]:
Enter the name of the web user [idslog]:

Creating SURFnet IDS database [idsserver]:                       [OK]
```

After this, the installer will continue to create and configure the database. You will be asked for a password for the user which is used to configure the database. That is the password for postgres which is not needed. Just press enter if you are using the postgres user. We will use the same password than the root password on the computer:

```
Creating webinterface database user [idslog]:                    [info]
Entrez le mot de passe pour le nouvel rôle :
Entrez-le de nouveau :
Creating webinterface database user [idslog]:                    [OK]

Creating nepenthes database user [nepenthes]:                    [info]
Entrez le mot de passe pour le nouvel rôle :
Entrez-le de nouveau :
Creating nepenthes database user [nepenthes]:                    [OK]

Creating p0f database user [pofuser]:                            [info]
```

```
Entrez le mot de passe pour le nouvel rôle :
Entrez-le de nouveau :
Creating p0f database user [pofuser]:                              [OK]

Creating argos database user [argos]:                              [info]
Entrez le mot de passe pour le nouvel rôle :
Entrez-le de nouveau :
Creating argos database user [argos]:                              [OK]
```

Finally, the database will be filled with the necessary tables.

```
Creating SURFnet IDS tables:                                       [OK]

Enter the IP address or hostname of the tunnel server here.

Tunnel server FQDN or IP (example: tunnelserver.surfnet.nl): 10.1.1.1
Server hostname/IP address:                                  [10.1.1.1]
Is this correct? [y/n]: y

Adding necessary records to the database:                          [OK]
```

This will insert the nepenthes SQL functions in the database and download the latest GeoIP database which is used for identifying the originating location of IP addresses.

```
Do you want to install the nepenthes SQL functions? [Y/n]: Y
Installing the nepenthes SQL functions:                            [OK]

Do you want to download the latest GeoIP database? [y/n]: y
Downloading GeoIP database:                                        [info]
--2008-05-13 15:42:32--
    http://www.maxmind.com/download/geoip/database/GeoLiteCity.dat.gz
Résolution de www.maxmind.com... 67.15.94.80
Connexion vers www.maxmind.com|67.15.94.80|:80...connecté.
requête HTTP transmise, en attente de la réponse...200 OK
Longueur: 17507302 (17M) [application/x-gzip]
Saving to: /opt/surfnetids/GeoLiteCity.dat.gz

100%[==================================>] 17 507 302   596K/s   in 43s

2008-05-13 15:43:17 (397 KB/s) -  /opt/surfnetids/GeoLiteCity.dat.gz
    sauvegardé [17507302/17507302]


Unzipping GeoIP database:                                          [OK]
```

```
Installing GeoIP database:                                    [OK]
Cleaning up the temporary files:                              [OK]
Building surfnetids-log.conf configuration file:              [OK]
```

Finally, the installation is complete. Check out the crontab to enable things like mail-logging and history stats generation. Then, we can procceed to the configuration fo the server.

```
####################################
# SURFnet IDS installation complete #
####################################

Interesting configuration files:
  /etc/crontab
  apache2 config files

Still needs configuration:
  /etc/surfnetids/surfnetids-log.conf
  /opt/surfnetids/webinterface/.htaccess

For more information go to http://ids.surfnet.nl/
```

Web interface available at `http://10.1.1.1/surfnetids/`

Configuration

Logging server crontab

After the installation of the logging server, a few lines have been added to the crontab.

```
25 6 * * * root /opt/surfnetids/scripts/getsandbox.pl >/dev/null
1 * * * * root /opt/surfnetids/scripts/mailreporter.pl >/dev/null
```

The mailreporter.pl script is used to send the email alerts that are configured by users in the webinterface. Run this script once each hour.

The getsandbox.pl script is used to retrieve the emails from the different sandboxes about uploaded binaries.

We will add RRD script that will generate the figures in the web interface:

```
root@vm-logging-server:~
% apt-get install librrds-perl
root@vm-logging-server:~
% mkdir /var/lib/rrd
root@vm-logging-server:/opt/surfnetids/webinterface
% mkdir /var/www/mimetemp
```

During the deployment of the prototype, we encountered a few problems with the built-in scripts. We modified them to work in our infrastructure. We need to get the modified /opt/surfnetids/scripts from the prototype server and copy the required ones:

```
root@dialga:~/prototype/scripts
% cd /opt/surfnetids/scripts/
root@dialga:/opt/surfnetids/scripts
% mv getsandbox.pl getsandbox.pl.orig
root@dialga:/opt/surfnetids/scripts
% cp /root/prototype/scripts/getsandbox.pl .
root@dialga:/opt/surfnetids/scripts
% cp /root/prototype/scripts/rrd_* .
root@dialga:/opt/surfnetids/scripts
% cp /root/prototype/scripts/tnfunctions.inc.pl .
```

We also need the /etc/surfnetids and copy the tunnel config file. We need to edit this file and set the postgresql password and address of the logserver (10.1.1.1).

```
root@dialga:~/prototype/config
% cp surfnetids-tn.conf /etc/surfnetids/
```

Now we can add the two following lines in /etc/crontab

```
*/5 * * * * root /opt/surfnetids/scripts/rrd_traffic.pl >/dev/null
*/5 * * * * root /opt/surfnetids/scripts/rrd_serverinfo.pl >/dev/null
```

Logging server configuration

The logging server configuration file is located at /etc/surfnetids/surfnetids-log.conf

The only thing you need to configure here is the password for the idslog user that needs to connect to the database. The default user is idslog as chosen at installation.

```
########################
# Database connection #
########################

# User info for the logging user in the postgresql database
$c_pgsql_pass = "enter_password_here";
$c_pgsql_user = "idslog";
```

Specify the IP the postgresql server is listening to.

```
# Postgresql database info
$c_pgsql_host = "10.1.1.1";
$c_pgsql_dbname = "idsserver";
```

This is the location of the phplot library. The default value for this variable is the default location on a debian system if phplot was installed with apt-get.

```
# Location of the phplot.php library
$c_phplot = "/usr/share/phplot/phplot.php";
```

This file is contained in the libphp-phplot package. By default, the version 5.0.5-1 is installed, but does not contain that file. We must install the version 4.4.6+5.0rc1.dfsg-0.1

```
root@dialga:~
% apt-get install libphp-phplot=4.4.6+5.0rc1.dfsg-0.1
root@dialga:~
% ll /usr/share/phplot/phplot.php
-rw-r--r-- 1 root root 143K nov 10  2006 /usr/share/phplot/phplot.php
```

Configure other features:

```
# Enable or disable the help popups in the webinterface
$c_showhelp = 1;

# Enable or disable the download option of binaries in the webinterface
$c_download_binaries = 1;

# Hide/show SURFnet specific functions (SOAP stuff).
$c_surfnet_funcs = 1;

# The starting day of the week modifier.
# If this is 0, Sunday is the first day of the week
# If this is 1, Monday is the first day of the week
# Etc
$c_startdayofweek = 1;
```

Enabling p0f fingerprinting results to be shown in the webinterface. We will need to install the p0f-db program in the sensors, in order to fingerprint the attackers OS.

```
######################
# TCP Fingerprinting #
######################
# Enable p0f TCP fingerprinting results to be shown in the webpage.
# Also requires p0f to be enabled at the tunnel server.
$c_enable_pof = 1;
```

This setting will enable/disable the geolocation data to be shown in the web interface.

```
#######################
# GeoIP Location Info #
#######################
# Enable GeoIP location database to enable source IP country identification.
$c_geoip_enable = 1;
```

To make it work we will need to enable a google map key for the site and add it in the configuration.

Finally, we enable argos.

```
#########
# Argos #
#########
# Enable Argos.  0 = OFF, 1 = ON
$c_enable_argos = 1;
```

RSS .htaccess file

In the /opt/surfnetids/webinterface/ directory is a .htaccess file, which controls access to the rssfeed.php module, and has to be configured.

```
<Files rssfeed.php>
AuthUserFile /dev/null
AuthName "Authenticate RSS"
AuthType Basic
AuthBasicAuthoritative Off
Auth_PG_host localhost
Auth_PG_port 5432
Auth_PG_user idslog
Auth_PG_pwd enter_database_pass_here
Auth_PG_database idsserver
Auth_PG_hash_type MD5
Auth_PG_pwd_table login
Auth_PG_uid_field username
Auth_PG_pwd_field password

Require valid-user
</Files>
```

PostgreSQL

We need to configure the postgresql daemon to accept connections from given hosts and addresses. As we already said, the network chosen for the logging infrastructure is 10.1.0.0/16. We will thus accept connections for the users idslog, nepenthes, argos and pofuser, created at the installation of the logserver, for this network in the file /etc/postgresql/8.1/main/pg_hba.conf

```
# TYPE  DATABASE    USER        CIDR-ADDRESS          METHOD

# "local" is for Unix domain socket connections only
local   all         all                               ident sameuser
# IPv4 local connections:
host    all         all         127.0.0.1/32          md5
# IPv6 local connections:
host    all         all         ::1/128               md5

# For surfnetIDS
host    idsserver       idslog          10.1.0.0/16   md5
host    idsserver       nepenthes       10.1.0.0/16   md5
host    idsserver       argos           10.1.0.0/16   md5
host    idsserver       pofuser         10.1.0.0/16   md5
```

But this is not sufficient, as by default, postgresql listens to the localhost interface only. Thus, we have to modify /etc/postgresql/8.1/main/postgresql.conf to make the daemon listen also to the address given to the host in the private network dedicated to the logging environment, 10.1.1.1.

```
#---------------------------------------------------------------------------
# CONNECTIONS AND AUTHENTICATION
#---------------------------------------------------------------------------

# - Connection Settings -

listen_addresses = '10.1.1.1,localhost'# what IP address(es) to listen on;
# comma-separated list of addresses;
# defaults to 'localhost', '*' = all
port = 5432
```

After postgresql restart, everything is ready and configured. We can now connect to `http://10.1.1.1/surfnetids` with the default user/password admin/admin (needs to be changed).

By default, the postgresql server limits the number of conections to 100. As we are planning to deploy more than 100 sensors and each of them needs at least 2 connections to the server, we need to parameter differently the server. This limitation is due to limitations in the host kernel. By default, the Linux kernel limits the shared memory allowed per application to 32Mb. In order to support more than 100 connections, we need to tune this parameter, and set the size of the whole shared memory to 2097152 pages [5]. To do so, use the commands:

[5] `http://www.postgresql.org/docs/8.2/static/kernel-resources.html#SYSVIPC`

```
$ sysctl -w kernel.shmmax=134217728
$ sysctl -w kernel.shmall=2097152

OR

$ echo 134217728 >/proc/sys/kernel/shmmax
$ echo 2097152 >/proc/sys/kernel/shmall
```

Add these values in */etc/sysctl.conf* to make sure these settings will be applied after the server is rebooted.

Then we can set the *max_connections* parameter in *postgresql.conf* to 300 and restart the service.

6.1.3 Mail reporting

The logserver will send on a daily basis a mail report to the address *lhsi.reports@gmail.com*. To do so, we need to install a few more packets and configure the reporting in the configuration file.

We need to install the prerequisites:

```
root@dialga:/opt/surfnetids/scripts
% apt-get install libemail-address-perl libnet-dns-perl libnet-xwhois-perl
```

Get the modules Net::Abuse::Utils and Net::Whois::IP and install them

```
root@dialga:/opt/surfnetids/scripts
% wget http://search.cpan.org/CPAN/authors/id/M/MI/MIKEGRB/Net-Abuse-Utils-0.07.tar.gz
root@dialga:~/files/mailreport
% wget http://search.cpan.org/CPAN/authors/id/B/BS/BSCHMITZ/Net-Whois-IP-1.04.tar.gz
```

Untar and compile the modules

```
root@dialga:~/files/mailreport
% cd Net-Whois-IP-1.04/
root@dialga:~/files/mailreport/Net-Whois-IP-1.04
% perl Makefile.PL
root@dialga:~/files/mailreport/Net-Whois-IP-1.04
% make
root@dialga:~/files/mailreport/Net-Whois-IP-1.04
% make install
root@dialga:~/files/mailreport/Net-Abuse-Utils-0.07
% cd ../Net-Abuse-Utils-0.07/
root@dialga:~/files/mailreport/Net-Abuse-Utils-0.07
% perl Makefile.PL
```

```
root@dialga:~/files/mailreport/Net-Abuse-Utils-0.07
% make
root@dialga:~/files/mailreport/Net-Abuse-Utils-0.07
% make install
```

Then create a report via the WEB interface as shown in figure 13.

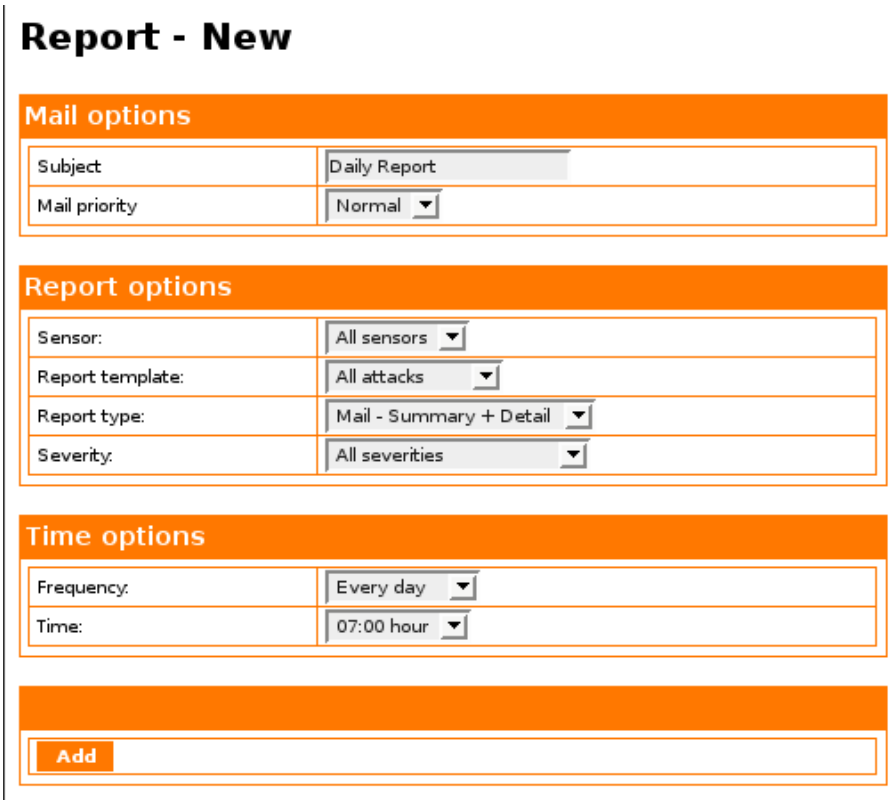


Figure 13: Daily Mail report

Then, simply add a crontab entry for the script *mailreporter.pl*

```
root@dialga:/opt/surfnetids/scripts
% vim /etc/crontab
00 * * * * root /opt/surfnetids/scripts/mailreporter.pl >/dev/null
```

Such a report looks like:

```
From: surfnetids@dialga.lhsi.loria.fr
To: root@localhost
Subject: [SURFids] Daily Report
Date: Sun, 14 Sep 2008 07:01:02 +0200
X-Mailer: MIME::Lite 3.021 (F2.76; T1.23; A2.03; B3.07_01; Q3.07)

Mailreport generated at 14-09-2008 07:01:01
Results from 13-09-2008 07:01:01 till 14-09-2008 07:01:01

######### Summary #########
Possible malicious attack: 29653
Malicious attack: 2559
Malware offered: 2680
Malware downloaded: 2342
```

6.1.4 RRD scripts

Two scripts are available for the tunnel server, monitoring the system resources: free disk space, CPU/memory/network usage. These two scripts, *rrd_traffic.pl* and *rrd_serverinfo.pl*, have been modified to work with the logserver. They are stored with the other scripts in */opt/surfnetids/scripts*.

To maintain the info up-to-date, we placed them in a crontab:

```
root@dialga:~
% cat /etc/crontab
*/5 * * * * root /opt/surfnetids/scripts/rrd_traffic.pl >/dev/null
*/5 * * * * root /opt/surfnetids/scripts/rrd_serverinfo.pl >/dev/null
```

Figure 14 shows some sample graphs generated with this script.

6.1.5 Google Map

As we activate the GeoLocalisation Module, we can use the Googlemap API to display these information on a world map. To do so, we need to get a googlemap API key by using one of the Gmail accounts created for the LHSI.

Go to `http://www.google.com/apis/maps/` and enter `http://10.1.1.1/surfnetids/` as path to access the WEB interface. Login with the account and put the key given in */etc/surfnetids/surfnetids-log.conf*.

The attackers localisation is shown in a world map, as shown in figure 15.

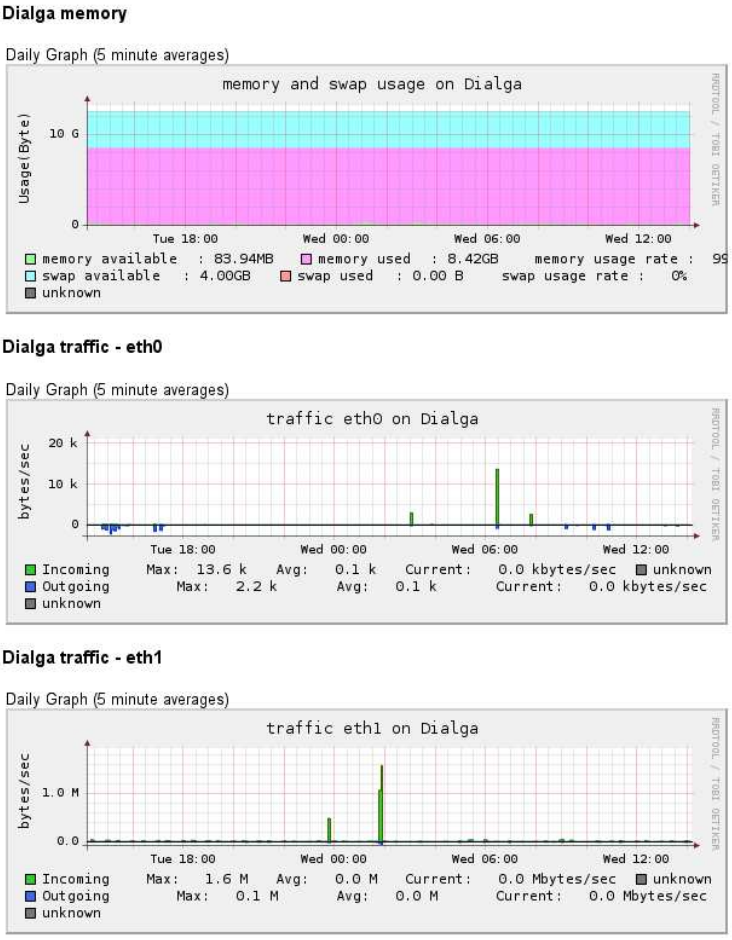


Figure 14: Network and Memory Usage Graphs

Figure 15: Attackers Geolocalisation

6.1.6 Antivirus analysis

All the binaries are stored in the logserver in the directory */var/lib/nepenthes/binaries*. To enable antivirus analysis, we need to tune that feature in the configuration file */etc/surfnetids/surfnetids-tn.conf*.

The analysis is performed with the script */opt/surfnetids/scripts/scanbinaries.pl* from the tunnel server. It is put in a crontab entry to execute it everyday at 03:00 (the binaries are copied at 23:59):

```
00 03 * * * root /opt/surfnetids/scripts/scanbinaries.pl >/dev/null
```

ClamAV

We simply need to install the ClamAV tool and its update engine Freshclam, which are available as debian packages:

```
root@dialga:~/surfIDS/tunserver
% apt-get install clamav-daemon clamav clamav-freshclam
```

BitDefender

Get it from `http://download.bitdefender.com/SMB/Workstation_Security_and_Management/BitDefender_Antivirus_Scanner_for_Unices/Unix/Current/EN/Version_7.x/Linux/`.

Download the file *BitDefender-scanner-7.5-4.linux-gcc3x.i586.tar.run* and execute it, by using the directory */opt/* for the installation target.

Install the dependencies

```
root@dialga:~
% apt-get install libstdc++5
```

We can check that it works with

```
root@dialga:~/files/antivirus/BitDefender
% bdscan --version
BitDefender Antivirus Scanner v7.60825 Linux-i686
Copyright (C) 1996-2006 Softwin SRL. All rights reserved.
```

BitDefender is not set by default in the logserver. We need to add it manually in the table *scanners* of the table *idsserver*. We need to provide the following data:

```
Command: bdscan --files !bindir!/!file! | grep !file! | awk '{print $3}'
Update: bdscan --update
Version: bdscan --info | head -n1 | sed -e 's/.*(v.*) .*/^A/'
```

This is done with the SQL command

```
INSERT INTO scanners (name, command, update, status, version, vercommand) \
  VALUES ('BitDefender', 'bdscan --files !bindir!/!file! | grep !file! | \
  awk \'{print $3}\'', 'bdscan --update', '1', '7.60825', 'bdscan --info | \
  head -n1 | sed -e \'s/.*(v.*) .*/^A/\'') ;
```

We need now to enter the license key by editing the file *vim /opt/BitDefender-scanner/etc/bdscan.conf*.

Kaspersky

Get Kaspersky Anti-Virus for Linux Workstations from `http://www.kaspersky.com/productupdates?chapter=146274389=`.
Download the file *kav4ws_5.7-17_i386.deb*. Install it:

```
root@dialga:~/files/antivirus/Kaspersky
% dpkg -i kav4ws_5.7-17_i386.deb
```

Leave the license file empty and continue with the default options. Then enter the license key file manually with:

```
root@dialga:~/files/antivirus/Kaspersky
% /opt/kaspersky/kav4ws/bin/kav4ws-licensemanager -a \
  /root/files/antivirus/Kaspersky/03A5FD00.key
```

```
Kaspersky license manager for Linux. Version 5.7.13/RELEASE #19
Copyright (C) Kaspersky Lab, 1997-2007.
Portions Copyright (C) Lan Crypto
Key file /root/files/antivirus/Kaspersky/03A5FD00.key has been successfully
 registered
```

Then we need to update the entry in the table *scanners* in the database to specify the right path:

```
idsserver=# UPDATE scanners SET command = '/opt/kaspersky/kav4ws/bin/kav4ws-kavscanner \
  !bindir!/!file! | grep !file! | tail -n1 | awk \'{print $NF}\'' where id='6';
UPDATE 1
idsserver=# UPDATE scanners SET update = '/opt/kaspersky/kav4ws/bin/kav4ws-keepup2date' \
  WHERE id='6';
UPDATE 1
idsserver=# UPDATE scanners SET vercommand='/opt/kaspersky/kav4ws/bin/kav4ws-kavscanner -v' \
  WHERE id='6';
UPDATE 1
idsserver=#  SELECT id,name from scanners where id='6';
 id |   name    |
----+-----------+
  6 | Kaspersky |
(1 ligne)
```

Free avast! Linux Home Edition

There is no professional edition of this antivirus for Linux. There is only a home edition at `http://www.avast.com/eng/avast-for-linux-workstation.html`. It is specified that *Institutions (even non-commercial ones) are not allowed to use avast! Linux Home Edition.* Thus we can not use it.

Avira AntiVir Professional

`http://www.avira.com/en/onlineshop/index.html?id_categ=1`

F-PROT Antivirus for LINUX / BSD Workstations

`http://www.f-prot.com/products/prices/price_unix_ws.html`

Conclusion

Finally, we did not install neither Antivir, nor F-Prot. We deployed ClamAV, Kaspersky and BitDefender. Figure 16 show the result of the *scanbinaries.pl* script.

Malware Downloaded All Period: 1 day(s) From: 15-09-2008 00:00 Until: 16-09-2008 00:00

Malware Downloaded

Malware	BitDefender	Kaspersky	ClamAV	Stats
7d99..	Backdoor.Padobot.Z	Net-Worm.Win32.Padob...	Worm.Padobot.M	256
3875..	Backdoor.RBot.F	Backdoor.Win32.Rbot.bni	Worm.Allaple-306	81
3228..	Backdoor.SDbot.DFNQ	Backdoor.Win32.Rbot.bqj	Trojan.SdBot-4763	71
f5fb..	Backdoor.Rbot.BNI	Backdoor.Win32.Rbot.bni	Worm.Allaple-313	56
9520..	Win32.Worm.Allaple.Gen	Net-Worm.Win32.Allap...	Worm.Allaple-223	47
eb90..	Backdoor.SDBot.DFOA.Dam	Backdoor.Win32.Rbot.bqj	Trojan.Mybot-10186	46
e3d9..	Backdoor.SDBot.DFOA.Dam	Backdoor.Win32.Rbot.bqj	Trojan.Mybot-10186	40
47c4..	Win32.Worm.Allaple.Gen	Virus.Win32.Virut.n	Worm.Allaple-223	34
69ff..	Backdoor.Bot.37932	Virus.Win32.Virut.n	W32.Virut.Gen.C-22	30
fd28..	Backdoor.SDbot.DFNQ	Net-Worm.Win32.Kolab...	Trojan.SdBot-4763	30
847c..	Worm.Generic.23197	Net-Worm.Win32.Kolab...	Trojan.IRCBot-2534	26
f4a2..	Backdoor.SDbot.DFNQ	Backdoor.Win32.Rbot.bqj	Trojan.SdBot-4763	25
d977..	Backdoor.PoeBot.IE	Virus.Win32.Virut.n	W32.Virut.ci	24
a2bf..	Backdoor.SDbot.DFNQ	Backdoor.Win32.Rbot.bqj	Trojan.SdBot-4763	18
4a56..	Win32.Worm.Allaple.E	Virus.Win32.Virut.n	Worm.Allaple-2	15
8170..	Backdoor.SDBot.DFOA.Dam	Backdoor.Win32.Rbot.bqj	Trojan.Mybot-10186	14
1313..	Backdoor.Bot.37932	Trojan-Proxy.Win32.S...	Trojan.SdBot-8490	12
98eb..	Backdoor.SDbot.DFNQ	Backdoor.Win32.Rbot.kez	Trojan.SdBot-4763	11
14a0..	Backdoor.SDbot.DFNQ	Backdoor.Win32.Rbot.bqj	Trojan.SdBot-4763	11
e269..	Backdoor.SDbot.DFNQ	Backdoor.Win32.Rbot.bqj	Trojan.SdBot-4763	8

Figure 16: Binaries Scanning Results

6.2 Low Interaction Honeypots

6.2.1 Nepenthes

In this section, we will present the Nepenthes [6] honeypot basing us on its documentation at `http://nepenthes.mwcollect.org/documentation:readme`.

What is Nepenthes?

Nepenthes is a low interaction honeypot like honeyd or mwcollect. Low Interaction Honeypots emulate known vulnerabilities to collect information about potential attacks. Nepenthes is designed to emulate vulnerabilties worms use to spread, and to capture these worms. As there are many possible ways for worms to spread, Nepenthes is modular. There are module interfaces to:

- resolve dns asynchronous
- emulate vulnerabilities
- download files
- submit the downloaded files
- trigger events (sounds abstract and it is abstract but is still quite useful)
- shellcode handler

[6] `http://nepenthes.mwcollect.org/`

How does Nepenthes work ?

Nepenthes vulnerability modules require knowledge about weaknesses so one can draft a Dialogue how the virus will exploit the weakness, gain the needed information to download the file and send the attacker just enough information he does not notice he gets fooled.

On the other hand Nepenthes is quite usefull to capture new exploits for old vulnerabilities.

As Nepenthes does not know these exploits, they will appear in the logfiles.

By running these captures against a real vulnerable machine one can gain new information about the exploit and start writing an Nepenthes Dialogue.

How will it be used ?

Instances of nepenthes will be deployed in Virtual Machines. We will use Xen as described in section 6.3. In the following, we will name Dom0 the host OS, DomU or VM the guest domain on which we will install nepenthes, xenbrO and xenbr1 the network bridges created in the host OS to give access to the network to the VMs, and eth0 and eth1 the interfaces in the VM or DomU.

Installation

To benefit from all the latest features of nepenthes, we installed the subversion version. In this section, we will present our installation as an howto.

The first step is to install and then remove the debian package to create the system user and group and other required parameters:

```
root@psyduck:~/
% apt-get install nepenthes
root@psyduck:~/
% apt-get remove --purge nepenthes
root@psyduck:~/
% mkdir -p /var/lib/nepenthes/binaries
root@psyduck:~/
% mkdir -p /var/lib/nepenthes/hexdumps
root@psyduck:~/
% chown -R nepenthes:nepenthes /var/lib/nepenthes
```

Get the sources from subversion:

```
svn checkout https://svn.mwcollect.org/nepenthes/trunk/ nepenthes
cd nepenthes
```

Install the dependencies:

```
apt-get install  libcurl3-dev libmagic-dev libpcre3-dev libadns1-dev \
  libpcap0.8-dev libcurl3-openssl-dev libcurl3=7.15.5-1etch1  postgresql-dev \
  libcap-dev autoconf automake1.9 autotools-dev libtool bison flex \
  postgresql-client-8.1 g++ make gcc gcc-4.1 gcc-4.3 gcc-3.4
```

Create the configure script and run it:

```
autoreconf -v -i --force
root@vm-nepenthes-client:~/nepenthes-svn
./configure --enable-postgre --with-postgre-lib=/usr/lib/postgresql/ \
  --with-postgre-include=/usr/include/postgresql/  --enable-pcap --disable-ipq \
  --disable-static --enable-shared --includedir=/usr/include --prefix=/usr/local \
  --libdir=/usr/local/lib/
```

Build and install nepenthes:

```
root@psyduck:~/honeypots/nepenthes
% make
root@psyduck:~/honeypots/nepenthes
% make install
```

Sandboxing Patch

Out of the box (SVN), Nepenthes does not work correctly with both the Norman sandbox and cwsandbox. A patch can be found at `http://ids.surfnet.nl/wiki/doku.php?id=kb:googlemap_norman`. It will patch Nepenthes so that submission to CWSandbox and Norman both work again.

```
root@psyduck:~
% cd honeypots/nepenthes/modules/submit-norman/
root@psyduck:~/honeypots/nepenthes/modules/submit-norman
(reverse-i-search)‘’: tail -f /var/log/nepenthes.log
root@psyduck:~/honeypots/nepenthes/modules/submit-norman
% patch -p1 < ./submit-norman.hpp.patch
root@psyduck:~/honeypots/nepenthes/modules/submit-norman
% make
root@psyduck:~/honeypots/nepenthes/modules/submit-norman
% make install
root@psyduck:~/honeypots/nepenthes/modules/submit-norman
% /etc/init.d/nepenthes restart
```

Configuration

nepenthes.conf
Set the module and module lib directories

```
    moduledir               "/usr/local/lib/nepenthes";
    moduleconfigdir         "/usr/local/etc/nepenthes";
```

Use the submit-file to store locally the downloaded binaries and submit-norman to send the binaries to the sandbox

```
// submission handler
    "submitfile.so",                "submit-file.conf",             ""
    "submitnorman.so",              "submit-norman.conf",           ""
```

Enabled postgresql support

```
// load the sql handler
  "sqlhandlerpostgres.so",          "",                             ""
```

And the log-surfnet module to store the info in the database on the logserver

```
// logging
    "logdownload.so",               "log-download.conf",            ""
    "logsurfnet.so",                "log-surfnet.conf",             ""
```

Specifiy /var for logging

```
    logmanager
    {
ring_logging_file "/var/log/nepenthes.%d.log";
file_logging_file "/var/log/nepenthes.log";
    };
```

Edit the other info that need to be changed in order to save the files:

```
    submitmanager
    {
        strictfiletype              "0";
        // where does submit-file write to? set this to the same dir
        filesdir                    "/var/lib/nepenthes/binaries/";
    };


    utilities
    {
hexdump_path                "/var/lib/nepenthes/hexdumps/";
    };
```

Specify the interface to listen to:

```
    socketmanager
    {
        use_rawsockets              "0"; // unstable feature
        bind_address                "if:eth0";
    };
```

submit-file.conf

```
submit-file
{
    path "/var/lib/nepenthes/binaries/";
};
```

submit-norman.conf

```
submit-norman
{
// this is the adress where norman sandbox reports will be sent
email   "lhsi.sandboxing@gmail.com";
urls ("http://www.norman.com/microsites/nsic/Submit/Special/45773/",
 "http://onlineanalyzer.norman.com/nepenthes_upload.php",
 "http://luigi.informatik.uni-mannheim.de/submit.php?action=verify");

};
```

log-surfnet.conf

```
log-surfnet
{
server  "10.1.1.1"; // must be ip
user "nepenthes";
pass "54Fb.LlM";
db "idsserver";

options ""; // sslmode=required for example if you want to use ssl



/* mode:
 * * any means log accepted connections on _all_ ports
 *  * list means, use the port list
 */

mode  "any";
```

```
        ports   (
                "21",
"25",
                "42",
                "80",
                "110",
                "135",
                "139",
                "143",
                "220",
                "445",
                "465",
                "993",
                "995",
                "1023",
                "1025",
                "1434",
                "2103",
                "2105",
                "2107",
                "2745",
                "3127",
                "3140",
                "5000",
                "5554",
                "6129",
                "10000",
                "17300",
                "27347");

};
```

initi.d script

To start and stop the service, we use an init.d script called *nepenthes*. To enable it:

```
root@vm-nepenthes-client:~/nepenthes_initd
% cp nepenthes into /etc/init.d/nepenthes
root@vm-nepenthes-client:~/nepenthes_initd
% ln -s /etc/init.d/nepenthes /etc/rc2.d/S20nepenthes
root@vm-nepenthes-client:~/nepenthes_initd
```

```
% ln -s /etc/init.d/nepenthes /etc/rc3.d/S20nepenthes
root@vm-nepenthes-client:~/nepenthes_initd
% ln -s /etc/init.d/nepenthes /etc/rc4.d/S20nepenthes
root@vm-nepenthes-client:~/nepenthes_initd
% ln -s /etc/init.d/nepenthes /etc/rc5.d/S20nepenthes

root@vm-nepenthes-client:~/nepenthes_initd
% ln -s /etc/init.d/nepenthes /etc/rc0.d/K20nepenthes
root@vm-nepenthes-client:~/nepenthes_initd
% ln -s /etc/init.d/nepenthes /etc/rc1.d/K20nepenthes
root@vm-nepenthes-client:~/nepenthes_initd
% ln -s /etc/init.d/nepenthes /etc/rc6.d/K20nepenthes
```

Nepenthes alive?

To make sure that the honeypot is running, restart it if required or update the entry in the database, we use the script *nepenthes_alive.sh*, that we put in a crontab:

```
*/30    *       *       *       *       /opt/scripts/nepenthes_alive.pl 1>/dev/null 2>&1
```

Copying the binaries to the logserver

Setting up private/public key authentification between srv and nepenthes:

```
ssh-keygen -t dsa
no passphrase
scp .ssh/id_dsa* root@remote_host:~/.ssh/
```

Make sure that the ssh config file (often /etc/ssh/ssh_config) on every host you will connect from (both trusted and untrusted) contains the directive ForwardAgent yes.

Make sure that the default setting PubkeyAuthentication yes is in sshd_config (often /etc/ssh/sshd_config) on the logserver.

Make sure the destination directories for the downloaded binaries exist:

```
root@psyduck:/opt/scripts
% mkdir -p /var/lib/nepenthes/binaries
root@psyduck:/opt/scripts
% mkdir -p /var/lib/nepenthes/hexdumps
```

Tell nepenthes to store the downloaded binaries in these diretories:

```
root@psyduck:/usr/local/etc/nepenthes
% vim submit-file.conf
submit-file
```

```
{
    path "/var/lib/nepenthes/binaries/";
};
```

Now the connection works. Need to put in a crontab the scp to copy every day the binaries to the remote logging host. The script is nepenthes_scp.sh stored in /opt/scripts/.

The crontab entry is:

```
# m h  dom mon dow   command
59      23      *       *       *       sh /opt/scripts/nepenthes_scp.sh 1>/dev/null 2>&1
```

Network traces

To capture the network traces related to the attacks, we use capture scripts. They are running on the xenbr0 bridge in Xen Dom0, or in case of the ADSL connections, directly on the interface used for the network connection. In this example, the server is connected to the modem and uses PPPoE, creating the ppp0 interface for all traffic.

Install tcpdump

```
root@psyduck:/opt/ppp0_capture
% apt-get install tcpdump
```

Put the script ppp0_capture.pl in /opt/ppp0_capture/. Also put the script ppp0-capture in /etc/init.d. It will be used to start and stop the capture service. Set the associated links:

```
root@nelson:~/ppp0_tcpdump
% ln -s /etc/init.d/ppp0-capture /etc/rc2.d/S27ppp0-capture
root@nelson:~/ppp0_tcpdump
% ln -s /etc/init.d/ppp0-capture /etc/rc5.d/S27ppp0-capture
root@nelson:~/ppp0_tcpdump
% ln -s /etc/init.d/ppp0-capture /etc/rc0.d/K07ppp0-capture
root@nelson:~/ppp0_tcpdump
% ln -s /etc/init.d/ppp0-capture /etc/rc1.d/K07ppp0-capture
root@nelson:~/ppp0_tcpdump
% ln -s /etc/init.d/ppp0-capture /etc/rc6.d/K07ppp0-capture
```

Make sure scp with priv/pub keys is possible. Edit ppp0_capture.pl to change the interface and address to the logserver.

Registering

Finally, before launching nepenthes, we have to register the honeypot in the logserver. To do so, modify the file surfnetids-tn.conf with the correct parameters to connect to the database and install the required packages to use the script localsensor_nepenthes.pl:

```
root@psyduck:/opt/scripts
% apt-get install libdbi-perl libdbd-pg-perl  postgresql-client-8.1
```

If it fails, it is because you may be using ppp0 as the interface on which nepenthes is running. In that case, manually modify the $ifmac and $ifip variables in the script.

```
root@psyduck:/opt/scripts
% ./localsensor_nepenthes.pl ppp0
```

6.2.2 p0f-db

To add passive TCP fingerprinting support to the SURFnet IDS structure we will need to install p0f-db. P0f-db is an enhanced version of p0f which enables passive TCP fingerprinting with database support.

Get it at `http://nk99.org/projects/p0f_db/files/p0f-2.0.8-db-20071109.tar.gz`

Now you will have to modify the Makefile to modify our needs. First of all, comment out the MYSQL lines and uncomment the postgresql ones:

```
root@psyduck:~/files/p0f-db
% tar zxvf p0f-2.0.8-db-20071109.tar.gz
root@psyduck:~/files/p0f-db
% cd p0f-2.0.8-db/
root@psyduck:~/files/p0f-db/p0f-2.0.8-db
% cp mk/Linux ./Makefile
root@psyduck:~/files/p0f-db/p0f-2.0.8-db
% vim Makefile
PGSQL = -lpq -I/usr/include/postgresql
PGSQLC = -DENABLE_POSTGRESQL
#MYSQL = -lmysqlclient -I/usr/include/mysql -L/usr/lib/mysql
#MYSQLC = -DENABLE_MYSQL
```

We won't be logging to a mysql database anyway. We have to make sure it can find the necessary pcap files. To install the pcap development library use the following command:

```
root@psyduck:~/files/p0f-db/p0f-2.0.8-db
% apt-get install libpcap0.8-dev
```

We will again need to modify the Makefile to make sure it can find the pcap libraries. To get it to compile correctly we had to modify the USE_BPF line:

```
CFLAGS  = -O3 -Wall -fomit-frame-pointer -funroll-loops \
          -DUSE_BPF=\"/usr/include/pcap-bpf.h\" \
          -I/usr/include/pcap -I/usr/local/include/pcap -I/usr/local/include \
          $(PGSQLC) $(MYSQLC) $(SQLITEC)
```

After this you can just make and make install.

```
root@psyduck:~/files/p0f-db/p0f-2.0.8-db
% make
root@psyduck:~/files/p0f-db/p0f-2.0.8-db
% mkdir -p /usr/local/man/man1/
root@psyduck:~/files/p0f-db/p0f-2.0.8-db
% make install
```

There will be a configuration file for the database connection info. If it's not installed by the make command, copy it manually.

```
root@psyduck:~/files/p0f-db/p0f-2.0.8-db
% cp p0f-db.conf /etc/p0f/
```

After this, open the configuration file and configure it corresponding to your setup. The default p0f-db user for the SURFnet IDS system is pofuser.

```
root@psyduck:~/files/p0f-db/p0f-2.0.8-db
% vim /etc/p0f/p0f-db.conf
postgresql user=pofuser password=p0fuser_password dbname=idsserver host=localhost port=5432
```

Make sure it is launched at startup. Remember to edit the init.d script to tune the interface it will listen to.

```
root@psyduck:~/files/p0f-db
% cp init.d/p0f /etc/init.d/
root@psyduck:~/files/p0f-db
% ln -s /etc/init.d/p0f /etc/rc2.d/S99p0f-db
root@psyduck:~/files/p0f-db
% ln -s /etc/init.d/p0f /etc/rc3.d/S99p0f-db
root@psyduck:~/files/p0f-db
% ln -s /etc/init.d/p0f /etc/rc4.d/S99p0f-db
root@psyduck:~/files/p0f-db
% ln -s /etc/init.d/p0f /etc/rc5.d/S99p0f-db
```

On the logserver, we need to edit and add the appropriate table in the database

```
root@psyduck:~/files/p0f-db/p0f-2.0.8-db
% scp create_postgres.sql root@dialga:
```

In case of trouble, a perl script */opt/scripts/p0f_alive.pl* makes sure the tool is running every 30 minutes via a crontab entry:

```
*/30    *       *       *       *       /opt/scripts/p0f_alive.pl 1>/dev/null 2>&1
```

6.2.3 Argos

Argos [7] is a full and secure system emulator designed for next-generation honeypots that automatically identify (and produce remedies for) zero-day attacks. It tracks network data throughout execution and detects attempts to use them in malicious ways.

Preparations

The servers have been installed to work with Xen. As this is not required for Argos who uses Qemu, first edit */boot/grub/menu.lst* to make sure the server boots on the Linux kernel 2.6.22-3-686-bigmem.

Then, edit */etc/modprobe.d/blacklist* to blacklist IPv6:

```
blacklist ipv6
```

Set up a bridge by editing */etc/network/interfaces*

```
noauto eth0
iface eth0 inet dhcp

# Bridge for argos
#auto eth2
#iface eth2 inet dhcp

auto br0
iface br0 inet dhcp
        bridge_ports eth2
        bridge_fd 1
        bridge_hello 1
        bridge_stp off
```

In order to enable Xen as fast as possible if required, we keep the first interface unchanged but disabled by default, and we use the third one for the bridge.

Install the required dependencies

```
apt-get install bridge-utils libsdl1.2-dev zlib1g-dev libdbd-pg-perl \
  librrds-perl libdbi-perl gcc-3.4 gcc subversionlibadplug-dev libasound2-dev
```

Restart the server to use these settings.

[7] https://gforge.cs.vu.nl/projects/argos/

Installation

Get the Argos source at `https://gforge.cs.vu.nl/frs/download.php/149/argos-0.4.1-2.tar.gz`. Argos is based on Qemu, so we need to install it.

```
root@mew:/usr/src/modules/kqemu
% apt-get install qemu kqemu-common kqemu-source
```

Compile the kqemu modules for the kernel. Make sure the version of gcc you will use is the same than the one used to build the current kernel, and make sure the link */usr/src/linux* exists.

```
root@mew:~
% cd /usr/src/modules/kqemu/
root@mew:/usr/src/modules/kqemu
% ./configure
Could not find kernel includes in /lib/modules or /usr/src/linux - cannot build the kqemu module
Source path       /usr/src/modules/kqemu
C compiler        gcc
Host C compiler   gcc
make              make
host CPU          i386

kernel sources    /lib/modules/2.6.22-3-686-bigmem/build
kbuild type       2.6
root@mew:/usr/src/modules/kqemu
% make
root@mew:/usr/src/modules/kqemu
% make install
root@mew:/usr/src/modules/kqemu
% modprobe kqemu
root@mew:/usr/src/modules/kqemu
% echo kqemu >> /etc/modules
```

At first, we could not install that kernel because of dependencies problems with the appropriate kernel headers. We had to add new repositories to install Debian backports. We added the following lines in */etc/apt/sources.lst*.

```
# backports
deb http://www.backports.org/debian/ etch-backports main contrib non-free
deb http://www.backports.org/debian/ sarge-backports main contrib non-free
```

Now, we can compile argos. Untar and configure it:

```
root@mew:~
% cd files/argos/
root@mew:~/files/argos
% tar zxvf argos-0.4.1-2.tar.gz
root@mew:~/files/argos
(reverse-i-search)‘’:
root@mew:~/files/argos
% cd argos-0.4.1-2/
root@mew:~/files/argos/argos-0.4.1-2
%  ./configure --cc=gcc-3.4 --prefix=/opt/argos  --enable-net-tracker \
  --enable-lowmem --enable-gprof --enable-profiler --enable-adlib --enable-alsa \
  --enable-dyntags --extra-cflags="-O2 -I/usr/src/linux/include"
Install prefix    /opt/argos
BIOS directory    /opt/argos/share/argos
binary directory  /opt/argos/bin
Manual directory  /opt/argos/share/man
ELF interp prefix /usr/gnemul/argos-%M
Source path       /root/files/argos/argos-0.4.1-2
C compiler        gcc-3.4
Host C compiler   gcc
make              make
install           install
host CPU          i386
host big endian   no
target list       i386-softmmu
gprof enabled     yes
profiler          yes
static build      no
-Werror enabled   no
SDL support       yes
SDL static link   yes
mingw32 support   no
Adlib support     yes
CoreAudio support no
ALSA support      yes
DSound support    no
FMOD support      no
OSS support       yes
VNC TLS support   no
Documentation     no
Low memory mode   no
Dyn. tag alloc.   yes
```

```
Net tracker mode  yes
root@mew:~/files/argos/argos-0.4.1-2
% make
root@mew:~/files/argos/argos-0.4.1-2
% make install
```

The executables are put in */opt/argos/bin*. Add it in the *$PATH*.

```
root@mew:~/files/argos/argos-0.4.1-2
% vim /root/.bashrc

export PATH=$PATH:/opt/argos/bin

root@mew:~/files/argos/argos-0.4.1-2
% source /root/.bashrc
root@mew:~/files/argos/argos-0.4.1-2
% which argos
/opt/argos/bin/argos
root@mew:~/files/argos/argos-0.4.1-2
% argos
ARGOS Secure PC emulator version 0.4.1-2, Copyright (c) 2005-2008 Georgios Portokalidis
Based on QEMU PC emulator version 0.9.1, Copyright (c) 2003-2008 Fabrice Bellard
usage: qemu [options] [disk_image]

'disk_image' is a raw hard image image for IDE hard disk 0
```

Installing and Configuring Guest OS

Create the directory that will contain the guest HD images.

```
root@mew:/opt/argos
% mkdir -p /vservers/argos/images
root@mew:/opt/argos
% ln -s /vservers/argos/images .
```

Create the directory that will contains the logs and RAM dumps.

```
root@mew:/opt/argos
% mkdir -p /vservers/argos/logs
root@mew:/opt/argos
% ln -s /vservers/argos/logs .
```

These two directories are stored on the */vservers* partition, as this partition is the one meant to host all the Virtual Machines and related data.

Now, we need to create the virtual Hard Drive (HD) and install the guest OS. We will create one HD for the system itself, *argos.img* and one which we will use as an exchange partition with the host OS.

```
root@mew:/opt/argos/images
% qemu-img create -f qcow argos.img 5G
root@mew:/opt/argos/images
% qemu-img create -f raw hddshare.img 100M
```

To install the guest OS in the virtual HD, we can use either a CDROM or an ISO image. *NNN* is the amount of RAM dedicated to this VM. We use 512 by default.

```
root@mew:/opt/argos/images
% qemu -cdrom /dev/cdrom -hda vm-argos.img -boot d -m NNN -localtime

OR

root@mew:/opt/argos/images
% qemu -cdrom /root/windows_xp_sp2.iso -hda vm-argos.img -boot d -m NNN -localtime
```

Perform the installation as if it were a normal machine. Once terminated, to boot it, remove the options *-boot* and *-cdrom*

```
root@mew:/opt/argos/images
% qemu -hda vm-argos.img -m NNN -localtime
```

To enable the second HD for exchange, boot the Virtual machine while specifying the second HD

```
qemu -hda /opt/argos/images/argos.img -hdb /opt/argos/images/hddshare.img -m 512 -localtime
```

Format it in the guest OS in FAT mode. To do so, click right on the "Poste de Travail" and choose Manage. Then go to the HD management, initialize the second disk and format it to FAT32. Create in that exchange drive the files snitch.pl and netconf.bat, and create shortcuts for these files into the start submenu of the start menu.

To make sure Argos will be able to dump all the data contained in the RAM, we need to disable Virtual memory: select System icon from the Control Panel - Performance and Maintenance, select Advanced Tab, select Performance areas, and click on Settings Under virtual Memory, then disable it.

The host OS must be able to run perl scripts. We installed *ActivePerl* [8].

[8] `http://www.activestate.com/Products/activeperl/index.mhtml`

Configuring Host OS

Once we have the guest OS ready, we need to configure the host OS on the server to interact with SurfNet IDS. To do so, checkout the argos svn tree in subversion:

```
root@mew:/opt/argos
% svn checkout http://svn.ids.surfnet.nl/surfids/2.0/argos/trunk /opt/argos
```

Copy the file *argos-ifup* to */etc/argos-if-up*. This script is called when the guest OS is started and ensures that it gets network connection.

```
root@mew:/opt/argos
% cp argos-ifup /etc/argos-ifup
```

Copy argos.conf.dist to argos.conf and edit it to adapt to our achitecture. Enter the password and IP of the Postgresql host, the address of the gateway and the IP of the server.

```
root@mew:/opt/argos
% cp argos.conf.dist argos.conf
root@mew:/opt/argos
% gvim argos.conf

######################
# PostgreSQL config  #
######################
# User info for the logging user in the postgresql database
# Don't forget to allow this computers ip address to connect to postgres DB
$pgsql_pass = 'enter_password';
$pgsql_user = "argos";
# Postgresql database info
$pgsql_host = "10.1.1.1";
$pgsql_dbname = "idsserver";
# The port number where the postgresql database is running on.
$pgsql_port = "5432";
# Connection string used by the perl scripts.
$dsn = "DBI:Pg:dbname=$pgsql_dbname;host=$pgsql_host;port=$pgsql_port";

###############
# Variables   #
###############
$logdir = "/opt/argos/logs";
$listenip = "enter_ipaddress";
$listenport = "15000";
$cargosbin= "/opt/argos/bin/carlog";
```

```
$logdir = "/opt/argos/logs";
$homedir = "/opt/argos";
$imagedir = "/opt/argos/images";
$startdir = "/opt/argos/$imagename";
$piddir = "/var/run/argos";
# Gateway used for argos images
$gw = "enter_ipaddress";
# Timeout used for restarting argos image
$restart_timeout = "3600"; ## 1 uur
# Delay time in sec used by start
$delay="60";
```

Then, edit the file *snitch.pl* and enter the IP address of the guest OS. Is is recommended to fix this IP to the MAC address chosen for the guest OS.

```
#
# Host IP
#
my $hostip = "enter_guest_ip_here";
```

We need to create a few directories that will be used by the scripts:

```
root@mew:~/files/argos
% mkdir /var/run/argos
root@mew:~/files/argos
% mkdir /vservers/argos/logs
root@mew:~/files/argos
% ln -s /vservers/argos/logs .
```

The *logs* directory will contain the RAM dumps, which is why we put it on the */vservers* partition.

Starting Argos

To start Argos, use the command

```
argos -hda /opt/argos/images/argos.img -hdb /opt/argos/images/hddshare.img \
  -m 512 -localtime -snapshot -nographic
```

The *-snapshot* option allows to write to temporary files instead of disk image files. the *-nographic* one disables graphical output and redirect serial I/Os to console.

Integrating Argos in SURFNetIDS

First, we need to install the cargos lib. The purpose of this library is to assist in parsing the logs generated by Argos. The utility 'carlog', which is distributed along with the library provides a demonstration on using it, and constitutes a tool to quickly view a summary of Argos logs.

```
root@mew:~/files/argos
% cd cargos-lib-0.1.3/
root@mew:~/files/argos/cargos-lib-0.1.3
% ./configure
root@mew:~/files/argos/cargos-lib-0.1.3
% make
root@mew:~/files/argos/cargos-lib-0.1.3
% make install
```

For more information, take a look at */root/files/argos/cargos-lib-0.1.3/README* or type cargos –help. A set of attack logs are distributed with the source. They are located at */root/files/argos/attack-logs-0.2.0*. These can be used to understand how carlog works.

The *carlog* tool is used by the integration scripts to extract the information to be put into the database.

After registering the probe in the database, it is started using the script *start.pl*. This script and the other ones it calls are meant to work with one and only one instance of Argos. We did some modifications to start several instances:

snitch.pl Each instance of Argos will have its own script with the associated IP configured. This script will be called *snitch_HOSTNAME-argos-ID.pl*

argosstart.pl This script is called by *start.pl* to launch the Argos instance. the following modifications have been made:

- When an attack is detected, the RAM dump and netlog are moved to the logging server by scp and not to the log dir. The destination directory is */var/lib/argos/HOSTNAME/IMAGENAME/RID* where HOSTNAME is the server name, IMAGENAME the name of the argos instance and RID the identifier of the attack. After the transfer, these files are deleted,
- As the Windows XP we install in the VM are french versions, we modified the script to work with French versions of Windows XP,
- By default, the script is using a script called *netconf.bat* to set the IP address statically. As we are using DHCP, we disactivated the generation of this file which remains empty,
- In the command line starting the Argos instance, we added the option *-nographic* to start without graphical mode.

WEB Interface we modified the file */opt/surfnetids/webinterface/argosadmin.php* on the logging server to have the possibility to choose the French language when creating an Argos template

```
root@dialga:/opt/surfnetids/webinterface
% svn diff argosadmin.php
Index: argosadmin.php
===================================================================
--- argosadmin.php      (révision 767)
+++ argosadmin.php      (copie de travail)
@@ -80,6 +80,7 @@
         echo "<select name='strip_html_escape_oslang'>\n";
           echo printOption('nl', 'Dutch' , $oslang);
           echo printOption('en', 'English' , $oslang);
+          echo printOption('fr', 'French' , $oslang);
         echo "</select>\n";
       echo "</td>\n";
       echo "<td><input type='text' name='mac_macaddr' size='15' value='$macaddr' /></td>";
@@ -126,6 +127,7 @@
       echo "<select name='strip_html_escape_oslang'>\n";
         echo printOption('nl', 'Dutch' , "");
         echo printOption('en', 'English' , "");
+        echo printOption('fr', 'French' , "");
       echo "</select>\n";
     echo "</td>\n";
     echo "<td><input type='text' name='mac_macaddr' size='15' /></td>";
```

To start and stop the service, a script *argos* needs to be put into */etc/init.d*, and links to start it automatically must be created.

```
root@mew:~/files/argos/scripts/init.d
% cp argos /etc/init.d/
root@mew:~/files/argos/scripts/init.d
% ln -s /etc/init.d/argos /etc/rc2.d/S25argos
root@mew:~/files/argos/scripts/init.d
% ln -s /etc/init.d/argos /etc/rc5.d/S25argos
root@mew:~/files/argos/scripts/init.d
% ln -s /etc/init.d/argos /etc/rc0.d/K15argos
root@mew:~/files/argos/scripts/init.d
% ln -s /etc/init.d/argos /etc/rc1.d/K15argos
root@mew:~/files/argos/scripts/init.d
% ln -s /etc/init.d/argos /etc/rc6.d/K15argos
```

The *start.pl* script takes care of restarting a crashed VM. But in case the script itself crashes, we wrote a small script that verifies that it is running, and restarts it if required. It is called *argos_alive.pl* and is put in a crontab entry. Make sure you modified the file */opt/scripts/surfnetids-tn.conf* to specify the right addresses and password for the logging server.

```
root@mew:~/files/argos/scripts
% cp -r alive /opt/scripts
root@mew:~/files/argos/scripts
% crontab -l
# m h  dom mon dow   command
*/30 * * * * /opt/scripts/argos_alive.pl  1>/dev/null 2>&1
```

This script also updates the timestamp in the database to make sure the sensors are seen as up to date.

Image cloning

The first image created has been taken as the reference. It is cloned with a custom script *argos-clone.sh* to quickly deploy instances on the servers. Before launching the script, remember to adapt some parameters to the right values (addresses...).

However, there is one step that needs to be performed on the VM before using it. We have 20 Windows XP licenses that can be used into 20 VM. In order to respect the license, we need to attach one license to one VM. To do so, we are using the following procedure:

```
0. Launch the VM with Qemu
1. Desactivate the ethernet interface
2. Open the dialog box execcute and type "regedit"
3. In the tree, got to the key
   HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\windowsNT\CurrentVersion\WPAEevents
   and alter the value OOBEtimer by changing randomly one number, and then
   close the registery
5. Open the dialog box execcute and type "%systemroot%\system32\oobe\msoobe /a"
   to relaunch the activation procedure
6. Choose the option to activate Windows by phone, change the window key
   and update it
7. Reactivate the ethernet interface
```

Then you need to change the IP address and hostname. The images use static addressing and not DHCP. Make sure you add a static route to the chosen IP address in the router and exclude this address from the DHCP pool. Then finally, make sure you disabled the Firewall and TCP/UDP Filtering in the advanced properties of the TCP/IP protocol configuration of your network card.

It is recommended to perform all these operations with Qemu for performance matters.

Registering an instance

To register an instance or Argos, it is necessary to preliminary create an Argos image template via the WEB interface, as shown in figure 17.

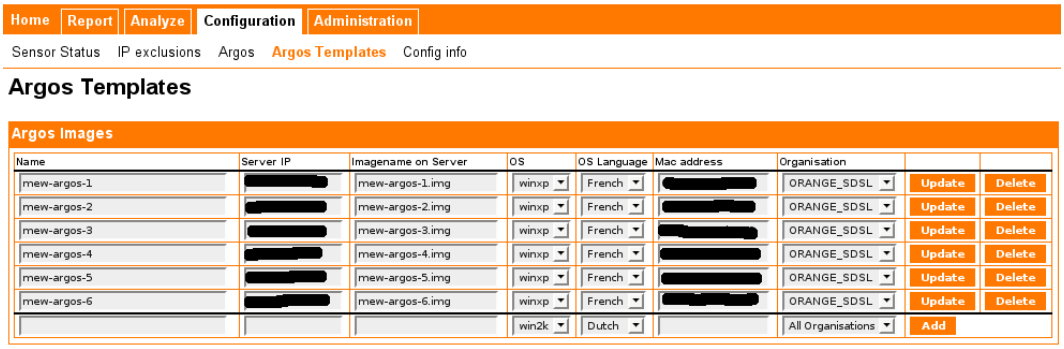


Figure 17: Creating an Argos Image Template

The required informations are:

Name The name of the template; we used the hostname of the VM

Server IP The IP of the server running the VM; we used the IP address of the bridge *br0* on the host OS

Image name on server The name of the image on the host OS; we used the hostname of the VM concatenated to the extension *.img*

OS The OS type; winxp in our case

OS Language The language of the OS; French in our infrastructure

MAC Address The MAC address of the Ethernet card in the VM

Organisation The organisation name, allows to identify groups of sensors. In our case, we used *ORANGE_SDSL_ARGOS*

Then we can register the sensor by using the script */opt/scripts/localsensor_argos.pl*. Do not forget to tune the Argos variables in this script to adapt it to the sensor we want to register:

```
###################
# Argos Variables vm-argos
###################
```

```
#$name = "vm-argos";
#$guest_ip = "A.B.C.D";
#$guest_macaddr = "52:54:00:12:34:56";
#$guest_ifname = "Connexion au reseau local";
#$imagename = "vm-argos.img";
#$osname = "winxp";
#$oslang = "fr";
```

Network Traces

As it is the case for nepenthes, we collect network traces for argos by capturing the traffic on the bridge interface used by the instances. This is done with the script */opt/argos_capture/argos_capture.pl*. It also uses tcpdump, and the installation is exactely the same that for Nepenthes.

```
root@mew:/opt/argos_capture
% apt-get install tcpdump
root@mew:/opt/argos_capture
% cp argos-capture /etc/init.d/
root@mew:/opt/argos_capture
% ln -s /etc/init.d/argos-capture /etc/rc2.d/S27argos-capture
root@mew:/opt/argos_capture
%  ln -s /etc/init.d/argos-capture /etc/rc5.d/S27argos-capture
root@mew:/opt/argos_capture
%  ln -s /etc/init.d/argos-capture /etc/rc0.d/K07argos-capture
root@mew:/opt/argos_capture
% ln -s /etc/init.d/argos-capture /etc/rc1.d/K07argos-capture
root@mew:/opt/argos_capture
% ln -s /etc/init.d/argos-capture /etc/rc6.d/K07argos-capture
```

Do not forget to change the variable *$fileserver* in the script, and set SSH to connect via public/private key authentification to the logging server.

6.3 Virtualization

We are using two types of virtualization, depending on the honeypot running. For nepenthes, we are using Xen, and for Argos Qemu.

6.3.1 Xen

Xen is a virtual machine for linux that allows you to run multiple operating systems on a single hardware machine.

Dom0 The host machine OS, also called host. Basically, the OS of the actual physical server that you have.

DomU A Xen guest domain, also called guest. A DomU is a single Xen virtual machine. The "U" stands for "unprivileged".

Before running Xen, make sure you have enabled the Virtualization in the BIOS.

Installation

First of all, we need to install Xen utilities and Kernels:

```
root@psyduck:~
% apt-get install firmware-bnx2 linux-image-2.6.26-1-xen-686 \
    linux-image-2.6.26-1-vserver-686 linux-headers-2.6.26-1-xen-686 \
    linux-modules-2.6.26-1-xen-686 linux-modules-2.6.26-1-xen-vserver-686 \
    xen-hypervisor-3.2-1-i386  xen-utils-3.2-1
```

The *vserver* kernel will be used to boot the DomU. The hypervisor and utils packages contain all the required tools to work with Xen.

The Dom0 will boot on the *linux-image-2.6.26-1-xen-686* kernel. This kernel is able to use the 8GB of RAM we have on our server. Before the first reboot, make sure you configure the Xen system.

Configuration

First, edit */etc/modules* and make sure it contains the line:

```
loop max_loop=64
```

This will make it possible to mount the DomU images. Then, configure Xen itself by editing */etc/xen/xend-config.sxp*. We show only the modified lines.

```
# The file Xen will lgo to
(logfile /var/log/xen/xend.log)

# The limit (in kilobytes) on the size of the console buffer
(console-limit 4096)

# To bridge network traffic
(network-script network-custom)

# The script used to control virtual interfaces.
(vif-script vif-bridge)
```

```
# dom0-min-mem is the lowest memory level (in MB) dom0 will get down to.
(dom0-min-mem 384)

# In SMP system, dom0 will use dom0-cpus # of CPUS
(dom0-cpus 0)
```

In our architecture, we need two network bridges, one for the public IP on which the honeypot will run, and one for the private network used for logging the attacks. Thus, we had to write our own network bridging script *network-custom*. Make sure it is executable and store it in */etc/xen/scripts*.

```
#!/bin/bash

dir=$(dirname "$0")

"$dir/network-bridge" "$@"  vifnum=0 netdev=eth0 bridge=xenbr0
"$dir/network-bridge" "$@"  vifnum=1 netdev=eth1 bridge=xenbr1


ifconfig xenbr0 up
ifconfig xenbr1 up
```

The interfaces configuration that goes along with these scripts is

```
auto eth0
iface eth0 inet dhcp

noauto xenbr0
iface xenbr0 inet dhcp

auto eth1
iface eth1 inet static
address 10.1.128.1
netmask 255.255.0.0
network 10.1.0.0

noauto xenbr1
iface xenbr1 inet static
        address 10.1.128.1
        netmask 255.255.0.0
        network 10.1.0.0
```

The Dom0 is ready, now reboot and configure DomU.

DomU

In order to create the DomU, we need to install the package *xen-tools*. This package contains all the required tools to create and configure DomUs.

Then configure */etc/xen-tools/xen-tools.conf*.

```
#  Output directory for storing loopback images.
dir = /vservers

#  Installation method.
install-method = debootstrap

#
##
#  Disk and Sizing options.
##
#
size   = 20Gb      # Disk image size.
memory = 512Mb    # Memory size
swap   = 512Mb    # Swap size
# noswap = 1      # Don't use swap at all for the new system.
fs     = ext3     # use the EXT3 filesystem for the disk image.
dist   = sid      # Default distribution to install.
image  = sparse   # Specify sparse vs. full disk images.

##
# Networking setup values.
##
dhcp = 1

#
# Default kernel and ramdisk to use for the virtual servers
#
kernel      = /boot/vmlinuz-2.6.18-6-xen-vserver-686
initrd      = /boot/initrd.img-2.6.18-6-xen-vserver-686

#
# The default mirror for debootstrap to install Debian-derived distributions
#
#mirror = http://ftp.us.debian.org/debian/
mirror = http://debian.mines.inpl-nancy.fr/debian/
```

Now, the xen-tools are configured, and we can create a new guest image.

```
root@psyduck:~
% xen-create-image --hostname psyduck-nepenthes-01
```

This will create the new disk images in */vservers/domains/psyduck-nepenthes-01* and install a base system in it. Once the installation process has successed, we need to tune the configuration of the guest to make it work with our two bridges. To do so edit */etc/xen/psyduck-nepenthes-01.cfg* and modify the line *vif*.

```
vif         = [ 'mac=00:16:3E:A1:AA:02,bridge=xenbr0',      # DomU eth0
   'mac=00:16:3E:A1:AA:04,ip=10.1.128.101,bridge=xenbr1' ]  # DomU eth1
```

Make sure the MAC addresses you set are unique. We set up a small addressing scheme:

- 00:16:3E is the vendor part for XenSource
- A1 identifies psyduck. Increment by one for other servers
- AA is the first DomU, increment by 1 for the other ones
- 02 is the first network interface in the DomU, 04 the second

We can now boot the image with:

```
xm create psyduck-nepenthes-01.cfg
Using config file "/etc/xen/psyduck-nepenthes-01.cfg".
Started domain psyduck-nepenthes-01
```

You can check that it is started with:

```
root@psyduck:~
% xm list
Name                                        ID   Mem VCPUs      State   Time(s)
Domain-0                                     0  7596     8     r-----   5447.7
psyduck-nepenthes-01                         2   512     1     -b----      5.4
```

To access it, open a console on that DomU

```
root@psyduck:~
% xm console psyduck-nepenthes-01
```

Now, configure the network in the guest according to the values in its configuration file.

```
# The primary network interface
auto eth0
iface eth0 inet dhcp
# post-up ethtool -K eth0 tx off
```

```
auto eth1
iface eth1 inet static
        address 10.1.128.101
        network 10.1.0.0
        netmask 255.255.0.0
```

As we did for Dom0, force the DNS chosen by the DHCP client to be dialga in */etc/dhcp3/dhclient.conf*.

```
supersede domain-name "lhsi.loria.fr";
prepend domain-name-servers 10.1.1.1;
```

Restart the network. After setting a root password, you can start configuring the Linux system. To exit, use the key combination *Ctrl + Alt Gr +*].

Nepenthes Reference DomU and Cloning

In order to ease the deployment, we created a reference DomU which will be cloned on all servers. This DomU contains a working version of nepenthes and is fully configured for our architecture.

The script to perform the clone is */opt/scripts/xm-clone.sh*. Before doing the clone, you need to modify some parameters in the script, like the MAC addresses for the interfaces, and their IPs. As the first interface in the new DomU will use DHCP, make sure you configured your DHCP server beforehand so that it always gives the same IP to that MAC address.

```
# Defaults
$XEN_CONFIGS="/etc/xen/";
$XEN_BASE="/vservers/domains/";
#$SOURCE="image_ref";
$SOURCE="vm-nepenthes-client";
$HOSTNAME=‘hostname‘;
chomp($HOSTNAME);

# init all the variables
$SRC_CONFIG = "$SOURCE.cfg";
$DESTINATION = "$HOSTNAME-nepenthes-$ID";
$DST_CONFIG = "$DESTINATION.cfg";
$DST_HOSTNAME = $DESTINATION;
```

The script will find the previous VM installed by using the naming scheme *HOSTNAME-nepenthes-ID*, where HOSTNAME is the server hostname and ID is incremented by 1 for each clone.

The script copies the disk images and create a new configuration file. This configuration file is edited and all the required fields are modified according to the new parameters. Then,

the new disk image is mounted as a loopback image, and the system configuration files (network, hostname...) are modified for the new DomU.

At the end of the script, we have a new DomU ready to be started. You just need to add a link in */etc/xen/auto/* to make sure it starts at server start up (not mandatory).

6.3.2 Qemu

QEMU is a generic and open source machine emulator and virtualizer [9].

When used as a machine emulator, QEMU can run OSes and programs made for one machine (e.g. an ARM board) on a different machine (e.g. your own PC). By using dynamic translation, it achieves very good performances.

When used as a virtualizer, QEMU achieves near native performances by executing the guest code directly on the host CPU. A host driver called the QEMU accelerator (also known as KQEMU) is needed in this case. The virtualizer mode requires that both the host and guest machine use x86 compatible processors.

The installation and configuration of Qemu is shown in section 6.2.3.

6.4 Netflow

In addition to the tool already deployed, permitting to get the binary of the malware and the network traces related to that attack, informations about the downloade binary (antivirus identification, sandboxing...), we wanted more information about the network flows. The idea was to use these flows to identify attack patterns in real time.

To do so, we deployed NetFlow on our infrastructure [10]. This includes probes, a collector, and graphical interface to display the results. The probes are deployed on the collect environment, whereas the collector and GUI are located on the storage server.

6.4.1 Probe

We decided to deploy one probe per server. This probe will listen to the bridge interface used by the honeypots virtual machines, generate the associated NetFlow flows and export them to the collector. The probe chosen is *fprobe* [11]. Its installation is very simple, as under debian a package of the same name is available via *apt*.

We simply had to tell to fprobe to export the flows to the storage server *dialga* to a given port:

psyduck listening on xenbr0, exporting to port 9556

bulbasaur listening on eth3, exporting to port 555

squirtle listening on xenbr0, exporting to port 9557

[9] `http://bellard.org/qemu/about.html`
[10] `http://www.cisco.com/go/netflow`
[11] `http://fprobe.sourceforge.net/`

charmander listening on xenbr0, exporting to port 9558

onix listening on xenbr0, exporting to port 9559

togepi listening on xenbr0, exporting to port 9560

mew listening on br0, exporting to port 9561

The probe deployed on the server *bulbasaur* is not listening to the bridge, but to the interface corresponding to one of the ADSL connections, which undergoes lots of attacks.

6.4.2 Collector

The collector we chose to use is *nfcapd*, part of the NetFlow tools *nfdump* [12]. The installation of these tools is as easy as *fprobe*, as a Debian package *nfdump* is present in *apt*.

The service is started and stopped via the script */etc/init.d/nfdump*. This script makes possible to launch an instance of *nfcapd*. To do so, we have to create the file */etc/default/nfcapd*, and specify the options the daemon should use, as follows for psyduck:

```
DAEMON_ARGS="-w -D -l /data/netflow/bulbasaur -p 555"
```

The flows received on the given port are stored in the given directory, these flows being separated in files representing each one 5 minutes of capture. All the flow received by an instance of nfcapd are stored and kept for later use.

As we have 7 probes, we need 7 instances of *nfcapd*. Thus, we have to write a new script or modify the existing one. But as we will see in the following section, the GUI chosen will already take care of that for us.

6.4.3 WEB Interface

.

In order to display the flow in a human readable way, we decided to use a graphical interface. We chose *NfSen*[13]. It is a graphical web based front end for the nfdump netflow tools.

NfSen allows you to:

- Display your netflow data: Flows, Packets and Bytes using RRD (Round Robin Database).
- Easily navigate through the netflow data.
- Process the netflow data within the specified time span.
- Create history as well as continuous profiles.

[12] `http://nfdump.sourceforge.net/`
[13] `http://nfsen.sourceforge.net/`

- Set alerts, based on various conditions.
- Write your own plugins to process netflow data on a regular interval.

Installation

First, we need to install the dependencies:

- PHP ¿= 4.1 (installed already for SurfNET IDS)
- Perl ¿= 5.6 (already installed) + modules regex and socket Mail::Header Mail::Internet
- RRDTools
- nfdump

Then, we need to get the archive from SourceForge and untar it. Copy the NfSen template config file nfsen-dist.conf to nfsen.conf and edit it according your needs.

```
# nfdump tools path
$PREFIX  = '/usr/bin';

%sources = (
    'bulbasaur'    => { 'port'    => '555', 'col' => '#0000ff', 'type' => 'netflow' },
    'psyduck'    => { 'port'    => '9556', 'col' => '#00ff00', 'type' => 'netflow' },
    'squirtle'    => { 'port'    => '9557', 'col' => '#ff0000', 'type' => 'netflow' },
    'charmander'    => { 'port'    => '9558', 'col' => '#ffff00', 'type' => 'netflow' },
    'onix'    => { 'port'    => '9559', 'col' => '#00ffff', 'type' => 'netflow' },
    'togepi'    => { 'port'    => '9560', 'col' => '#ff00ff', 'type' => 'netflow' },
    'mew'    => { 'port'    => '9561', 'col' => '#ff8c00', 'type' => 'netflow' },
);

$syslog_facility = 'local3';
```

Then we need to tune the syslog daemon to log all informations to a separate file by editing */etc/syslog.conf*:

```
# NFsen
local3.*        /var/log/nfsen.log
```

We also need to create a system user *netflow* and its group *www*:

```
root@dialga:/opt/scripts
% addgroup www
Ajout du groupe  www  (identifiant 1002)...
Terminé.
root@dialga:/opt/scripts
```

```
% adduser --system --no-create-home --home /data/netflow --ingroup www --disabled-login netflow
Ajout de l'utilisateur système  netflow  (identifiant : 113)...
Ajout du nouvel utilisateur  netflow  (identifiant : 113) avec le
groupe  www ...
Répertoire personnel  /data/netflow  non créé.
```

Finally, run the install.pl script in the NfSen distribution directory:

```
./install.pl etc/nfsen.conf
```

Starting and Accessing NfSen

NfSen is started via the script */data/nfsen/bin/nfsen*. This script creates all the required instances of nfcapd, which makes the nfdump script unnecessary. To replace ot, we created the script */etc/init.d/nfsen.sh*, which must replace nfdump in the rcX.d directories:

```
root@dialga:~
% rm /etc/rc2.d/S20nfdump
root@dialga:~
% rm /etc/rc3.d/S20nfdump
root@dialga:~
% rm /etc/rc4.d/S20nfdump
root@dialga:~
% rm /etc/rc5.d/S20nfdump
root@dialga:~
% rm /etc/rc0.d/K20nfdump
root@dialga:~
% rm /etc/rc1.d/K20nfdump
root@dialga:~
% rm /etc/rc6.d/K20nfdump
root@dialga:~
% ln -s /etc/init.d/nfsen.sh /etc/rc2.d/S20nfsen
root@dialga:~
% ln -s /etc/init.d/nfsen.sh /etc/rc3.d/S20nfsen
root@dialga:~
% ln -s /etc/init.d/nfsen.sh /etc/rc4.d/S20nfsen
root@dialga:~
% ln -s /etc/init.d/nfsen.sh /etc/rc5.d/S20nfsen
root@dialga:~
% ln -s /etc/init.d/nfsen.sh /etc/rc0.d/K20nfsen
root@dialga:~
% ln -s /etc/init.d/nfsen.sh /etc/rc1.d/K20nfsen
root@dialga:~
% ln -s /etc/init.d/nfsen.sh /etc/rc6.d/K20nfsen
```

The flows are stored in the directories */data/nfsen/profiles-data/live/PROBE/YEAR/MONTH/DAY*.

The HTML files for the web interface are located in */var/www/nfsen/*. Therefore, the interface is available at `http://dialga/nfsen/nfsen.php`. The WEB interface communicates with the nfsen daemon via the socket */data/nfsen/var/run/nfsen.comm*. When connecting to the WEB interface, we had permissions problems to access to this socket. Thus, the startup script automatically set the rights to this socket to 777 to avoid any trouble.

On the WEB interface, the flows are displayed in graphs, such as shown in figure 18.

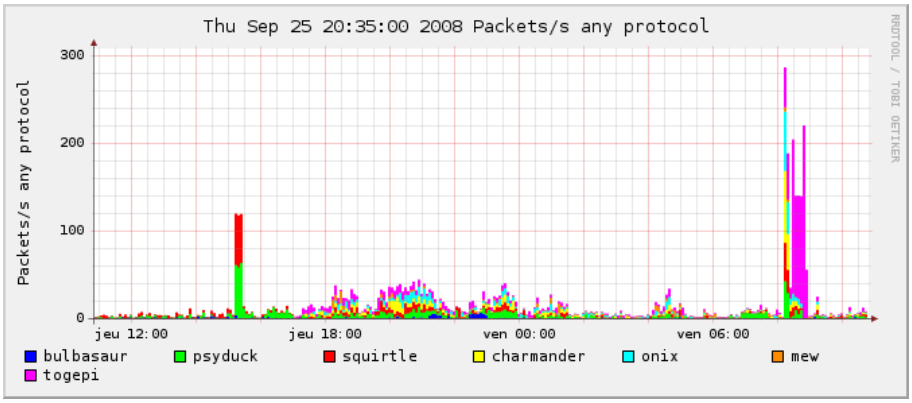


Figure 18: NfSen - Packets per second

Adding a Probe

To add a new probe, simply edit the configuration file and add a new probe in the sources section. Then, stop the daemon, run */data/nfsen/bin/nfsen reconfig* and accept the new source before restarting NfSen.

6.5 Backup

All the data is stored on the MD1000 storage unit. But in case of hardware failure on it, we decided to make backups on the storage server. In this section, we will present these backup mechanisms.

6.5.1 Database

Making backups of the database gives us the opportunity to rebuild in case of problem. We use the tool *pg_dump* to extract the database and the data contained in it.

The first time, as the database does not contain much data, we do a weekly full save on sundays. The other days, full backups are also made, but they are deleted automatically

every week. Thus, we always have the weekly full saves and one save per week day, which are called differential saves.

The script used is */opt/backup/psql_backup.sh*:

```
#!/bin/bash
#
# Postgresql backup
#

BACKUP_PARTITION="/backup"
DATABASE="idsserver"
OUTPUT="$BACKUP_PARTITION/postgresql/$DATABASE"

# create the dest dir if does not exist
mkdir -p $OUTPUT

set $(date +'%A %d %m %Y')


if test "$1" = "dimanche" ; then
        # weekly a full backup of all data and config. settings:
        pg_dump $DATABASE | gzip -9 > $OUTPUT/idsserver_full_$4-$2-$3.gz
else
        # incremental backup:
        pg_dump $DATABASE | gzip -9 > $OUTPUT/idsserver_diff_$4-$3-$2.gz
        # remove the oldest diff backup
        set $(date -d "last week" +'%A %d %m %Y')
        test -f $OUTPUT/idsserver_diff_$4-$3-$2.gz && rm -f $OUTPUT/idsserver_diff_$4-$3-$2.gz
fi
```

This script must be launched by the user *postgres* which is the only one in our configuration being able to dump the database. Its execution is put in a crontab to launch it daily.

```
root@dialga:~
% cat /etc/crontab

# postgresql
30 23 * * * postgres /opt/backup/psql_backup.sh 1>/dev/null 2>&1
```

6.5.2 Daily backup

Daily, a backup of the configured targets is made. The data backed up are not vital nor essential, it is just data that may be interesting to keep in case of crash.

This operation is performed by the script */opt/backup/backup.sh*

```
#!/bin/bash
#
# Daily backup
#

BACKUP_PARTITION="/backup"
TARGET="/data/nepenthes"
OUTPUT="$BACKUP_PARTITION/daily"

# create the dest dir if does not exist
mkdir -p $OUTPUT

set $(date +'%A %d %m %Y')


# incremental backup:
tar zcvf $OUTPUT/daily_save_$4-$3-$2.tgz $TARGET


# remove the oldest diff backup
set $(date -d "last week" +'%A %d %m %Y')
test -f $OUTPUT/daily_save_$4-$3-$2.tgz && rm -f $OUTPUT/daily_save_$4-$3-$2.tgz
```

All the directories specified by the variable *TARGET* avec saved in a .tar.gz archive. The archives are kept 7 days and are then deleted. Thus, we have, at each moment, a backup of the last week. As we already said, these data are not as important as the database, and may use more disk space. Therefore, there is no need to keep a weekly full backup.

At the moment, only the nepenthes binaries and hexdumps are saved.

This script is executed daily at 01:00 after all the binaries have been copied by the honeypots, via a crontab entry.

```
root@dialga:~
% cat /etc/crontab

# daily backup
00 01 * * * backup /opt/backup/backup.sh 1>/dev/null 2>&1
```

6.5.3 Manual Save

Other important data that do not change often are saved manually in */backup/manual*. This folder contains:

- All the files and scripts required to install and configure the logserver,
- All the files and scripts required to install and configure a host in the collect environment,
- All the files and scripts required to install and configure a host in the analysis environment,
- Xen related configuration files and the reference Virtual Machine to be cloned on hosts,
- Argos related configuration files and the reference Virtual Machine to be cloned on hosts.

7 Deployment

In this section we present the deployment we realized on our platform.

7.1 Sensors Deployed

The 25th of Septembre 2008 we had 80 Nepenthes instances and 6 Argos instances deployed, using 3 Internet connection from different providers (one SDSL connection with /24 public network by Orange/Oleana, one ADSL Pro with 1 public IP by Orange Pro and one ADSL 20 Mb with one public IP by Free).

Nepenthes instances are deployed on 6 servers: psyduck, squirtle, bulbsasaur, charmander, onix and togepi. Argos instances are deployed on mew.

Psyduck is multihomed with the SDSL and Orange Pro connections, whereas bulbasaur is multihomed with the SDSL and Free ADSL connections. All the other servers are only connected to the SDSL connection. The server squirtle is expected to be multihomed as soon as possible with Neuf ADSL and the SDSL connection.

7.2 Results

We will give some results and follow one binary in details to show all the informations that can be found thanks to our platform.

7.2.1 Attacks and Binaries Downloaded

Since the launching of the platform the 30th of June 2008, at the date of 26th September 2008, we did collect 39 084 binaries, resulting from 60 182 malwares proposed for download. Most of the failed download are caused by the server on which the malwares were supposed to be downloaded being offline. The platform underwent 522 893 possible malicious attacks (abnormal traffic or requests but not known as parts of real attacks) and 60 088 malicious attacks. This number is lower than the binaries offered for download because during some attacks, the malwares was offered by several sources or its download was retried several times because of failures. 65% of the attacks led to successful downloaded binaries, resulting to 6 077 unique binaries.

Daily, the 80 nepenthes sensors undergo between 15 000 and 40 000 possible malicious attacks, for an average of 23 068 possible attacks. The sensors see an average of 1 660 malicious attacks resulting in 1 129 downloaded binaries. The best days we collected up to 2 350 binaries for 2 700 malicious attacks. The figure 19 gives an idea of the evolution of the attacks over the time.

The top 3 exploits the sensors reported are:

1. DCOM - `http://nepenthes.mwcollect.org/documentation:modules:vulnerability:vuln_dcom` - 63% of the attacks

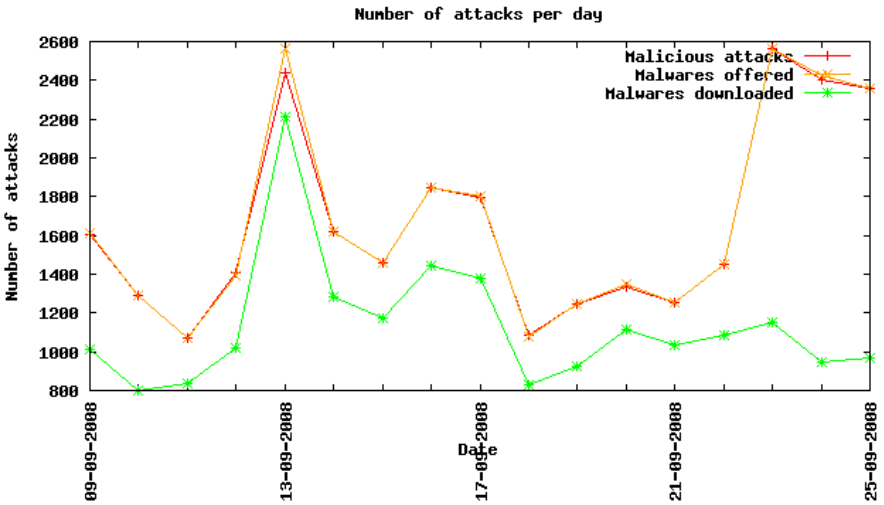


Figure 19: Evolution of the Attacks

2. LSASS - `http://www.microsoft.com/technet/security/bulletin/MS04-011.mspx` - 18% of the attacks

3. ASN1 - `http://www.microsoft.com/technet/security/bulletin/ms04-007.mspx` - 14% of the attacks

The top 3 ports attacked on all sensors are:

1. microsoft-ds (445) - 45% of the attacks

2. netbios-ssn (139) - 35% of the attacks

3. msrpc (135) - 14% of the attacks

Three IP addresses are responsible of 63 % of the attacks. The first one with 26 % is American, the second one with 23 % is Finnish and the third with 14 % is from Malaysia. 99 % of the attacks are performed from a Windows machine. The remaining 1 % are from Linux stations, whereas we have very few FreeBSD or SunOS ones. The binaries are downloaded mainly via link protocol (44 %), tftp (19 %), ftp (15 %) or creceive (15 %).

All these results are obtained with Nepenthes. Argos did not report yet a single attack. This is a point we want to dig and solve as soon as possible. The top 3 attacked ports are opened and accessible via Internet, if we take a look in the network traces we see some traffic to these ports, but no attacks has been reported.

During the rest of the analysis, we will use the binary *3875b6257d4d21d51ec13247ee4c1cdb* as reference. This binary was downloaded 877 times and is a good example for all the functionnalities of the platform. Its size is 49 KB and it is a MS-DOS executable Portable Executable (PE) for MS Windows (GUI) Intel 80386 32-bit.

7.2.2 Antivirus Scanning

Daily, all the binaries downloaded are scanned by the 3 installed antivirus. BitDefender has identified 4428 out of 4716 binaries (93%), Kaspersky 100% but with some of them marked as *OK* (the real number is close to BitDefender, maybe a little bit better) and Clamav 4154 out of 4716 (88%).

For our reference binary, BitDefender has identified it as *Backdoor.RBot.F*, Kaspersky as *Backdoor.Win32.Rbot.bni* and ClamAV successively as *Worm.Allaple-2*, *Worm.Allaple-126* and *Worm.Allaple-306*.

7.2.3 Network Traces

This binary was successfully downloaded for the last time on September 17th, 2008 at 21:53:23 from the IP A.B.C.D on the sensor *bulbasaur* with IP E.F.G.H. The corresponding file with network traces on the storage server is */var/lib/tcpdump/bulbasaur/20080917/eth3-bulbasaur-20080917T21h31m37s-20080917T22h31m37s.pcap*. If we retrieve this file and open it in *wireshark* we can trace the network activity related to this download, by setting the filter *ip.host == A.B.C.D and ip.host == E.F.G.H*, as shown in figure 20.

To give a better idea of the information obtained thanks to these network traces, the appendix A shows the whole traffic exported in text format.

7.2.4 Sandboxing

Depending on the binary submitted, we got more or less informations. the results are sent to a dedicated email address and a script retrieves them daily. the results fo our example are:

```
[ DetectionInfo ]
   * Sandbox name: NO_MALWARE
   * Signature name: W32/Spybot.BAYA
   * Compressed: YES
   * TLS hooks: NO
   * Executable type: Application
   * Executable file structure: OK

[ General information ]
   * File length:       50176 bytes.
   * MD5 hash: 3875b6257d4d21d51ec13247ee4c1cdb.
```

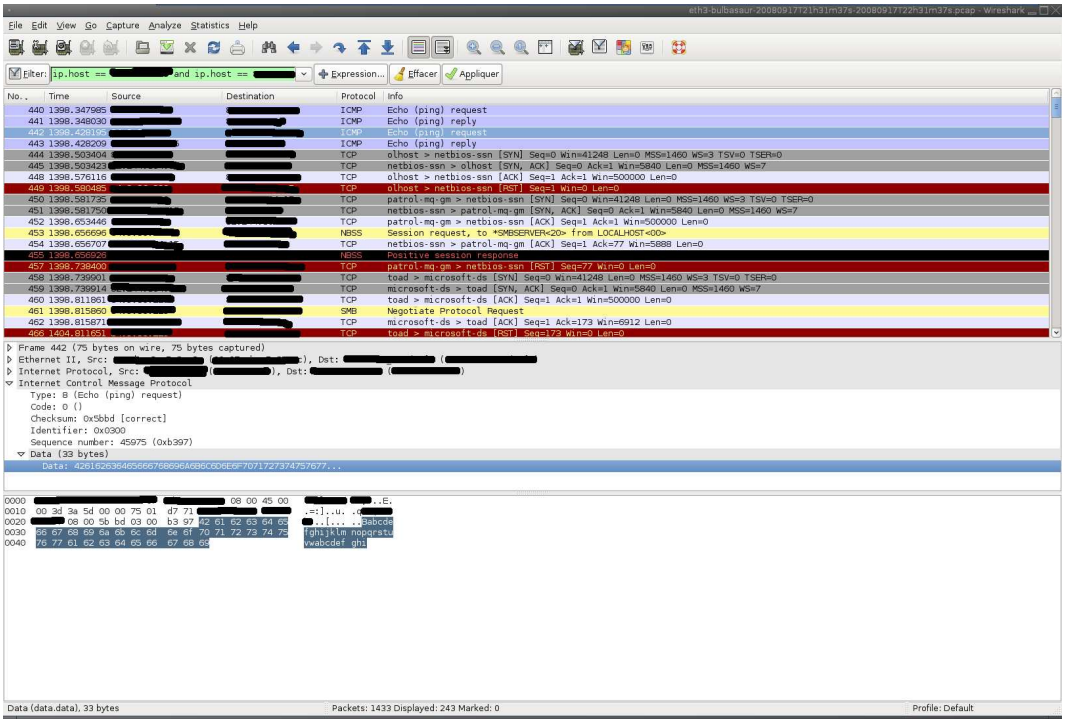


Figure 20: Network Traces

```
 [ Changes to registry ]
    * Creates key "HKCR\CLSID\{EDFE42DB-520D-3376-A5C0-CF95929CCC70}".
    * Sets value "default"="lvehvjlxtstjsjst" in key
      "HKCR\CLSID\{EDFE42DB-520D-3376-A5C0-CF95929CCC70}".
    * Creates key "HKCR\CLSID\{EDFE42DB-520D-3376-A5C0-CF95929CCC70}\LocalServer32".
    * Sets value "default"="c:\sample.exe" in key
      "HKCR\CLSID\{EDFE42DB-520D-3376-A5C0-CF95929CCC70}\LocalServer32".

 [ Network services ]
    * Sends a ping request (ICMP.DLL) to 212.166.6.4.
    * Sends data stream (76 bytes) to remote address "212.166.6.4", port 139.
    * Connects to "212.166.6.4" on port 445 (TCP).
    * Sends a ping request (ICMP.DLL) to 212.166.8.6.
    * Sends data stream (76 bytes) to remote address "212.166.8.6", port 139.
    * Connects to "212.166.8.6" on port 445 (TCP).
    * Sends a ping request (ICMP.DLL) to 212.166.10.8.
    * Sends data stream (76 bytes) to remote address "212.166.10.8", port 139.
    * Connects to "212.166.10.8" on port 445 (TCP).
    * Sends a ping request (ICMP.DLL) to 212.166.12.10.
    * Sends data stream (76 bytes) to remote address "212.166.12.10", port 139.
    * Connects to "212.166.12.10" on port 445 (TCP).

 [ Process/window information ]
    * Creates a mutex jhdgcjhasgdc09890gjasgcjhg2763876uyg3fhg.



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**********************************
Sent from an unmonitored email address.
Please DO NOT reply.
```

As we can see, we earn many informations about the changes in the registry or on the filesystem, network activity, processes created... It help to have a better idea of the behavior of the malware.

8 Maintenance

In this section, we will present maintenance procedures for the platform.

8.1 Starting the servers

To start all the servers safely, it is not possible to press simply all the power buttons one after the other, as a server requires lots of power when it starts to perform all the hardwares tests (fan, harddrives...). If all the servers perform these tests at the same time, it may cause a power outage, as the power would be cut for security issues. This is why the servers are not configured to boot automatically when the power goes up.

Thus, it is necessary to wait until these hardware tests are performed on a server before turning on the following one. When all the fans stop turning at full speed and the hard disks begin to blink normally, it is safe to turn on the following server.

However, before turning on the servers, the network infrastructure must be ready, which means that all the switches, the router and the firewall must be up. As they boot automatically when the power is restored, it should not cause problems. Just make sure to verify that they are up and running.

Finally, the logging server requires a more precise attention, as it is using the storage unit. This storage unit turns on automatically when the power is restored, but it requires a certain amount of time to perform all the required checks and be ready. Between the power restore and the starting of the logging server, it is recommended to wait a few minutes until all the leds blink normally and watch closely the boot process to make sure the storage unit is detected.

8.2 Shutting down the platform

During the normal shutdown procedure, the Xen domains running are saved in */var/lib/xen/save*, in order to be restored quickly in the same state they were when the server was halted. However, often, the restore operation causes kernels panics, which implies multiple hard resets of the server until the domain(s) creating these issues cannot be restored and restarts from scratch its booting process.

The solution to avoid these troubles is to not use the restore facility. This will imply a longer boot process, but as the guest domains are very light, this delay will not be harmful. To make sure the domains are not restored at startup, it is necessary to modify the configuration file of the *xendomains* daemon, namely */etc/default/xendomains*, and deactivate this restore feature:

```
## Type: boolean
## Default: true
#
# This variable determines whether saved domains from XENDOMAINS_SAVE
# will be restored on system startup.
```

```
#
XENDOMAINS_RESTORE=false
```

Even if the domains are saved, they are not restored but started from scratch avoiding the problems. To avoid saving the domains, it is possible to destroy all domains before shutting down the server with the following procedure.

First identify the domains running:

```
root@bulbasaur:~
% xm list
Name                                        ID   Mem VCPUs      State   Time(s)
Domain-0                                     0  1964     8     r-----     77.4
bulbasaur-nepenthes-1                        1   512     1     -b----      7.2
bulbasaur-nepenthes-10                       2   512     1     -b----      7.3
bulbasaur-nepenthes-11                       3   512     1     -b----      7.3
bulbasaur-nepenthes-12                       4   512     1     -b----      7.4
bulbasaur-nepenthes-2                        5   512     1     -b----      7.2
bulbasaur-nepenthes-3                        6   512     1     -b----      7.2
bulbasaur-nepenthes-4                        7   512     1     -b----      7.2
bulbasaur-nepenthes-5                        8   512     1     -b----      7.2
bulbasaur-nepenthes-6                        9   512     1     -b----      7.2
bulbasaur-nepenthes-7                       10   512     1     -b----      7.2
bulbasaur-nepenthes-8                       11   512     1     -b----      7.2
bulbasaur-nepenthes-9                       12   512     1     -b----      7.2
```

Then, destroy the domains one by one:

```
root@bulbasaur:~
% xm destroy bulbasaur-nepenthes-X
```

Then, you can safely halt or reboot the system.

8.3 Daily status check

Daily, it is necessary to check that all the servers and sensors are running. To do so, we have several indicators.

First of all, all servers are configured to log daily error and status messages to an email address. If one of the servers does not send it, it may be a hint that something crashed.

Secondly, the logging server send daily reports about the attacks the platform underwent the day before. These reports include the number of addresses and binaries downloaded. If these numbers are not consistent or the report is missing, it may indicate that the logging server or some sensors are down.

In order to check that all the sensors are running, the web interface can be used. In the tab *Configuration -¿ Sensor Status*, a table presents all the sensors status. If all of the are

in a green state as shown in figure 21 everything is fine, but if one of them is in an orange or red state, it must be checked.

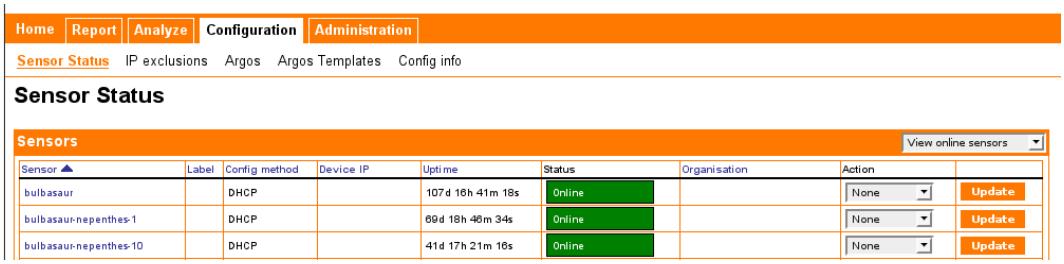

Figure 21: Sensor Status

If all the sensors running on a same server are down, it may indicate taht the server or a service on this server crashed.

8.4 Communication

In order to promote the platform and the results gathered, a small web interface has been developped. Daily, Perl scripts are runt on the logging server and generate graphs via *Gnuplot* and XML files giving information about the attacks, the downloaded binaries:

- one file describes the activities of the apst day
- one file describes all the attacks since the end of the deployment phase
- one file describes an average of the attacks undergone
- one file gives information about the downloaded binaries

These files are translated "on the fly" to HTML via XSLT processing. All the resulting HTML pages also include information about the active sensors, the total attacks and downloaded binaries since the starting of the project, and the total amount of network traces captured. These pages are available on the WEB server running on the logging server at the URL `http://dialga/lhsi/`.

In order to promote the LHSI, this mini website is displayed on a big screen in the laboratory. This screen is couple to a PC running *Firefox* with the addon *iMacros*, which permits to script actions in the browser. That way, the pages are shown as a diaporama, and used as communication material.

9 Conclusion and Future Work

We presented in this report the network telescope deployed in the scope on the High Security Laboratory project at Loria - INRIA Nancy Grand Est. We detailed the whole infrastructure, physical, logical and software. We also gave guidelines that can help to deploy the same kind of infrastructure, by highlighting and explaining our choices, the problems encountered and their solutions.

Then finally, we gave the first results we obtained, and detailed all the information that can be used to understand how an attack was performed by using a given binary as example.

As future work on this platform, we will also analyze deeper the results to extract statistics and launch studies on the informations collected, and especially take care of their dissemination.

Appendix A: Network Traces for Malicious attack

```
No.     Time        Source                Destination           Protocol Info
    440 1398.347985 A.B.C.D           E.F.G.H         ICMP     Echo (ping) request

Frame 440 (75 bytes on wire, 75 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Internet Control Message Protocol

No.     Time        Source                Destination           Protocol Info
    441 1398.348030 E.F.G.H         A.B.C.D           ICMP     Echo (ping) reply

Frame 441 (75 bytes on wire, 75 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Internet Control Message Protocol

No.     Time        Source                Destination           Protocol Info
    442 1398.428195 A.B.C.D           E.F.G.H         ICMP     Echo (ping) request

Frame 442 (75 bytes on wire, 75 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Internet Control Message Protocol

No.     Time        Source                Destination           Protocol Info
    443 1398.428209 E.F.G.H         A.B.C.D           ICMP     Echo (ping) reply

Frame 443 (75 bytes on wire, 75 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Internet Control Message Protocol

No.     Time        Source                Destination           Protocol Info
    444 1398.503404 A.B.C.D           E.F.G.H         TCP      olhost > netbios-ssn [SYN] Seq=0 Win=41248 Len=0 MSS=1460 WS=3 TSV=0 TSER=0

Frame 444 (78 bytes on wire, 78 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: olhost (2661), Dst Port: netbios-ssn (139), Seq: 0, Len: 0
    Source port: olhost (2661)
    Destination port: netbios-ssn (139)
    Sequence number: 0    (relative sequence number)
    Header length: 44 bytes
    Flags: 0x02 (SYN)
    Window size: 41248
    Checksum: 0x3b8c [correct]
    Options: (24 bytes)

No.     Time        Source                Destination           Protocol Info
    445 1398.503423 E.F.G.H         A.B.C.D           TCP      netbios-ssn > olhost [SYN, ACK] Seq=0 Ack=1 Win=5840 Len=0 MSS=1460 WS=7

Frame 445 (66 bytes on wire, 66 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: netbios-ssn (139), Dst Port: olhost (2661), Seq: 0, Ack: 1, Len: 0
    Source port: netbios-ssn (139)
    Destination port: olhost (2661)
    Sequence number: 0    (relative sequence number)
    Acknowledgement number: 1    (relative ack number)
```

```
    Header length: 32 bytes
    Flags: 0x12 (SYN, ACK)
    Window size: 5840
    Checksum: 0x5565 [correct]
    Options: (12 bytes)
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    448 1398.576116 A.B.C.D           E.F.G.H         TCP      olhost > netbios-ssn [ACK] Seq=1 Ack=1 Win=500000 Len=0

Frame 448 (62 bytes on wire, 62 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: olhost (2661), Dst Port: netbios-ssn (139), Seq: 1, Ack: 1, Len: 0
    Source port: olhost (2661)
    Destination port: netbios-ssn (139)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 500000 (scaled)
    Checksum: 0xb8e2 [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    449 1398.580485 A.B.C.D           E.F.G.H         TCP      olhost > netbios-ssn [RST] Seq=1 Win=0 Len=0

Frame 449 (62 bytes on wire, 62 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: olhost (2661), Dst Port: netbios-ssn (139), Seq: 1, Len: 0
    Source port: olhost (2661)
    Destination port: netbios-ssn (139)
    Sequence number: 1    (relative sequence number)
    Acknowledgment number: Broken TCP. The acknowledge field is nonzero while the ACK flag is not set
    Header length: 20 bytes
    Flags: 0x04 (RST)
    Window size: 0
    Checksum: 0x5f0f [correct]

No.     Time        Source                Destination           Protocol Info
    450 1398.581735 A.B.C.D           E.F.G.H         TCP      patrol-mq-gm > netbios-ssn [SYN] Seq=0 Win=41248 Len=0 MSS=1460 WS=3 TSV=0 T

Frame 450 (78 bytes on wire, 78 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: patrol-mq-gm (2664), Dst Port: netbios-ssn (139), Seq: 0, Len: 0
    Source port: patrol-mq-gm (2664)
    Destination port: netbios-ssn (139)
    Sequence number: 0    (relative sequence number)
    Header length: 44 bytes
    Flags: 0x02 (SYN)
    Window size: 41248
    Checksum: 0x1f4c [correct]
    Options: (24 bytes)

No.     Time        Source                Destination           Protocol Info
    451 1398.581750 E.F.G.H         A.B.C.D           TCP      netbios-ssn > patrol-mq-gm [SYN, ACK] Seq=0 Ack=1 Win=5840 Len=0 MSS=1460 WS

Frame 451 (66 bytes on wire, 66 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: netbios-ssn (139), Dst Port: patrol-mq-gm (2664), Seq: 0, Ack: 1, Len: 0
```

```
    Source port: netbios-ssn (139)
    Destination port: patrol-mq-gm (2664)
    Sequence number: 0    (relative sequence number)
    Acknowledgement number: 1    (relative ack number)
    Header length: 32 bytes
    Flags: 0x12 (SYN, ACK)
    Window size: 5840
    Checksum: 0x29a8 [correct]
    Options: (12 bytes)
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    452 1398.653446 A.B.C.D           E.F.G.H         TCP      patrol-mq-gm > netbios-ssn [ACK] Seq=1 Ack=1 Win=500000 Len=0

Frame 452 (62 bytes on wire, 62 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: patrol-mq-gm (2664), Dst Port: netbios-ssn (139), Seq: 1, Ack: 1, Len: 0
    Source port: patrol-mq-gm (2664)
    Destination port: netbios-ssn (139)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 500000 (scaled)
    Checksum: 0x8d25 [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    453 1398.656696 A.B.C.D           E.F.G.H         NBSS     Session request, to *SMBSERVER<20> from LOCALHOST<00>

Frame 453 (130 bytes on wire, 130 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: patrol-mq-gm (2664), Dst Port: netbios-ssn (139), Seq: 1, Ack: 1, Len: 76
    Source port: patrol-mq-gm (2664)
    Destination port: netbios-ssn (139)
    Sequence number: 1    (relative sequence number)
    [Next sequence number: 77    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 500000 (scaled)
    Checksum: 0x26f7 [correct]
NetBIOS Session Service

No.     Time        Source                Destination           Protocol Info
    454 1398.656707 E.F.G.H         A.B.C.D           TCP      netbios-ssn > patrol-mq-gm [ACK] Seq=1 Ack=77 Win=5888 Len=0

Frame 454 (54 bytes on wire, 54 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: netbios-ssn (139), Dst Port: patrol-mq-gm (2664), Seq: 1, Ack: 77, Len: 0
    Source port: netbios-ssn (139)
    Destination port: patrol-mq-gm (2664)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 77    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 5888 (scaled)
    Checksum: 0x80d0 [correct]
    [SEQ/ACK analysis]
```

```
No.     Time        Source                Destination           Protocol Info
    455 1398.656926 E.F.G.H         A.B.C.D           NBSS     Positive session response

Frame 455 (118 bytes on wire, 118 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: netbios-ssn (139), Dst Port: patrol-mq-gm (2664), Seq: 1, Ack: 77, Len: 64
    Source port: netbios-ssn (139)
    Destination port: patrol-mq-gm (2664)
    Sequence number: 1    (relative sequence number)
    [Next sequence number: 65    (relative sequence number)]
    Acknowledgement number: 77    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 5888 (scaled)
    Checksum: 0x344c [incorrect, should be 0xfe87 (maybe caused by "TCP checksum offload"?)]
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No.     Time        Source                Destination           Protocol Info
    457 1398.738400 A.B.C.D           E.F.G.H         TCP      patrol-mq-gm > netbios-ssn [RST] Seq=77 Win=0 Len=0

Frame 457 (62 bytes on wire, 62 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: patrol-mq-gm (2664), Dst Port: netbios-ssn (139), Seq: 77, Len: 0
    Source port: patrol-mq-gm (2664)
    Destination port: netbios-ssn (139)
    Sequence number: 77    (relative sequence number)
    Acknowledgment number: Broken TCP. The acknowledge field is nonzero while the ACK flag is not set
    Header length: 20 bytes
    Flags: 0x04 (RST)
    Window size: 0
    Checksum: 0x216e [correct]

No.     Time        Source                Destination           Protocol Info
    458 1398.739901 A.B.C.D           E.F.G.H         TCP      toad > microsoft-ds [SYN] Seq=0 Win=41248 Len=0 MSS=1460 WS=3 TSV=0 TSER=0

Frame 458 (78 bytes on wire, 78 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: toad (2669), Dst Port: microsoft-ds (445), Seq: 0, Len: 0
    Source port: toad (2669)
    Destination port: microsoft-ds (445)
    Sequence number: 0    (relative sequence number)
    Header length: 44 bytes
    Flags: 0x02 (SYN)
    Window size: 41248
    Checksum: 0x73f6 [correct]
```

```
    Options: (24 bytes)

No.     Time        Source                Destination           Protocol Info
    459 1398.739914 E.F.G.H         A.B.C.D           TCP      microsoft-ds > toad [SYN, ACK] Seq=0 Ack=1 Win=5840 Len=0 MSS=1460 WS=7

Frame 459 (66 bytes on wire, 66 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: microsoft-ds (445), Dst Port: toad (2669), Seq: 0, Ack: 1, Len: 0
    Source port: microsoft-ds (445)
    Destination port: toad (2669)
    Sequence number: 0    (relative sequence number)
    Acknowledgement number: 1    (relative ack number)
    Header length: 32 bytes
    Flags: 0x12 (SYN, ACK)
    Window size: 5840
    Checksum: 0x6cca [correct]
    Options: (12 bytes)
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    460 1398.811861 A.B.C.D           E.F.G.H         TCP      toad > microsoft-ds [ACK] Seq=1 Ack=1 Win=500000 Len=0

Frame 460 (62 bytes on wire, 62 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: toad (2669), Dst Port: microsoft-ds (445), Seq: 1, Ack: 1, Len: 0
    Source port: toad (2669)
    Destination port: microsoft-ds (445)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 500000 (scaled)
    Checksum: 0xd047 [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    461 1398.815860 A.B.C.D           E.F.G.H         SMB      Negotiate Protocol Request

Frame 461 (226 bytes on wire, 226 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: toad (2669), Dst Port: microsoft-ds (445), Seq: 1, Ack: 1, Len: 172
    Source port: toad (2669)
    Destination port: microsoft-ds (445)
    Sequence number: 1    (relative sequence number)
    [Next sequence number: 173    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 500000 (scaled)
    Checksum: 0xae39 [correct]
NetBIOS Session Service
SMB (Server Message Block Protocol)

No.     Time        Source                Destination           Protocol Info
    462 1398.815871 E.F.G.H         A.B.C.D           TCP      microsoft-ds > toad [ACK] Seq=1 Ack=173 Win=6912 Len=0

Frame 462 (54 bytes on wire, 54 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: microsoft-ds (445), Dst Port: toad (2669), Seq: 1, Ack: 173, Len: 0
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    Source port: microsoft-ds (445)
    Destination port: toad (2669)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 173    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 6912 (scaled)
    Checksum: 0xc38a [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    466 1404.811651 A.B.C.D           E.F.G.H         TCP      toad > microsoft-ds [RST] Seq=173 Win=0 Len=0

Frame 466 (62 bytes on wire, 62 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: toad (2669), Dst Port: microsoft-ds (445), Seq: 173, Len: 0
    Source port: toad (2669)
    Destination port: microsoft-ds (445)
    Sequence number: 173    (relative sequence number)
    Header length: 20 bytes
    Flags: 0x04 (RST)
    Window size: 0
    Checksum: 0x8e4c [correct]

No.     Time        Source                Destination           Protocol Info
    467 1404.813645 A.B.C.D           E.F.G.H         TCP      acc-raid > netbios-ssn [SYN] Seq=0 Win=41248 Len=0 MSS=1460 WS=3 TSV=0 TSER=

Frame 467 (78 bytes on wire, 78 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: acc-raid (2800), Dst Port: netbios-ssn (139), Seq: 0, Len: 0
    Source port: acc-raid (2800)
    Destination port: netbios-ssn (139)
    Sequence number: 0    (relative sequence number)
    Header length: 44 bytes
    Flags: 0x02 (SYN)
    Window size: 41248
    Checksum: 0x157f [correct]
    Options: (24 bytes)

No.     Time        Source                Destination           Protocol Info
    468 1404.813664 E.F.G.H         A.B.C.D           TCP      netbios-ssn > acc-raid [SYN, ACK] Seq=0 Ack=1 Win=5840 Len=0 MSS=1460 WS=7

Frame 468 (66 bytes on wire, 66 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: netbios-ssn (139), Dst Port: acc-raid (2800), Seq: 0, Ack: 1, Len: 0
    Source port: netbios-ssn (139)
    Destination port: acc-raid (2800)
    Sequence number: 0    (relative sequence number)
    Acknowledgement number: 1    (relative ack number)
    Header length: 32 bytes
    Flags: 0x12 (SYN, ACK)
    Window size: 5840
    Checksum: 0x484f [correct]
    Options: (12 bytes)
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    469 1404.886731 A.B.C.D           E.F.G.H         TCP      acc-raid > netbios-ssn [ACK] Seq=1 Ack=1 Win=500000 Len=0

Frame 469 (62 bytes on wire, 62 bytes captured)
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Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: acc-raid (2800), Dst Port: netbios-ssn (139), Seq: 1, Ack: 1, Len: 0
    Source port: acc-raid (2800)
    Destination port: netbios-ssn (139)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 500000 (scaled)
    Checksum: 0xabcc [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    470 1404.892355 A.B.C.D           E.F.G.H         NBSS     Session request, to *SMBSERVER<20> from LOCALHOST<00>

Frame 470 (130 bytes on wire, 130 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: acc-raid (2800), Dst Port: netbios-ssn (139), Seq: 1, Ack: 1, Len: 76
    Source port: acc-raid (2800)
    Destination port: netbios-ssn (139)
    Sequence number: 1    (relative sequence number)
    [Next sequence number: 77    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 500000 (scaled)
    Checksum: 0x459e [correct]
NetBIOS Session Service

No.     Time        Source                Destination           Protocol Info
    471 1404.892364 E.F.G.H         A.B.C.D           TCP      netbios-ssn > acc-raid [ACK] Seq=1 Ack=77 Win=5888 Len=0

Frame 471 (54 bytes on wire, 54 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: netbios-ssn (139), Dst Port: acc-raid (2800), Seq: 1, Ack: 77, Len: 0
    Source port: netbios-ssn (139)
    Destination port: acc-raid (2800)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 77    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 5888 (scaled)
    Checksum: 0x9f77 [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    472 1404.892554 E.F.G.H         A.B.C.D           NBSS     Positive session response

Frame 472 (118 bytes on wire, 118 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: netbios-ssn (139), Dst Port: acc-raid (2800), Seq: 1, Ack: 77, Len: 64
    Source port: netbios-ssn (139)
    Destination port: acc-raid (2800)
    Sequence number: 1    (relative sequence number)
    [Next sequence number: 65    (relative sequence number)]
    Acknowledgement number: 77    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 5888 (scaled)
```

```
    Checksum: 0x344c [incorrect, should be 0x1d2f (maybe caused by "TCP checksum offload"?)]
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No.     Time        Source                Destination           Protocol Info
    473 1404.966316 A.B.C.D           E.F.G.H         TCP      acc-raid > netbios-ssn [RST] Seq=77 Win=0 Len=0

Frame 473 (62 bytes on wire, 62 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: acc-raid (2800), Dst Port: netbios-ssn (139), Seq: 77, Len: 0
    Source port: acc-raid (2800)
    Destination port: netbios-ssn (139)
    Sequence number: 77    (relative sequence number)
    Acknowledgment number: Broken TCP. The acknowledge field is nonzero while the ACK flag is not set
    Header length: 20 bytes
    Flags: 0x04 (RST)
    Window size: 0
    Checksum: 0xf60a [correct]

No.     Time        Source                Destination           Protocol Info
    474 1404.968313 A.B.C.D           E.F.G.H         TCP      veritas-tcp1 > microsoft-ds [SYN] Seq=0 Win=41248 Len=0 MSS=1460 WS=3 TSV=0

Frame 474 (78 bytes on wire, 78 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: veritas-tcp1 (2802), Dst Port: microsoft-ds (445), Seq: 0, Len: 0
    Source port: veritas-tcp1 (2802)
    Destination port: microsoft-ds (445)
    Sequence number: 0    (relative sequence number)
    Header length: 44 bytes
    Flags: 0x02 (SYN)
    Window size: 41248
    Checksum: 0x3173 [correct]
    Options: (24 bytes)

No.     Time        Source                Destination           Protocol Info
    475 1404.968323 E.F.G.H         A.B.C.D           TCP      microsoft-ds > veritas-tcp1 [SYN, ACK] Seq=0 Ack=1 Win=5840 Len=0 MSS=1460 W

Frame 475 (66 bytes on wire, 66 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: microsoft-ds (445), Dst Port: veritas-tcp1 (2802), Seq: 0, Ack: 1, Len: 0
    Source port: microsoft-ds (445)
    Destination port: veritas-tcp1 (2802)
    Sequence number: 0    (relative sequence number)
    Acknowledgement number: 1    (relative ack number)
    Header length: 32 bytes
    Flags: 0x12 (SYN, ACK)
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    Window size: 5840
    Checksum: 0x050b [correct]
    Options: (12 bytes)
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    476 1405.041523 A.B.C.D           E.F.G.H         TCP      veritas-tcp1 > microsoft-ds [ACK] Seq=1 Ack=1 Win=500000 Len=0

Frame 476 (62 bytes on wire, 62 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: veritas-tcp1 (2802), Dst Port: microsoft-ds (445), Seq: 1, Ack: 1, Len: 0
    Source port: veritas-tcp1 (2802)
    Destination port: microsoft-ds (445)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 500000 (scaled)
    Checksum: 0x6888 [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    477 1405.046647 A.B.C.D           E.F.G.H         SMB      Negotiate Protocol Request

Frame 477 (226 bytes on wire, 226 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: veritas-tcp1 (2802), Dst Port: microsoft-ds (445), Seq: 1, Ack: 1, Len: 172
    Source port: veritas-tcp1 (2802)
    Destination port: microsoft-ds (445)
    Sequence number: 1    (relative sequence number)
    [Next sequence number: 173    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 500000 (scaled)
    Checksum: 0xfa37 [correct]
NetBIOS Session Service
SMB (Server Message Block Protocol)

No.     Time        Source                Destination           Protocol Info
    478 1405.046655 E.F.G.H         A.B.C.D           TCP      microsoft-ds > veritas-tcp1 [ACK] Seq=1 Ack=173 Win=6912 Len=0

Frame 478 (54 bytes on wire, 54 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: microsoft-ds (445), Dst Port: veritas-tcp1 (2802), Seq: 1, Ack: 173, Len: 0
    Source port: microsoft-ds (445)
    Destination port: veritas-tcp1 (2802)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 173    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 6912 (scaled)
    Checksum: 0x5bcb [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    479 1411.041850 A.B.C.D           E.F.G.H         TCP      veritas-tcp1 > microsoft-ds [RST] Seq=173 Win=0 Len=0

Frame 479 (62 bytes on wire, 62 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
```

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Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: veritas-tcp1 (2802), Dst Port: microsoft-ds (445), Seq: 173, Len: 0
    Source port: veritas-tcp1 (2802)
    Destination port: microsoft-ds (445)
    Sequence number: 173    (relative sequence number)
    Acknowledgment number: Broken TCP. The acknowledge field is nonzero while the ACK flag is not set
    Header length: 20 bytes
    Flags: 0x04 (RST)
    Window size: 0
    Checksum: 0xfdb6 [correct]

No.     Time        Source                Destination           Protocol Info
    480 1411.043216 A.B.C.D           E.F.G.H         TCP      funk-dialout > netbios-ssn [SYN] Seq=0 Win=41248 Len=0 MSS=1460 WS=3 TSV=0 T

Frame 480 (78 bytes on wire, 78 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: funk-dialout (2909), Dst Port: netbios-ssn (139), Seq: 0, Len: 0
    Source port: funk-dialout (2909)
    Destination port: netbios-ssn (139)
    Sequence number: 0    (relative sequence number)
    Header length: 44 bytes
    Flags: 0x02 (SYN)
    Window size: 41248
    Checksum: 0x7d9e [correct]
    Options: (24 bytes)

No.     Time        Source                Destination           Protocol Info
    481 1411.043237 E.F.G.H         A.B.C.D           TCP      netbios-ssn > funk-dialout [SYN, ACK] Seq=0 Ack=1 Win=5840 Len=0 MSS=1460 WS

Frame 481 (66 bytes on wire, 66 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: netbios-ssn (139), Dst Port: funk-dialout (2909), Seq: 0, Ack: 1, Len: 0
    Source port: netbios-ssn (139)
    Destination port: funk-dialout (2909)
    Sequence number: 0    (relative sequence number)
    Acknowledgement number: 1    (relative ack number)
    Header length: 32 bytes
    Flags: 0x12 (SYN, ACK)
    Window size: 5840
    Checksum: 0xa3f4 [correct]
    Options: (12 bytes)
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    482 1411.121049 A.B.C.D           E.F.G.H         TCP      funk-dialout > netbios-ssn [ACK] Seq=1 Ack=1 Win=500000 Len=0

Frame 482 (62 bytes on wire, 62 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: funk-dialout (2909), Dst Port: netbios-ssn (139), Seq: 1, Ack: 1, Len: 0
    Source port: funk-dialout (2909)
    Destination port: netbios-ssn (139)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 500000 (scaled)
    Checksum: 0x0772 [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
```

```
    483 1411.123046 A.B.C.D           E.F.G.H         NBSS     Session request, to *SMBSERVER<20> from LOCALHOST<00>

Frame 483 (130 bytes on wire, 130 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: funk-dialout (2909), Dst Port: netbios-ssn (139), Seq: 1, Ack: 1, Len: 76
    Source port: funk-dialout (2909)
    Destination port: netbios-ssn (139)
    Sequence number: 1    (relative sequence number)
    [Next sequence number: 77    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 500000 (scaled)
    Checksum: 0xa143 [correct]
NetBIOS Session Service

No.     Time        Source                Destination           Protocol Info
    484 1411.123058 E.F.G.H         A.B.C.D           TCP      netbios-ssn > funk-dialout [ACK] Seq=1 Ack=77 Win=5888 Len=0

Frame 484 (54 bytes on wire, 54 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: netbios-ssn (139), Dst Port: funk-dialout (2909), Seq: 1, Ack: 77, Len: 0
    Source port: netbios-ssn (139)
    Destination port: funk-dialout (2909)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 77    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 5888 (scaled)
    Checksum: 0xfb1c [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    485 1411.123270 E.F.G.H         A.B.C.D           NBSS     Positive session response

Frame 485 (118 bytes on wire, 118 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: netbios-ssn (139), Dst Port: funk-dialout (2909), Seq: 1, Ack: 77, Len: 64
    Source port: netbios-ssn (139)
    Destination port: funk-dialout (2909)
    Sequence number: 1    (relative sequence number)
    [Next sequence number: 65    (relative sequence number)]
    Acknowledgement number: 77    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 5888 (scaled)
    Checksum: 0x344c [incorrect, should be 0x78d4 (maybe caused by "TCP checksum offload"?)]
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No.     Time        Source                Destination           Protocol Info
    486 1411.198763 A.B.C.D           E.F.G.H         TCP      funk-dialout > netbios-ssn [RST] Seq=77 Win=0 Len=0

Frame 486 (62 bytes on wire, 62 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: funk-dialout (2909), Dst Port: netbios-ssn (139), Seq: 77, Len: 0
    Source port: funk-dialout (2909)
    Destination port: netbios-ssn (139)
    Sequence number: 77    (relative sequence number)
    Acknowledgment number: Broken TCP. The acknowledge field is nonzero while the ACK flag is not set
    Header length: 20 bytes
    Flags: 0x04 (RST)
    Window size: 0
    Checksum: 0xe877 [correct]

No.     Time        Source                Destination           Protocol Info
    487 1411.200382 A.B.C.D           E.F.G.H         TCP      boosterware > microsoft-ds [SYN] Seq=0 Win=41248 Len=0 MSS=1460 WS=3 TSV=0 T

Frame 487 (78 bytes on wire, 78 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: boosterware (2913), Dst Port: microsoft-ds (445), Seq: 0, Len: 0
    Source port: boosterware (2913)
    Destination port: microsoft-ds (445)
    Sequence number: 0    (relative sequence number)
    Header length: 44 bytes
    Flags: 0x02 (SYN)
    Window size: 41248
    Checksum: 0x1a33 [correct]
    Options: (24 bytes)

No.     Time        Source                Destination           Protocol Info
    488 1411.200395 E.F.G.H         A.B.C.D           TCP      microsoft-ds > boosterware [SYN, ACK] Seq=0 Ack=1 Win=5840 Len=0 MSS=1460 WS

Frame 488 (66 bytes on wire, 66 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: microsoft-ds (445), Dst Port: boosterware (2913), Seq: 0, Ack: 1, Len: 0
    Source port: microsoft-ds (445)
    Destination port: boosterware (2913)
    Sequence number: 0    (relative sequence number)
    Acknowledgement number: 1    (relative ack number)
    Header length: 32 bytes
    Flags: 0x12 (SYN, ACK)
    Window size: 5840
    Checksum: 0x1150 [correct]
    Options: (12 bytes)
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    489 1411.271222 A.B.C.D           E.F.G.H         TCP      boosterware > microsoft-ds [ACK] Seq=1 Ack=1 Win=500000 Len=0

Frame 489 (62 bytes on wire, 62 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: boosterware (2913), Dst Port: microsoft-ds (445), Seq: 1, Ack: 1, Len: 0
    Source port: boosterware (2913)
    Destination port: microsoft-ds (445)
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    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 500000 (scaled)
    Checksum: 0x74cd [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    490 1411.276343 A.B.C.D           E.F.G.H         SMB      Negotiate Protocol Request

Frame 490 (226 bytes on wire, 226 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: boosterware (2913), Dst Port: microsoft-ds (445), Seq: 1, Ack: 1, Len: 172
    Source port: boosterware (2913)
    Destination port: microsoft-ds (445)
    Sequence number: 1    (relative sequence number)
    [Next sequence number: 173    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 500000 (scaled)
    Checksum: 0xe2b5 [correct]
NetBIOS Session Service
SMB (Server Message Block Protocol)

No.     Time        Source                Destination           Protocol Info
    491 1411.276354 E.F.G.H         A.B.C.D           TCP      microsoft-ds > boosterware [ACK] Seq=1 Ack=173 Win=6912 Len=0

Frame 491 (54 bytes on wire, 54 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: microsoft-ds (445), Dst Port: boosterware (2913), Seq: 1, Ack: 173, Len: 0
    Source port: microsoft-ds (445)
    Destination port: boosterware (2913)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 173    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 6912 (scaled)
    Checksum: 0x6810 [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    502 1417.273654 A.B.C.D           E.F.G.H         TCP      boosterware > microsoft-ds [RST] Seq=173 Win=0 Len=0

Frame 502 (62 bytes on wire, 62 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: boosterware (2913), Dst Port: microsoft-ds (445), Seq: 173, Len: 0
    Source port: boosterware (2913)
    Destination port: microsoft-ds (445)
    Sequence number: 173    (relative sequence number)
    Acknowledgment number: Broken TCP. The acknowledge field is nonzero while the ACK flag is not set
    Header length: 20 bytes
    Flags: 0x04 (RST)
    Window size: 0
    Checksum: 0x0777 [correct]

No.     Time        Source                Destination           Protocol Info
    503 1417.275144 A.B.C.D           E.F.G.H         TCP      event_listener > netbios-ssn [SYN] Seq=0 Win=41248 Len=0 MSS=1460 WS=3 TSV=0
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Frame 503 (78 bytes on wire, 78 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: event_listener (3017), Dst Port: netbios-ssn (139), Seq: 0, Len: 0
    Source port: event_listener (3017)
    Destination port: netbios-ssn (139)
    Sequence number: 0    (relative sequence number)
    Header length: 44 bytes
    Flags: 0x02 (SYN)
    Window size: 41248
    Checksum: 0x8172 [correct]
    Options: (24 bytes)

No.     Time        Source                Destination           Protocol Info
    504 1417.275166 E.F.G.H         A.B.C.D           TCP      netbios-ssn > event_listener [SYN, ACK] Seq=0 Ack=1 Win=5840 Len=0 MSS=1460

Frame 504 (66 bytes on wire, 66 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: netbios-ssn (139), Dst Port: event_listener (3017), Seq: 0, Ack: 1, Len: 0
    Source port: netbios-ssn (139)
    Destination port: event_listener (3017)
    Sequence number: 0    (relative sequence number)
    Acknowledgement number: 1    (relative ack number)
    Header length: 32 bytes
    Flags: 0x12 (SYN, ACK)
    Window size: 5840
    Checksum: 0xe4ad [correct]
    Options: (12 bytes)
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    505 1417.347358 A.B.C.D           E.F.G.H         TCP      event_listener > netbios-ssn [ACK] Seq=1 Ack=1 Win=500000 Len=0

Frame 505 (62 bytes on wire, 62 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: event_listener (3017), Dst Port: netbios-ssn (139), Seq: 1, Ack: 1, Len: 0
    Source port: event_listener (3017)
    Destination port: netbios-ssn (139)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 500000 (scaled)
    Checksum: 0x482b [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    506 1417.349480 A.B.C.D           E.F.G.H         NBSS     Session request, to *SMBSERVER<20> from LOCALHOST<00>

Frame 506 (130 bytes on wire, 130 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: event_listener (3017), Dst Port: netbios-ssn (139), Seq: 1, Ack: 1, Len: 76
    Source port: event_listener (3017)
    Destination port: netbios-ssn (139)
    Sequence number: 1    (relative sequence number)
    [Next sequence number: 77    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 500000 (scaled)
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    Checksum: 0xe1fc [correct]
NetBIOS Session Service

No.     Time        Source                Destination           Protocol Info
    507 1417.349493 E.F.G.H         A.B.C.D           TCP      netbios-ssn > event_listener [ACK] Seq=1 Ack=77 Win=5888 Len=0

Frame 507 (54 bytes on wire, 54 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: netbios-ssn (139), Dst Port: event_listener (3017), Seq: 1, Ack: 77, Len: 0
    Source port: netbios-ssn (139)
    Destination port: event_listener (3017)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 77    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 5888 (scaled)
    Checksum: 0x3bd6 [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    508 1417.349712 E.F.G.H         A.B.C.D           NBSS     Positive session response

Frame 508 (118 bytes on wire, 118 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: netbios-ssn (139), Dst Port: event_listener (3017), Seq: 1, Ack: 77, Len: 64
    Source port: netbios-ssn (139)
    Destination port: event_listener (3017)
    Sequence number: 1    (relative sequence number)
    [Next sequence number: 65    (relative sequence number)]
    Acknowledgement number: 77    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 5888 (scaled)
    Checksum: 0x344c [incorrect, should be 0xb98d (maybe caused by "TCP checksum offload"?)]
NetBIOS Session Service
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No.     Time        Source                Destination           Protocol Info
    509 1417.422441 A.B.C.D           E.F.G.H         TCP      event_listener > netbios-ssn [RST] Seq=77 Win=0 Len=0

Frame 509 (62 bytes on wire, 62 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: event_listener (3017), Dst Port: netbios-ssn (139), Seq: 77, Len: 0
    Source port: event_listener (3017)
    Destination port: netbios-ssn (139)
    Sequence number: 77    (relative sequence number)
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    Header length: 20 bytes
    Flags: 0x04 (RST)
    Window size: 0
    Checksum: 0x9c28 [correct]

No.     Time        Source                Destination           Protocol Info
    510 1417.423690 A.B.C.D           E.F.G.H         TCP      nds_sso > microsoft-ds [SYN] Seq=0 Win=41248 Len=0 MSS=1460 WS=3 TSV=0 TSER=

Frame 510 (78 bytes on wire, 78 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: nds_sso (3024), Dst Port: microsoft-ds (445), Seq: 0, Len: 0
    Source port: nds_sso (3024)
    Destination port: microsoft-ds (445)
    Sequence number: 0    (relative sequence number)
    Header length: 44 bytes
    Flags: 0x02 (SYN)
    Window size: 41248
    Checksum: 0x0909 [correct]
    Options: (24 bytes)

No.     Time        Source                Destination           Protocol Info
    511 1417.423704 E.F.G.H         A.B.C.D           TCP      microsoft-ds > nds_sso [SYN, ACK] Seq=0 Ack=1 Win=5840 Len=0 MSS=1460 WS=7

Frame 511 (66 bytes on wire, 66 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: microsoft-ds (445), Dst Port: nds_sso (3024), Seq: 0, Ack: 1, Len: 0
    Source port: microsoft-ds (445)
    Destination port: nds_sso (3024)
    Sequence number: 0    (relative sequence number)
    Acknowledgement number: 1    (relative ack number)
    Header length: 32 bytes
    Flags: 0x12 (SYN, ACK)
    Window size: 5840
    Checksum: 0xc962 [correct]
    Options: (12 bytes)
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    512 1417.495902 A.B.C.D           E.F.G.H         TCP      nds_sso > microsoft-ds [ACK] Seq=1 Ack=1 Win=500000 Len=0

Frame 512 (62 bytes on wire, 62 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: nds_sso (3024), Dst Port: microsoft-ds (445), Seq: 1, Ack: 1, Len: 0
    Source port: nds_sso (3024)
    Destination port: microsoft-ds (445)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 500000 (scaled)
    Checksum: 0x2ce0 [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    513 1417.500899 A.B.C.D           E.F.G.H         SMB      Negotiate Protocol Request

Frame 513 (226 bytes on wire, 226 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: nds_sso (3024), Dst Port: microsoft-ds (445), Seq: 1, Ack: 1, Len: 172
```

```
    Source port: nds_sso (3024)
    Destination port: microsoft-ds (445)
    Sequence number: 1    (relative sequence number)
    [Next sequence number: 173    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 500000 (scaled)
    Checksum: 0x7e8a [correct]
NetBIOS Session Service
SMB (Server Message Block Protocol)

No.     Time        Source                Destination           Protocol Info
    514 1417.500911 E.F.G.H         A.B.C.D           TCP      microsoft-ds > nds_sso [ACK] Seq=1 Ack=173 Win=6912 Len=0

Frame 514 (54 bytes on wire, 54 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: microsoft-ds (445), Dst Port: nds_sso (3024), Seq: 1, Ack: 173, Len: 0
    Source port: microsoft-ds (445)
    Destination port: nds_sso (3024)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 173    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 6912 (scaled)
    Checksum: 0x2023 [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    515 1423.496953 A.B.C.D           E.F.G.H         TCP      nds_sso > microsoft-ds [RST] Seq=173 Win=0 Len=0

Frame 515 (62 bytes on wire, 62 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: nds_sso (3024), Dst Port: microsoft-ds (445), Seq: 173, Len: 0
    Source port: nds_sso (3024)
    Destination port: microsoft-ds (445)
    Sequence number: 173    (relative sequence number)
    Acknowledgment number: Broken TCP. The acknowledge field is nonzero while the ACK flag is not set
    Header length: 20 bytes
    Flags: 0x04 (RST)
    Window size: 0
    Checksum: 0xd133 [correct]

No.     Time        Source                Destination           Protocol Info
    516 1423.498705 A.B.C.D           E.F.G.H         TCP      beacon-port > netbios-ssn [SYN] Seq=0 Win=41248 Len=0 MSS=1460 WS=3 TSV=0 TS

Frame 516 (78 bytes on wire, 78 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: beacon-port (3124), Dst Port: netbios-ssn (139), Seq: 0, Len: 0
    Source port: beacon-port (3124)
    Destination port: netbios-ssn (139)
    Sequence number: 0    (relative sequence number)
    Header length: 44 bytes
    Flags: 0x02 (SYN)
    Window size: 41248
    Checksum: 0xa416 [correct]
    Options: (24 bytes)

No.     Time        Source                Destination           Protocol Info
    517 1423.498728 E.F.G.H         A.B.C.D           TCP      netbios-ssn > beacon-port [SYN, ACK] Seq=0 Ack=1 Win=5840 Len=0 MSS=1460 WS=
```

```
Frame 517 (66 bytes on wire, 66 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: netbios-ssn (139), Dst Port: beacon-port (3124), Seq: 0, Ack: 1, Len: 0
    Source port: netbios-ssn (139)
    Destination port: beacon-port (3124)
    Sequence number: 0    (relative sequence number)
    Acknowledgement number: 1    (relative ack number)
    Header length: 32 bytes
    Flags: 0x12 (SYN, ACK)
    Window size: 5840
    Checksum: 0x5f89 [correct]
    Options: (12 bytes)
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    518 1423.571789 A.B.C.D           E.F.G.H         TCP      beacon-port > netbios-ssn [ACK] Seq=1 Ack=1 Win=500000 Len=0

Frame 518 (62 bytes on wire, 62 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: beacon-port (3124), Dst Port: netbios-ssn (139), Seq: 1, Ack: 1, Len: 0
    Source port: beacon-port (3124)
    Destination port: netbios-ssn (139)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 500000 (scaled)
    Checksum: 0xc306 [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    519 1423.573786 A.B.C.D           E.F.G.H         NBSS     Session request, to *SMBSERVER<20> from LOCALHOST<00>

Frame 519 (130 bytes on wire, 130 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: beacon-port (3124), Dst Port: netbios-ssn (139), Seq: 1, Ack: 1, Len: 76
    Source port: beacon-port (3124)
    Destination port: netbios-ssn (139)
    Sequence number: 1    (relative sequence number)
    [Next sequence number: 77    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 500000 (scaled)
    Checksum: 0x5cd8 [correct]
NetBIOS Session Service

No.     Time        Source                Destination           Protocol Info
    520 1423.573799 E.F.G.H         A.B.C.D           TCP      netbios-ssn > beacon-port [ACK] Seq=1 Ack=77 Win=5888 Len=0

Frame 520 (54 bytes on wire, 54 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: netbios-ssn (139), Dst Port: beacon-port (3124), Seq: 1, Ack: 77, Len: 0
    Source port: netbios-ssn (139)
    Destination port: beacon-port (3124)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 77    (relative ack number)
    Header length: 20 bytes
```

```
    Flags: 0x10 (ACK)
    Window size: 5888 (scaled)
    Checksum: 0xb6b1 [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    521 1423.574016 E.F.G.H         A.B.C.D           NBSS     Positive session response

Frame 521 (118 bytes on wire, 118 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: netbios-ssn (139), Dst Port: beacon-port (3124), Seq: 1, Ack: 77, Len: 64
    Source port: netbios-ssn (139)
    Destination port: beacon-port (3124)
    Sequence number: 1    (relative sequence number)
    [Next sequence number: 65    (relative sequence number)]
    Acknowledgement number: 77    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 5888 (scaled)
    Checksum: 0x344c [incorrect, should be 0x3469 (maybe caused by "TCP checksum offload"?)]
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No.     Time        Source                Destination           Protocol Info
    522 1423.646997 A.B.C.D           E.F.G.H         TCP      beacon-port > netbios-ssn [RST] Seq=77 Win=0 Len=0

Frame 522 (62 bytes on wire, 62 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: beacon-port (3124), Dst Port: netbios-ssn (139), Seq: 77, Len: 0
    Source port: beacon-port (3124)
    Destination port: netbios-ssn (139)
    Sequence number: 77    (relative sequence number)
    Acknowledgment number: Broken TCP. The acknowledge field is nonzero while the ACK flag is not set
    Header length: 20 bytes
    Flags: 0x04 (RST)
    Window size: 0
    Checksum: 0x243d [correct]

No.     Time        Source                Destination           Protocol Info
    523 1423.649120 A.B.C.D           E.F.G.H         TCP      netport-id > microsoft-ds [SYN] Seq=0 Win=41248 Len=0 MSS=1460 WS=3 TSV=0 TS

Frame 523 (78 bytes on wire, 78 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: netport-id (3129), Dst Port: microsoft-ds (445), Seq: 0, Len: 0
    Source port: netport-id (3129)
    Destination port: microsoft-ds (445)
```

```
    Sequence number: 0    (relative sequence number)
    Header length: 44 bytes
    Flags: 0x02 (SYN)
    Window size: 41248
    Checksum: 0x9880 [correct]
    Options: (24 bytes)

No.     Time        Source                Destination           Protocol Info
    524 1423.649133 E.F.G.H         A.B.C.D           TCP      microsoft-ds > netport-id [SYN, ACK] Seq=0 Ack=1 Win=5840 Len=0 MSS=1460 WS=

Frame 524 (66 bytes on wire, 66 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: microsoft-ds (445), Dst Port: netport-id (3129), Seq: 0, Ack: 1, Len: 0
    Source port: microsoft-ds (445)
    Destination port: netport-id (3129)
    Sequence number: 0    (relative sequence number)
    Acknowledgement number: 1    (relative ack number)
    Header length: 32 bytes
    Flags: 0x12 (SYN, ACK)
    Window size: 5840
    Checksum: 0x71c3 [correct]
    Options: (12 bytes)
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    525 1423.724081 A.B.C.D           E.F.G.H         TCP      netport-id > microsoft-ds [ACK] Seq=1 Ack=1 Win=500000 Len=0

Frame 525 (62 bytes on wire, 62 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: netport-id (3129), Dst Port: microsoft-ds (445), Seq: 1, Ack: 1, Len: 0
    Source port: netport-id (3129)
    Destination port: microsoft-ds (445)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 500000 (scaled)
    Checksum: 0xd540 [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    526 1423.727703 A.B.C.D           E.F.G.H         SMB      Negotiate Protocol Request

Frame 526 (226 bytes on wire, 226 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: netport-id (3129), Dst Port: microsoft-ds (445), Seq: 1, Ack: 1, Len: 172
    Source port: netport-id (3129)
    Destination port: microsoft-ds (445)
    Sequence number: 1    (relative sequence number)
    [Next sequence number: 173    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 500000 (scaled)
    Checksum: 0x16e9 [correct]
NetBIOS Session Service
SMB (Server Message Block Protocol)

No.     Time        Source                Destination           Protocol Info
    527 1423.727716 E.F.G.H         A.B.C.D           TCP      microsoft-ds > netport-id [ACK] Seq=1 Ack=173 Win=6912 Len=0
```

```
Frame 527 (54 bytes on wire, 54 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: microsoft-ds (445), Dst Port: netport-id (3129), Seq: 1, Ack: 173, Len: 0
    Source port: microsoft-ds (445)
    Destination port: netport-id (3129)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 173    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 6912 (scaled)
    Checksum: 0xc883 [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    528 1429.720144 A.B.C.D           E.F.G.H         TCP      netport-id > microsoft-ds [RST] Seq=173 Win=0 Len=0

Frame 528 (62 bytes on wire, 62 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: netport-id (3129), Dst Port: microsoft-ds (445), Seq: 173, Len: 0
    Source port: netport-id (3129)
    Destination port: microsoft-ds (445)
    Sequence number: 173    (relative sequence number)
    Acknowledgment number: Broken TCP. The acknowledge field is nonzero while the ACK flag is not set
    Header length: 20 bytes
    Flags: 0x04 (RST)
    Window size: 0
    Checksum: 0x51cd [correct]

No.     Time        Source                Destination           Protocol Info
    529 1429.721384 A.B.C.D           E.F.G.H         TCP      dsnl > netbios-ssn [SYN] Seq=0 Win=41248 Len=0 MSS=1460 WS=3 TSV=0 TSER=0

Frame 529 (78 bytes on wire, 78 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: dsnl (3231), Dst Port: netbios-ssn (139), Seq: 0, Len: 0
    Source port: dsnl (3231)
    Destination port: netbios-ssn (139)
    Sequence number: 0    (relative sequence number)
    Header length: 44 bytes
    Flags: 0x02 (SYN)
    Window size: 41248
    Checksum: 0xdba3 [correct]
    Options: (24 bytes)

No.     Time        Source                Destination           Protocol Info
    530 1429.721404 E.F.G.H         A.B.C.D           TCP      netbios-ssn > dsnl [SYN, ACK] Seq=0 Ack=1 Win=5840 Len=0 MSS=1460 WS=7

Frame 530 (66 bytes on wire, 66 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: netbios-ssn (139), Dst Port: dsnl (3231), Seq: 0, Ack: 1, Len: 0
    Source port: netbios-ssn (139)
    Destination port: dsnl (3231)
    Sequence number: 0    (relative sequence number)
    Acknowledgement number: 1    (relative ack number)
    Header length: 32 bytes
    Flags: 0x12 (SYN, ACK)
    Window size: 5840
    Checksum: 0x124c [correct]
    Options: (12 bytes)
```

```
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    531 1429.794585 A.B.C.D           E.F.G.H         TCP      dsnl > netbios-ssn [ACK] Seq=1 Ack=1 Win=500000 Len=0

Frame 531 (62 bytes on wire, 62 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: dsnl (3231), Dst Port: netbios-ssn (139), Seq: 1, Ack: 1, Len: 0
    Source port: dsnl (3231)
    Destination port: netbios-ssn (139)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 500000 (scaled)
    Checksum: 0x75c9 [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    532 1429.796466 A.B.C.D           E.F.G.H         NBSS     Session request, to *SMBSERVER<20> from LOCALHOST<00>

Frame 532 (130 bytes on wire, 130 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: dsnl (3231), Dst Port: netbios-ssn (139), Seq: 1, Ack: 1, Len: 76
    Source port: dsnl (3231)
    Destination port: netbios-ssn (139)
    Sequence number: 1    (relative sequence number)
    [Next sequence number: 77    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 500000 (scaled)
    Checksum: 0x0f9b [correct]
NetBIOS Session Service

No.     Time        Source                Destination           Protocol Info
    533 1429.796473 E.F.G.H         A.B.C.D           TCP      netbios-ssn > dsnl [ACK] Seq=1 Ack=77 Win=5888 Len=0

Frame 533 (54 bytes on wire, 54 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: netbios-ssn (139), Dst Port: dsnl (3231), Seq: 1, Ack: 77, Len: 0
    Source port: netbios-ssn (139)
    Destination port: dsnl (3231)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 77    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 5888 (scaled)
    Checksum: 0x6974 [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    534 1429.796849 E.F.G.H         A.B.C.D           NBSS     Positive session response

Frame 534 (118 bytes on wire, 118 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: netbios-ssn (139), Dst Port: dsnl (3231), Seq: 1, Ack: 77, Len: 64
    Source port: netbios-ssn (139)
    Destination port: dsnl (3231)
```

```
    Sequence number: 1    (relative sequence number)
    [Next sequence number: 65    (relative sequence number)]
    Acknowledgement number: 77    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 5888 (scaled)
    Checksum: 0x344c [incorrect, should be 0xe72b (maybe caused by "TCP checksum offload"?)]
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No.     Time        Source                Destination           Protocol Info
    535 1429.869440 A.B.C.D           E.F.G.H         TCP      dsnl > netbios-ssn [RST] Seq=77 Win=0 Len=0

Frame 535 (62 bytes on wire, 62 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: dsnl (3231), Dst Port: netbios-ssn (139), Seq: 77, Len: 0
    Source port: dsnl (3231)
    Destination port: netbios-ssn (139)
    Sequence number: 77    (relative sequence number)
    Acknowledgment number: Broken TCP. The acknowledge field is nonzero while the ACK flag is not set
    Header length: 20 bytes
    Flags: 0x04 (RST)
    Window size: 0
    Checksum: 0xf3c1 [correct]

No.     Time        Source                Destination           Protocol Info
    536 1429.872178 A.B.C.D           E.F.G.H         TCP      whisker > microsoft-ds [SYN] Seq=0 Win=41248 Len=0 MSS=1460 WS=3 TSV=0 TSER=

Frame 536 (78 bytes on wire, 78 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: whisker (3233), Dst Port: microsoft-ds (445), Seq: 0, Len: 0
    Source port: whisker (3233)
    Destination port: microsoft-ds (445)
    Sequence number: 0    (relative sequence number)
    Header length: 44 bytes
    Flags: 0x02 (SYN)
    Window size: 41248
    Checksum: 0xc7eb [correct]
    Options: (24 bytes)

No.     Time        Source                Destination           Protocol Info
    537 1429.872192 E.F.G.H         A.B.C.D           TCP      microsoft-ds > whisker [SYN, ACK] Seq=0 Ack=1 Win=5840 Len=0 MSS=1460 WS=7

Frame 537 (66 bytes on wire, 66 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: microsoft-ds (445), Dst Port: whisker (3233), Seq: 0, Ack: 1, Len: 0
```

```
    Source port: microsoft-ds (445)
    Destination port: whisker (3233)
    Sequence number: 0    (relative sequence number)
    Acknowledgement number: 1    (relative ack number)
    Header length: 32 bytes
    Flags: 0x12 (SYN, ACK)
    Window size: 5840
    Checksum: 0xe5fe [correct]
    Options: (12 bytes)
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    538 1429.944144 A.B.C.D           E.F.G.H         TCP      whisker > microsoft-ds [ACK] Seq=1 Ack=1 Win=500000 Len=0

Frame 538 (62 bytes on wire, 62 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: whisker (3233), Dst Port: microsoft-ds (445), Seq: 1, Ack: 1, Len: 0
    Source port: whisker (3233)
    Destination port: microsoft-ds (445)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 500000 (scaled)
    Checksum: 0x497c [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    539 1429.948516 A.B.C.D           E.F.G.H         SMB      Negotiate Protocol Request

Frame 539 (226 bytes on wire, 226 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: whisker (3233), Dst Port: microsoft-ds (445), Seq: 1, Ack: 1, Len: 172
    Source port: whisker (3233)
    Destination port: microsoft-ds (445)
    Sequence number: 1    (relative sequence number)
    [Next sequence number: 173    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 500000 (scaled)
    Checksum: 0x9b22 [correct]
NetBIOS Session Service
SMB (Server Message Block Protocol)

No.     Time        Source                Destination           Protocol Info
    540 1429.948559 E.F.G.H         A.B.C.D           TCP      microsoft-ds > whisker [ACK] Seq=1 Ack=173 Win=6912 Len=0

Frame 540 (54 bytes on wire, 54 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: microsoft-ds (445), Dst Port: whisker (3233), Seq: 1, Ack: 173, Len: 0
    Source port: microsoft-ds (445)
    Destination port: whisker (3233)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 173    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 6912 (scaled)
    Checksum: 0x3cbf [correct]
    [SEQ/ACK analysis]
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No.     Time        Source                Destination           Protocol Info
    541 1435.948573 A.B.C.D           E.F.G.H         TCP      whisker > microsoft-ds [RST] Seq=173 Win=0 Len=0

Frame 541 (62 bytes on wire, 62 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: whisker (3233), Dst Port: microsoft-ds (445), Seq: 173, Len: 0
    Source port: whisker (3233)
    Destination port: microsoft-ds (445)
    Sequence number: 173    (relative sequence number)
    Acknowledgment number: Broken TCP. The acknowledge field is nonzero while the ACK flag is not set
    Header length: 20 bytes
    Flags: 0x04 (RST)
    Window size: 0
    Checksum: 0x7ee4 [correct]

No.     Time        Source                Destination           Protocol Info
    542 1435.949810 A.B.C.D           E.F.G.H         TCP      dec-notes > netbios-ssn [SYN] Seq=0 Win=41248 Len=0 MSS=1460 WS=3 TSV=0 TSE

Frame 542 (78 bytes on wire, 78 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: dec-notes (3333), Dst Port: netbios-ssn (139), Seq: 0, Len: 0
    Source port: dec-notes (3333)
    Destination port: netbios-ssn (139)
    Sequence number: 0    (relative sequence number)
    Header length: 44 bytes
    Flags: 0x02 (SYN)
    Window size: 41248
    Checksum: 0x16b6 [correct]
    Options: (24 bytes)

No.     Time        Source                Destination           Protocol Info
    543 1435.949825 E.F.G.H         A.B.C.D           TCP      netbios-ssn > dec-notes [SYN, ACK] Seq=0 Ack=1 Win=5840 Len=0 MSS=1460 WS=7

Frame 543 (66 bytes on wire, 66 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: netbios-ssn (139), Dst Port: dec-notes (3333), Seq: 0, Ack: 1, Len: 0
    Source port: netbios-ssn (139)
    Destination port: dec-notes (3333)
    Sequence number: 0    (relative sequence number)
    Acknowledgement number: 1    (relative ack number)
    Header length: 32 bytes
    Flags: 0x12 (SYN, ACK)
    Window size: 5840
    Checksum: 0x0232 [correct]
    Options: (12 bytes)
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    544 1436.025649 A.B.C.D           E.F.G.H         TCP      dec-notes > netbios-ssn [ACK] Seq=1 Ack=1 Win=500000 Len=0

Frame 544 (62 bytes on wire, 62 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: dec-notes (3333), Dst Port: netbios-ssn (139), Seq: 1, Ack: 1, Len: 0
    Source port: dec-notes (3333)
    Destination port: netbios-ssn (139)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
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    Flags: 0x10 (ACK)
    Window size: 500000 (scaled)
    Checksum: 0x65af [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    545 1436.027647 A.B.C.D           E.F.G.H         NBSS     Session request, to *SMBSERVER<20> from LOCALHOST<00>

Frame 545 (130 bytes on wire, 130 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: dec-notes (3333), Dst Port: netbios-ssn (139), Seq: 1, Ack: 1, Len: 76
    Source port: dec-notes (3333)
    Destination port: netbios-ssn (139)
    Sequence number: 1    (relative sequence number)
    [Next sequence number: 77    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 500000 (scaled)
    Checksum: 0xff80 [correct]
NetBIOS Session Service

No.     Time        Source                Destination           Protocol Info
    546 1436.027658 E.F.G.H         A.B.C.D           TCP      netbios-ssn > dec-notes [ACK] Seq=1 Ack=77 Win=5888 Len=0

Frame 546 (54 bytes on wire, 54 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: netbios-ssn (139), Dst Port: dec-notes (3333), Seq: 1, Ack: 77, Len: 0
    Source port: netbios-ssn (139)
    Destination port: dec-notes (3333)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 77    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 5888 (scaled)
    Checksum: 0x595a [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    547 1436.027877 E.F.G.H         A.B.C.D           NBSS     Positive session response

Frame 547 (118 bytes on wire, 118 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: netbios-ssn (139), Dst Port: dec-notes (3333), Seq: 1, Ack: 77, Len: 64
    Source port: netbios-ssn (139)
    Destination port: dec-notes (3333)
    Sequence number: 1    (relative sequence number)
    [Next sequence number: 65    (relative sequence number)]
    Acknowledgement number: 77    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 5888 (scaled)
    Checksum: 0x344c [incorrect, should be 0xd711 (maybe caused by "TCP checksum offload"?)]
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No.     Time        Source                Destination           Protocol Info
    548 1436.103097 A.B.C.D           E.F.G.H         TCP      dec-notes > netbios-ssn [RST] Seq=77 Win=0 Len=0

Frame 548 (62 bytes on wire, 62 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: dec-notes (3333), Dst Port: netbios-ssn (139), Seq: 77, Len: 0
    Source port: dec-notes (3333)
    Destination port: netbios-ssn (139)
    Sequence number: 77    (relative sequence number)
    Acknowledgment number: Broken TCP. The acknowledge field is nonzero while the ACK flag is not set
    Header length: 20 bytes
    Flags: 0x04 (RST)
    Window size: 0
    Checksum: 0xcd32 [correct]

No.     Time        Source                Destination           Protocol Info
    549 1436.104987 A.B.C.D           E.F.G.H         TCP      directv-catlg > microsoft-ds [SYN] Seq=0 Win=41248 Len=0 MSS=1460 WS=3 TSV=(

Frame 549 (78 bytes on wire, 78 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: directv-catlg (3337), Dst Port: microsoft-ds (445), Seq: 0, Len: 0
    Source port: directv-catlg (3337)
    Destination port: microsoft-ds (445)
    Sequence number: 0    (relative sequence number)
    Header length: 44 bytes
    Flags: 0x02 (SYN)
    Window size: 41248
    Checksum: 0x539d [correct]
    Options: (24 bytes)

No.     Time        Source                Destination           Protocol Info
    550 1436.105007 E.F.G.H         A.B.C.D           TCP      microsoft-ds > directv-catlg [SYN, ACK] Seq=0 Ack=1 Win=5840 Len=0 MSS=1460

Frame 550 (66 bytes on wire, 66 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: microsoft-ds (445), Dst Port: directv-catlg (3337), Seq: 0, Ack: 1, Len: 0
    Source port: microsoft-ds (445)
    Destination port: directv-catlg (3337)
    Sequence number: 0    (relative sequence number)
    Acknowledgement number: 1    (relative ack number)
    Header length: 32 bytes
    Flags: 0x12 (SYN, ACK)
    Window size: 5840
    Checksum: 0xba06 [correct]
    Options: (12 bytes)
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    551 1436.176194 A.B.C.D           E.F.G.H         TCP      directv-catlg > microsoft-ds [ACK] Seq=1 Ack=1 Win=500000 Len=0
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Frame 551 (62 bytes on wire, 62 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: directv-catlg (3337), Dst Port: microsoft-ds (445), Seq: 1, Ack: 1, Len: 0
    Source port: directv-catlg (3337)
    Destination port: microsoft-ds (445)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 500000 (scaled)
    Checksum: 0x1d84 [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    552 1436.181690 A.B.C.D           E.F.G.H         SMB      Negotiate Protocol Request

Frame 552 (226 bytes on wire, 226 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: directv-catlg (3337), Dst Port: microsoft-ds (445), Seq: 1, Ack: 1, Len: 172
    Source port: directv-catlg (3337)
    Destination port: microsoft-ds (445)
    Sequence number: 1    (relative sequence number)
    [Next sequence number: 173    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 500000 (scaled)
    Checksum: 0xcf27 [correct]
NetBIOS Session Service
SMB (Server Message Block Protocol)

No.     Time        Source                Destination           Protocol Info
    553 1436.181704 E.F.G.H         A.B.C.D           TCP      microsoft-ds > directv-catlg [ACK] Seq=1 Ack=173 Win=6912 Len=0

Frame 553 (54 bytes on wire, 54 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: microsoft-ds (445), Dst Port: directv-catlg (3337), Seq: 1, Ack: 173, Len: 0
    Source port: microsoft-ds (445)
    Destination port: directv-catlg (3337)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 173    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 6912 (scaled)
    Checksum: 0x10c7 [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    554 1442.181501 A.B.C.D           E.F.G.H         TCP      directv-catlg > microsoft-ds [RST] Seq=173 Win=0 Len=0

Frame 554 (62 bytes on wire, 62 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: directv-catlg (3337), Dst Port: microsoft-ds (445), Seq: 173, Len: 0
    Source port: directv-catlg (3337)
    Destination port: microsoft-ds (445)
    Sequence number: 173    (relative sequence number)
    Acknowledgment number: Broken TCP. The acknowledge field is nonzero while the ACK flag is not set
    Header length: 20 bytes
    Flags: 0x04 (RST)
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    Window size: 0
    Checksum: 0x1a98 [correct]

No.     Time        Source                Destination           Protocol Info
    555 1442.182616 A.B.C.D           E.F.G.H         TCP      3comfaxrpc > netbios-ssn [SYN] Seq=0 Win=41248 Len=0 MSS=1460 WS=3 TSV=0 TSE

Frame 555 (78 bytes on wire, 78 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: 3comfaxrpc (3446), Dst Port: netbios-ssn (139), Seq: 0, Len: 0
    Source port: 3comfaxrpc (3446)
    Destination port: netbios-ssn (139)
    Sequence number: 0    (relative sequence number)
    Header length: 44 bytes
    Flags: 0x02 (SYN)
    Window size: 41248
    Checksum: 0xf298 [correct]
    Options: (24 bytes)

No.     Time        Source                Destination           Protocol Info
    556 1442.182634 E.F.G.H         A.B.C.D           TCP      netbios-ssn > 3comfaxrpc [SYN, ACK] Seq=0 Ack=1 Win=5840 Len=0 MSS=1460 WS=7

Frame 556 (66 bytes on wire, 66 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: netbios-ssn (139), Dst Port: 3comfaxrpc (3446), Seq: 0, Ack: 1, Len: 0
    Source port: netbios-ssn (139)
    Destination port: 3comfaxrpc (3446)
    Sequence number: 0    (relative sequence number)
    Acknowledgement number: 1    (relative ack number)
    Header length: 32 bytes
    Flags: 0x12 (SYN, ACK)
    Window size: 5840
    Checksum: 0x47a9 [correct]
    Options: (12 bytes)
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    557 1442.255828 A.B.C.D           E.F.G.H         TCP      3comfaxrpc > netbios-ssn [ACK] Seq=1 Ack=1 Win=500000 Len=0

Frame 557 (62 bytes on wire, 62 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: 3comfaxrpc (3446), Dst Port: netbios-ssn (139), Seq: 1, Ack: 1, Len: 0
    Source port: 3comfaxrpc (3446)
    Destination port: netbios-ssn (139)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 500000 (scaled)
    Checksum: 0xab26 [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    558 1442.257950 A.B.C.D           E.F.G.H         NBSS     Session request, to *SMBSERVER<20> from LOCALHOST<00>

Frame 558 (130 bytes on wire, 130 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: 3comfaxrpc (3446), Dst Port: netbios-ssn (139), Seq: 1, Ack: 1, Len: 76
    Source port: 3comfaxrpc (3446)
    Destination port: netbios-ssn (139)
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    Sequence number: 1    (relative sequence number)
    [Next sequence number: 77    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 500000 (scaled)
    Checksum: 0x44f8 [correct]
NetBIOS Session Service

No.     Time        Source                Destination           Protocol Info
    559 1442.257963 E.F.G.H         A.B.C.D           TCP      netbios-ssn > 3comfaxrpc [ACK] Seq=1 Ack=77 Win=5888 Len=0

Frame 559 (54 bytes on wire, 54 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: netbios-ssn (139), Dst Port: 3comfaxrpc (3446), Seq: 1, Ack: 77, Len: 0
    Source port: netbios-ssn (139)
    Destination port: 3comfaxrpc (3446)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 77    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 5888 (scaled)
    Checksum: 0x9ed1 [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    560 1442.258199 E.F.G.H         A.B.C.D           NBSS     Positive session response

Frame 560 (118 bytes on wire, 118 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: netbios-ssn (139), Dst Port: 3comfaxrpc (3446), Seq: 1, Ack: 77, Len: 64
    Source port: netbios-ssn (139)
    Destination port: 3comfaxrpc (3446)
    Sequence number: 1    (relative sequence number)
    [Next sequence number: 65    (relative sequence number)]
    Acknowledgement number: 77    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 5888 (scaled)
    Checksum: 0x344c [incorrect, should be 0x1c89 (maybe caused by "TCP checksum offload"?)]
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No.     Time        Source                Destination           Protocol Info
    561 1442.333786 A.B.C.D           E.F.G.H         TCP      3comfaxrpc > netbios-ssn [RST] Seq=77 Win=0 Len=0

Frame 561 (62 bytes on wire, 62 bytes captured)
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Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: 3comfaxrpc (3446), Dst Port: netbios-ssn (139), Seq: 77, Len: 0
    Source port: 3comfaxrpc (3446)
    Destination port: netbios-ssn (139)
    Sequence number: 77    (relative sequence number)
    Acknowledgment number: Broken TCP. The acknowledge field is nonzero while the ACK flag is not set
    Header length: 20 bytes
    Flags: 0x04 (RST)
    Window size: 0
    Checksum: 0x8798 [correct]

No.     Time        Source                Destination           Protocol Info
    562 1442.335408 A.B.C.D           E.F.G.H         TCP      castorproxy > microsoft-ds [SYN] Seq=0 Win=41248 Len=0 MSS=1460 WS=3 TSV=0 T

Frame 562 (78 bytes on wire, 78 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: castorproxy (3450), Dst Port: microsoft-ds (445), Seq: 0, Len: 0
    Source port: castorproxy (3450)
    Destination port: microsoft-ds (445)
    Sequence number: 0    (relative sequence number)
    Header length: 44 bytes
    Flags: 0x02 (SYN)
    Window size: 41248
    Checksum: 0x4e64 [correct]
    Options: (24 bytes)

No.     Time        Source                Destination           Protocol Info
    563 1442.335421 E.F.G.H         A.B.C.D           TCP      microsoft-ds > castorproxy [SYN, ACK] Seq=0 Ack=1 Win=5840 Len=0 MSS=1460 WS

Frame 563 (66 bytes on wire, 66 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: microsoft-ds (445), Dst Port: castorproxy (3450), Seq: 0, Ack: 1, Len: 0
    Source port: microsoft-ds (445)
    Destination port: castorproxy (3450)
    Sequence number: 0    (relative sequence number)
    Acknowledgement number: 1    (relative ack number)
    Header length: 32 bytes
    Flags: 0x12 (SYN, ACK)
    Window size: 5840
    Checksum: 0x5706 [correct]
    Options: (12 bytes)
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    564 1442.408124 A.B.C.D           E.F.G.H         TCP      castorproxy > microsoft-ds [ACK] Seq=1 Ack=1 Win=500000 Len=0

Frame 564 (62 bytes on wire, 62 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: castorproxy (3450), Dst Port: microsoft-ds (445), Seq: 1, Ack: 1, Len: 0
    Source port: castorproxy (3450)
    Destination port: microsoft-ds (445)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 500000 (scaled)
    Checksum: 0xba83 [correct]
    [SEQ/ACK analysis]
```

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No.     Time        Source                Destination           Protocol Info
    565 1442.411865 A.B.C.D           E.F.G.H         SMB      Negotiate Protocol Request

Frame 565 (226 bytes on wire, 226 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: castorproxy (3450), Dst Port: microsoft-ds (445), Seq: 1, Ack: 1, Len: 172
    Source port: castorproxy (3450)
    Destination port: microsoft-ds (445)
    Sequence number: 1    (relative sequence number)
    [Next sequence number: 173    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 500000 (scaled)
    Checksum: 0xec24 [correct]
NetBIOS Session Service
SMB (Server Message Block Protocol)

No.     Time        Source                Destination           Protocol Info
    566 1442.411883 E.F.G.H         A.B.C.D           TCP      microsoft-ds > castorproxy [ACK] Seq=1 Ack=173 Win=6912 Len=0

Frame 566 (54 bytes on wire, 54 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: microsoft-ds (445), Dst Port: castorproxy (3450), Seq: 1, Ack: 173, Len: 0
    Source port: microsoft-ds (445)
    Destination port: castorproxy (3450)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 173    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 6912 (scaled)
    Checksum: 0xadc6 [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    567 1448.407922 A.B.C.D           E.F.G.H         TCP      castorproxy > microsoft-ds [RST] Seq=173 Win=0 Len=0

Frame 567 (62 bytes on wire, 62 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: castorproxy (3450), Dst Port: microsoft-ds (445), Seq: 173, Len: 0
    Source port: castorproxy (3450)
    Destination port: microsoft-ds (445)
    Sequence number: 173    (relative sequence number)
    Acknowledgment number: Broken TCP. The acknowledge field is nonzero while the ACK flag is not set
    Header length: 20 bytes
    Flags: 0x04 (RST)
    Window size: 0
    Checksum: 0xae2e [correct]

No.     Time        Source                Destination           Protocol Info
    568 1448.410670 A.B.C.D           E.F.G.H         TCP      kfxaclicensing > netbios-ssn [SYN] Seq=0 Win=41248 Len=0 MSS=1460 WS=3 TSV=(

Frame 568 (78 bytes on wire, 78 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: kfxaclicensing (3581), Dst Port: netbios-ssn (139), Seq: 0, Len: 0
    Source port: kfxaclicensing (3581)
    Destination port: netbios-ssn (139)
    Sequence number: 0    (relative sequence number)
    Header length: 44 bytes
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    Flags: 0x02 (SYN)
    Window size: 41248
    Checksum: 0x033c [correct]
    Options: (24 bytes)

No.     Time        Source                Destination           Protocol Info
    569 1448.410688 E.F.G.H         A.B.C.D           TCP      netbios-ssn > kfxaclicensing [SYN, ACK] Seq=0 Ack=1 Win=5840 Len=0 MSS=1460

Frame 569 (66 bytes on wire, 66 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: netbios-ssn (139), Dst Port: kfxaclicensing (3581), Seq: 0, Ack: 1, Len: 0
    Source port: netbios-ssn (139)
    Destination port: kfxaclicensing (3581)
    Sequence number: 0    (relative sequence number)
    Acknowledgement number: 1    (relative ack number)
    Header length: 32 bytes
    Flags: 0x12 (SYN, ACK)
    Window size: 5840
    Checksum: 0x66e4 [correct]
    Options: (12 bytes)
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    570 1448.634302 A.B.C.D           E.F.G.H         TCP      kfxaclicensing > netbios-ssn [ACK] Seq=1 Ack=1 Win=500000 Len=0

Frame 570 (62 bytes on wire, 62 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: kfxaclicensing (3581), Dst Port: netbios-ssn (139), Seq: 1, Ack: 1, Len: 0
    Source port: kfxaclicensing (3581)
    Destination port: netbios-ssn (139)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 500000 (scaled)
    Checksum: 0xca61 [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    571 1448.637049 A.B.C.D           E.F.G.H         NBSS     Session request, to *SMBSERVER<20> from LOCALHOST<00>

Frame 571 (130 bytes on wire, 130 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: kfxaclicensing (3581), Dst Port: netbios-ssn (139), Seq: 1, Ack: 1, Len: 76
    Source port: kfxaclicensing (3581)
    Destination port: netbios-ssn (139)
    Sequence number: 1    (relative sequence number)
    [Next sequence number: 77    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 500000 (scaled)
    Checksum: 0x6433 [correct]
NetBIOS Session Service

No.     Time        Source                Destination           Protocol Info
    572 1448.637062 E.F.G.H         A.B.C.D           TCP      netbios-ssn > kfxaclicensing [ACK] Seq=1 Ack=77 Win=5888 Len=0

Frame 572 (54 bytes on wire, 54 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
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Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: netbios-ssn (139), Dst Port: kfxaclicensing (3581), Seq: 1, Ack: 77, Len: 0
    Source port: netbios-ssn (139)
    Destination port: kfxaclicensing (3581)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 77    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 5888 (scaled)
    Checksum: 0xbe0c [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    573 1448.637273 E.F.G.H         A.B.C.D           NBSS     Positive session response

Frame 573 (118 bytes on wire, 118 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: netbios-ssn (139), Dst Port: kfxaclicensing (3581), Seq: 1, Ack: 77, Len: 64
    Source port: netbios-ssn (139)
    Destination port: kfxaclicensing (3581)
    Sequence number: 1    (relative sequence number)
    [Next sequence number: 65    (relative sequence number)]
    Acknowledgement number: 77    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 5888 (scaled)
    Checksum: 0x344c [incorrect, should be 0x3bc4 (maybe caused by "TCP checksum offload"?)]
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No.     Time        Source                Destination           Protocol Info
    574 1449.011981 A.B.C.D           E.F.G.H         TCP      kfxaclicensing > netbios-ssn [RST] Seq=77 Win=0 Len=0

Frame 574 (62 bytes on wire, 62 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: kfxaclicensing (3581), Dst Port: netbios-ssn (139), Seq: 77, Len: 0
    Source port: kfxaclicensing (3581)
    Destination port: netbios-ssn (139)
    Sequence number: 77    (relative sequence number)
    Acknowledgment number: Broken TCP. The acknowledge field is nonzero while the ACK flag is not set
    Header length: 20 bytes
    Flags: 0x04 (RST)
    Window size: 0
    Checksum: 0xe9a7 [correct]

No.     Time        Source                Destination           Protocol Info
    575 1449.013472 A.B.C.D           E.F.G.H         TCP      emprise-lls > microsoft-ds [SYN] Seq=0 Win=41248 Len=0 MSS=1460 WS=3 TSV=0 T
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Frame 575 (78 bytes on wire, 78 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: emprise-lls (3585), Dst Port: microsoft-ds (445), Seq: 0, Len: 0
    Source port: emprise-lls (3585)
    Destination port: microsoft-ds (445)
    Sequence number: 0    (relative sequence number)
    Header length: 44 bytes
    Flags: 0x02 (SYN)
    Window size: 41248
    Checksum: 0xa7d5 [correct]
    Options: (24 bytes)

No.     Time        Source                Destination           Protocol Info
    576 1449.013491 E.F.G.H         A.B.C.D           TCP      microsoft-ds > emprise-lls [SYN, ACK] Seq=0 Ack=1 Win=5840 Len=0 MSS=1460 WS

Frame 576 (66 bytes on wire, 66 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: microsoft-ds (445), Dst Port: emprise-lls (3585), Seq: 0, Ack: 1, Len: 0
    Source port: microsoft-ds (445)
    Destination port: emprise-lls (3585)
    Sequence number: 0    (relative sequence number)
    Acknowledgement number: 1    (relative ack number)
    Header length: 32 bytes
    Flags: 0x12 (SYN, ACK)
    Window size: 5840
    Checksum: 0xc7b0 [correct]
    Options: (12 bytes)
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    577 1449.440750 A.B.C.D           E.F.G.H         TCP      emprise-lls > microsoft-ds [ACK] Seq=1 Ack=1 Win=500000 Len=0

Frame 577 (62 bytes on wire, 62 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: emprise-lls (3585), Dst Port: microsoft-ds (445), Seq: 1, Ack: 1, Len: 0
    Source port: emprise-lls (3585)
    Destination port: microsoft-ds (445)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 500000 (scaled)
    Checksum: 0x2b2e [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    578 1449.444376 A.B.C.D           E.F.G.H         SMB      Negotiate Protocol Request

Frame 578 (180 bytes on wire, 180 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: emprise-lls (3585), Dst Port: microsoft-ds (445), Seq: 1, Ack: 1, Len: 126
    Source port: emprise-lls (3585)
    Destination port: microsoft-ds (445)
    Sequence number: 1    (relative sequence number)
    [Next sequence number: 127    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
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    Window size: 500000 (scaled)
    Checksum: 0x6992 [correct]
NetBIOS Session Service
SMB (Server Message Block Protocol)

No.     Time        Source                Destination           Protocol Info
    579 1449.444393 E.F.G.H         A.B.C.D           TCP      microsoft-ds > emprise-lls [ACK] Seq=1 Ack=127 Win=5888 Len=0

Frame 579 (54 bytes on wire, 54 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: microsoft-ds (445), Dst Port: emprise-lls (3585), Seq: 1, Ack: 127, Len: 0
    Source port: microsoft-ds (445)
    Destination port: emprise-lls (3585)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 127    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 5888 (scaled)
    Checksum: 0x1ea7 [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    580 1455.464903 A.B.C.D           E.F.G.H         TCP      [TCP segment of a reassembled PDU]

Frame 580 (1514 bytes on wire, 1514 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: emprise-lls (3585), Dst Port: microsoft-ds (445), Seq: 127, Ack: 1, Len: 1460
    Source port: emprise-lls (3585)
    Destination port: microsoft-ds (445)
    Sequence number: 127    (relative sequence number)
    [Next sequence number: 1587    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 500000 (scaled)
    Checksum: 0x61ee [correct]
    [SEQ/ACK analysis]
    TCP segment data (1460 bytes)

No.     Time        Source                Destination           Protocol Info
    581 1455.464914 E.F.G.H         A.B.C.D           TCP      microsoft-ds > emprise-lls [ACK] Seq=1 Ack=1587 Win=8832 Len=0

Frame 581 (54 bytes on wire, 54 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: microsoft-ds (445), Dst Port: emprise-lls (3585), Seq: 1, Ack: 1587, Len: 0
    Source port: microsoft-ds (445)
    Destination port: emprise-lls (3585)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 1587    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 8832 (scaled)
    Checksum: 0x18dc [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    582 1455.488401 A.B.C.D           E.F.G.H         TCP      [TCP segment of a reassembled PDU]

Frame 582 (1514 bytes on wire, 1514 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
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Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: emprise-lls (3585), Dst Port: microsoft-ds (445), Seq: 1587, Ack: 1, Len: 1460
    Source port: emprise-lls (3585)
    Destination port: microsoft-ds (445)
    Sequence number: 1587    (relative sequence number)
    [Next sequence number: 3047    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 500000 (scaled)
    Checksum: 0x0b62 [correct]
    [SEQ/ACK analysis]
    [Reassembled PDU in frame: 584]
    TCP segment data (1460 bytes)

No.     Time        Source                Destination           Protocol Info
    583 1455.488412 E.F.G.H         A.B.C.D           TCP      microsoft-ds > emprise-lls [ACK] Seq=1 Ack=3047 Win=11776 Len=0

Frame 583 (54 bytes on wire, 54 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: microsoft-ds (445), Dst Port: emprise-lls (3585), Seq: 1, Ack: 3047, Len: 0
    Source port: microsoft-ds (445)
    Destination port: emprise-lls (3585)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 3047    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 11776 (scaled)
    Checksum: 0x1311 [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    584 1455.511011 A.B.C.D           E.F.G.H         SMB      Session Setup AndX Request

Frame 584 (1425 bytes on wire, 1425 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: emprise-lls (3585), Dst Port: microsoft-ds (445), Seq: 3047, Ack: 1, Len: 1371
    Source port: emprise-lls (3585)
    Destination port: microsoft-ds (445)
    Sequence number: 3047    (relative sequence number)
    [Next sequence number: 4418    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 500000 (scaled)
    Checksum: 0xecd3 [correct]
    [SEQ/ACK analysis]
    TCP segment data (1371 bytes)
[Reassembled TCP Segments (4291 bytes): #580(1460), #582(1460), #584(1371)]
NetBIOS Session Service
SMB (Server Message Block Protocol)

No.     Time        Source                Destination           Protocol Info
    585 1455.511021 E.F.G.H         A.B.C.D           TCP      microsoft-ds > emprise-lls [ACK] Seq=1 Ack=4418 Win=14720 Len=0

Frame 585 (54 bytes on wire, 54 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: microsoft-ds (445), Dst Port: emprise-lls (3585), Seq: 1, Ack: 4418, Len: 0
    Source port: microsoft-ds (445)
    Destination port: emprise-lls (3585)
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    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 4418    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 14720 (scaled)
    Checksum: 0x0d9f [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    586 1461.442850 A.B.C.D           E.F.G.H         TCP      emprise-lls > microsoft-ds [RST] Seq=4418 Win=0 Len=0

Frame 586 (62 bytes on wire, 62 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: emprise-lls (3585), Dst Port: microsoft-ds (445), Seq: 4418, Len: 0
    Source port: emprise-lls (3585)
    Destination port: microsoft-ds (445)
    Sequence number: 4418    (relative sequence number)
    Acknowledgment number: Broken TCP. The acknowledge field is nonzero while the ACK flag is not set
    Header length: 20 bytes
    Flags: 0x04 (RST)
    Window size: 0
    Checksum: 0x915d [correct]

No.     Time        Source                Destination           Protocol Info
    587 1463.440784 A.B.C.D           E.F.G.H         TCP      mni-prot-rout > 9988 [SYN] Seq=0 Win=41248 Len=0 MSS=1460 WS=3 TSV=0 TSER=0

Frame 587 (78 bytes on wire, 78 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: mni-prot-rout (3764), Dst Port: 9988 (9988), Seq: 0, Len: 0
    Source port: mni-prot-rout (3764)
    Destination port: 9988 (9988)
    Sequence number: 0    (relative sequence number)
    Header length: 44 bytes
    Flags: 0x02 (SYN)
    Window size: 41248
    Checksum: 0x6520 [correct]
    Options: (24 bytes)

No.     Time        Source                Destination           Protocol Info
    588 1463.440808 E.F.G.H         A.B.C.D           TCP      9988 > mni-prot-rout [SYN, ACK] Seq=0 Ack=1 Win=5840 Len=0 MSS=1460 WS=7

Frame 588 (66 bytes on wire, 66 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: 9988 (9988), Dst Port: mni-prot-rout (3764), Seq: 0, Ack: 1, Len: 0
    Source port: 9988 (9988)
    Destination port: mni-prot-rout (3764)
    Sequence number: 0    (relative sequence number)
    Acknowledgement number: 1    (relative ack number)
    Header length: 32 bytes
    Flags: 0x12 (SYN, ACK)
    Window size: 5840
    Checksum: 0x410b [correct]
    Options: (12 bytes)
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    589 1463.513742 A.B.C.D           E.F.G.H         TCP      mni-prot-rout > 9988 [ACK] Seq=1 Ack=1 Win=500000 Len=0

Frame 589 (62 bytes on wire, 62 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
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Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: mni-prot-rout (3764), Dst Port: 9988 (9988), Seq: 1, Ack: 1, Len: 0
    Source port: mni-prot-rout (3764)
    Destination port: 9988 (9988)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 500000 (scaled)
    Checksum: 0xa488 [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    590 1463.519362 A.B.C.D           E.F.G.H         TCP      mni-prot-rout > 9988 [PSH, ACK] Seq=1 Ack=1 Win=500000 Len=255

Frame 590 (309 bytes on wire, 309 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: mni-prot-rout (3764), Dst Port: 9988 (9988), Seq: 1, Ack: 1, Len: 255
    Source port: mni-prot-rout (3764)
    Destination port: 9988 (9988)
    Sequence number: 1    (relative sequence number)
    [Next sequence number: 256    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 500000 (scaled)
    Checksum: 0x8029 [correct]
Data (255 bytes)

0000  4d 5a 90 00 03 00 00 00 04 00 00 00 ff ff 00 00   MZ..............
0010  b8 00 00 00 00 00 00 00 40 00 00 00 00 00 00 00   ........@.......
0020  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0030  00 00 00 00 00 00 00 00 00 00 00 00 b8 00 00 00   ................
0040  0e 1f ba 0e 00 b4 09 cd 21 b8 01 4c cd 21 54 68   ........!..L.!Th
0050  69 73 20 70 72 6f 67 72 61 6d 20 63 61 6e 6e 6f   is program canno
0060  74 20 62 65 20 72 75 6e 20 69 6e 20 44 4f 53 20   t be run in DOS
0070  6d 6f 64 65 2e 0d 0d 0a 24 00 00 00 00 00 00 00   mode....$.......
0080  0d 04 86 c3 49 65 e8 90 49 65 e8 90 49 65 e8 90   ....Ie..Ie..Ie..
0090  b3 41 d5 90 48 65 e8 90 b3 41 d5 90 4c 65 e8 90   .A..He...A..Le..
00a0  b3 46 d5 90 48 65 e8 90 52 69 63 68 d9 67 d7 8a   .F..He..Rich.g..
00b0  00 00 00 00 00 00 00 00 50 45 00 00 4c 01 03 00   ........PE..L...
00c0  4d 73 0c 23 00 00 00 00 00 00 00 00 e0 00 0f 01   Ms.#............
00d0  0b 01 05 0c 00 1a 00 00 00 a6 00 00 00 20 01 00   ............. ..
00e0  ff 12 00 00 00 10 00 00 00 30 00 00 00 00 40 00   .........0....@.
00f0  00 10 00 00 00 02 00 00 04 00 00 00 00 00 00 00   ................

No.     Time        Source                Destination           Protocol Info
    591 1463.519371 E.F.G.H         A.B.C.D           TCP      9988 > mni-prot-rout [ACK] Seq=1 Ack=256 Win=6912 Len=0

Frame 591 (54 bytes on wire, 54 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: 9988 (9988), Dst Port: mni-prot-rout (3764), Seq: 1, Ack: 256, Len: 0
    Source port: 9988 (9988)
    Destination port: mni-prot-rout (3764)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 256    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 6912 (scaled)
    Checksum: 0x9778 [correct]
    [SEQ/ACK analysis]
```

```
No.     Time        Source                Destination           Protocol Info
    592 1463.545474 A.B.C.D           E.F.G.H         TCP      mni-prot-rout > 9988 [PSH, ACK] Seq=256 Ack=1 Win=500000 Len=1460

Frame 592 (1514 bytes on wire, 1514 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: mni-prot-rout (3764), Dst Port: 9988 (9988), Seq: 256, Ack: 1, Len: 1460
    Source port: mni-prot-rout (3764)
    Destination port: 9988 (9988)
    Sequence number: 256    (relative sequence number)
    [Next sequence number: 1716    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 500000 (scaled)
    Checksum: 0x43a7 [correct]
    [SEQ/ACK analysis]
Data (1460 bytes)

0000  00 04 00 00 00 00 00 00 00 00 00 02 00 00 04 00   ................
0010  00 27 dd 00 00 02 00 00 00 00 00 10 00 00 10 00   .'..............
0020  00 00 00 10 00 00 10 00 00 00 00 00 00 10 00 00   ................
0030  00 00 00 00 00 00 00 00 00 ea 28 00 00 28 00 00   ..........(..(..
0040  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0050  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0060  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0070  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0080  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0090  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
00a0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
00b0  00 2e 74 65 78 74 00 00 00 30 18 00 00 00 10 00   ..text...0......
00c0  00 00 1a 00 00 00 04 00 00 00 00 00 00 00 00 00   ................
00d0  00 00 00 00 00 20 00 00 c0 72 64 61 74 61 00 00   ..... ...rdata..
00e0  00 00 20 01 00 00 30 00 00 00 00 00 00 00 00 00   .. ...0.........
00f0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 80 00   ................
0100  c0 2e 64 61 74 61 00 00 00 70 a5 00 00 00 50 01   ..data...p....P.
0110  00 00 a6 00 00 00 1e 00 00 00 00 00 00 00 00 00   ................
0120  00 00 00 00 00 40 00 00 c0 00 00 00 00 00 00 00   .....@..........
0130  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0140  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0150  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0160  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0170  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0180  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0190  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
01a0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
01b0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
01c0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
01d0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
01e0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
01f0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0200  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0210  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0220  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0230  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0240  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0250  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0260  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0270  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0280  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0290  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
02a0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
```

```
02b0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
02c0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
02d0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
02e0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
02f0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0300  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0310  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0320  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0330  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0340  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0350  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0360  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0370  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0380  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0390  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
03a0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
03b0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
03c0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
03d0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
03e0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
03f0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0400  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0410  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0420  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0430  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0440  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0450  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0460  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0470  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0480  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0490  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
04a0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
04b0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
04c0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
04d0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
04e0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
04f0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0500  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0510  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0520  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0530  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0540  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0550  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0560  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0570  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0580  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0590  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
05a0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
05b0  00 00 00 00                                       ....

No.     Time        Source                Destination           Protocol Info
    593 1463.545482 E.F.G.H         A.B.C.D           TCP      9988 > mni-prot-rout [ACK] Seq=1 Ack=1716 Win=9856 Len=0

Frame 593 (54 bytes on wire, 54 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: 9988 (9988), Dst Port: mni-prot-rout (3764), Seq: 1, Ack: 1716, Len: 0
    Source port: 9988 (9988)
    Destination port: mni-prot-rout (3764)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 1716    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
```

```
    Window size: 9856 (scaled)
    Checksum: 0x91ad [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    594 1463.545589 A.B.C.D           E.F.G.H         TCP      mni-prot-rout > 9988 [PSH, ACK] Seq=1716 Ack=1 Win=500000 Len=70

Frame 594 (124 bytes on wire, 124 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: mni-prot-rout (3764), Dst Port: 9988 (9988), Seq: 1716, Ack: 1, Len: 70
    Source port: mni-prot-rout (3764)
    Destination port: 9988 (9988)
    Sequence number: 1716    (relative sequence number)
    [Next sequence number: 1786    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 500000 (scaled)
    Checksum: 0x9d87 [correct]
    [SEQ/ACK analysis]
Data (70 bytes)

0000  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0010  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0020  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0030  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0040  00 00 00 00 00 00                                 ......

No.     Time        Source                Destination           Protocol Info
    595 1463.545594 E.F.G.H         A.B.C.D           TCP      9988 > mni-prot-rout [ACK] Seq=1 Ack=1786 Win=9856 Len=0

Frame 595 (54 bytes on wire, 54 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: 9988 (9988), Dst Port: mni-prot-rout (3764), Seq: 1, Ack: 1786, Len: 0
    Source port: 9988 (9988)
    Destination port: mni-prot-rout (3764)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 1786    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 9856 (scaled)
    Checksum: 0x9167 [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    596 1463.617314 A.B.C.D           E.F.G.H         TCP      mni-prot-rout > 9988 [PSH, ACK] Seq=1786 Ack=1 Win=500000 Len=1460

Frame 596 (1514 bytes on wire, 1514 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: mni-prot-rout (3764), Dst Port: 9988 (9988), Seq: 1786, Ack: 1, Len: 1460
    Source port: mni-prot-rout (3764)
    Destination port: 9988 (9988)
    Sequence number: 1786    (relative sequence number)
    [Next sequence number: 3246    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 500000 (scaled)
    Checksum: 0xa655 [correct]
    [SEQ/ACK analysis]
```

```
Data (1460 bytes)

0000  00 00 00 00 00 00 85 c6 c7 44 24 ee de 12 41 00   .........D$...A.
0010  85 c6 66 33 c9 8b 7c 24 ee b8 66 85 d8 c7 ab 66   ..f3..|$..f....f
0020  33 c9 33 c0 b0 04 01 44 24 ee 23 df 23 d9 66 0b   3.3....D$.#.#.f.
0030  f5 8b 7c 24 ee b8 44 24 e6 de ab 23 d9 66 0b f5   ..|$..D$...#.f..
0040  33 d2 b2 04 01 54 24 ee 66 0b f5 8b 44 24 ee 81   3....T$.f...D$..
0050  00 02 41 00 66 66 33 c1 c1 d0 02 33 c9 b1 04 01   ..A.ff3....3....
0060  4c 24 ee c1 d0 02 8b 54 24 ee 81 02 85 d8 8b 54   L$.....T$......T
0070  23 d8 0f be de 33 c0 b0 04 01 44 24 ee 0f be de   #....3....D$....
0080  8b 54 24 ee 81 02 24 e6 81 02 81 db ec db 40 00   .T$...$.......@.
0090  33 c0 b0 04 01 44 24 ee 2b f5 f7 c2 fa fa 40 00   3....D$.+.....@.
00a0  8b 7c 24 ee b8 6b d7 90 3b ab f7 c2 fa fa 40 00   .|$..k..;.....@.
00b0  33 c9 b1 04 01 4c 24 ee c1 ea 02 66 8b ce 8b 44   3....L$....f...D
00c0  24 ee c7 00 81 32 d2 e9 66 8b ce 33 c9 b1 04 01   $....2..f..3....
00d0  4c 24 ee 66 85 ea 8b 4c 24 ee 81 01 92 3b 0f b6   L$.f...L$....;..
00e0  23 f2 66 85 ea 33 c0 b0 04 01 44 24 ee 66 85 ea   #.f..3....D$.f..
00f0  8b 4c 24 ee c7 01 dc 23 f5 33 66 85 c3 66 03 dd   .L$....#.3f..f..
0100  66 0b c0 33 c9 b1 04 01 4c 24 ee 66 03 dd 8b 5c   f..3....L$.f...\
0110  24 ee 81 03 d2 b2 04 01 66 0b c0 8d bf eb fe 40   $.......f......@
0120  00 33 c9 b1 04 01 4c 24 ee 8d bf eb fe 40 00 8b   .3....L$.....@..
0130  44 24 ee 81 00 54 24 e6 23 85 ed 33 c0 b0 04 01   D$...T$.#..3....
0140  44 24 ee c1 e1 02 8b 44 24 ee 81 00 f5 8b 4c 24   D$.....D$.....L$
0150  66 03 f5 33 db b3 04 01 5c 24 ee 66 23 c0 0f a4   f..3....\$.f#...
0160  c8 03 8b 5c 24 ee 81 03 e6 81 01 00 0f a4 c8 03   ...\$...........
0170  33 c0 b0 04 01 44 24 ee 66 0b c5 8b 4c 24 ee 81   3....D$.f...L$..
0180  09 b8 e0 1e 33 66 23 d2 33 c9 b1 04 01 4c 24 ee   ....3f#.3....L$.
0190  f7 df 23 fb 66 23 ff 8b 5c 24 ee 81 03 fa 83 eb   ..#.f#..\$......
01a0  02 23 fb 33 c9 b1 04 01 4c 24 ee 66 23 ff 8b 4c   .#.3....L$.f#..L
01b0  24 ee 81 01 33 c0 b0 04 85 ee 0f be d2 23 f3 81   $...3........#..
01c0  f1 ec f8 40 00 33 c0 b0 04 01 44 24 ee 0f be d2   ...@.3....D$....
01d0  23 f3 8b 7c 24 ee b8 01 44 24 e6 ab 23 f3 33 c9   #..|$...D$..#.3.
01e0  b1 04 01 4c 24 ee 81 f1 ec f8 40 00 8b 5c 24 ee   ...L$.....@..\$.
01f0  81 03 83 eb 02 8b c1 d1 02 c1 c9 02 33 db b3 04   ............3...
0200  01 5c 24 ee c1 c9 02 66 85 f5 8b 5c 24 ee 81 03   .\$....f...\$...
0210  44 24 e6 81 66 85 f5 33 d2 b2 04 01 54 24 ee 81   D$..f..3....T$..
0220  f3 e8 fc 40 00 8b 7c 24 ee b8 00 40 00 50 ab 33   ...@..|$...@.P.3
0230  ef 33 c9 b1 04 01 4c 24 ee 66 03 c6 8b 5c 24 ee   .3....L$.f...\$.
0240  81 0b ba 66 85 ce 66 03 da 33 c0 b0 04 01 44 24   ...f..f..3....D$
0250  ee 8b f2 8b 7c 24 ee b8 33 c0 b0 04 ab 23 ea 23   ....|$..3....#.#
0260  ed 83 d8 02 33 c0 b0 04 01 44 24 ee 23 ed 8b 4c   ....3....D$.#..L
0270  24 ee 81 01 01 44 24 e6 83 d8 02 66 0b de 33 c9   $....D$....f..3.
0280  b1 04 01 4c 24 ee 66 0b de 8b 5c 24 ee 81 03 0b   ...L$.f...\$....
0290  fb 8b 54 c1 d6 02 33 db b3 04 01 5c 24 ee 66 2b   ..T...3....\$.f+
02a0  d6 8b 54 24 ee 81 0a 24 e6 81 02 66 0b d8 8d 6d   ..T$...$...f...m
02b0  02 66 8b ef 33 c0 b0 04 01 44 24 ee 8d 6d 02 8b   .f..3....D$..m..
02c0  4c 24 ee 81 01 09 5f 70 18 66 8b ef 33 c9 b1 04   L$...._p.f..3...
02d0  01 4c 24 ee 23 f3 8b 4c 24 ee 81 01 81 32 4a 98   .L$.#..L$....2J.
02e0  23 cf 33 db b3 04 01 5c 24 ee 33 cd 0f b6 cb 8b   #.3....\$.3.....
02f0  54 24 ee 81 0a da 5a 81 df 0f b6 cb 33 d2 b2 04   T$....Z.....3...
0300  01 54 24 ee 0f a4 d8 03 8b 54 24 ee 81 02 fb f8   .T$......T$.....
0310  40 00 03 d0 b9 79 dd 40 00 33 d2 b2 04 01 54 24   @....y.@.3....T$
0320  ee b9 79 dd 40 00 8b 5c 24 ee c7 03 33 d2 b2 04   ..y.@..\$...3...
0330  03 d0 33 d2 b2 04 01 54 24 ee 8d 95 69 f9 40 00   ..3....T$...i.@.
0340  8b 5c 24 ee 81 03 01 54 24 e6 8d 9f eb dc 40 00   .\$....T$.....@.
0350  33 d2 b2 04 01 54 24 ee 66 03 cd 8b 4c 24 ee 81   3....T$.f...L$..
0360  01 8d 7b 02 8b 66 85 da 33 ff 33 d2 b2 04 01 54   ..{..f..3.3....T
0370  24 ee 33 ff 8b 54 24 ee 81 02 5c 24 e6 81 66 23   $.3..T$...\$..f#
0380  ef 0f b6 df 66 2b f5 33 c0 b0 04 01 44 24 ee 0f   ....f+.3....D$..
0390  b6 df 8b 54 24 ee 81 02 03 e8 02 00 66 2b f5 66   ...T$.......f+.f
03a0  23 fd 66 23 f1 33 db b3 04 01 5c 24 ee 66 23 fd   #.f#.3....\$.f#.
03b0  8b 5c 24 ee 81 03 00 f7 ea 0f 66 23 f1 66 33 d3   .\$.......f#.f3.
03c0  83 dd 02 33 d2 b2 04 01 54 24 ee 66 33 d3 8b 7c   ...3....T$.f3..|
```

```
03d0  24 ee b8 be db 0b c1 ab 83 dd 02 33 c0 b0 04 01   $..........3....
03e0  44 24 ee 0f ac e8 03 8b 54 24 ee c7 02 33 d2 b2   D$......T$...3..
03f0  04 c1 d6 02 33 c9 b1 04 01 4c 24 ee 66 03 de 81   ....3....L$.f...
0400  c1 6a f9 40 00 8b 54 24 ee 81 02 01 54 24 e6 81   .j.@..T$....T$..
0410  c1 6a f9 40 00 33 db b3 04 01 5c 24 ee f7 eb 0b   .j.@.3....\$....
0420  fd 8b 4c 24 ee 81 01 0f be db 0b 0b fd 8d 95 69   ..L$...........i
0430  f9 40 00 33 d2 b2 04 01 54 24 ee 8d 95 69 f9 40   .@.3....T$...i.@
0440  00 8b 5c 24 ee 81 03 c1 8b 5c 24 33 ea 81 f1 ec   ..\$.....\$3....
0450  f8 40 00 33 c9 b1 04 01 4c 24 ee 81 f1 ec f8 40   .@.3....L$.....@
0460  00 8b 5c 24 ee 81 0b e6 81 03 07 0f be c6 66 2b   ..\$..........f+
0470  fd 33 fa 33 db b3 04 01 5c 24 ee 66 2b fd 33 fa   .3.3....\$.f+.3.
0480  8b 4c 24 ee 81 01 10 f8 e1 81 33 fa 66 2b f6 66   .L$.......3.f+.f
0490  85 e8 33 db b3 04 01 5c 24 ee 66 2b f6 66 85 e8   ..3....\$.f+.f..
04a0  8b 4c 24 ee c7 01 33 07 fb f1 66 85 e8 66 23 c0   .L$...3...f..f#.
04b0  33 db b3 04 01 5c 24 ee 66 23 c0 8b 5c 24 ee c7   3....\$.f#..\$..
04c0  03 d0 0b c1 66 66 03 d6 33 c0 b0 04 01 44 24 ee   ....ff..3....D$.
04d0  66 03 ed 8b 4c 24 ee 81 01 33 c9 33 c9 2b fe 33   f...L$...3.3.+.3
04e0  d2 b2 04 01 54 24 ee b9 79 dd 40 00 8b 7c 24 ee   ....T$..y.@..|$.
04f0  b8 b1 04 01 4c ab 85 f7 33 de 66 03 dd 33 d2 b2   ....L...3.f..3..
0500  04 01 54 24 ee 33 de 66 03 dd 8b 44 24 ee 81 00   ..T$.3.f...D$...
0510  24 e6 66 33 66 03 dd 8b ca 66 03 f9 33 db b3 04   $.f3f....f..3...
0520  01 5c 24 ee 8b ca 66 03 f9 8b 5c 24 ee 81 0b c9   .\$...f...\$....
0530  8b f7 8b 66 03 f9 33 f9 33 c0 b0 04 01 44 24 ee   ...f..3.3....D$.
0540  33 f9 81 c0 ed d8 40 00 8b 4c 24 ee c7 01 4c 24   3.....@..L$...L$
0550  e6 81 81 c0 ed d8 40 00 33 c9 b1 04 01 4c 24 ee   ......@.3....L$.
0560  8b c7 8b 44 24 ee 81 08 01 10 83 c0 2b c8 33 c9   ...D$.......+.3.
0570  b1 04 01 4c 24 ee 03 ce 8b 4c 24 ee 81 09 04 8b   ...L$....L$.....
0580  f7 66 83 c0 02 33 c9 b1 04 01 4c 24 ee 2b ce 8b   .f...3....L$.+..
0590  54 24 ee c7 02 23 e9 0f b6 0f c1 d0 8d 4e 02 33   T$...#.......N.3
05a0  db b3 04 01 5c 24 ee 8d 4e 02 0f be c3 8b 44 24   ....\$..N.....D$
05b0  ee 81 00 c3                                       ....

No.     Time        Source                Destination           Protocol Info
    597 1463.617320 E.F.G.H         A.B.C.D           TCP      9988 > mni-prot-rout [ACK] Seq=1 Ack=3246 Win=12800 Len=0

Frame 597 (54 bytes on wire, 54 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: 9988 (9988), Dst Port: mni-prot-rout (3764), Seq: 1, Ack: 3246, Len: 0
    Source port: 9988 (9988)
    Destination port: mni-prot-rout (3764)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 3246    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 12800 (scaled)
    Checksum: 0x8b9c [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    598 1463.643549 A.B.C.D           E.F.G.H         TCP      mni-prot-rout > 9988 [PSH, ACK] Seq=3246 Ack=1 Win=500000 Len=1460

Frame 598 (1514 bytes on wire, 1514 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: mni-prot-rout (3764), Dst Port: 9988 (9988), Seq: 3246, Ack: 1, Len: 1460
    Source port: mni-prot-rout (3764)
    Destination port: 9988 (9988)
    Sequence number: 3246    (relative sequence number)
    [Next sequence number: 4706    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
```

```
    Window size: 500000 (scaled)
    Checksum: 0x3273 [correct]
    [SEQ/ACK analysis]
Data (1460 bytes)

0000  33 c0 b0 0f be c3 81 e2 78 fe 40 00 33 c9 b1 04   3.......x.@.3...
0010  01 4c 24 ee 81 e2 78 fe 40 00 8b 54 24 ee 81 02   .L$...x.@..T$...
0020  04 01 44 24 83 ea 02 33 c9 b1 04 01 4c 24 ee 83   ..D$...3....L$..
0030  df 02 8b 7c 24 ee b8 e6 66 23 e9 ab 66 23 c8 66   ...|$...f#..f#.f
0040  85 f0 33 db b3 04 01 5c 24 ee 66 85 f0 8b 44 24   ..3....\$.f...D$
0050  ee 81 00 8b 54 24 e6 81 cd e8 fd 40 00 33 db b3   ....T$.....@.3..
0060  04 01 5c 24 ee 2b f8 03 ca 8b 7c 24 ee b8 81 02   ..\$.+....|$....
0070  49 75 ab 03 ca 66 8b ed 66 85 db 33 c9 b1 04 01   Iu...f..f..3....
0080  4c 24 ee 66 8b ed 8b 44 24 ee c7 00 f8 c3 0f b6   L$.f...D$.......
0090  66 85 db 33 db b3 04 01 5c 24 ee 33 e9 8b 4c 24   f..3....\$.3..L$
00a0  ee 81 01 c3 8d 79 02 66 0b d9 2b c2 0f be c8 33   .....y.f..+....3
00b0  db b3 04 01 5c 24 ee 2b c2 0f be c8 8b 4c 24 ee   ....\$.+.....L$.
00c0  c7 01 66 33 ff 33 0f be c8 33 fb 33 c9 b1 04 01   ..f3.3...3.3....
00d0  4c 24 ee 33 fb 8b 5c 24 ee c7 03 d2 b2 04 01 66   L$.3..\$.......f
00e0  2b d2 33 db b3 04 01 5c 24 ee 85 c5 8b 44 24 ee   +.3....\$....D$.
00f0  c7 00 54 24 e6 8d 0f c1 c0 33 db b3 04 01 5c 24   ..T$.....3....\$
0100  ee 8d 78 02 8b 7c 24 ee b8 79 02 8b 4c ab 85 ce   ..x..|$..y..L...
0110  8d 97 fb f9 40 00 33 c0 b0 04 01 44 24 ee 8d 97   ....@.3....D$...
0120  fb f9 40 00 8b 44 24 ee 81 00 24 e6 81 01 2b f3   ..@..D$...$...+.
0130  c1 e7 02 8d 8b 6a f9 40 00 33 db b3 04 01 5c 24   .....j.@.3....\$
0140  ee c1 e7 02 8b 4c 24 ee 81 01 b9 80 29 00 8d 8b   .....L$.....)...
0150  6a f9 40 00 33 c0 b0 04 01 44 24 ee 66 8b f1 8b   j.@.3....D$.f...
0160  7c 24 ee b8 66 33 ff 23 ab 8b f9 66 33 c0 66 8b   |$..f3.#...f3.f.
0170  e9 33 c9 b1 04 01 4c 24 ee 66 33 c0 8b 4c 24 ee   .3....L$.f3..L$.
0180  c7 01 cf 8b f8 66 66 8b e9 33 ea 33 db b3 04 01   .....ff..3.3....
0190  5c 24 ee 33 ea 8b 4c 24 ee 81 01 0b db 33 c9 0b   \$.3..L$.....3..
01a0  d9 33 db b3 04 01 5c 24 ee 66 2b ea 8b 54 24 ee   .3....\$.f+..T$.
01b0  81 02 b1 04 01 4c 66 23 c1 81 f2 6d de 40 00 33   .....Lf#...m.@.3
01c0  d2 b2 04 01 54 24 ee 81 f2 6d de 40 00 8b 4c 24   ....T$...m.@..L$
01d0  ee 81 09 24 e6 23 cf 66 8b d9 33 c9 b1 04 01 4c   ...$.#.f..3....L
01e0  24 ee 0f b6 d9 8b 7c 24 ee b8 8b f8 66 0b ab 66   $.....|$....f..f
01f0  2b f5 66 23 ef 66 23 ca 33 db b3 04 01 5c 24 ee   +.f#.f#.3....\$.
0200  66 23 ef 8b 44 24 ee c7 00 db 8b 5c 24 66 23 ca   f#..D$.....\$f#.
0210  03 dd 33 db b3 04 01 5c 24 ee 03 dd 8b 5c 24 ee   ..3....\$....\$.
0220  81 0b e6 81 03 00 66 33 c3 33 c0 b0 04 01 44 24   ......f3.3....D$
0230  ee 0f be d6 0f be c2 8b 54 24 ee 81 02 b8 00 50   ........T$.....P
0240  8b 0f be c2 0b f0 0b ef 33 c0 b0 04 01 44 24 ee   ........3....D$.
0250  0b f0 8b 5c 24 ee c7 03 f8 66 0b db 0b ef 66 03   ...\$....f....f.
0260  db 66 8b ca 33 c9 b1 04 01 4c 24 ee 66 03 db 8b   .f..3....L$.f...
0270  5c 24 ee 81 03 66 0b c3 33 66 8b ca c1 f8 02 33   \$...f..3f.....3
0280  c9 b1 04 01 4c 24 ee c1 f8 02 8b 44 24 ee c7 00   ....L$.....D$...
0290  c0 b0 04 01 66 2b ea 66 0b df 66 2b d8 33 d2 b2   ....f+.f..f+.3..
02a0  04 01 54 24 ee 66 0b df 66 2b d8 8b 4c 24 ee 81   ..T$.f..f+..L$..
02b0  01 44 24 e6 66 66 2b d8 33 c0 b0 04 01 44 24 ee   .D$.ff+.3....D$.
02c0  66 23 ee 8b 44 24 ee 81 00 0b db 8b 4c 66 8b ce   f#..D$......Lf..
02d0  66 85 de 33 c9 b1 04 01 4c 24 ee 66 85 de 8b 4c   f..3....L$.f...L
02e0  24 ee 81 01 24 e6 81 01 23 de c1 ea 02 33 c0 b0   $...$...#....3..
02f0  04 01 44 24 ee c1 ea 02 8b 44 24 ee 81 00 41 00   ..D$.....D$...A.
0300  ba 9a c1 e6 02 33 d2 b2 04 01 54 24 ee 2b f6 66   .....3....T$.+.f
0310  23 cb 8b 7c 24 ee b8 66 0b c3 0f ab 66 23 cb 8d   #..|$..f....f#..
0320  47 02 33 c9 b1 04 01 4c 24 ee 8d 47 02 8b 4c 24   G.3....L$..G..L$
0330  ee 81 01 be d9 33 c9 66 8b c3 33 c0 b0 04 01 44   .....3.f..3....D
0340  24 ee 81 ef ee da 40 00 8b 5c 24 ee 81 03 b1 04   $.....@..\$.....
0350  01 4c 66 33 d8 85 d9 8b f1 33 c0 b0 04 01 44 24   .Lf3.....3....D$
0360  ee 85 d9 8b 54 24 ee c7 02 24 e6 0f be 8b f1 23   ....T$...$.....#
0370  ed f7 ea 33 c0 b0 04 01 44 24 ee 23 ed f7 ea 8b   ...3....D$.#....
0380  4c 24 ee 81 01 d9 23 d6 8b f7 ea 33 c0 b0 04 01   L$....#....3....
0390  44 24 ee 81 c3 79 f9 40 00 8b 7c 24 ee b8 54 24   D$...y.@..|$..T$
```

```
03a0  e6 81 ab 8b f3 33 db b3 04 01 5c 24 ee 03 f9 0b   .....3....\$....
03b0  fb 8b 54 24 ee 81 02 02 cc 97 6b 0b fb 33 d2 b2   ..T$......k..3..
03c0  04 01 54 24 ee 8b f2 8b 4c 24 ee 81 09 fc 81 32   ..T$....L$.....2
03d0  2a 66 8b d0 66 8b ee 33 c0 b0 04 01 44 24 ee 66   *f..f..3....D$.f
03e0  8b ee c1 d7 02 8b 5c 24 ee 81 0b 8f 2d 14 23 c1   ......\$....-.#.
03f0  d7 02 03 ea 0f be d8 33 d2 b2 04 01 54 24 ee 03   .......3....T$..
0400  ea 8b 4c 24 ee 81 01 d6 33 c9 b1 0f be d8 33 c0   ..L$....3.....3.
0410  b0 04 01 44 24 ee 66 2b c7 8b 7c 24 ee b8 04 01   ...D$.f+..|$....
0420  4c 24 ab 23 c8 81 f0 78 dd 40 00 33 d2 b2 04 01   L$.#...x.@.3....
0430  54 24 ee 81 f0 78 dd 40 00 8b 44 24 ee c7 00 e6   T$...x.@..D$....
0440  2b c6 8b 66 2b cf 33 c9 b1 04 01 4c 24 ee 81 c6   +..f+.3....L$...
0450  fa fd 40 00 8b 4c 24 ee 81 01 4c 24 e6 81 66 03   ..@..L$...L$..f.
0460  ea 66 85 f8 8d 86 6b ff 40 00 33 d2 b2 04 01 54   .f....k.@.3....T
0470  24 ee 66 85 f8 8b 54 24 ee c7 02 01 e3 ff ff 8d   $.f...T$........
0480  86 6b ff 40 00 66 33 ff 33 db b3 04 01 5c 24 ee   .k.@.f3.3....\$.
0490  66 33 ff 8b 7c 24 ee b8 ff 66 23 d2 ab 0f b6 c1   f3..|$...f#.....
04a0  66 0b de 0b da 33 c0 b0 04 01 44 24 ee 66 0b de   f....3....D$.f..
04b0  8b 7c 24 ee b8 33 d2 b2 04 ab 0b da 33 c0 b0 04   .|$..3......3...
04c0  01 44 24 ee 33 ea 81 f5 fd da 40 00 8b 4c 24 ee   .D$.3.....@..L$.
04d0  81 09 01 54 24 e6 81 f5 fd da 40 00 33 db b3 04   ...T$.....@.3...
04e0  01 5c 24 ee 66 8b cb 8b 5c 24 ee 81 0b 8b d9 8b   .\$.f...\$......
04f0  54 66 23 c8 33 db b3 04 01 5c 24 ee 23 d7 66 03   Tf#.3....\$.#.f.
0500  cb 8b 7c 24 ee b8 24 e6 81 02 ab 66 03 cb 85 f1   ..|$..$....f....
0510  8d 4d 02 33 c0 b0 04 01 44 24 ee 85 f1 8b 44 24   .M.3....D$....D$
0520  ee 81 00 ed fe 03 86 8d 4d 02 33 c9 b1 04 01 4c   ........M.3....L
0530  24 ee 66 8b f3 66 23 c5 8b 4c 24 ee c7 01 81 32   $.f..f#..L$....2
0540  2e 96 66 23 c5 33 d2 b2 04 01 54 24 ee 03 ef 66   ..f#.3....T$...f
0550  2b eb 8b 54 24 ee 81 02 5b 84 c1 c2 66 2b eb 33   +..T$...[...f+.3
0560  d2 b2 04 01 54 24 ee 0f be cf 8b 7c 24 ee b8 02   ....T$.....|$...
0570  83 c1 02 ab 66 0b d7 33 db b3 04 01 5c 24 ee 66   ....f..3....\$.f
0580  0b d9 8b d7 8b 5c 24 ee 81 03 23 d1 33 db 8b d7   .....\$...#.3...
0590  66 85 ee 23 de 2b c9 33 c9 b1 04 01 4c 24 ee 66   f..#.+.3....L$.f
05a0  85 ee 23 de 8b 5c 24 ee 81 03 b3 04 01 5c 23 de   ..#..\$......\#.
05b0  2b c9 33 c0                                       +.3.

No.     Time        Source                Destination           Protocol Info
    599 1463.643555 E.F.G.H         A.B.C.D           TCP      9988 > mni-prot-rout [ACK] Seq=1 Ack=4706 Win=15744 Len=0

Frame 599 (54 bytes on wire, 54 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: 9988 (9988), Dst Port: mni-prot-rout (3764), Seq: 1, Ack: 4706, Len: 0
    Source port: 9988 (9988)
    Destination port: mni-prot-rout (3764)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 4706    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 15744 (scaled)
    Checksum: 0x85d1 [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    600 1463.667408 A.B.C.D           E.F.G.H         TCP      mni-prot-rout > 9988 [PSH, ACK] Seq=4706 Ack=1 Win=500000 Len=1460

Frame 600 (1514 bytes on wire, 1514 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: mni-prot-rout (3764), Dst Port: 9988 (9988), Seq: 4706, Ack: 1, Len: 1460
    Source port: mni-prot-rout (3764)
    Destination port: 9988 (9988)
    Sequence number: 4706    (relative sequence number)
    [Next sequence number: 6166    (relative sequence number)]
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    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 500000 (scaled)
    Checksum: 0xb4ad [correct]
    [SEQ/ACK analysis]
Data (1460 bytes)

0000  b0 04 01 44 24 ee 2b c9 03 de 8b 4c 24 ee c7 01   ...D$.+....L$...
0010  24 e6 68 de 03 de f7 ed 33 c9 b1 04 01 4c 24 ee   $.h.....3....L$.
0020  f7 ed 8b 7c 24 ee b8 02 41 00 c3 ab 66 8b ef c1   ...|$...A...f...
0030  e2 02 33 c9 b1 04 01 4c 24 ee c1 e2 02 8b 5c 24   ..3....L$.....\$
0040  ee 81 03 83 c1 02 23 8b fa 8d 8a fe dc 40 00 33   ......#......@.3
0050  c9 b1 04 01 4c 24 ee 8d 8a fe dc 40 00 8b 4c 24   ....L$.....@..L$
0060  ee 81 01 d1 66 8b f3 66 85 fe 23 fb 33 db b3 04   ....f..f..#.3...
0070  01 5c 24 ee 68 de 12 41 00 c3 23 fb c1 ee 02 ab   .\$.h..A..#.....
0080  c7 aa 42 43 99 2b a4 43 c7 55 bd c8 39 a9 34 7f   ..BC.+.C.U..9.4.
0090  4c f4 76 ce b1 d2 c1 85 cf 21 54 40 10 21 00 53   L.v......!T@.!.S
00a0  c4 6d c9 4b 4e a7 b6 b7 86 aa c9 0b c3 23 4f bb   .m.KN........#O.
00b0  33 eb 42 2b 21 58 03 43 af 16 b0 02 c7 42 3f 46   3.B+!X.C.....B?F
00c0  c7 aa cf 4e d7 ba 02 43 af 7a 4c 43 c7 fb aa 9f   ...N...C.zLC....
00d0  c2 aa 42 84 c2 82 b0 02 c7 3e 42 43 c7 27 47 6b   ..B......>BC.'Gk
00e0  35 eb 42 13 38 bf 76 b6 86 aa bd 56 f7 5f 03 43   5.B.8.v....V._.C
00f0  4c 52 a9 48 46 95 10 26 8a de 37 41 2c ac 05 c3   LR.HF..&..7A,...
0100  f8 aa 37 b3 46 95 10 26 8a de 37 49 00 af 66 b1   ..7.F..&..7I..f.
0110  86 aa 43 43 c7 aa 2a 9d 36 eb 42 2b c7 fa 03 43   ..CC..*.6.B+...C
0120  2f 76 42 43 c7 c2 a4 b2 86 aa bd 76 19 5b 03 43   /vBC.......v.[.C
0130  2f 10 40 43 c7 55 77 a5 36 eb 42 ab f8 a9 42 43   /.@C.Uw.6.B...BC
0140  44 97 66 b1 86 aa 43 4c 42 22 42 43 c7 29 7f 7b   D.f...CLB"BC.).{
0150  35 eb 42 41 b2 d5 2a 63 35 eb 42 2b db 58 03 43   5.BA..*c5.B+.X.C
0160  af b2 b0 02 c7 c2 a8 b2 86 aa bd 76 19 5b 03 43   ...........v.[.C
0170  2f d0 43 43 c7 a1 82 37 88 55 77 63 35 eb 42 bc   /.CC...7.Uwc5.B.
0180  f2 4c b3 02 c7 42 b7 42 c7 aa bd 76 21 5b 03 43   .L...B.B...v![.C
0190  38 9f 62 b1 86 aa bd 76 db 58 03 43 38 9f 5a b1   8.b....v.X.C8.Z.
01a0  86 aa aa bb c7 aa 42 48 07 de 5f 2b c7 2a 42 43   ......BH.._+.*BC
01b0  ad aa bd 76 21 5b 03 43 38 bf 66 b6 86 aa 85 46   ...v![.C8.f....F
01c0  e3 58 03 43 c2 aa 42 43 44 97 66 b1 86 aa 47 37   .X.C..BCD.f...G7
01d0  ef 41 40 a8 e3 55 77 a5 36 eb 42 bc f2 4c b3 02   .A@..Uw.6.B..L..
01e0  c7 42 db 42 c7 aa e3 a5 36 eb 42 40 87 96 c9 03   .B.B....6.B@....
01f0  ef a9 47 a5 36 eb 42 bc 27 c0 42 bc d2 82 b7 02   ..G.6.B.'.B.....
0200  c7 ff c9 af 44 6e b6 14 91 f9 aa 43 c7 aa 42 1d   ....Dn.....C..B.
0210  46 4c 42 43 38 55 c9 bd c4 dc 7e c2 01 52 42 43   FLBC8U....~..RBC
0220  c7 13 43 43 c7 aa 29 8a ef a9 b3 c8 89 a6 41 ba   ..CC..).......A.
0230  90 55 37 4b 2f 2c 44 43 c7 29 86 4b 4e ef be 46   .U7K/,DC.).KN..F
0240  e7 e4 42 43 4c 62 cf 46 30 5b 03 43 97 fb 28 43   ..BCLb.F0[.C..(C
0250  ad ae 28 43 ad 55 bd 56 fb 5f 03 43 4e ef ba 29   ..(C.U.V._.CN..)
0260  c7 c0 42 29 c7 c0 44 bc b2 52 bd 56 87 5f 03 43   ..B)..D..R.V._.C
0270  4e ef b6 c8 8a 56 cb 4b 44 6a 46 12 90 fa aa 3f   N....V.KDjF....?
0280  c5 aa 42 bc b2 5e bd 56 83 5f 03 43 4c e7 4e ca   ..B..^.V._.CL.N.
0290  fe f1 1c 1c 0e 68 4a 43 4a 0e 66 43 c7 aa 42 16   .....hJCJ.fC..B.
02a0  4c 46 c1 87 3b fd 14 10 4c 9f a4 b2 86 aa 41 35   LF..;...L.....A5
02b0  fb 27 07 bf 97 55 34 13 38 9f a4 b2 86 aa bd 76   .'...U4.8......v
02c0  e7 58 03 43 38 9f 5a b1 86 aa bd 56 df 5f 03 43   .X.C8.Z....V._.C
02d0  38 9f 5e b1 86 aa bd 56 db 5f 03 43 38 9f 5e b1   8.^....V._.C8.^.
02e0  86 aa bd 56 e7 5f 03 43 9c f4 1d 8a 05 ba 42 16   ...V._.C......B.
02f0  4c 46 c1 87 3f fd 14 10 f4 71 2a 8e 36 eb 42 ab   LF..?....q*.6.B.
0300  ec a8 42 43 38 df 4e ab 64 a8 42 43 cc 6a 36 1c   ..BC8.N.d.BC.j6.
0310  97 c0 42 29 fd 55 57 4f 32 eb 42 c8 37 a1 82 37   ..B).UWO2.B.7..7
0320  89 21 0f 53 4e ab c9 3e cf a9 3d 7f ad ea 2a 43   .!.SN..>..=...*C
0330  d7 aa 42 bc b0 fa 28 43 91 55 57 53 32 eb 42 ca   ..B...(C.UWS2.B.
0340  82 56 49 83 b3 83 c9 0e df 23 43 c8 90 82 41 16   .VI......#C...A.
0350  3b 27 07 bb 97 c0 46 29 c7 f8 28 43 ad aa 14 bc   ;'....F)..(C....
0360  d2 be b7 02 c7 a1 82 37 c1 21 0f 57 4e ab 01 c8   .......7.!.WN...
```

```
0370  04 f1 1c 1c 0e 68 56 43 4a 0e 66 43 c7 aa 42 16   .....hVCJ.fC..B.
0380  4c 46 c1 87 3b fd 14 10 4c df 4a 40 b1 96 c9 1d   LF..;...L.J@....
0390  f3 27 34 3b 44 6c 6a c8 f9 a9 3f 4b 2c 94 c9 4c   .'4;Dlj...?K,..L
03a0  c4 e7 4a c8 80 ae cb 06 3b 29 85 4b 44 c7 be 4b   ..J.....;).KD..K
03b0  2c 8e 24 c0 f8 aa 37 46 44 6d 40 a8 d8 a5 f5 74   ,.$...7FDm@....t
03c0  46 4c bd 4c c7 aa 41 b2 4c ef 4e 6a d9 ab 44 c0   FL.L..A.L.Nj..D.
03d0  aa 56 40 c0 00 a8 c1 3e 3b aa 37 95 44 95 42 36   .V@....>;.7.D.B6
03e0  7a f1 1c 1c 0e 68 4a 43 4a 0e 66 43 c7 aa 42 16   z....hJCJ.fC..B.
03f0  4c 46 c1 87 3f fd 14 10 4c d7 4a 40 b8 96 4d f4   LF..?...L.J@..M.
0400  b0 ac 28 03 af aa 52 43 c7 55 35 13 ad aa bd 56   ..(...RC.U5....V
0410  cf 5f 03 43 4e ef be c8 8a a6 cb 42 38 dd 16 bc   ._.CN......B8...
0420  b2 a2 bd 36 3b 42 97 43 c7 aa c3 84 3f aa 42 43   ...6;B.C....?.BC
0430  4c f7 4a 40 9c 96 c3 80 3f aa 42 43 44 cf ba 43   L.J@....?.BCD..C
0440  4c ef ba 78 01 d8 40 a8 ef 21 0f bb ac 63 6a c8   L..x..@..!...cj.
0450  10 a9 93 c8 8a 56 41 09 cb 21 17 4b c4 f9 56 bc   .....VA..!.K..V.
0460  b4 ba 10 12 2f 3c 42 43 c7 29 81 6b 38 ef ba a8   ..../<BC.).k8...
0470  08 f1 1c 1c 0e 68 4a 43 4a 0e 66 43 c7 aa 42 16   .....hJCJ.fC..B.
0480  4c 46 c1 87 3b fd 14 10 4c d7 4a 40 b8 96 c9 1c   LF..;...L.J@....
0490  f3 27 3d 3b 44 6d 4a c8 f8 a9 3f 4b 2c ed c9 1c   .'=;DmJ...?K,...
04a0  cb a9 1f 4b 94 55 57 b7 33 eb 42 ca 82 56 c9 34   ...K.UW.3.B..V.4
04b0  d7 a9 37 4b 2c 8d c9 45 6e aa 42 43 47 de 45 66   ..7K,..En.BCG.Ef
04c0  c7 aa 42 c3 2c a2 c9 45 c4 ef 4a c0 07 a8 12 bc   ..B.,..E..J.....
04d0  b2 56 bd 56 3f 5e 03 43 4e ac c1 85 c3 29 7c 43   .V.V?^.CN....)|C
04e0  b2 7e c1 84 d3 29 3d 4f c7 df f1 18 99 f5 8b 81   .~...)=O........
04f0  c3 aa cf e7 e3 aa 42 43 c7 27 d9 43 c7 aa 42 16   ......BC.'.C..B.
0500  4c 46 15 15 94 21 0f 53 4c df 4e c8 ba a2 c9 82   LF...!.SL.N.....
0510  06 43 40 b0 62 21 8a c0 26 a9 b1 e7 9c f4 1d 8a   .C@.b!..&.......
0520  05 a6 42 ce 63 8e 42 43 c7 aa 47 43 c7 aa 42 16   ..B.c.BC..GC..B.
0530  4c 46 c1 87 2f fd 14 10 f4 55 cb 3e 3b 27 07 af   LF../....U.>;'..
0540  97 55 37 4b 4a ef be 13 38 bf 1e b6 86 aa 79 84   .U7KJ...8.....y.
0550  b3 ec bd 56 eb 5f 03 43 4c 7a cf 06 3f fa 28 6b   ...V._.CLz..?.(k
0560  95 55 57 23 32 eb 42 78 00 de 6f c8 37 6d 07 ab   .UW#2.Bx..o.7m..
0570  c6 aa 42 43 00 ef b6 41 c7 aa 42 14 90 fd cf 06   ..BC...A..B.....
0580  2f fa 15 bc b2 52 bd 56 a3 5f 03 43 fc 6d 36 42   /....R.V._.C.m6B
0590  80 fc bd 56 e7 5f 03 43 4c 6d 19 1d 98 63 80 47   ...V._.CLm...c.G
05a0  c7 27 e6 67 c7 aa 42 43 4a 0e 66 43 c7 aa 42 16   .'.g..BCJ.fC..B.
05b0  4c 46 c3 87                                       LF..
```

```
No.     Time        Source                Destination           Protocol Info
    601 1463.667416 E.F.G.H         A.B.C.D           TCP      9988 > mni-prot-rout [ACK] Seq=1 Ack=6166 Win=18688 Len=0

Frame 601 (54 bytes on wire, 54 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: 9988 (9988), Dst Port: mni-prot-rout (3764), Seq: 1, Ack: 6166, Len: 0
    Source port: 9988 (9988)
    Destination port: mni-prot-rout (3764)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 6166    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 18688 (scaled)
    Checksum: 0x8006 [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    602 1463.691147 A.B.C.D           E.F.G.H         TCP      mni-prot-rout > 9988 [PSH, ACK] Seq=6166 Ack=1 Win=500000 Len=1460

Frame 602 (1514 bytes on wire, 1514 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: mni-prot-rout (3764), Dst Port: 9988 (9988), Seq: 6166, Ack: 1, Len: 1460
    Source port: mni-prot-rout (3764)
```

```
    Destination port: 9988 (9988)
    Sequence number: 6166    (relative sequence number)
    [Next sequence number: 7626    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 500000 (scaled)
    Checksum: 0x2c6b [correct]
    [SEQ/ACK analysis]
Data (1460 bytes)

0000  13 54 bd bc 90 fc 11 70 38 29 ba 42 b2 c1 15 29   .T.....p8).B...)
0010  c5 55 57 bf 33 eb 42 78 00 de 1c ca 82 56 85 c6   .UW.3.Bx.....V..
0020  13 54 bd bc ef ab 42 43 4a 2f 96 bd 38 55 12 bc   .T....BCJ/..8U..
0030  b2 56 bd 56 c7 5f 03 43 fc 6d 36 77 38 df 4a ce   .V.V._.C.m6w8.J.
0040  42 52 bc bc 38 fa bd 56 ff 5f 03 43 fc 6d 37 4b   BR..8..V._.C.m7K
0050  4c 17 9e bd 38 55 a9 5b 4a 2f 96 bd 38 55 12 bc   L...8U.[J/..8U..
0060  b2 56 bd 56 c3 5f 03 43 fc 6d 37 41 2c a8 a9 8f   .V.V._.C.m7A,...
0070  38 df be bc d2 8a b7 02 c7 21 85 18 99 f5 8b 81   8........!......
0080  c3 aa cf e7 e3 aa 42 43 c7 21 bd 16 4c 46 c1 87   ......BC.!..LF..
0090  33 fd 14 10 00 ef b6 43 c7 aa 42 ce f2 4c b0 02   3......C..B..L..
00a0  c7 27 7f bf 33 eb 42 a8 fc 21 0f 4b 4c ef b6 ce   .'..3.B..!.KL...
00b0  db 6b bd 30 c3 55 57 b7 33 eb 42 ca 82 56 c9 40   .k.0.UW.3.B..V.@
00c0  4e ef ba a8 d1 55 74 bc b2 56 bd 56 3f 5e 03 43   N....Ut..V.V?^.C
00d0  4e ad c1 84 c3 29 84 47 38 e7 ba c0 ba 52 42 36   N....).G8....RB6
00e0  23 55 07 b7 44 d7 b6 41 b2 15 19 1d 98 63 80 4b   #U..D..A.....c.K
00f0  c7 27 e6 67 c7 aa 42 43 4a e3 42 16 4c 46 c3 87   .'.g..BCJ.B.LF..
0100  7b 54 bd bc 90 fc 11 2b eb ab 42 43 4a 2f fe bd   {T.....+..BCJ/..
0110  38 55 12 29 c7 55 57 0b 32 eb 42 29 c7 c2 c2 43   8U.).UW.2.B)...C
0120  c7 aa 28 40 ad aa 28 43 af aa 42 43 47 27 c7 ff   ..(@..(C..BCG'..
0130  39 55 bd 13 38 bf 0e b6 86 aa c1 bb 38 a5 c6 a1   9U..8.......8...
0140  c7 aa 42 ca 82 56 28 43 38 df be bc d2 fa b7 02   ..B..V(C8.......
0150  c7 23 07 b7 44 6a 56 c8 0f 27 47 45 35 eb 42 13   .#..DjV..'GE5.B.
0160  96 c0 42 29 c3 c0 42 29 38 55 57 7f 32 eb 42 ca   ..B)..B)8UW.2.B.
0170  82 52 28 43 ad aa 28 43 ad ac bd 36 3f 55 57 03   .R(C..(C...6?UW.
0180  32 eb 42 ca 82 5a c9 0e 33 23 4a c8 3f 29 85 47   2.B..Z..3#J.?).G
0190  4e d7 aa 29 c7 fe bd 36 33 fd bd 36 3b 55 57 17   N..)...63..6;UW.
01a0  32 eb 42 bc b2 56 bd 56 e7 5f 03 43 4c e5 7e 40   2.B..V.V._.CL.~@
01b0  3e a5 f5 1c c1 c0 42 bc d2 f2 b7 02 c7 23 07 af   >.....B......#..
01c0  4c 5a c9 0e cf 81 0f af 4e e5 6a c2 00 52 42 43   LZ......N.j..RBC
01d0  c7 21 0c 7f c4 5b c3 85 3f aa 42 43 2c b7 c9 05   .!...[..?.BC,...
01e0  cb a9 07 af 4c fd 56 40 92 42 bd 35 d7 fa 10 ab   ....L.V@.B.5....
01f0  90 57 bd bc 44 6c 6a c0 00 82 09 48 1c df 9d c8   .W..Dlj....H....
0200  8a a2 69 0e 2b fb bd 36 2f 42 0f 43 c7 aa 41 06   ..i.+..6/B.C..A.
0210  2f 55 37 4f ad aa 12 ab d8 aa 42 43 38 df b2 bc   /U7O......BC8...
0220  d2 ee b7 02 c7 f1 1c 1c 0e 68 4a 43 4a 0e 66 43   .........hJCJ.fC
0230  c7 aa 42 ce 63 8e 42 43 c7 aa d2 16 4c 46 15 c8   ..B.c.BC....LF..
0240  8a ba 71 83 4c d7 4a c8 16 6b ab 41 34 01 c9 89   ..q.L.J..k.A4...
0250  44 4b 41 b0 6d f5 8b 81 cb aa d2 16 4c 46 c1 87   DKA.m.......LF..
0260  3f ca c9 3e cb 21 37 4b 4c e4 7e 40 36 a5 f5 05   ?..>.!7KL.~@6...
0270  c1 23 07 bb 46 6c ba 43 c7 aa c9 9d 44 69 6a a8   .#..Fl.C....Dij.
0280  e8 21 0c 4f 4c e9 4e 78 3e d8 4e 78 3f d9 4a 68   .!.OL.Nx>.Nx?.Jh
0290  b9 a6 41 3d d3 41 5d 78 3e dc 4e 78 3f dd 4a 68   ..A=.A]x>.Nx?.Jh
02a0  bc a6 41 38 d3 41 4d c0 04 82 c1 85 ef 55 0f bb   ..A8.AM......U..
02b0  44 d7 ba 43 b2 61 cb 3e 3b cb c9 06 3b 63 80 4b   D..C.a.>;...;c.K
02c0  c7 27 e6 67 c7 aa 42 43 4a e3 42 43 c7 aa 42 43   .'.g..BCJ.BC..BC
02d0  c7 aa 42 43 c7 aa 42 43 c7 aa 42 43 c7 aa 42 43   ..BC..BC..BC..BC
02e0  c7 aa 42 43 c7 aa 42 43 c7 aa 42 43 c7 aa 42 43   ..BC..BC..BC..BC
02f0  c7 aa 42 43 c7 aa 42 43 c7 aa 42 43 c7 55 67 47   ..BC..BC..BC.UgG
0300  d7 ea 42 bc e2 aa 52 03 c7 66 8e 23 4c de 66 67   ..B...R..f.#L.fg
0310  4c d6 66 6b 3b 18 c2 72 1c 0e f1 41 2f c7 42 43   L.fk;..r...A/.BC
0320  c7 d9 b4 72 0e 42 26 43 c7 aa 31 5f f6 6a aa 18   ...r.B&C..1_.j..
0330  c7 aa 42 30 e4 19 40 02 77 ba aa 0c c7 aa 42 53   ..B0..@.w.....BS
```

```
0340  07 d9 b5 36 f8 00 a9 97 2f e7 42 43 c7 83 9b 36   ...6..../.BC...6
0350  d7 42 00 43 c7 aa a9 6b 6b 7b aa 37 8a bb 8b a8   .B.C...kk{.7....
0360  db 3b 0a 82 27 a2 ee ab eb aa 42 43 fa aa 3f 43   .;..'.....BC..?C
0370  c7 d9 48 c3 3b af 31 45 44 52 3d 34 c5 eb 03 d6   ..H.;.1EDR=4....
0380  4e 42 f1 42 91 23 bc 6a 01 59 e6 1d 2c 24 42 91   NB.B.#.j.Y..,$B.
0390  b2 af c8 55 81 ba 90 80 f6 63 03 ab 29 55 bd bc   ...U.....c..)U..
03a0  d6 63 aa a4 38 55 bd 31 35 69 69 3f e3 82 cb 3f   .c..8U.15ii?...?
03b0  e3 b6 23 80 0b 66 8e 43 c7 aa 42 43 c7 aa 42 43   ..#..f.C..BC..BC
03c0  c7 aa 42 00 00 00 00 00 00 00 00 00 00 00 00 00   ..B.............
03d0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
03e0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
03f0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0400  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0410  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0420  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0430  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0440  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0450  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0460  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0470  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0480  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0490  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
04a0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
04b0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
04c0  00 00 00 00 00 00 00 00 00 30 29 00 00 1e 29 00   .........0)...).
04d0  00 00 00 00 00 12 29 00 00 00 00 00 00 00 00 00   ......).........
04e0  00 40 29 00 00 de 28 00 00 00 00 00 00 00 00 00   .@)...(.........
04f0  00 00 00 00 00 00 00 00 00 00 00 00 00 30 29 00   .............0).
0500  00 1e 29 00 00 00 00 00 00 98 01 47 65 74 50 72   ..).........GetPr
0510  6f 63 41 64 64 72 65 73 73 00 00 48 02 4c 6f 61   ocAddress..H.Loa
0520  64 4c 69 62 72 61 72 79 41 00 00 4b 45 52 4e 45   dLibraryA..KERNE
0530  4c 33 32 2e 64 6c 6c 00 00 00 00 00 00 00 00 00   L32.dll.........
0540  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0550  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0560  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0570  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0580  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0590  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
05a0  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
05b0  00 00 00 00                                       ....

No.     Time        Source                Destination           Protocol Info
    603 1463.691153 E.F.G.H         A.B.C.D           TCP      9988 > mni-prot-rout [ACK] Seq=1 Ack=7626 Win=21632 Len=0

Frame 603 (54 bytes on wire, 54 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: 9988 (9988), Dst Port: mni-prot-rout (3764), Seq: 1, Ack: 7626, Len: 0
    Source port: 9988 (9988)
    Destination port: mni-prot-rout (3764)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 7626    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 21632 (scaled)
    Checksum: 0x7a3b [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    604 1463.707137 A.B.C.D           E.F.G.H         TCP      mni-prot-rout > 9988 [PSH, ACK] Seq=7626 Ack=1 Win=500000 Len=1045

Frame 604 (1099 bytes on wire, 1099 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
```

```
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: mni-prot-rout (3764), Dst Port: 9988 (9988), Seq: 7626, Ack: 1, Len: 1045
    Source port: mni-prot-rout (3764)
    Destination port: 9988 (9988)
    Sequence number: 7626    (relative sequence number)
    [Next sequence number: 8671    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 500000 (scaled)
    Checksum: 0xc519 [correct]
    [SEQ/ACK analysis]
Data (1045 bytes)

0000  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0010  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0020  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
0030  00 00 00 00 00 00 00 d7 de 42 d6 a2 e5 7e 44 9e   .........B...~D.
0040  ef 69 b9 1b 5e da d7 9b a6 da 53 5c 36 11 5a 94   .i..^.....S\6.Z.
0050  f9 a2 be 9a 52 11 8b bb 5e 19 0a 5a ec 4c 2e f3   ....R...^..Z.L..
0060  95 38 48 ea 94 77 21 fd 87 75 c1 f9 a1 76 59 d5   .8H..w!..u...vY.
0070  92 ff 24 ff 49 d7 33 c5 7e 71 40 de a9 66 15 99   ..$.I.3.~q@..f..
0080  8b 77 22 ff c8 15 cf 90 c2 54 02 e0 e7 f3 47 c1   .w".......T....G.
0090  d8 92 29 92 ac 1c 78 f4 d6 27 57 cb 73 73 be a6   ..)...x..'W.ss..
00a0  6e da ec e6 9b 5c 47 2a d8 8d 3a b8 a6 12 14 f3   n....\G*..:.....
00b0  85 70 6e b9 72 48 16 df 66 54 47 3a 28 e5 d9 e0   .pn.rH..fTG:(...
00c0  ad b4 52 ca 06 be 47 e8 ed 20 43 96 dd 00 a3 80   ..R...G.. C.....
00d0  7a 39 52 0a 92 80 4d 8a ef 28 47 36 08 99 4a 98   z9R...M..(G6..J.
00e0  c3 10 4b ae 04 a1 7b 9b bb 15 e7 a5 d3 21 95 92   ..K...{......!..
00f0  76 1f c0 7a dd 48 24 33 f7 c0 77 9e 2e 86 73 42   v..z.H$3..w...sB
0100  a6 70 4d 7b bc 19 e2 d4 4e c0 33 85 4e 36 5a ee   .pM{....N.3.N6Z.
0110  83 60 a4 8f 16 0e 47 0b 76 f4 cc 9e c2 c9 66 1a   .`....G.v.....f.
0120  e0 78 68 e8 82 79 32 7f 6c 0a cf 96 1a fe 48 8b   .xh..y2.l.....H.
0130  b0 04 1f 16 a6 1f 68 3e c1 f8 3a cb 66 09 d7 db   ......h>..:.f...
0140  88 33 6c b2 00 d8 e6 92 83 74 29 f9 ec d4 4d 46   .3l......t)...MF
0150  28 0c 1e b1 7e 30 a1 d8 ec 19 91 ec e7 4d cd 76   (...~0.......M.v
0160  67 dc 96 64 86 e3 11 82 b0 4b 75 96 93 10 62 72   g..d.....Ku...br
0170  b6 f2 c3 da 6f 9d 46 8e 6d 2d 72 26 a7 f9 9e 87   ....o.F.m-r&....
0180  de df 4b 71 d8 ed f3 87 f2 9b 70 17 63 cc 4b 8b   ..Kq......p.c.K.
0190  b6 f0 67 c9 45 7b 49 8b e0 18 4d 5a 93 0b cd 8c   ..g.E{I...MZ....
01a0  e5 48 d3 b3 ac 78 14 a0 ea f0 b0 f7 26 34 01 d1   .H...x......&4..
01b0  65 de 42 a5 ed c3 46 24 6d df 1d c4 b9 d1 1e 58   e.B...F$m......X
01c0  5b 10 cb 3e c2 56 a8 d3 fd f7 ae af a2 5f 99 5a   [..>.V......._.Z
01d0  e8 25 1e 4e 8a 26 06 de fd de 8a 72 74 5b 5e 19   .%.N.&.....rt[^.
01e0  1e 19 84 11 e1 03 4f 9f da 35 af 5d e2 81 d7 d1   ......O..5.]....
01f0  75 f9 c3 15 25 95 dd b6 26 b0 05 67 ea f0 cb f6   u...%...&..g....
0200  c4 93 6f 4a 8e b7 59 c8 bd a6 b3 73 16 91 1c 59   ..oJ..Y....s...Y
0210  fa 37 2c aa e2 70 1e 98 2c ed c3 ae f9 48 ec 55   .7,..p..,....H.U
0220  66 0c ae ab a4 75 9f 6d a7 e2 6e f1 a2 d5 03 53   f....u.m..n....S
0230  25 21 f6 33 07 32 ed 81 82 0b d0 9d 89 5d 42 c8   %!.3.2.......]B.
0240  e4 19 d2 6a a1 f1 3a 1d 47 a8 ce 56 1d da d9 9f   ...j..:.G..V....
0250  ea 8e cf a9 5b e4 67 f2 63 2f d1 9e 18 59 11 72   ....[.g.c/...Y.r
0260  0b 73 c4 80 dd df 32 ef 7e 09 2e 1d ce 5e 07 87   .s....2.~....^..
0270  a2 e4 ae fa dd 21 c5 5e ea 70 36 a5 ae 17 79 eb   .....!.^.p6...y.
0280  ec e7 53 01 af 91 de 6a bb 5f fc c3 41 61 2b bc   ..S....j._..Aa+.
0290  b4 1e 17 16 13 55 74 8a 04 1a 2e 8a 28 2f 14 57   .....Ut.....(/.W
02a0  0b 89 ab 23 7f 13 10 ea 71 10 9e 12 ee 5f 22 c9   ...#....q...._".
02b0  fa b3 0c cc e1 5f c5 7a e7 17 c3 60 07 51 da 80   ....._.z...`.Q..
02c0  83 77 1d 5c 62 f9 75 f2 8e 5d 0e d6 93 87 e8 1a   .w.\b.u..]......
02d0  2e 2e f9 21 7f 9d be 61 26 55 f6 71 32 5e 2c 9b   ...!...a&U.q2^,.
02e0  49 5d e5 ca fd 1d ae 92 4e a5 2e 31 74 d6 b2 88   I]......N..1t...
02f0  1d 5a 6b 56 c3 19 0e ad 36 a0 6e 9c ec 5c 92 99   .ZkV....6.n..\..
0300  4f 0c 9e 8b c6 19 4e 46 6d 9c 74 7a f0 5a a2 bb   O.....NFm.tz.Z..
```

```
0310  f6 0c ae 84 33 37 d4 97 5b f4 67 0e ca e8 0e 50   ....37..[.g....P
0320  6b 7e f4 b6 12 37 d3 ac a6 8d 44 17 f9 6b a6 14   k~...7....D..k..
0330  1a b6 4c 36 5c 6f 85 67 c3 a8 04 f6 1a 5c eb bb   ..L6\o.g.....\..
0340  14 1b d9 e7 82 0c 10 be 92 64 56 ec ef 6c 18 f2   .........dV..l..
0350  e2 b2 58 9a 82 bf 07 71 cb 70 ae 20 6f 2c dd 47   ..X....q.p. o,.G
0360  bf 02 77 2d f7 95 4b db eb 9b 3f 42 e7 6c 30 9c   ..w-..K...?B.l0.
0370  39 a6 06 ec e4 f3 41 65 a3 e9 cc 18 93 d7 77 df   9.....Ae......w.
0380  8c 7a d9 35 cb b5 67 c5 e8 b3 94 ee 85 2a f6 6a   .z.5..g......*.j
0390  f7 5a 4a 5d 9b 5d e2 0d 27 16 b2 7a f2 58 84 1f   .ZJ].]..'..z.X..
03a0  58 e0 19 5b ab 1d 6a 79 ae 6e cb 56 da 48 ca 21   X..[..jy.n.V.H.!
03b0  4e 41 33 90 fe f0 2d f3 3b d7 27 18 c3 4a 43 8a   NA3...-.;.'..JC.
03c0  b6 52 55 62 e4 23 4d 9f 92 24 2c 8a cd ec 72 bb   .RUb.#M..$,...r.
03d0  a2 52 d9 29 4d d9 45 dd 0d 88 ec 8c 6e 62 e7 2d   .R.)M.E.....nb.-
03e0  9e db d6 3b 86 80 49 58 d3 72 66 8f 74 02 3f ce   ...;..IX.rf.t.?.
03f0  bc 08 d2 95 44 88 8a 2a cf f0 73 f9 e8 58 53 c8   ....D..*..s..XS.
0400  80 bf 10 de 59 bb 6c ba 5a 5b 0e b7 f4 59 10 a8   ....Y.l.Z[...Y..
0410  c5 12 cf a7 f2                                    .....

No.     Time        Source                Destination           Protocol Info
    605 1463.707144 E.F.G.H         A.B.C.D           TCP      9988 > mni-prot-rout [ACK] Seq=1 Ack=8671 Win=24448 Len=0

Frame 605 (54 bytes on wire, 54 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: 9988 (9988), Dst Port: mni-prot-rout (3764), Seq: 1, Ack: 8671, Len: 0
    Source port: 9988 (9988)
    Destination port: mni-prot-rout (3764)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 8671    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 24448 (scaled)
    Checksum: 0x7610 [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    606 1463.757112 A.B.C.D           E.F.G.H         TCP      mni-prot-rout > 9988 [PSH, ACK] Seq=8671 Ack=1 Win=500000 Len=1460

Frame 606 (1514 bytes on wire, 1514 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: mni-prot-rout (3764), Dst Port: 9988 (9988), Seq: 8671, Ack: 1, Len: 1460
    Source port: mni-prot-rout (3764)
    Destination port: 9988 (9988)
    Sequence number: 8671    (relative sequence number)
    [Next sequence number: 10131    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 500000 (scaled)
    Checksum: 0x3fd0 [correct]
    [SEQ/ACK analysis]
Data (1460 bytes)

0000  78 54 98 85 62 08 1f 6a 9f 4b b6 8c 1c d5 bf c8   xT..b..j.K......
0010  db e0 28 86 12 f7 5e ad 0c c6 53 27 9b a6 3f 93   ..(...^...S'..?.
0020  15 5e 65 d3 24 3f 72 45 7e 2e b4 0d 03 03 92 82   .^e.$?rE~.......
0030  43 4c 7b aa 2b 42 23 a6 db ae 3f a6 cf d6 22 3a   CL{.+B#...?...":
0040  15 4f a3 db 08 c8 ee ac e6 86 5f 6a 14 44 9d 29   .O........_j.D.)
0050  58 e5 f7 c7 68 7a 15 cc 1d 4e 93 0b 1a 5a b6 db   X...hz...N...Z..
0060  1c be 94 3c 15 92 5a 8b 1d 5e 5f c3 f3 40 84 48   ...<..Z..^_..@.H
0070  3a e0 89 2e f8 66 30 88 9d e7 33 26 50 be 0f 4a   :....f0...3&P..J
0080  eb 1e f4 cf 7f 8b 08 fb 99 64 0f a0 10 d2 d8 81   .........d......
```

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0090  11 7d 6d 92 1e e3 c5 f1 ba 13 db ea ce af 4a 09   .}m..........J.
00a0  7f 0b bc ef 8c 0a d0 b1 0a 53 a7 ef 6f 2c 6a e9   .........S..o,j.
00b0  42 3c dd 96 34 96 93 1a e5 2a da 55 dd 83 b2 c6   B<..4....*.U....
00c0  69 1c f2 9b c9 98 8c 64 f0 95 fd 6e 3a 74 b6 30   i......d...n:t.0
00d0  09 01 ef 25 7d c6 72 c9 fd 43 b1 93 3c 4c 51 e7   ...%}.r..C..<LQ.
00e0  59 ae 0a f4 4f 24 36 53 9a 68 72 d0 8a 65 12 09   Y...O$6S.hr..e..
00f0  08 24 6c 81 11 7a 66 08 7c 95 94 cb a8 42 17 61   .$l..zf.|....B.a
0100  c5 cc f9 96 c6 21 1c b4 02 12 e2 ec e4 ae 5b 81   .....!........[.
0110  49 8a 81 4e bd 08 d0 06 50 16 c9 56 25 fe d2 3a   I..N....P..V%..:
0120  68 58 ef ad 70 2a 0a 58 4a 20 5b 87 c0 cb af 21   hX..p*.XJ [....!
0130  7a 87 bf db 32 0d 1b ff ac 05 15 69 f2 ad 83 8f   z...2......i....
0140  2e 40 78 d1 5b f4 c7 7e d4 54 8b 6f 1f 8a 20 19   .@x.[..~.T.o.. .
0150  34 0b 66 39 a9 c2 7b 6d aa 0e af ec 7a 33 9e b4   4.f9..{m....z3..
0160  19 9a 85 25 bd 36 0b 0e 5a 21 8a 0d 7d d9 81 5a   ...%.6..Z!..}..Z
0170  01 76 3c 02 03 e5 02 5c a1 f3 9c e9 9c c0 c1 cc   .v<....\........
0180  70 94 82 a4 d4 67 0e 6f 6c 34 12 5f 0c d6 22 6e   p....g.ol4._.."n
0190  84 83 c4 2b af 07 95 0a 48 7f 35 b3 0e 67 64 e3   ...+....H.5..gd.
01a0  36 04 01 a2 f0 26 1c 87 c8 6c d2 1e 77 5f b2 b4   6....&...l..w_..
01b0  28 da 82 ca 80 51 2a d4 52 ae bf 7e 9d 7f 3e 11   (....Q*.R..~..>.
01c0  4f 9f 98 ae f0 67 4e 7f 9a be d0 7e 01 72 e3 0e   O....gN....~.r..
01d0  2c fd fe de ba a0 45 86 92 fc 18 ef 96 f1 de e9   ,.....E.........
01e0  7b dc 97 0e 28 02 5b 65 1a b8 4a 31 53 57 ca c6   {...(.[e..J1SW..
01f0  39 d4 5e f6 65 71 ba d0 ed af de b4 92 6e 06 b6   9.^.eq.......n..
0200  7c 9a 72 67 41 56 81 a3 d0 50 ab 0a ef 84 f5 76   |.rgAV...P.....v
0210  3a 26 d9 60 9c f6 fe dc 7d 7c 0c ce 3b cb 16 b5   :&.`....}|..;...
0220  10 1e 49 cf f8 c2 c1 6d 25 d8 c7 65 ef 45 ec da   ..I....m%..e.E..
0230  c0 18 ae 6b f4 3e 04 04 07 91 54 a4 14 e4 5d 45   ...k.>....T...]E
0240  9a c5 83 ac 00 af c0 c6 ec 99 17 4c 6f 25 63 09   ...........Lo%c.
0250  a4 74 13 af 1e b6 e9 95 db 40 d3 ed d1 33 75 28   .t.......@...3u(
0260  5a c4 bb c6 a7 b5 3c e9 5c 0b 39 4c 98 2b ce 41   Z.....<.\.9L.+.A
0270  28 66 ee 1a 9e 51 f2 e8 5d 63 71 77 5c 34 f9 77   (f...Q..]cqw\4.w
0280  43 e4 e0 9c d0 e6 dc e9 9d 0e 4e c7 c9 55 b8 d1   C.........N..U..
0290  34 2e b6 de 7a 3a 66 ca 36 d8 1e a5 b2 d5 56 47   4...z:f.6.....VG
02a0  b3 99 b9 d8 c8 4a 1a b6 64 a1 c6 f5 6c 40 fc f8   .....J..d...l@..
02b0  8f 7d 4c f9 0b 2e 1e f5 20 9a 99 0e 3f 9e f8 75   .}L..... ...?..u
02c0  7b 04 84 6c 67 8e 94 9e d0 19 16 0e 31 ef 11 b6   {..lg.......1...
02d0  a5 55 fc e6 99 79 d7 bc 6d 57 99 99 73 7a 88 0d   .U...y..mW..sz..
02e0  61 98 3c 14 6f 36 8c be 38 e4 db de b8 4a be 6a   a.<.o6..8....J.j
02f0  4b 36 d9 6c 58 7b ee ea b4 57 df 74 29 95 e2 b9   K6.lX{...W.t)...
0300  59 a6 92 cc f0 6f 3a 85 cc 29 cf 67 0e 75 5a 8b   Y....o:..).g.uZ.
0310  97 6e 7a 04 e0 6a f6 8e c1 3f e0 e2 a5 54 27 e5   .nz..j...?...T'.
0320  fd 53 da 52 a5 7b c8 84 7e 55 b0 6f 02 a1 a8 ef   .S.R.{..~U.o....
0330  1a d6 47 fb 7b e7 fc b2 2a 7a 03 c4 50 52 84 ee   ..G.{...*z..PR..
0340  bd cf 76 da 5f ce fa 4a 4f 81 62 6b 65 25 23 a2   ..v._..JO.bke%#.
0350  0e 65 69 4c 06 45 32 ef 3f 75 48 cb 36 4e 6d 44   .eiL.E2.?uH.6NmD
0360  4a eb 9b 39 fc ae 45 b6 79 0f 6a 16 ab ef 92 12   J..9..E.y.j.....
0370  39 22 3d f7 86 b4 c8 76 a8 80 21 19 1b c3 2f f7   9"=....v..!.../.
0380  1b 67 9b d9 5a 72 12 8d 48 f6 22 6c 55 f7 5f 3a   .g..Zr..H."lU._:
0390  57 54 62 4a 58 0e 8a 45 41 16 8e f5 64 cc d2 41   WTbJX..EA...d..A
03a0  33 cd 61 7b 15 63 18 ab 14 cf a3 7d cc 06 20 d4   3.a{.c.....}.. .
03b0  04 10 f8 34 3a 6c 54 de 08 3e e0 6f 19 3f d9 bf   ...4:lT..>.o.?..
03c0  db 62 6e 7a 78 06 dc 1d 09 d3 dd b3 5b 04 6a 87   .bnzx.......[.j.
03d0  b8 1a c0 6f 9d 02 4f d1 21 dc b4 69 8f 99 38 0b   ...o..O.!..i..8.
03e0  50 cb 1f 46 2c cd 92 16 95 27 d2 f7 9b 86 9e 08   P..F,....'......
03f0  8e db b0 53 50 75 16 52 2c c3 d6 fd 3c 55 87 71   ...SPu.R,...<U.q
0400  f0 4b a5 0e 41 24 aa 0d 35 b5 ec ee 48 bd d6 bc   .K..A$..5...H...
0410  15 cd bb fa 50 74 94 aa 2a 64 86 0e d3 bc e2 8f   ....Pt..*d......
0420  a5 60 85 b8 09 09 d8 f8 55 d6 38 e0 40 2b cf 85   .`......U.8.@+..
0430  f8 77 e3 0a 58 4a 45 ff b9 5f 62 f6 9d f0 57 3b   .w..XJE.._b...W;
0440  0a 69 9c 53 8b ed 8a f4 7f 27 15 ea 16 e3 8e 5c   .i.S.....'.....\
0450  bc 22 3c ef 0c e7 33 71 0e d7 1c 5d 73 49 c7 2b   ."<...3q...]sI.+
0460  aa ed 4a 7b 78 c9 e7 ea 23 e6 7a a8 24 45 9e 17   ..J{x...#.z.$E..
0470  17 f1 dc e0 89 ea 1b 20 d7 50 db 6d c6 45 6c ce   ....... .P.m.El.
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0480  f3 69 fd d4 26 05 ab dd e1 34 1b ee e0 35 92 cd   .i..&....4...5..
0490  66 37 b6 2a 0c ad fe f9 38 30 d2 91 08 3d e9 67   f7.*....80...=.g
04a0  17 ea cd c1 21 c9 65 ab e0 6a e7 9e 6d 0c 51 ef   ....!.e..j..m.Q.
04b0  bc 27 f9 fd 4a 9b 2a 47 14 bb 96 21 73 c3 88 a0   .'..J.*G...!s...
04c0  f0 df 42 c0 b5 1e 49 b9 c7 5f fb c0 c0 bf 88 b7   ..B...I._.......
04d0  07 de fa e7 a6 4e db a8 05 54 a3 6e 00 fb de c9   .....N...T.n....
04e0  f3 63 66 73 b9 59 11 b1 4b 82 9e 22 29 d7 7a 5f   .cfs.Y..K.."z_
04f0  02 c6 d7 11 e9 cc 58 31 b2 6c d4 19 01 59 91 10   ......X1.l...Y..
0500  6d 74 0a a2 0a 5e f4 8e e1 09 dd c2 8c c4 8c b8   mt...^..........
0510  fc 65 c5 f6 74 a7 11 ad e7 6e 5a d5 ba f4 d4 0a   .e..t....nZ.....
0520  e3 bc fe 0c 5a 86 8c 78 46 24 05 9a 35 68 50 84   ....Z..xF$..5hP.
0530  7b 00 26 c0 96 18 74 8a 3b 2e ea f9 77 49 27 84   {.&...t.;...wI'.
0540  f0 07 c5 63 0b b2 d2 f9 d7 22 6a 61 07 ea 9c 0a   ...c.....ja....
0550  88 30 d3 12 e0 39 bf 98 40 ef 15 a0 cb 1e 6a 9f   .0...9..@.....j.
0560  94 ea f9 6d d9 60 13 a0 40 11 db e9 65 18 fc 76   ...m.`..@...e..v
0570  70 d7 ca 6d 0b 18 ab f9 13 a4 4b 6b 71 17 da 84   p..m......Kkq...
0580  30 b0 80 97 29 6b b3 60 bc e1 98 07 83 75 3b a2   0...)k.`.....u;.
0590  42 75 d2 10 64 07 bf c4 dd 0b 84 3c 98 6c 88 fe   Bu..d......<.l..
05a0  8c 76 9d ce 4e 18 7c b9 a9 01 1c e3 f1 94 ef 60   .v..N.|........`
05b0  01 70 f2 ef                                       .p..

No.     Time        Source                Destination           Protocol Info
    607 1463.757131 E.F.G.H         A.B.C.D           TCP      9988 > mni-prot-rout [ACK] Seq=1 Ack=10131 Win=27392 Len=0

Frame 607 (54 bytes on wire, 54 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: 9988 (9988), Dst Port: mni-prot-rout (3764), Seq: 1, Ack: 10131, Len: 0
    Source port: 9988 (9988)
    Destination port: mni-prot-rout (3764)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 10131    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 27392 (scaled)
    Checksum: 0x7045 [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    608 1463.757137 A.B.C.D           E.F.G.H         TCP      mni-prot-rout > 9988 [PSH, ACK] Seq=10131 Ack=1 Win=500000 Len=70

Frame 608 (124 bytes on wire, 124 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: mni-prot-rout (3764), Dst Port: 9988 (9988), Seq: 10131, Ack: 1, Len: 70
    Source port: mni-prot-rout (3764)
    Destination port: 9988 (9988)
    Sequence number: 10131    (relative sequence number)
    [Next sequence number: 10201    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 500000 (scaled)
    Checksum: 0x0879 [correct]
    [SEQ/ACK analysis]
Data (70 bytes)

0000  8d 5e b8 46 e5 54 72 66 45 cb c2 ca 77 05 89 a6   .^.F.TrfE...w...
0010  2f 02 11 f7 d8 ce 62 6c 95 4c 0c b6 6a 58 f0 7f   /.....bl.L..jX..
0020  a7 68 cd bf 8d 36 ab f3 f0 78 08 77 a3 77 4e db   .h...6...x.w.wN.
0030  03 c4 25 0d 4b b9 ad 57 03 db b9 7e 32 4e 1d 83   ..%.K..W...~2N..
0040  22 60 16 fc 52 7e                                 "`..R~
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No.     Time        Source                Destination           Protocol Info
    609 1463.757139 E.F.G.H         A.B.C.D           TCP      9988 > mni-prot-rout [ACK] Seq=1 Ack=10201 Win=27392 Len=0

Frame 609 (54 bytes on wire, 54 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: 9988 (9988), Dst Port: mni-prot-rout (3764), Seq: 1, Ack: 10201, Len: 0
    Source port: 9988 (9988)
    Destination port: mni-prot-rout (3764)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 10201    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 27392 (scaled)
    Checksum: 0x6fff [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    610 1463.781224 A.B.C.D           E.F.G.H         TCP      mni-prot-rout > 9988 [PSH, ACK] Seq=10201 Ack=1 Win=500000 Len=1275

Frame 610 (1329 bytes on wire, 1329 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: mni-prot-rout (3764), Dst Port: 9988 (9988), Seq: 10201, Ack: 1, Len: 1275
    Source port: mni-prot-rout (3764)
    Destination port: 9988 (9988)
    Sequence number: 10201    (relative sequence number)
    [Next sequence number: 11476    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 500000 (scaled)
    Checksum: 0x8a00 [correct]
    [SEQ/ACK analysis]
Data (1275 bytes)

0000  f8 e6 fa cf 81 e8 f9 1c 64 ac 14 71 fe bd 72 4b   ........d..q..rK
0010  f1 ee 89 2a df 2e 11 07 5d bf e5 52 33 f6 3a c8   ...*....]..R3.:.
0020  80 a0 f1 ba f7 f7 b4 c6 b9 a7 91 43 8c a6 39 d6   ...........C..9.
0030  64 76 df 0f 02 62 c8 b8 ce a8 9d ae 85 b8 b1 23   dv...b.........#
0040  7e de 07 ad ee b0 be db aa 51 e0 45 ef f4 78 2c   ~........Q.E..x,
0050  a8 d3 8a c5 b5 7e 48 73 a1 53 ba 41 f9 1c 0c 1f   .....~Hs.S.A....
0060  11 6b 13 4a 5c a7 1a cb 0e 50 1d 2e 84 ac 94 4f   .k.J\....P.....O
0070  bb a6 00 31 72 94 49 1a a3 e1 6b b0 6b de 98 4e   ...1r.I...k.k..N
0080  72 a5 c7 33 e5 35 15 64 fa 2a ce cc 97 a6 13 45   r..3.5.d.*.....E
0090  6a 66 26 42 c3 61 d8 ce 32 f4 19 77 72 c2 3d af   jf&B.a..2..wr.=.
00a0  c3 b2 de cc 9a 72 36 63 6e c2 15 2c 0e 9a 9c 7e   .....r6cn..,...~
00b0  ba 62 e8 80 1c a9 26 03 66 8e 16 f4 b0 da 10 34   .b....&.f......4
00c0  50 f7 95 52 3a 34 3e fb c1 1e 7d 10 f8 f6 1f e6   P..R:4>...}.....
00d0  15 6d c0 af 5b 26 79 c6 e4 ca 36 49 ab 62 a8 53   .m..[&y...6I.b.S
00e0  17 a0 f1 16 c4 df 3b c2 94 10 1e 23 ee f3 7a 52   ......;....#..zR
00f0  e4 bc 0c 0a fe 50 7a cf 71 9d 97 73 e5 b2 43 78   .....Pz.q..s..Cx
0100  04 bd d1 6f 54 44 18 c7 e6 de e4 68 f2 92 75 a2   ...oTD.....h..u.
0110  90 45 12 4f 89 8a 6d 14 de aa 0e ae 48 ba 2c 70   .E.O..m.....H.,p
0120  af ad 3a ec 10 6c 2b 30 b3 d2 28 5a f2 d6 3a d5   ..:..l+0..(Z..:.
0130  ab 6d 59 1d 81 aa fa b7 5e f7 3c 5e c6 cd 74 53   .mY.....^.<^..tS
0140  a2 6c 1a 4e 62 bc 11 a6 e8 a3 43 d8 c3 83 2f 1f   .l.Nb.....C.../.
0150  09 fa 33 53 97 a3 6d 01 7f b8 35 96 6f e2 e8 c6   ..3S..m...5.o...
0160  62 d6 70 24 29 7a b3 4f 74 bc c3 41 92 a2 e3 03   b.p$)z.Ot..A....
0170  9f b9 4f ba ae df 09 65 bb bb 0d df f0 c6 38 cb   ..O....e......8.
0180  11 fb 15 4a 12 e8 68 ba 3a 2c 90 55 76 1e 9f ce   ...J..h.:,.Uv...
0190  9f e5 5a da 67 ff d0 74 d5 a5 39 0e bc a7 02 42   ..Z.g..t..9....B
01a0  6d 6b 47 5e b4 01 4e 10 26 c2 21 4c 02 67 20 fa   mkG^..N.&.!L.g .
```

```
01b0  98 55 ed 53 2a 1f 8a 16 2d 0e 97 2a 4f 16 90 44   .U.S*...-..*O..D
01c0  0d 8e 12 6d db eb 30 6c 64 7d 4c 7a a6 62 57 ab   ...m..0ld}Lz.bW.
01d0  ac 46 0a 02 7e ae 88 94 7f 59 74 d8 59 e0 29 98   .F..~....Yt.Y.).
01e0  54 b7 44 c4 72 96 e8 e2 b1 a3 da c3 a8 a7 49 10   T.D.r.........I.
01f0  96 a9 03 e9 99 b5 eb 65 da f7 ea 97 5b fc 24 af   .......e....[.$.
0200  48 97 64 cc 92 fc b6 17 53 85 3c 6d 1a 09 0c c2   H.d.....S.<m....
0210  4f 20 23 43 cd b7 ad 55 3a ea 0a c3 77 ed 86 47   O #C...U:...w..G
0220  dd c2 10 c2 62 6d 64 1c 0c c4 e1 77 7a fa 14 2e   ....bmd....wz...
0230  cb d1 c9 0c ab bf af c8 09 f4 34 13 f2 b1 58 5b   ..........4...X[
0240  12 90 b9 dd 93 72 42 00 8d 9e 94 d7 73 b4 ae b6   .....rB.....s...
0250  bb 06 e4 ef 4d ff 2a 13 da c7 06 0a 6b 96 5a b8   ....M.*.....k.Z.
0260  ac f2 3d 71 04 3e 0c a6 45 22 12 1c be b7 14 65   ..=q.>..E".....e
0270  1e 03 41 a4 d2 75 fa 36 49 2e 93 56 2c 7b fa 20   ..A..u.6I..V,{.
0280  c2 3d 6a 59 4a 07 8a 92 fc a9 fa 03 8f 82 e3 6f   .=jYJ..........o
0290  55 fe 0c ca 2f 77 58 98 b7 48 b4 ef 89 6e c8 b8   U.../wX..H...n..
02a0  0b fb 5b 4d ac 04 5b 89 d1 f6 71 d6 f7 25 1b 03   ..[M..[...q..%..
02b0  92 e9 ae 0e 01 b7 39 4d 94 f6 15 ce 96 a2 13 64   ......9M.......d
02c0  90 f7 11 4e 92 67 af bb 9c ee 1c b8 65 b0 28 e5   ...N.g......e.(.
02d0  90 0e d2 11 06 a3 2c b5 ea 43 bf d6 7b 4b 4f 48   ......,..C..{KOH
02e0  1e 6b 40 3a 22 a0 40 56 f6 b1 a5 7e 9a 5f 8b d5   .k@:".@V...~._..
02f0  fe 7e 80 ae cf 38 ec bc e1 f4 7a 8d c3 28 8b c2   .~...8....z..(..
0300  95 85 6a fb 20 82 9c b1 bc a8 69 5f fb 83 12 ef   ..j. .....i_....
0310  92 b9 07 cd da 8c 14 ad 9a e7 50 c6 a6 f6 44 33   ..........P...D3
0320  63 c1 de 02 d8 aa 6b 7f 58 d8 5e 57 96 d6 da 10   c.....k.X.^W....
0330  04 df 42 08 8a 01 41 a6 91 20 08 4a 64 6e 1d 14   ..B...A.. .Jdn..
0340  8a e9 b4 11 3f 20 90 4a 64 a2 f4 77 01 82 70 94   ....? .Jd..w..p.
0350  1e 8e 8a 92 7e 84 0c 41 c3 4b 1d 56 f2 b1 34 52   ....~..A.K.V..4R
0360  69 33 15 1d 78 e3 5d 86 0b 26 05 81 df 4e 08 6e   i3..x.]..&...N.n
0370  24 f6 7a be 5e 22 7a 26 cd 6c 02 45 11 9b 10 ad   $.z.^"z&.l.E....
0380  86 3f 4d 82 79 b5 5e 57 3c ca b1 48 7a 81 27 0d   .?M.y.^W<..Hz.'.
0390  10 d6 44 cf 5e 8e 8f b2 d2 26 52 61 fb 6d ae 13   ..D.^....&Ra.m..
03a0  b3 10 23 c0 d0 97 b0 2e 3c a9 07 67 0d 77 7f 0d   ..#.....<..g.w..
03b0  9e c7 6c 10 98 a0 99 b8 c4 c7 8c 30 45 d3 ec 49   ..l........0E..I
03c0  82 54 3f 75 6c c3 f3 e2 5d 96 3a 36 c1 32 92 fb   .T?ul...].:6.2..
03d0  b0 d3 ad d9 3e 6c b2 10 5e ea 02 ea 9e a5 62 0b   ....>l..^.....b.
03e0  a4 d6 16 44 72 bd ef 34 78 6b 31 6f 0a bd fa 61   ...Dr..4xk1o...a
03f0  3a af 70 38 fc e2 54 c6 1b 6e 0b fb 79 d4 f4 44   :.p8..T..n..y..D
0400  e4 94 21 92 13 72 e8 2c 15 d5 f6 ad fc 91 46 b0   ..!..r.,......F.
0410  8a 52 77 2a d0 2c 4d 10 d3 0f 58 af 34 60 0d 7b   .Rw*.,M...X.4`.{
0420  a9 c1 12 bf 4d f2 72 a6 9c be 12 3b 7e 6d 43 56   ....M.r....;~mCV
0430  42 7f 74 9a 13 8e f8 16 e2 dd e7 41 f9 0e da 0d   B.t........A....
0440  c7 65 20 4f ef 9f 0b 42 dd 0d bb 3f 88 91 4e b5   .e O...B...?..N.
0450  d8 75 18 f6 23 9e 4e 72 88 b6 a0 43 ca b6 a2 40   .u..#.Nr...C...@
0460  72 71 b8 38 71 ef 29 56 24 92 1a 0f ef 1e db d2   rq.8q.)V$.......
0470  ba 62 07 0f 79 0c 3c 85 9f 88 6a 74 5f 12 08 2e   .b..y.<...jt_...
0480  6d b9 51 27 43 19 4c 4f 98 15 dd 74 6b 3c 54 b5   m.Q'C.LO...tk<T.
0490  44 3f 2f 60 62 9a cc 51 d7 0a c2 97 a5 93 d1 cd   D?/`b..Q........
04a0  b8 e8 d4 7a 6a fd 4f d3 b8 06 8c ee 92 3e 26 50   ...zj.O......>&P
04b0  39 ba fd b3 26 c8 28 1e 8b 21 1d 16 5e eb 88 6e   9...&.(..!..^..n
04c0  1b 5b a1 83 10 ed 99 af 91 e3 91 4b d6 ae 03 12   .[.........K....
04d0  01 96 f3 64 8e a6 5b 44 b8 ae 38 96 94 b6 70 55   ...d..[D..8...pU
04e0  72 b5 5a d5 bf 12 23 99 88 2d b8 12 56 5e 94 b7   r.Z...#..-..V^..
04f0  ec e8 00 18 c9 0d 55 4e 59 06 ec                  ......UNY..

No.     Time        Source                Destination           Protocol Info
    611 1463.781233 E.F.G.H         A.B.C.D           TCP      9988 > mni-prot-rout [ACK] Seq=1 Ack=11476 Win=30336 Len=0

Frame 611 (54 bytes on wire, 54 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: 9988 (9988), Dst Port: mni-prot-rout (3764), Seq: 1, Ack: 11476, Len: 0
    Source port: 9988 (9988)
    Destination port: mni-prot-rout (3764)
```

```
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 11476    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 30336 (scaled)
    Checksum: 0x6aed [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    612 1463.805336 A.B.C.D           E.F.G.H         TCP      mni-prot-rout > 9988 [PSH, ACK] Seq=11476 Ack=1 Win=500000 Len=1460

Frame 612 (1514 bytes on wire, 1514 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: mni-prot-rout (3764), Dst Port: 9988 (9988), Seq: 11476, Ack: 1, Len: 1460
    Source port: mni-prot-rout (3764)
    Destination port: 9988 (9988)
    Sequence number: 11476    (relative sequence number)
    [Next sequence number: 12936    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 500000 (scaled)
    Checksum: 0xabac [correct]
    [SEQ/ACK analysis]
Data (1460 bytes)

0000  cf 9b c6 08 4a df 0a bf 5c 55 66 bd 87 aa 1b 15   ....J...\Uf.....
0010  aa c7 ee bd 82 92 95 04 ce d0 b2 8c c3 87 8a 39   ...............9
0020  40 82 16 ad e6 96 0e d0 1e 3d 82 97 d2 ea 63 63   @........=....cc
0030  12 ff ea 5e 4e d1 ce 1e 3e da 5e e2 8a 96 d2 1e   ...^N...>.^.....
0040  0a 3c c8 38 8d 22 b3 93 4d e7 96 29 00 ae 63 88   .<.8."..M..)..c.
0050  01 b4 7b 40 a3 16 a6 11 05 ae 37 a4 30 80 ee 44   ..{@......7.0..D
0060  4e 94 d2 7b 91 68 fa 45 05 92 0c 64 3f 13 da 38   N..{.h.E...d?..8
0070  cd 72 dc 0a 22 0a d4 20 12 b4 23 a5 00 c2 98 0c   .r.."..  ..#.....
0080  40 3a 06 f7 42 85 d5 d8 ad aa e9 21 41 ee 98 e1   @:..B......!A...
0090  40 5d f6 91 fb e6 43 9f 1e 0b 99 1d cd 4a e5 8d   @]....C......J..
00a0  06 ac b5 10 6d 60 27 1e a9 98 6f 63 62 9c 64 81   ....m`'...ocb.d.
00b0  65 f1 e5 5e 35 0e d8 08 6d cb df 1a d9 e2 c6 9b   e..^5...m.......
00c0  80 ca 6d b3 32 a9 d6 14 a8 de 23 9c 0c a8 ad 2c   ..m.2.....#....,
00d0  6e 3a b7 34 06 54 f6 d9 ae 44 72 40 76 9c ae 4b   n:.4.T...Dr@v..K
00e0  b4 83 7c a3 0e 56 a1 65 0f da fc 36 c2 58 22 98   ..|..V.e...6.X".
00f0  63 81 a4 62 de 8a 0e 82 f2 7b c5 8e 24 73 17 a8   c..b.....{..$s..
0100  0d 11 ad b9 d2 17 a1 2b b2 5b 6d 2b 4a 9b a8 30   .......+.[m+J..0
0110  16 1e 4c 36 67 dc 0e 51 e0 ae ea 5e 0d c2 c7 87   ..L6g..Q...^....
0120  05 b2 c6 0d 06 22 a9 e8 cb 3e 4a 1a 6d d1 f2 9b   ....."...>J.m...
0130  af 8a 07 4e 14 d6 be 09 23 23 a2 1b 74 56 cd bd   ...N....##..tV..
0140  18 ca d7 00 cf 22 e4 95 05 cf ac 8c f3 3e ea 0c   .....".......>..
0150  b3 d5 48 21 6f 44 65 0a 15 c8 8d d9 37 d5 16 0e   ..H!oDe.....7...
0160  26 b2 ac 79 6b 59 e3 7d 86 3e dc a4 6e 99 58 80   &..ykY.}.>..n.X.
0170  43 6f 06 f0 9c d2 19 ce ca 96 fa 08 c7 8e 1f d4   Co..............
0180  53 2d 16 88 76 56 9d 58 05 96 da 91 01 9b ea 20   S-..vV.X.......
0190  c7 9c e4 58 42 96 ee 50 56 bb c6 5c 06 bc aa 99   ...XB..PV..\....
01a0  6d b1 dc 38 64 6e 74 b8 66 51 30 34 2e 3e ea 5a   m..8dnt.fQ04.>.Z
01b0  70 9b e5 72 77 7b ef 52 e9 83 ae 61 87 7a fc 00   p..rw{.R...a.z..
01c0  e5 02 d4 c9 88 da ee 70 96 b4 65 b7 43 99 c6 f9   .......p..e.C...
01d0  ae ea b6 85 5f 84 19 7a 6b 8c 97 49 25 af d7 15   ...._..zk..I%...
01e0  6d f2 86 f2 4c 73 dd 91 63 71 57 0c 48 ce d3 79   m...Ls..cqW.H..y
01f0  03 d5 b7 26 a7 c6 56 bc fa 01 0a f5 04 d5 2e 56   ...&..V........V
0200  80 db 37 0e cd 42 e3 ed 59 ad 8b 53 d4 4a 39 91   ..7..B..Y..S.J9.
0210  50 e0 7f 5a 6e 13 b5 41 fa 91 63 48 76 51 75 57   P..Zn..A..cHvQuW
0220  c2 0a 32 54 5f 7e ac 7a c3 22 6f a6 09 0b 48 c8   ..2T_~.z."o...H.
0230  17 7a f3 c9 7f 72 3a a4 39 25 ab d5 64 80 a7 1d   .z...r:.9%..d...
```

```
0240  f5 d8 fa 69 8f 91 e2 1a d2 99 a9 51 7f 1a ff 95   ...i.......Q....
0250  92 64 19 50 47 be 6e 56 23 66 8a 0e 7e 1c bb e0   .d.PG.nV#f..~...
0260  13 ec ba 19 24 46 c2 25 80 0c f7 15 75 41 6d 65   ....$F.%....uAme
0270  72 17 cc f3 63 45 d6 94 ff 04 8c a8 a4 4b 04 17   r...cE.......K..
0280  3b 2d f8 22 cd 51 ea f9 13 88 ca 07 7f fc 6f 6f   ;-.".Q........oo
0290  4f 1a dc 45 05 1b 59 08 35 ef 35 a1 86 f6 7a f8   O..E..Y.5.5...z.
02a0  ec 7f 7b e8 d7 66 b4 4b 6b 6a fc a0 12 80 a2 3d   ..{..f.Kkj.....=
02b0  ca 80 ee be dc 1a db 03 16 36 a1 62 51 1f 41 8c   .........6.bQ.A.
02c0  86 b2 9b 10 d9 0e 1c 23 24 62 fa 26 86 4e e4 5b   .......#$b.&.N.[
02d0  b7 4d f3 e6 33 68 8b bc ee 0a 52 dc 34 32 76 87   .M..3h....R.42v.
02e0  43 ce 8e 50 d1 5c b5 05 32 bc ec 7c 4f ba f9 f6   C..P.\..2..|O...
02f0  cf c5 c3 d5 00 35 a0 d4 16 bc e3 88 66 3b ec 08   .....5......f;..
0300  e6 28 72 20 ae e7 96 56 da 75 76 e7 92 e0 ef d2   .(r ...V.uv.....
0310  87 7b e5 dc 4b 06 fe 25 af 20 c1 f3 4c e5 8e 7c   .{..K..%. ..L..|
0320  61 d7 2f 5a c5 a7 5a 98 73 ef 0b 93 4b 39 d8 aa   a./Z..Z.s...K9..
0330  53 fe 9e ba 70 1a d3 2c 4c 91 d3 81 8a ae ea 12   S...p..,L.......
0340  7e f2 fb 14 ae a4 85 17 42 54 6f 2d 3c 29 3a fc   ~.......BTo-<):.
0350  42 ce 19 14 2e 6f af a8 42 50 6a ff cf ea ab a7   B....o..BPj.....
0360  df 05 32 b4 55 55 f5 34 64 ab 53 9b 40 72 d3 5b   ..2.UU.4d.S.@r.[
0370  39 91 d4 22 7f f0 26 bf 01 d4 40 96 64 ea f1 5b   9.."..&...@.d..[
0380  7d b8 76 17 74 ed 0b 99 76 0e 42 9e 30 91 cc 5c   }.v.t...v.B.0..\
0390  e6 ca ec 6b 44 71 f6 0f 0f 96 30 36 49 ab 64 2e   ...kDq....06I.d.
03a0  d7 fe 69 3b 78 d5 f2 80 5d b9 d6 92 ad 81 38 d7   ..i;x...].....8.
03b0  5f 5d 19 49 50 19 5b 5a 40 9c 18 b9 52 93 87 84   _].IP.[Z@...R...
03c0  4f ed 3a 22 c2 b8 56 e9 0a e6 c6 fc e6 02 9b aa   O.:"..V.........
03d0  02 a8 bb 9d 84 df 56 89 41 32 ef 62 18 7a 49 96   ......V.A2.b.zI.
03e0  16 ec ef 42 44 cb 20 81 5d 8b 8e 5c 18 18 ec 55   ...BD. .]..\...U
03f0  9f 71 c1 3a fb 04 a8 4c d9 e8 a7 db e6 09 9a f4   .q.:...L........
0400  8b 27 38 0c 4e 3a 0e 4e 08 f8 42 19 c0 9c 40 6f   .'8.N:.N..B...@o
0410  29 9e d8 a8 0a 4d 7b 71 95 ba c2 5e 0c a9 16 d0   ).....M{q...^....
0420  cd d1 0a 45 39 6b db f0 4c dc f0 04 09 68 ae fc   ...E9k..L....h..
0430  b6 2b b6 fe 0b a6 02 d7 2c d5 2c 48 e4 fe e2 fc   .+......,.,H....
0440  60 94 96 f0 c0 b8 3a 19 8e 0a 46 00 a6 ea 02 48   `.....:...F....H
0450  df 40 fc c4 4b 3e ea cf ca 26 92 76 6c 1d 42 3d   .@..K>...&.vl.B=
0460  2e 13 91 8c b2 d6 12 d1 cd a9 e4 5e 32 0a d7 60   ...........^2..`
0470  15 73 1d 93 5d 71 e0 c1 68 8e 35 0d 6f f9 1e df   .s..]q..h.5.o...
0480  e0 22 02 cf 28 8a b8 55 e8 8b b4 55 b7 27 e7 09   ."..(..U...U.'..
0490  54 d7 ec 9c a8 d6 85 45 95 48 32 30 11 1d 96 c7   T......E.H20....
04a0  0a 1c a4 05 65 82 ee 4a 0d f8 5b 19 50 14 0d 5a   ....e..J..[.P..Z
04b0  a6 b2 9e 68 29 e7 c8 71 4e 0a e5 36 71 0b 1d 5e   ...h)..qN..6q..^
04c0  50 f7 76 bd dd 06 63 e7 30 90 68 b0 0e 31 00 f9   P.v...c.0.h..1..
04d0  61 e7 ac dd 96 73 eb 68 44 e1 d2 ab 52 ae da 3a   a....s.hD...R..:
04e0  fb 80 19 0d ee 81 84 5f 4f 86 ee d0 40 a8 d5 b8   ......._O...@...
04f0  a0 96 a3 74 46 9b 8e 8a 0c 24 d6 87 36 7b f3 25   ...tF....$..6{.%
0500  c7 c3 91 7c 7a f2 b0 90 c3 c3 4a 03 04 b4 d9 c0   ...|z.....J.....
0510  5a d7 7e cc d3 8b ef 70 96 9d c4 6c 22 cb 64 97   Z.~....p...l".d.
0520  15 c8 30 ed 66 c1 2e c2 ea 30 ef 75 59 d7 d1 89   ..0.f....0.uY...
0530  66 2a 9a 64 1b b2 65 63 ef 27 6b e2 a0 ad 82 6f   f*.d..ec.'k....o
0540  6f 17 8e 88 fd d8 f3 6d d8 a4 6e ac d3 11 c3 49   o......m..n....I
0550  6a a6 f0 3d 44 29 d0 30 3e 0a f9 8f a8 c4 6a 10   j..=D).0>.....j.
0560  67 8f e4 dd d6 b4 e7 a6 95 9e ab e7 a9 93 a2 96   g...............
0570  c5 d8 8d f0 bf e4 fd 98 13 cc b1 93 2a be be 00   ............*...
0580  b8 a1 da 9a 12 b2 9e 1b 93 64 19 d8 9b 79 d4 51   .........d...y.Q
0590  b0 ae 1d f8 b3 a9 c0 e7 ba 34 e6 b4 7e 7a 92 1f   .........4..~z..
05a0  87 a5 29 15 c6 62 0d ea 7d e6 c2 0c 71 ef 07 50   ..)..b..}...q..P
05b0  2e 87 80 94                                      ....

No.     Time        Source                Destination           Protocol Info
    613 1463.805342 E.F.G.H         A.B.C.D           TCP      9988 > mni-prot-rout [ACK] Seq=1 Ack=12936 Win=33280 Len=0

Frame 613 (54 bytes on wire, 54 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
```

```
Transmission Control Protocol, Src Port: 9988 (9988), Dst Port: mni-prot-rout (3764), Seq: 1, Ack: 12936, Len: 0
    Source port: 9988 (9988)
    Destination port: mni-prot-rout (3764)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 12936    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 33280 (scaled)
    Checksum: 0x6522 [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    614 1463.805346 A.B.C.D           E.F.G.H         TCP      mni-prot-rout > 9988 [PSH, ACK] Seq=12936 Ack=1 Win=500000 Len=70

Frame 614 (124 bytes on wire, 124 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: mni-prot-rout (3764), Dst Port: 9988 (9988), Seq: 12936, Ack: 1, Len: 70
    Source port: mni-prot-rout (3764)
    Destination port: 9988 (9988)
    Sequence number: 12936    (relative sequence number)
    [Next sequence number: 13006    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 500000 (scaled)
    Checksum: 0x7b10 [correct]
    [SEQ/ACK analysis]
Data (70 bytes)

0000  4a d1 f4 04 c5 69 e2 3e 12 5f 31 58 19 c4 bb 43   J....i.>._1X...C
0010  5d 13 a2 3c 58 0d aa 17 4e 75 4b 0f 06 27 25 46   ]..<X...NuK..'%F
0020  49 f0 d6 41 22 35 ff fe 1d 96 e0 60 5a e0 fd 15   I..A"5.....`Z...
0030  3d 92 65 f4 56 55 be 78 90 94 c8 7d 3e d4 6f 9f   =.e.VU.x...}>.o.
0040  52 cd 76 f2 0f 10                                 R.v...

No.     Time        Source                Destination           Protocol Info
    615 1463.805425 E.F.G.H         A.B.C.D           TCP      9988 > mni-prot-rout [ACK] Seq=1 Ack=13006 Win=33280 Len=0

Frame 615 (54 bytes on wire, 54 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: 9988 (9988), Dst Port: mni-prot-rout (3764), Seq: 1, Ack: 13006, Len: 0
    Source port: 9988 (9988)
    Destination port: mni-prot-rout (3764)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 13006    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 33280 (scaled)
    Checksum: 0x64dc [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    616 1463.830696 A.B.C.D           E.F.G.H         TCP      mni-prot-rout > 9988 [PSH, ACK] Seq=13006 Ack=1 Win=500000 Len=1460

Frame 616 (1514 bytes on wire, 1514 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: mni-prot-rout (3764), Dst Port: 9988 (9988), Seq: 13006, Ack: 1, Len: 1460
    Source port: mni-prot-rout (3764)
    Destination port: 9988 (9988)
    Sequence number: 13006    (relative sequence number)
```

```
    [Next sequence number: 14466    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 500000 (scaled)
    Checksum: 0x2a36 [correct]
    [SEQ/ACK analysis]
Data (1460 bytes)

0000  0e 11 b9 4c 8c 1e 9e 95 08 c8 fe 10 86 1c 62 41   ...L..........bA
0010  6c 3b af 19 c6 0e 4a 92 68 56 48 76 e7 2b 8f fc   l;....J.hVHv.+..
0020  5f 74 83 cb 1d d8 74 b4 82 f2 31 ec 95 2c 19 ce   _t....t...1..,..
0030  b2 db ff c9 3e ae 5f 82 b6 ff 6f 8a 38 0e 48 e3   ....>._...o.8.H.
0040  20 48 ce 82 e4 76 4d b5 af 93 17 32 9e 4a 5d 92    H...vM....2.J].
0050  39 28 44 22 fe 3f 42 1a 93 ec b0 11 f5 dc 2c 8a   9(D".?B.......,.
0060  53 8a c4 c8 42 02 36 5d ea 5e 1e 5c f1 b5 68 7d   S...B.6].^.\..h}
0070  3d 2a 77 f2 c6 79 67 db 03 51 c0 50 f4 62 2e 49   =*w..yg..Q.P.b.I
0080  68 1c b8 cf fe 9d 01 37 a7 0c cd 46 74 66 39 2b   h.......7...Ftf9+
0090  00 4b e6 b5 b3 08 40 1f 26 66 4c ca ff 58 42 96   .K....@.&fL..XB.
00a0  cc f3 a3 8e b6 00 fd c1 fd 54 5c 47 9d 5d 6a cb   .........T\G.]j.
00b0  f0 c6 60 92 7e e6 cc 94 7e c8 52 75 28 39 a6 fa   ..‘.~...~.Ru(9..
00c0  de 12 4c 92 e4 1c b1 3a e7 57 c3 28 32 88 4e 15   ..L....:.W.(2.N.
00d0  0d a2 6f 80 f6 df 2e dd 85 82 4e c8 a8 00 e4 0e   ..o.......N.....
00e0  ab 02 b8 5b d4 7c 45 da d6 37 05 41 96 04 eb 22   ...[.|E..7.A..."
00f0  9e 10 18 01 f2 67 7e d9 51 10 35 6e cf ac 6b 87   .....g~.Q.5n..k.
0100  c2 05 cc 8a 8f 99 53 93 5e 5a f2 11 e5 ea 07 2d   ......S.^Z.....-
0110  e7 e6 d7 32 c5 14 56 9e 12 26 47 b3 e2 28 b0 0b   ...2..V..&G..(..
0120  2a 3f ef cd f3 f0 52 51 ee d9 1e d7 e2 06 1c 86   *?....RQ........
0130  f0 b3 27 b5 e2 f2 d6 9b 58 1d aa 5b 2e 69 7f 96   ..’.....X..[.i..
0140  e8 08 0b 9e 1e b3 67 e5 42 40 4f b2 a2 7c 57 3c   ......g.B@O..|W<
0150  f2 99 4e c8 27 57 da 9f b2 0a 1a 86 2d 03 1f 93   ..N.’W......-...
0160  b6 0c 8e d7 2c 05 76 98 88 0e ab da 61 f8 41 90   ....,.v.....a.A.
0170  e7 fd 86 ae ea ff 0a 82 0d 10 4e fd f3 31 3c ec   ..........N..1<.
0180  ee 47 67 cd 86 50 09 de 6e 86 fa 47 98 4b d6 9b   .Gg..P..n..G.K..
0190  09 e6 0d d4 02 1c 53 9b 1c 98 26 18 f6 62 40 78   ......S...&..b@x
01a0  cd fe 47 eb e3 29 44 3a fe 76 76 12 ee 72 e7 92   ..G..)D:.vv..r..
01b0  80 3b 49 f8 e5 8e fa d8 cd 59 47 65 10 68 45 22   .;I......YGe.hE"
01c0  ed 3a 4a cd 96 12 6f 0a a4 1a 69 af ea c7 4c cf   .:J...o...i...L.
01d0  a4 19 19 c5 e5 3b 4c 99 ee 98 be 95 e7 ba 42 59   .....;L.......BY
01e0  f8 c2 7f bd f7 1e 05 99 e3 38 b6 67 99 4b 86 97   .........8.g.K..
01f0  80 99 aa ea 66 0b cf 7c 0e e5 4e 9a 19 2e 2e 93   ....f..|..N.....
0200  f4 ce 25 62 11 ca 5f 62 3a 60 16 38 f2 6e 45 9e   ..%b.._b:‘.8.nE.
0210  8e 73 96 b1 2c f2 a4 3d f3 14 c2 a5 96 e2 d1 98   .s..,..=........
0220  9b 54 02 57 d7 64 9d e5 f6 99 15 fe 92 db 59 cc   .T.W.d........Y.
0230  6d 6e 7d 8e 21 a1 56 9f 15 bc 18 ab 6e 99 15 28   mn}.!.V.....n..(
0240  b3 44 10 92 8a 86 92 5e 64 d9 77 c1 1c d8 45 72   .D.....^d.w...Er
0250  c5 ce 37 da cb 14 cb c2 9a 9b 48 d9 da 1d c7 13   ..7.......H.....
0260  ce 6c e9 21 54 7b 48 6a 2c 7f 84 d7 26 5d 52 ca   .l.!T{Hj,...&]R.
0270  28 64 85 fd 34 7c b1 a8 d5 91 64 b4 20 a0 8b d5   (d..4|....d. ...
0280  05 d1 f7 98 0e c7 b5 35 e8 6c 45 d9 0d c6 05 e4   .......5.lE.....
0290  f6 7c c9 62 be 79 85 b3 86 a7 8d 96 6d 07 81 13   .|.b.y......m...
02a0  91 1f b4 62 f1 99 81 e2 0b c9 43 63 df 01 32 5a   ...b......Cc..2Z
02b0  7e 11 ad 62 12 e2 b2 c0 15 f5 43 77 b4 e3 a5 6c   ~..b......Cw...l
02c0  05 09 b5 d0 06 de 05 67 84 19 28 3b ea 9d 70 da   .......g..(;..p.
02d0  25 8f 1e a6 88 06 36 42 f2 16 00 9e 31 82 4e 87   %.....6B....1.N.
02e0  ce 7e 43 16 ac f2 71 87 67 f3 a5 a2 ef f8 a8 ab   .~C...q.g.......
02f0  b6 e7 d3 66 72 05 a9 78 21 f3 b2 b4 d6 c2 0e 76   ...fr..x!......v
0300  fb cf 54 85 fb 8a ae 1d e8 ac 27 21 f9 b3 cc 64   ..T.......’!...d
0310  a5 19 31 cf 4a 01 44 9e c6 1b 4f cd 6d b9 80 73   ..1.J.D...O.m..s
0320  57 3c d2 de e7 b2 f8 48 0d 72 00 b7 76 cb e0 26   W<.....H.r..v..&
0330  21 57 e2 db 5a 85 04 db 13 a3 aa 73 0f 3e 28 12   !W..Z......s.>(.
0340  4d 1b 77 1e a7 12 b3 19 9d d3 51 8a 91 84 09 6b   M.w.......Q....k
0350  4f f6 46 19 1e e3 33 93 e3 f1 b3 9e 32 9d 23 82   O.F...3.....2.#.
```

```
0360  09 6c 2c bd c1 30 bf 54 ff 72 c0 44 f5 2f 2e 79   .l,..0.T.r.D./.y
0370  45 dd f3 98 f8 f0 11 09 62 31 36 ac d9 5a dd bb   E.......b16..Z..
0380  3d 88 36 1e 6e 8c 64 f6 f2 5a 37 bb 21 88 2a 1e   =.6.n.d..Z7.!.*.
0390  2f 8d a8 a9 6e 41 4c ab 6b 5d c2 24 dc 31 c6 58   /...nAL.k].$.1.X
03a0  85 d5 43 e6 cf 74 3a d5 c1 60 e4 9d e0 be c2 9c   ..C..t:..‘......
03b0  f2 98 2c b6 db dd aa 31 eb 44 d2 c1 59 35 5e e4   ..,....1.D..Y5^.
03c0  46 04 cd 0f 45 30 f4 17 64 2d 4d 53 31 1d b8 27   F...E0..d-MS1..’
03d0  fa 06 7a 4a 26 f5 27 99 db 5c 57 66 98 90 75 7a   ..zJ&.’..\Wf..uz
03e0  20 03 2c 8e 6a 9a 6b 4d 76 98 67 e3 64 9c 0a 06    .,.j.kMv.g.d...
03f0  96 95 73 d1 b6 90 e4 73 96 f4 e7 8f 7e 12 01 04   ..s....s....~...
0400  98 4c 70 a8 96 4b 42 07 14 22 7f d5 fd 09 a7 05   .Lp..KB.."......
0410  5e 72 e2 ff a4 19 a4 91 d3 09 48 5e 0c b2 2e e6   ^r........H^....
0420  6b f0 b3 92 2c 1a 79 96 9a 12 be 82 f5 ca 49 20   k...,.y.......I
0430  ec 04 4a 68 47 60 d9 71 c3 46 02 06 d8 3c cf 81   ..JhG‘.q.F...<..
0440  ed 69 03 f2 fe 89 2f 0c f3 93 f3 c8 e6 56 6e 4b   .i..../......VnK
0450  07 9b 87 99 93 98 21 66 ea 34 30 6b 86 ef bf 7c   ......!f.40k...|
0460  09 18 2b 17 9b 90 2c 82 b0 4f 5e 72 38 6f 10 64   ..+...,..O^r8o.d
0470  a1 30 47 21 a9 29 f8 6e eb f1 4d 1e ed 91 31 82   .0G!.).n..M...1.
0480  6d cf 3e e2 6e be 90 c8 73 91 62 27 be 7a 33 b9   m.>.n...s.b’.z3.
0490  7b c7 d7 a3 2e 13 cc 71 c7 3b 18 dd e9 69 0f 33   {......q.;...i.3
04a0  e4 b9 3c 04 f8 9c 8e 9b d2 5a bd eb 6d 52 f0 55   ..<......Z..mR.U
04b0  1f f5 84 0a f0 fa 30 c8 fa 81 ca 9f fe 34 75 71   ......0......4uq
04c0  e5 12 6e ba b2 e4 51 5d e2 09 ef 91 75 a0 75 f2   ..n...Q]....u.u.
04d0  6b 94 4e 46 1b a7 32 ca b4 0b ae ab b9 3b a9 df   k.NF..2......;..
04e0  ea 90 b2 0a 1b a4 30 3c f9 03 17 72 82 2b 8b 16   ......0<...r.+..
04f0  42 5e f9 f8 02 9a 18 77 18 1b fd 90 cb 8d f8 c8   B^.....w........
0500  32 3c af b5 c4 66 67 e9 e7 cc 67 73 4e 4e 65 5c   2<...fg...gsNNe\
0510  4e 5a 1e 07 d3 2d 7a 94 c4 be 57 4a 4d 2d d7 8d   NZ...-z...WJM-..
0520  c9 3e a7 a3 c4 9a fd 62 a0 6b 7c 02 fe f0 ca 05   .>.....b.k|.....
0530  22 9d 74 ef cc 84 d6 be e3 e6 4f 71 cf 05 00 12   ".t.......Oq....
0540  f8 3a b7 53 f2 61 b5 ab 2b 51 7e 40 03 4e 48 49   .:.S.a..+Q~@.NHI
0550  41 0d 4d 1e 5e b9 64 ea f7 b5 4a ee 62 5d e4 f1   A.M.^.d...J.b]..
0560  2b b4 68 39 26 ce ee da 54 40 e6 00 8c 58 ae 81   +.h9&...T@...X..
0570  bc 39 f4 43 f0 93 be 23 a9 36 47 a8 43 4e 91 12   .9.C...#.6G.CN..
0580  13 6c 49 19 21 84 d5 9d c0 f2 54 db e2 a1 e3 63   .lI.!.....T....c
0590  36 0a 54 22 e3 94 74 f0 fa 6e 4a 9e 5c 2f 8b b9   6.T"..t..nJ.\/..
05a0  e8 37 00 95 c5 1a 6b c2 f1 28 6d 64 04 0c cf a3   .7....k..(md....
05b0  51 f4 ed c0                                      Q...

No.     Time        Source                Destination           Protocol Info
    617 1463.830702 E.F.G.H         A.B.C.D           TCP      9988 > mni-prot-rout [ACK] Seq=1 Ack=14466 Win=36224 Len=0

Frame 617 (54 bytes on wire, 54 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: 9988 (9988), Dst Port: mni-prot-rout (3764), Seq: 1, Ack: 14466, Len: 0
    Source port: 9988 (9988)
    Destination port: mni-prot-rout (3764)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 14466    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 36224 (scaled)
    Checksum: 0x5f11 [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    618 1463.830706 A.B.C.D           E.F.G.H         TCP      mni-prot-rout > 9988 [PSH, ACK] Seq=14466 Ack=1 Win=500000 Len=70

Frame 618 (124 bytes on wire, 124 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: mni-prot-rout (3764), Dst Port: 9988 (9988), Seq: 14466, Ack: 1, Len: 70
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    Source port: mni-prot-rout (3764)
    Destination port: 9988 (9988)
    Sequence number: 14466    (relative sequence number)
    [Next sequence number: 14536    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 500000 (scaled)
    Checksum: 0x216a [correct]
    [SEQ/ACK analysis]
Data (70 bytes)

0000  f6 ea 06 3e ce b8 3d d8 c6 ea 13 8f 47 11 e4 19   ...>..=.....G...
0010  d6 f0 a3 ff 6d e8 97 ee 06 3d 9e fc 30 33 db 98   ....m....=..03..
0020  5c 22 86 c8 ec 5a f3 55 a0 f7 71 54 a1 cc 36 bc   \"...Z.U..qT..6.
0030  a8 84 5e 92 c4 14 15 3c 5a 38 b8 e9 d1 1b bd 84   ..^....<Z8......
0040  a8 7d a1 66 8f a3                                 .}.f..

No.     Time        Source                Destination           Protocol Info
    619 1463.830745 E.F.G.H         A.B.C.D           TCP      9988 > mni-prot-rout [ACK] Seq=1 Ack=14536 Win=36224 Len=0

Frame 619 (54 bytes on wire, 54 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: 9988 (9988), Dst Port: mni-prot-rout (3764), Seq: 1, Ack: 14536, Len: 0
    Source port: 9988 (9988)
    Destination port: mni-prot-rout (3764)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 14536    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 36224 (scaled)
    Checksum: 0x5ecb [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    620 1463.854308 A.B.C.D           E.F.G.H         TCP      mni-prot-rout > 9988 [PSH, ACK] Seq=14536 Ack=1 Win=500000 Len=1275

Frame 620 (1329 bytes on wire, 1329 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: mni-prot-rout (3764), Dst Port: 9988 (9988), Seq: 14536, Ack: 1, Len: 1275
    Source port: mni-prot-rout (3764)
    Destination port: 9988 (9988)
    Sequence number: 14536    (relative sequence number)
    [Next sequence number: 15811    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 500000 (scaled)
    Checksum: 0xf7ff [correct]
    [SEQ/ACK analysis]
Data (1275 bytes)

0000  48 5d 12 ba fc 8a 8a e6 96 59 47 a0 59 91 c6 14   H].......YG.Y...
0010  cf 5b 8e c5 c2 b7 4b 08 2a 64 60 a4 58 03 cf dc   .[....K.*d‘.X...
0020  4a 06 8e 00 2e 14 ee 99 df 03 1e 28 5e 58 5c f5   J..........(^X\.
0030  d0 e8 a0 14 6f fc 6f 3a 91 cb 20 87 e6 96 e5 c4   ....o.o:.. .....
0040  66 8f ee 81 e4 8a f0 50 4a fa 4a df e4 0b ef 08   f.......PJ.J.....
0050  33 0a a4 3f cb 8e d3 5b c3 08 f5 f3 5c 30 d7 60   3..?...[....\0.‘
0060  c0 85 ea 11 8e dd e7 91 ad 92 a0 21 6c ef 07 35   ...........!l..5
0070  06 a9 9d 9c 2b bc b2 47 38 59 14 b1 c2 bf 22 6a   ....+..G8Y...."j
0080  b8 96 42 16 4c 64 13 47 7f bb 33 5c 8d f6 96 9d   ..B.Ld.G..3\....
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0090  37 11 4b 3a 35 0f 8e d8 e9 48 98 e4 16 e3 e5 50   7.K:5....H.....P
00a0  5e 42 b7 35 ba 65 18 d8 44 6d 35 3b 8d 1b c4 f9   ^B.5.e..Dm5;....
00b0  c6 a4 92 f1 70 5b ea 56 7d ef e0 e2 0f 8a 1e 1a   ....p[.V}.......
00c0  96 7b fd da 1d cd 03 58 2f ea 46 89 6c 88 49 4d   .{.....X/.F.l.IM
00d0  17 03 b9 bc d2 3e 4f 13 be b5 53 61 8a 9d 5e 7d   .....>O...Sa..^}
00e0  b8 87 0d 9b 1a d7 0d 23 71 a6 9a 06 ae d9 bb 31   .......#q......1
00f0  12 cf 20 55 aa a1 2c 28 39 be 81 50 bb 14 2a 65   .. U..,(9..P..*e
0100  56 e5 6c 16 45 6b 11 c1 df aa 0d f6 b9 a6 16 1b   V.l.Ek..........
0110  07 a0 e2 29 32 9f 56 60 be 71 f8 03 cb 86 69 93   ...)2.V‘.q....i.
0120  13 9e 6c 7c c5 fc dc bf 6a 72 03 6b 0c f6 15 7c   ..l|....jr.k...|
0130  e6 5b a9 58 8b 6b f4 bf 4a 65 56 38 fe 60 60 0e   .[.X.k..JeV8.‘‘.
0140  2e 0c 48 b0 fc 8c 38 04 fe 4f 20 9d 96 b7 24 0b   ..H...8..O ...$.
0150  ae 23 f8 c9 45 92 08 e4 04 7c fb 10 6e dd a0 b3   .#..E....|..n...
0160  12 76 00 28 53 06 0c f0 60 de 80 e9 87 97 38 4b   .v.(S...‘.....8K
0170  2c b4 cb 15 bd 6a be 67 1b 0a db 56 cc 3e 90 21   ,....j.g...V.>.!
0180  44 cd 8f 76 22 ee eb c5 e9 22 ee 85 43 73 de 1b   D..v"...."..Cs..
0190  fd a9 23 79 52 81 0d 13 68 c6 d0 2d 65 b1 b2 86   ..#yR...h..-e...
01a0  4c 19 6b ad 80 fe f7 ae 30 dc 6f 1e 56 d8 c0 3e   L.k.....0.o.V..>
01b0  00 22 6c ce bd 93 f6 10 67 1c 76 14 67 ac 76 08   ."l.....g.v.g.v.
01c0  56 7c 1c 90 52 ba dd af a6 e3 36 e2 ce 8c 10 dc   V|..R.....6.....
01d0  4c a9 2f cf 2c 0b 6b 1d 3b b5 60 23 dd 6a 6d c3   L./.,.k.;.‘#.jm.
01e0  57 01 3c 56 07 d1 e5 f8 4a 1c 42 74 6a 73 7a 51   W.<V....J.BtjszQ
01f0  fb 00 db 89 7f ef a7 fa bc a6 4b de af f7 cd d0   ..........K.....
0200  58 52 04 9b fb 38 ff 6d 62 ca c4 70 70 9e 1c 48   XR...8.mb..pp..H
0210  2a 08 07 54 72 9b 6f 91 17 b5 0d 0a d6 d3 d1 fa   *..Tr.o.........
0220  0e b0 f8 f9 49 1e 1d b9 17 6e d4 0c b7 b0 57 91   ....I....n....W.
0230  cb 10 f8 3e 04 8e f4 50 da a8 ea e3 63 73 e7 3d   ...>...P....cs.=
0240  2e fb a6 59 65 a8 f2 37 cf d3 cb e8 ee f1 cf 88   ...Ye..7........
0250  59 68 2e 09 d2 96 16 08 ae cc 6c 90 b2 df fa 1c   Yh........l.....
0260  56 6c 7d 80 35 74 17 52 77 bb 71 08 b5 5b 12 f0   Vl}.5t.Rw.q..[..
0270  c3 11 8a da 8c be eb 0d 8e b4 82 74 86 e8 5e 06   ...........t..^.
0280  03 fb c7 56 44 72 5c 30 be 88 58 6b 5b 5c 34 da   ...VDr\0..Xk[\4.
0290  55 bb e8 db 6e fc a4 2d 3b f3 22 03 05 1b 52 41   U...n..-;."...RA
02a0  48 7a fe a2 ca 3c ff 98 2a e6 73 8e a2 0e 32 0e   Hz...<..*.s...2.
02b0  c8 42 16 92 f3 a8 d2 14 50 ab 1a c6 05 05 f1 5e   .B......P......^
02c0  ca 02 dc 83 8c 41 6d 30 e0 43 40 bb 48 d2 e2 ff   .....Am0.C@.H...
02d0  8f 95 12 9e ca 05 2e 9c 40 ee da 70 4c 2b 1e 96   ........@..pL+..
02e0  27 1b 5b c3 84 90 57 7c c5 1e 81 96 9e b2 8e b9   ’.[...W|........
02f0  c6 bc d2 e5 ce 72 7c 78 5f 1b 22 00 ad a0 49 24   .....r|x_."...I$
0300  56 05 6e 2f b0 dc b8 41 a8 4a 4a 9c cc 00 7e 26   V.n/...A.JJ...~&
0310  c4 6b fe 62 b7 b3 e0 9b 55 71 c1 8a 49 fc 09 51   .k.b....Uq..I..Q
0320  4f d4 39 de 50 f2 1c 75 54 72 df 02 ca 64 d9 86   O.9.P..uTr...d..
0330  72 80 6c b7 82 04 35 7d e8 bc b9 44 f1 f8 58 c9   r.l...5}...D..X.
0340  11 80 bd 2d 2a 1b 8d b1 ad 66 26 42 25 4a 7c ec   ...-*....f&B%J|.
0350  13 54 16 71 c9 28 dd 36 86 72 e7 9f dd ed cf 20   .T.q.(.6.r..... 
0360  59 ee 86 31 2e 86 5e 90 7a 61 a0 16 a0 16 ea 0c   Y..1..^.za......
0370  2e 83 a7 29 6f 96 4b 3c b2 d8 db 5c 16 7f 18 30   ...)o.K<...\...0
0380  6f f2 c6 37 24 45 ff 05 d7 a4 b3 91 8a a7 a0 c8   o..7$E..........
0390  21 38 d3 16 8b 0a 48 4f ae 26 34 47 ec b8 bb 20   !8....HO.&4G... 
03a0  60 17 ea 70 11 e2 42 54 d6 0d 60 93 4a b3 66 08   ‘..p..BT..‘.J.f.
03b0  0d 3a 4d 3c 90 98 06 fc 8a d3 6b 92 ff f1 79 34   .:M<......k...y4
03c0  e2 1f 04 52 47 03 fa a8 4e 27 ad 34 76 3f 6d 1f   ...RG...N’.4v?m.
03d0  75 9a 34 72 7a c3 11 e9 6d dd 72 b0 5e 98 fc a1   u.4rz...m.r.^...
03e0  e6 c4 e3 bc b2 11 d9 da 2f c4 13 4e 66 e4 c8 85   ......../..Nf...
03f0  9f ce fb 2a e0 38 b7 2e ac 83 d1 c6 6e 3f 82 0f   ...*.8......n?..
0400  2e da 4c be 7d 7b f7 16 be 67 f5 f0 ad 18 ff 4f   ..L.}{...g.....O
0410  f7 97 2a 0c 60 96 52 5d 7e 0c fe 3c ca a6 ce bc   ..*.‘.R]~..<....
0420  41 19 88 ec da 8c fe 8f b5 a1 c6 8e 16 6c e9 61   A............l.a
0430  0c 02 5a 3d e7 11 19 67 8c 61 d1 a6 37 71 de a9   ..Z=...g.a..7q..
0440  4e 72 c7 bd c0 8b 0a 0e 32 d7 91 8d 97 72 16 9f   Nr......2....r..
0450  4a ee ac 2b bf da 34 b6 30 1b d0 e2 d4 03 bb 0f   J..+..4.0.......
0460  5e ff ee 52 04 f0 d7 92 59 04 9f 43 36 84 23 eb   ^..R....Y..C6.#.
0470  cd 5c af 63 52 57 46 0c 8a 1a 47 72 6e f5 34 14   .\.cRWF...Grn.4.
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0480  92 62 b6 58 2d f2 b1 83 cb bb fe 88 ba 18 a9 70   .b.X-..........p
0490  e5 f4 a8 4f 25 17 c6 2d 02 56 36 f1 e6 e2 dc 86   ...O%..-.V6.....
04a0  d0 2b dc be db 82 fe a0 96 e9 f6 de 06 13 e4 32   .+............2
04b0  ad 09 e0 c8 d5 9e ec 5a f3 15 84 52 37 0d 70 97   .......Z...R7.p.
04c0  0c 96 0b a8 f7 5a 18 15 4b 09 61 71 2e 8e a7 01   .....Z..K.aq....
04d0  33 22 70 f0 bb d5 f3 b0 78 4a 7b b9 3d 1f ec 50   3"p.....xJ{.=..P
04e0  54 b8 6a 9d e7 12 24 9e 82 e8 49 d2 c7 a1 2a dd   T.j...$...I...*.
04f0  0a b9 f6 be 08 1a ce d2 c9 0b 2c                  ..........,

No.     Time        Source                Destination           Protocol Info
    621 1463.854314 E.F.G.H         A.B.C.D           TCP      9988 > mni-prot-rout [ACK] Seq=1 Ack=15811 Win=39040 Len=0

Frame 621 (54 bytes on wire, 54 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: 9988 (9988), Dst Port: mni-prot-rout (3764), Seq: 1, Ack: 15811, Len: 0
    Source port: 9988 (9988)
    Destination port: mni-prot-rout (3764)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 15811    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 39040 (scaled)
    Checksum: 0x59ba [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    622 1463.890542 A.B.C.D           E.F.G.H         TCP      mni-prot-rout > 9988 [PSH, ACK] Seq=15811 Ack=1 Win=500000 Len=1275

Frame 622 (1329 bytes on wire, 1329 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: mni-prot-rout (3764), Dst Port: 9988 (9988), Seq: 15811, Ack: 1, Len: 1275
    Source port: mni-prot-rout (3764)
    Destination port: 9988 (9988)
    Sequence number: 15811    (relative sequence number)
    [Next sequence number: 17086    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 500000 (scaled)
    Checksum: 0xdf00 [correct]
    [SEQ/ACK analysis]
Data (1275 bytes)

0000  0c 86 b9 6e dc 23 2f fc 29 4a 98 d6 72 48 fc 76   ...n.#/.)J..rH.v
0010  5b da 8d 92 03 56 cd cf 15 4e ef f4 0a 42 b1 26   [....V...N...B.&
0020  8b 4f 11 73 bb 4f 2b 94 1c 0e aa 0e 37 0d 0b 3d   .O.s.O+.....7..=
0030  2a 52 0c 38 aa 56 c5 8b 08 e1 92 f6 c5 3c 8a 22   *R.8.V.......<."
0040  7f c5 1f ce 57 c0 3a 23 66 d2 02 6c b5 54 ee fc   ....W.:#f..l.T..
0050  2c a1 1b de f9 df ac a1 dd 74 0c c4 71 6c ae 7a   ,........t..ql.z
0060  68 28 a0 27 ed 5d b7 83 db 36 8c 6a 8d 4f 0f 9d   h(.'.]...6.j.O..
0070  48 4c 71 ee 0d 57 44 ac e4 1a 15 f6 77 8b ed 4b   HLq..WD.....w..K
0080  5d d1 78 94 67 13 6e fc c7 69 e4 02 41 6b 0a 2e   ].x.g.n..i..Ak..
0090  95 cb 94 9c 84 f6 72 04 b6 05 8c c7 dc d7 5c 79   ......r.......\y
00a0  7b 2a d2 44 92 b3 a1 70 3a 5a c2 42 ba 3d 1f 6d   {*.D...p:Z.B.=.m
00b0  e3 7e 6f 0d 7e dc ba b2 f9 25 4e b2 1e 41 42 07   .~o.~....%N..AB.
00c0  14 8a df e7 37 e3 96 c7 4d 65 c8 83 e3 8a 71 d4   ....7...Me....q.
00d0  86 07 00 2c c7 ed 6d df 1b d1 92 a3 55 9a 1a d3   ...,..m.....U...
00e0  f8 97 9e af f6 85 0d 6d 97 da 5d bb c4 f9 60 bc   .......m..]...`.
00f0  6f ce 7d f3 5b 32 ad 93 b5 2c a8 c6 58 67 2c ee   o.}.[2...,..Xg,.
0100  c0 53 fb 92 05 6d 72 ed c3 d2 3f 70 fc 8e b7 f0   .S...mr...?p....
0110  12 45 6a 67 e3 19 9d 95 12 cd 15 2a 1e 43 98 6f   .Ejg.......*.C.o
```

```
0120  8b 39 10 af 36 a6 4c ff 0c 09 93 98 89 ba 73 b8   .9..6.L.......s.
0130  7a 10 b2 e4 56 03 0c e4 10 00 b2 62 0b a2 ee 1e   z...V......b....
0140  e3 89 9a 81 da fa 92 4e 70 d8 c5 6d 4f 55 d6 61   .......Np..mOU.a
0150  3b ee 67 ee 2a 53 d3 b4 d3 6d f8 f2 3d 57 58 ac   ;.g.*S...m..=WX.
0160  2b 45 36 f0 0d cb a7 c2 0d ee b3 96 c8 48 9f 77   +E6..........H.w
0170  37 61 43 6f 3e 97 eb 6e 59 41 f5 ad 0d 0a 34 67   7aCo>..nYA....4g
0180  06 fd 8c 94 5d 35 92 c2 05 ca b4 92 3e 9e 92 52   ....]5......>..R
0190  e5 d5 12 28 96 60 8d 02 10 f2 67 6e af d5 93 0f   ...(.‘....gn....
01a0  ec 60 c1 0d 78 09 46 cf 89 4e 86 7d 52 c6 d7 8b   .‘..x.F..N.}R...
01b0  a8 51 98 8c 08 df 8c 63 5b 74 2b d4 4f 11 b8 56   .Q.....c[t+.O..V
01c0  08 82 1b 47 3f ea 86 fd be 50 ba b8 8b c0 a8 a4   ...G?....P......
01d0  4b 64 e5 7d c9 52 2f cd 48 a6 18 36 38 76 78 c8   Kd.}.R/.H..68vx.
01e0  04 04 b9 c4 57 de 0b 60 a0 04 10 ef df c3 22 3d   ....W..‘......"=
01f0  73 46 1a 9f 12 76 ef c0 8f 55 dd 6a e1 76 96 56   sF...v...U.j.v.V
0200  2b 06 82 f9 be 11 c2 11 75 d7 b1 f2 f1 e9 b6 64   +.......u......d
0210  29 33 a4 fe 1c 45 12 fe 20 c1 0b 2d 5b 5d 28 56   )3...E.. ..-[](V
0220  a0 01 71 8d d9 ce 92 a8 6d 65 d4 96 d0 c1 c2 0d   ..q.....me......
0230  5a 84 c9 b5 6d 7a 81 64 1b 64 86 dd 06 03 c4 e8   Z...mz.d.d......
0240  03 8c d9 a2 f3 48 11 35 2a 65 b3 11 88 8f 72 1a   .....H.5*e....r.
0250  7b 57 cd e2 3f c2 17 39 20 84 08 eb c6 bd d7 d9   {W..?..9 .......
0260  a8 cd 9d 7c 7a ab 8e d4 5b b6 70 4d a1 0f 7f 08   ...|z...[.pM....
0270  0e 25 40 f1 9b 3b d3 b6 14 7f 8b 04 95 7b 16 81   .%@..;.......{..
0280  4d 04 1e 61 0c 67 76 e2 68 20 1d 69 10 8e 9e 22   M..a.gv.h .i..."
0290  10 22 08 d1 36 78 bb 82 66 96 d4 77 91 45 95 f6   ."..6x..f..w.E..
02a0  95 39 72 c1 bf f8 8b fa 0e af 4b c4 5e f1 fd d1   .9r.......K.^...
02b0  25 e5 1a 24 ef d6 8c 9d f4 cf 3b 24 25 4f ee e0   %..$......;$%O..
02c0  81 57 bb ea 80 02 92 fa 5c 78 ac 68 3c fc 0c 6f   .W......\x.h<..o
02d0  66 67 e9 f6 40 18 60 61 7a 21 0a f0 4b 1a 01 6e   fg..@.‘az!..K..n
02e0  49 ed 13 68 90 45 88 c8 9b 56 9b 60 b9 2f 99 fe   I..h.E...V.‘./..
02f0  17 c1 10 05 9d 58 5e ad 7d 7a e7 b3 97 ce 7d 9a   .....X^.}z....}.
0300  6c 64 4b 69 5c 6c f2 8e 9a 10 3a b6 14 38 0b 67   ldKi\l....:..8.g
0310  c8 e0 15 63 8c dd ac de ec 02 45 77 99 84 ac 99   ...c......Ew....
0320  24 14 ec d6 90 2d de 22 86 c7 49 97 50 79 9c f6   $....-."..I.Py..
0330  ac 0c db 67 1c 5a a5 a4 8d 8f bd f8 bc 16 da cf   ...g.Z..........
0340  eb 05 ca 2e 0e 1c 24 42 39 89 94 be a2 be 1d 84   ......$B9.......
0350  db c8 8c 9d a0 c3 04 4b f9 21 7e be 46 67 c7 62   .......K.!~.Fg.b
0360  5a 83 9b f1 0d 79 84 2e bf 8c 3e 9f 4a 59 8a a5   Z....y....>.JY..
0370  63 ae b7 a2 96 61 1e a5 64 dc 82 7b bc 52 98 50   c....a..d..{.R.P
0380  f9 b1 17 7a 75 b7 b8 ae d3 e2 7b 74 65 58 8a 34   ...zu.....{teX.4
0390  95 f4 5d 62 28 87 11 42 b9 4a ba f7 a3 25 88 ef   ..]b(..B.J...%..
03a0  20 dd 09 61 7a ce 96 c4 2b 11 0c cf 5a 34 4f 42    ..az...+...Z4OB
03b0  e9 6d 97 ec dc 50 6d dd 08 59 17 54 0c da 24 a3   .m...Pm..Y.T..$.
03c0  11 0a 3e e4 3c ad d9 91 71 1b b2 2d 43 08 32 ea   ..>.<...q..-C.2.
03d0  4e 65 21 10 d0 7c 96 92 13 d0 32 62 3d 88 74 a8   Ne!..|....2b=.t.
03e0  6b 63 ac ea 4e a6 e4 7b 0d 06 9e 65 dc d2 78 3b   kc..N..{...e..x;
03f0  6e f2 68 80 10 9e ca 7a 9c d8 54 67 72 53 91 f6   n.h....z..TgrS..
0400  01 39 b7 6d 08 ac b5 b1 a8 26 5f 0f 70 38 52 dc   .9.m.....&_.p8R.
0410  ac 1a dc 83 7c 66 b6 15 f3 04 15 f7 8c 42 f8 c2   ....|f.......B..
0420  1e 4b e0 2d e3 84 81 5a b7 dc 2a 63 a3 66 9a dc   .K.-...Z..*c.f..
0430  db 5d 99 bb 08 86 96 e0 93 b5 1b 20 a7 2f be b0   .]......... ./..
0440  27 43 85 7f 13 5a ea 70 ef e5 cc e5 4b 0b d8 20   'C...Z.p....K..
0450  5f 8d e9 e9 10 4f 82 80 e6 00 90 e1 10 4b ea fc   _....O.......K..
0460  7b 7f a0 c6 de a5 96 f7 34 47 65 ee 1d 42 8b 59   {.......4Ge..B.Y
0470  a0 4c ff eb 11 49 ed f6 f7 cf 76 e9 00 53 d3 32   .L...I....v..S.2
0480  e5 04 94 d4 01 24 81 1f 97 e6 38 c6 3f 19 a4 e5   .....$....8.?...
0490  65 5a f0 ec b2 e9 fd ad 03 15 ff 85 5d a9 13 e0   eZ..........]...
04a0  1d cf 9e 8e 2b c0 c9 72 ed 94 5b 91 8d df 64 61   ....+..r..[...da
04b0  1b 49 2d b9 1d 10 60 e1 89 de 59 9a 08 fa 72 a5   .I-...‘...Y...r.
04c0  e0 0e e8 8e 0b 47 13 47 1e cd 22 82 2a 8a 9c e5   .....G.G.."*...
04d0  11 66 33 b0 72 79 6d 7e 11 ae 4d b8 3d 94 2f fb   .f3.rym~..M.=./.
04e0  14 db 27 40 53 29 1c 0e f9 fb b1 6f 1f b2 de 94   ..'@S).....o....
04f0  31 bb 52 ed 5d 1f 88 29 19 47 99                  1.R.]..).G.
```

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No.     Time        Source                Destination           Protocol Info
    623 1463.890579 E.F.G.H         A.B.C.D           TCP      9988 > mni-prot-rout [ACK] Seq=1 Ack=17086 Win=41984 Len=0

Frame 623 (54 bytes on wire, 54 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: 9988 (9988), Dst Port: mni-prot-rout (3764), Seq: 1, Ack: 17086, Len: 0
    Source port: 9988 (9988)
    Destination port: mni-prot-rout (3764)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 17086    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 41984 (scaled)
    Checksum: 0x54a8 [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    624 1463.911280 A.B.C.D           E.F.G.H         TCP      mni-prot-rout > 9988 [PSH, ACK] Seq=17086 Ack=1 Win=500000 Len=1275

Frame 624 (1329 bytes on wire, 1329 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: mni-prot-rout (3764), Dst Port: 9988 (9988), Seq: 17086, Ack: 1, Len: 1275
    Source port: mni-prot-rout (3764)
    Destination port: 9988 (9988)
    Sequence number: 17086    (relative sequence number)
    [Next sequence number: 18361    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 500000 (scaled)
    Checksum: 0x348c [correct]
    [SEQ/ACK analysis]
Data (1275 bytes)

0000  19 2d 02 97 60 0e 4d 1b 21 4b f4 3d 33 1c 94 7b   .-..‘.M.!K.=3..{
0010  0b 54 f8 20 af 13 dc 08 f9 4e 2e 03 8d ec 8b de   .T. .....N......
0020  8d ec be 29 f3 aa 52 76 10 11 8f 6a d9 88 9e de   ...)..Rv...j....
0030  16 95 ec bd 34 69 d1 69 30 a8 54 72 8b 13 d3 43   ....4i.i0.Tr...C
0040  8c d3 57 da e4 22 a4 62 76 7e 64 d2 64 d3 4f 95   ..W..".bv~d.d.O.
0050  96 1d e6 b2 a0 1d 09 71 3f 07 7c 29 16 f8 0b fb   .......q?.|).....
0060  8f 05 28 c9 85 62 44 ce 8e 7d 34 fe ac 25 bc 1b   ..(..bD..}4..%..
0070  71 c8 3d ca a7 9b c4 c8 5e 94 3f 63 76 0a 82 52   q.=.....^.?cv..R
0080  f6 09 f2 db f0 da 0c e8 99 76 76 8e 89 6a 2d da   .........vv..j-.
0090  78 09 23 20 f3 f0 bd 5a ea 70 45 1a f3 4d 24 93   x.# ...Z.pE..M$.
00a0  ed 94 43 be 11 ec f8 98 7b c2 0a d4 1f 52 79 80   ..C.....{....Ry.
00b0  ec 08 a9 12 d4 5c a3 b8 ac 09 9d 92 84 9c 04 4b   .....\.........K
00c0  f6 1e ff f7 88 b9 76 8c ec a7 df 49 0a be 83 f0   ......v....I....
00d0  ee 68 fd 8b 72 30 2e 93 d1 f0 e6 cd b4 ad dd 51   .h..r0.........Q
00e0  78 e7 1f 6d 72 e4 8d be 0b 3d a6 39 4d 8a 96 6d   x..mr....=.9M..m
00f0  31 fa 3b fc 7c 52 56 76 31 01 7b 1a 81 1a 2d 3a   1.;.|RVv1.{...-:
0100  cd 8c 24 04 be f1 db 0a 57 82 e6 52 f3 8b e5 b3   ..$.....W..R....
0110  40 e8 53 8d cf 93 41 16 f6 4b ad ed 91 76 3f ab   @.S...A..K...v?.
0120  0c 68 65 53 6e b8 65 e9 6c 83 61 ce 90 a9 d5 74   .heSn.e.l.a....t
0130  ab b4 65 da e7 38 50 72 58 1b f4 40 cf 20 6a d8   ..e..8PrX..@. j.
0140  8a 85 61 9f 94 0d e7 be c7 6c 95 74 92 bd 26 b9   ..a......l.t..&.
0150  ea f0 ef d9 78 37 41 de 11 bb 00 5e 0d d6 e3 e4   ....x7A....^....
0160  bd c5 02 d6 46 a2 d5 82 9f 67 33 b4 18 81 eb 56   ....F....g3....V
0170  ba 1c d4 ed 79 e9 36 f5 4e 1f ce be 5a 86 1e 3b   ....y.6.N...Z..;
0180  ef 6c 54 12 2b 17 cc 51 e0 4d fe df 39 0a 92 d5   .lT.+..Q.M..9...
0190  ee f7 74 d5 16 5d 70 00 51 59 26 32 59 19 db c9   ..t..]p.QY&2Y...
01a0  63 5d 3c bd a2 f3 9e c4 a8 1e eb 60 34 5a ec ea   c]<........‘4Z..
```

```
01b0  ca 58 d7 af 46 10 00 d4 ee e4 fd 2e 22 c1 74 80   .X..F.......".t.
01c0  60 34 2a cc 6f a7 02 23 c5 23 11 ef 93 5f 61 bb   `4*.o..#.#..._a.
01d0  80 be 13 8c 19 a2 25 e1 82 48 93 93 c6 cc 51 88   ......%..H....Q.
01e0  cf 04 8c 08 6a 4e 4b 35 d4 d4 62 0b 52 1c d7 bd   ....jNK5..b.R...
01f0  9f 7a 49 a6 e0 fd b6 0b 16 09 2e 52 ca f0 c3 d3   .zI........R....
0200  b6 e1 df ed 4b d2 1a ec e6 22 fa ec 82 14 be 92   ....K....".......
0210  e2 0e b2 b9 b4 78 42 0b 8e 98 a8 ac 5e 25 ca 69   .....xB.....^%.i
0220  87 9b 7e e7 16 63 0d 83 75 4b db 6e c5 ec 84 25   ..~..c..uK.n...%
0230  72 5e 73 71 fb 27 4c fb f1 0f 53 e4 f9 7d 08 3a   r^sq.'L...S..}.:
0240  c1 07 4e de 53 e2 cc fa 37 95 2f 62 63 2e 3b 1f   ..N.S...7./bc.;.
0250  cc b2 ce e3 65 0b 83 9e 5d ba 9a c0 13 6c 26 d3   ....e...]....l&.
0260  ef 54 40 89 2f 38 b9 83 f8 01 48 b6 e8 c6 44 d5   .T@./8....H...D.
0270  f0 ef 87 45 ac fe 10 79 f4 c3 f6 e8 fb 3e ae a4   ...E...y.....>..
0280  c1 94 c5 64 18 14 32 22 07 23 6f af ea 1f c5 bd   ...d..2".#o.....
0290  0b 1c 32 8a 90 85 87 05 18 23 e0 0a fe f0 27 47   ..2......#....'G
02a0  8e e0 0f 07 bd 08 65 c3 db bb 8b f9 99 6d 2a 03   ......e......m*.
02b0  c0 bd 9a 29 c4 17 12 30 42 f0 61 a5 e0 ee d3 c9   ...)...0B.a.....
02c0  bf 62 df 17 cc b9 79 68 a1 a1 4b ab 8d b8 c8 9e   .b....yh..K.....
02d0  7f 43 dc 3f e8 47 29 8a c6 88 04 ea 7a 8b 22 25   .C.?.G).....z."%
02e0  91 4b 5f 08 6f cd 0b 7a 7c cd 60 84 f7 d0 dd 3c   .K_.o..z|.`....<
02f0  41 6c 72 b7 b2 e0 a8 50 e3 b5 0a ce 81 5c 54 40   Alr....P.....\T@
0300  35 0f fc 8a c4 da e7 49 4d bb 06 c7 ec ff eb 96   5......IM.......
0310  0f c7 ee c3 ca 74 c9 1a 7e 2e 96 d5 86 dd 2e da   .....t..~.......
0320  8e 03 67 10 33 5f f4 33 b6 da 02 67 fc 91 d3 4d   ..g.3_.3...g...M
0330  7f df dc de 05 f6 9a 87 8e 40 e2 1d 62 6f d0 f8   .........@..bo..
0340  eb 82 50 1e ea 1b 55 65 f0 a6 ed a5 e6 3d ba 64   ..P...Ue.....=.d
0350  4b 6e 39 da 63 89 07 1e 72 1b 65 c9 22 9d 4e 30   Kn9.c...r.e.".N0
0360  6d 24 94 64 d7 bb a4 99 fe e8 04 98 34 e6 6f 3a   m$.d........4.o:
0370  8c eb 26 3f 1e 3f d5 13 0b 4b 24 de bc 65 ae 53   ..&?.?...K$..e.S
0380  a8 78 fa f2 dd 52 ef 55 94 58 30 6a ed ee f3 6a   .x...R.U.X0j...j
0390  1c 78 02 bb b0 f0 6d 99 4e 67 0d 39 84 b0 17 f2   .x....m.Ng.9....
03a0  b5 bc 52 8d 86 2f e5 36 62 5b 26 b9 e5 1c 65 39   ..R../.6b[&...e9
03b0  56 3a 37 82 09 1a c0 8b e9 bb f2 d8 8c 39 47 b5   V:7..........9G.
03c0  a2 5c 63 70 e4 f6 8c e0 06 81 a6 08 25 29 36 c6   .\cp........%)6.
03d0  1f 15 2c 69 f3 c9 ed ad 7f 5f a3 0f e1 16 0e 1a   ..,i....._......
03e0  81 08 36 c6 e9 9d fd 4c 74 e2 2e 95 0e 64 ce 07   ..6....Lt....d..
03f0  1d d3 f2 df 19 c1 0d 78 e4 70 44 d8 0c 21 62 88   .......x.pD..!b.
0400  cc 49 0a 94 76 46 80 72 5f cc c3 89 ee f4 bc d8   .I..vF.r_.......
0410  1a 1a 58 bb ba e1 57 73 f4 70 52 cb 14 3c ce 5c   ..X...Ws.pR..<.\
0420  6b 70 4b b9 fe 3a f3 4b c4 05 8d ab 83 7f 5c f3   kpK..:.K......\.
0430  ca 21 64 81 ce cf 8b e4 05 3a 59 68 76 cd aa 5a   .!d......:Yhv..Z
0440  64 e5 93 5f 24 e1 5b 3e 75 0f 6b 53 87 f7 29 f9   d.._$.[>u.kS..).
0450  97 ff c3 8c f4 fb 56 45 b6 e3 19 1e 65 f9 db f0   ......VE....e...
0460  86 e6 cd c7 fe 63 c5 8d e7 67 4c 68 b3 0a af 38   .....c...gLh...8
0470  6e 36 4a c6 e5 ad 58 b1 15 16 90 23 f2 4a 07 02   n6J...X....#.J..
0480  89 ba 90 84 15 b3 ca 51 af 20 52 3e e8 98 d2 10   .......Q. R>....
0490  e0 19 00 13 ea 9f 0f ef 11 a4 69 0d ab e4 b4 14   ..........i.....
04a0  d6 0c 34 92 0d 0d ac 5b aa 33 fd 8d 9f 1d 71 33   ..4....[.3....q3
04b0  23 e8 bb 2c ea ce 3a dc 85 1c 7f ab dc 99 7f ee   #..,..:.........
04c0  f7 93 c2 1f a6 5a 7d 42 93 27 a4 17 e4 29 47 71   .....Z}B.'...)Gq
04d0  07 51 f6 86 93 17 b0 e3 cf ed b9 01 56 75 00 71   .Q..........Vu.q
04e0  2d bd 6d 8a 4d dd f0 11 b1 05 a4 28 de 0c 7b 56   -.m.M......(..{V
04f0  ed 3d ca ab 05 ad f4 12 42 1e 4e                  .=......B.N
```

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No.     Time        Source                Destination           Protocol Info
    625 1463.911286 E.F.G.H         A.B.C.D           TCP      9988 > mni-prot-rout [ACK] Seq=1 Ack=18361 Win=44928 Len=0

Frame 625 (54 bytes on wire, 54 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: 9988 (9988), Dst Port: mni-prot-rout (3764), Seq: 1, Ack: 18361, Len: 0
    Source port: 9988 (9988)
    Destination port: mni-prot-rout (3764)
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    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 18361    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 44928 (scaled)
    Checksum: 0x4f96 [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    626 1463.919023 A.B.C.D           E.F.G.H         TCP      mni-prot-rout > 9988 [PSH, ACK] Seq=18361 Ack=1 Win=500000 Len=255

Frame 626 (309 bytes on wire, 309 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: mni-prot-rout (3764), Dst Port: 9988 (9988), Seq: 18361, Ack: 1, Len: 255
    Source port: mni-prot-rout (3764)
    Destination port: 9988 (9988)
    Sequence number: 18361    (relative sequence number)
    [Next sequence number: 18616    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 500000 (scaled)
    Checksum: 0xcd3b [correct]
    [SEQ/ACK analysis]
Data (255 bytes)

0000  a8 e2 01 72 96 d6 9e 05 b6 c7 30 d6 be 2e 38 22   ...r......0...8"
0010  86 d4 00 5f 8e ea 08 c0 d9 ea 08 ee aa 6e f4 22   ..._.........n."
0020  3a d4 b4 5f c6 ea 48 c0 d9 b2 39 1e 0a 86 d0 22   :._..H...9....."
0030  fe 8e 2a 2a 83 96 14 32 1c a5 60 67 e6 76 98 8e   ..**...2..`g.v..
0040  1e 82 90 74 16 ff 88 4a 0e 60 5b de bb 7a 8c 7a   ...t...J.`[..z.z
0050  0c 2c 58 40 0a de d2 e2 82 73 a8 40 bb 52 88 fe   .,X@.....s.@.R..
0060  52 5a 7c 86 a8 22 01 8e 96 2a 9e 05 4a c7 cc d6   RZ|.."...*..J...
0070  42 2e c4 22 7a d4 fc 5f 72 ea 5c ef fc 16 14 b2   B.."z.._r.\.....
0080  1c a5 e0 67 66 5e 4d 58 58 ff 50 4a fe 4f 0a 26   ...gf^MXX.PJ.O.&
0090  c8 e0 74 5f c6 ea 40 c0 d9 92 32 5a b0 b2 00 40   ..t_..@...2Z...@
00a0  da 60 5b 56 bb f2 88 66 52 c2 7c 6e a8 ca 03 9a   .`[V...fR.|n....
00b0  a8 d2 01 7e 96 da 9e 12 5e b2 d8 ef 9c 5a 14 fe   ...~....^....Z..
00c0  1c a5 ac 67 2a 76 b0 8e 3a 82 c8 74 06 ff 8c 4a   ...g*v..:..t...J
00d0  02 60 5b e2 bb 2e 88 8a 52 4a be 76 f7 fe 26 a1   .`[.....RJ.v..&.
00e0  4a 96 9e a7 64 f7 2d 84 a0 f7 17 9a ff da 31 da   J...d.-.......1.
00f0  0a f7 53 f7 fc 02 58 17 51 c8 d3 af 5c ab eb      ..S...X.Q...\..

No.     Time        Source                Destination           Protocol Info
    627 1463.919029 E.F.G.H         A.B.C.D           TCP      9988 > mni-prot-rout [ACK] Seq=1 Ack=18616 Win=47488 Len=0

Frame 627 (54 bytes on wire, 54 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: 9988 (9988), Dst Port: mni-prot-rout (3764), Seq: 1, Ack: 18616, Len: 0
    Source port: 9988 (9988)
    Destination port: mni-prot-rout (3764)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 18616    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 47488 (scaled)
    Checksum: 0x4e83 [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    628 1463.946512 A.B.C.D           E.F.G.H         TCP      mni-prot-rout > 9988 [PSH, ACK] Seq=18616 Ack=1 Win=500000 Len=1275
```

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Frame 628 (1329 bytes on wire, 1329 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: mni-prot-rout (3764), Dst Port: 9988 (9988), Seq: 18616, Ack: 1, Len: 1275
    Source port: mni-prot-rout (3764)
    Destination port: 9988 (9988)
    Sequence number: 18616    (relative sequence number)
    [Next sequence number: 19891    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 500000 (scaled)
    Checksum: 0x9ff5 [correct]
    [SEQ/ACK analysis]
Data (1275 bytes)

0000  87 39 fb 27 a5 ae 35 b7 70 9e d7 d3 08 8a ef c8   .9.'..5.p.......
0010  2a 22 7b 63 9b 14 87 38 56 17 bd bb 27 2a 7b 0e   *"{c...8V...'*{.
0020  c6 97 a6 55 69 5b 25 25 0a 50 ea 23 d9 8a 7a d9   ...Ui[%%.P.#..z.
0030  28 1b e9 eb e3 3b 2e 9b a7 99 3b bc 2d b7 a6 b5   (....;....;.-...
0040  0f 56 ae 68 49 39 9a 33 56 bd 9a 7c 17 35 a8 da   .V.hI9.3V..|.5..
0050  3e 5f 5f 08 df 73 73 62 1f 03 42 15 7c 27 1f 76   >__..ssb..B.|'.v
0060  3f be 77 32 fc d5 5a 0f b2 64 3c 3f 8f 1c a4 5d   ?.w2..Z..d<?...]
0070  39 f3 c1 33 5b a5 50 0f 50 ff 1b 8a ec ce 12 6b   9..3[.P.P......k
0080  2e 8b f4 88 e0 17 d2 5c 27 20 cb d9 2d 68 87 b0   .......\' ..-h..
0090  61 4d b9 bf c7 d1 d5 01 3d c0 c3 e5 27 6b fd e5   aM......=...'k..
00a0  0a 5e cb 84 63 df c1 a2 d9 fb df a3 94 e1 c8 d1   .^..c...........
00b0  2e 37 98 79 17 71 93 f1 79 28 56 f9 0e 61 eb 15   .7.y.q..y(V..a..
00c0  d4 f0 14 f0 d0 74 82 a0 66 0f e7 f0 d3 c1 e1 c0   .....t..f.......
00d0  c4 71 6d 38 54 9c a2 fa cf a9 63 bc 1f f2 ac ac   .qm8T.....c.....
00e0  42 64 22 90 40 72 5e f3 0d f0 8a bb a9 77 88 ff   Bd".@r^......w..
00f0  12 be 20 24 7e 1f b6 70 86 12 85 35 f7 1f 83 3e   .. $~..p...5...>
0100  4c ce 53 6d d0 f2 36 7c ae 33 d0 af 17 f6 a6 72   L.Sm..6|.3.....r
0110  60 f2 17 f9 0c d6 c1 37 18 f2 a3 49 70 87 8c 98   `.......7...Ip...
0120  38 72 c4 f3 0d ee a5 01 db 8c 1a a3 6b 0d 13 4c   8r..........k..L
0130  c3 ed 65 e2 60 87 35 4a bf 6a 0a a3 f0 71 a3 1d   ..e.`.5J.j...q..
0140  72 6b d4 36 d9 b3 13 0c d4 d8 46 2c 87 e9 4a b8   rk.6......F,..J.
0150  fb bc a5 60 b2 96 74 4f 33 72 50 b0 1c ef f2 18   ...`..tO3rP.....
0160  a2 ae da 4e cf d4 1e 17 3c 26 d3 df 80 e9 12 38   ...N....<&.....8
0170  56 92 13 15 56 6c ec 01 b1 a7 c8 e0 4e 71 af 11   V...Vl......Nq..
0180  d3 93 65 d8 47 ee fd 79 42 e9 f9 2c 8d 95 d0 a6   ..e.G..yB..,....
0190  57 b1 ea 19 0a 9f 12 23 97 ef ed 9e 8c 92 65 da   W......#......e.
01a0  04 5d ea f3 8d be 34 ce 93 a8 12 9d 09 53 64 27   .]....4......Sd'
01b0  85 b7 df 86 58 d8 b1 9d e2 ec 55 f7 25 93 e3 92   ....X.....U.%...
01c0  4f 72 ca bc 50 6a 39 21 54 d0 ea ae 59 81 27 02   Or..Pj9!T...Y.'.
01d0  a6 9c e5 38 b2 9e ff 28 05 19 1f 1a 01 0d 8c 22   ...8...(.......".
01e0  fa 70 94 dd 5c e1 97 04 c8 da ab d9 c5 2e 84 3a   .p..\..........:
01f0  d5 bc 84 33 4a ce eb 99 c8 58 93 16 12 1b d1 b7   ...3J....X......
0200  25 73 d8 0c 37 71 29 6a 41 8b 6e 4d a1 c5 fa f3   %s..7q)jA.nM....
0210  5d 12 0e b3 d4 12 1f df 3c 5a 64 e8 7d 8b 95 3e   ].......<Zd.}..>
0220  99 ac b5 3d d6 1f 65 f8 47 fc b6 34 b6 5a 17 ad   ...=..e.G..4.Z..
0230  74 9c f9 05 66 11 d5 a9 ae 92 f2 36 76 b9 e4 08   t...f......6v...
0240  9a e9 6b 84 9e bb 17 1c 5e 42 65 84 2a 32 61 fc   ..k.....^Be.*2a.
0250  4e f8 32 16 37 28 9e 07 d7 8a 6e c8 7f 5c 2e 50   N.2.7(....n..\.P
0260  38 dc c6 38 8a 7d fd 3a 5e b4 0f 6f 2b 18 b8 93   8..8.}.:^..o+...
0270  a3 c7 9b 7d 56 f3 ef 58 c8 50 0f ec 6b 12 82 c0   ...}V..X.P..k...
0280  87 72 af 1b c4 ee a9 d0 1c e6 fa 4d c1 7c ee 10   .r.........M.|..
0290  24 50 5c 7c 84 a7 35 fa f6 48 39 92 4e b8 88 d2   $P\|..5..H9.N...
02a0  8e 7e 6e 12 c0 23 d8 31 32 bb cf 62 62 bd ec 7e   .~n..#.12..bb..~
02b0  ab 2f 15 48 08 dc ee 90 f8 39 00 57 02 36 8d 8c   ./.H.....9.W.6..
02c0  b9 89 0f 33 26 9f a9 17 c1 d6 b7 57 cd cf e7 e1   ...3&......W....
02d0  62 0f 2c e9 06 b0 e0 07 af d8 c5 84 b2 d5 ac 20   b.,............
```

```
02e0  4c a5 a4 39 68 8a e5 90 62 de e2 3a 5c 8b e3 10   L..9h...b..:\...
02f0  56 1e a4 1e 33 1e a4 1f 57 66 e7 39 4e 8a 14 90   V...3...Wf.9N...
0300  4f de 0e 3a 4c 8b 38 10 4d 1e a4 cc 67 96 f6 d2   O..:L.8.M...g...
0310  ce 97 a2 d8 64 94 f7 ae 4e 95 62 5a ea bb f6 08   ....d...N.bZ....
0320  e4 12 f7 5c de b8 f4 09 c8 92 f5 9c 04 1e c7 0c   ...\............
0330  56 e0 6e 0d 02 ea c4 0e 57 fc ee 0f c2 d8 ba 39   V.n.....W......9
0340  5e 8a b4 90 5f de ae 3a 5c 8b d8 10 5d 1e a4 2c   ^..._..:\...]..,
0350  67 86 f6 32 ce 87 a2 38 64 84 f7 0e 4e 85 62 5a   g..2...8d...N.bZ
0360  4a bb c6 08 44 12 c7 5f be 92 76 3a ce 74 a2 3b   J...D.._..v:.t.;
0370  64 7e f7 3c 4e 40 62 5a 63 bb 36 08 60 12 20 5c   d~.<N@bZc.6.`. \
0380  61 b8 5a 09 6e 92 54 9c 04 b3 c7 b0 56 b0 6e 86   a.Z.n.T.....V.n.
0390  02 b1 c4 8c 57 b6 ee 92 c2 d8 cb 39 c6 8b c8 05   ....W......9....
03a0  ad e3 32 37 41 a5 94 39 76 85 8d 88 77 15 82 d0   ..27A..9v...w...
03b0  74 dd bb fc 75 b9 b0 ea 72 8b a9 e1 73 92 ae e4   t...u...r...s...
03c0  70 1e 98 59 04 ad d9 22 67 a2 f9 2b d6 a3 69 34   p..Y..."g..+..i4
03d0  8e a0 a1 3d a2 a1 c5 06 b4 a6 f7 0f bf a7 ee 08   ...=............
03e0  ba a4 62 66 4f d8 d9 56 f7 14 c2 9a 85 d7 50 49   ..bfO..V......PI
03f0  74 5e ef a5 dc 92 e4 1c 3b 1f e2 9c 0e 14 77 80   t^......;.....w.
0400  64 38 a2 b4 f0 13 26 0a 8c be 32 5c 82 1d 88 08   d8....&...2\....
0410  a4 1c c4 f4 03 6c 25 2a 67 90 ef 0c 62 84 ae 30   .....l%*g...b..0
0420  d7 a8 c4 24 02 dc ab 91 12 88 bd 3c 24 d2 8f 89   ...$.......<$...
0430  36 b8 91 5c 38 1f 6f 94 54 09 c2 82 0e 3b 77 b0   6..\8.o.T....;w.
0440  6d 35 66 61 98 c9 46 f0 64 93 14 5c ba 9c 4f 90   m5fa..F.d..\..O.
0450  56 0b ef 02 64 be a2 36 7e 13 a4 0a 0a be b0 50   V...d..6~......P
0460  26 0b 8c 3a 32 de 98 90 cf 08 f4 84 62 3c ae a8   &..:2.......b<..
0470  d7 20 c4 dc 02 54 3e 92 21 5a ef dc d6 7f a9 3f   . ...T>.!Z.....?
0480  f5 f8 64 28 5e 63 12 9a 27 4e 76 a6 52 b7 b6 dc   ..d(^c..'Nv.R...
0490  3c b5 85 ee 2d 16 4b 00 53 f6 9b 0c 95 44 5e 8d   <...-.K.S....D^.
04a0  3f 44 e0 5e ae 6c 13 30 d8 9e 58 e2 b8 dc 79 69   ?D.^.l.0..X...yi
04b0  8d dc 3d 33 d9 c3 2d 07 fe 3b f4 8c af f8 2d 08   ..=3..-..;....-.
04c0  cb 70 d3 33 92 d8 49 57 1f e9 70 92 0c 03 cc 68   .p.3..IW..p....h
04d0  1e a1 9b 9e 0d 6e 41 02 4c 0e 0e 26 5c 5e 85 42   .....nA.L..&\^.B
04e0  64 9e 7a 03 be 83 62 4d 03 78 3c 70 65 bf f6 57   d.z...bM.x<pe..W
04f0  e2 4e 8c b2 32 94 d4 03 6e bf 6d                  .N..2...n.m

No.     Time        Source                Destination           Protocol Info
    629 1463.946517 E.F.G.H         A.B.C.D           TCP      9988 > mni-prot-rout [ACK] Seq=1 Ack=19891 Win=50432 Len=0

Frame 629 (54 bytes on wire, 54 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: 9988 (9988), Dst Port: mni-prot-rout (3764), Seq: 1, Ack: 19891, Len: 0
    Source port: 9988 (9988)
    Destination port: mni-prot-rout (3764)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 19891    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 50432 (scaled)
    Checksum: 0x4971 [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    630 1463.967123 A.B.C.D           E.F.G.H         TCP      mni-prot-rout > 9988 [PSH, ACK] Seq=19891 Ack=1 Win=500000 Len=1275

Frame 630 (1329 bytes on wire, 1329 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: mni-prot-rout (3764), Dst Port: 9988 (9988), Seq: 19891, Ack: 1, Len: 1275
    Source port: mni-prot-rout (3764)
    Destination port: 9988 (9988)
    Sequence number: 19891    (relative sequence number)
    [Next sequence number: 21166    (relative sequence number)]
```

```
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 500000 (scaled)
    Checksum: 0xd49d [correct]
    [SEQ/ACK analysis]
Data (1275 bytes)

0000  07 0d 27 56 99 2f 17 e2 1a 38 99 db 9b b8 96 e9   ..'V./...8......
0010  9d 55 cd 6d c7 6a 98 20 12 17 cc 7f f5 e8 38 b3   .U.m.j. ......8.
0020  ca c6 96 8c 38 ba ce 7c ea cf 8d 5d ce d7 e2 ef   ....8..|...]....
0030  ba 6c 8a cf c3 02 e0 24 cd b2 a3 22 da 77 aa ed   .l.....$..."..w..
0040  08 e8 6e 54 1f 5a da f2 81 f3 29 12 82 de 1e be   ..nT.Z....).....
0050  02 fd c4 f8 aa f6 19 d0 5d 3b 80 a9 3f 19 c3 e2   ........];..?...
0060  ab dc 20 e9 4b c5 60 fc 51 65 ee b7 4b 5c b2 a0   .. .K.`.Qe..K\..
0070  eb 9f 14 42 79 0b 82 6f 19 29 ef 13 1d e9 71 d4   ...By..o.)....q.
0080  34 65 b9 6c 22 49 1c 5e 0c 59 1b b1 c0 cf 8b 5e   4e.l"I.^.Y.....^
0090  1e a8 0f 36 70 65 2b 17 ea 0d a8 81 9a a4 60 d4   ...6pe+.......`.
00a0  5c e0 c9 7f ff d4 c4 2a d0 56 fa 91 91 35 3a fa   \.......*.V...5:.
00b0  55 e2 17 23 b0 ae ba d1 c5 a1 ca a3 4d 0e 95 b1   U..#........M...
00c0  a4 3d 6b 9f 6d 62 c9 97 bd 5d d0 c3 71 17 09 47   .=k.mb...]..q..G
00d0  80 81 da f2 f9 50 a4 22 0c 07 8a d4 4d 4d 9b 15   .....P."....MM..
00e0  3b 03 fd b6 05 42 13 4d 39 8b 75 67 10 b8 46 5c   ;....B.M9.ug..F\
00f0  80 4e d8 e0 14 30 ce d4 08 d7 ce 25 62 52 ad b0   .N...0.....%bR..
0100  4f be 12 c1 14 f4 9c ae 19 56 5b 0f 1b c5 7b d9   O........V[...{.
0110  83 58 6e b0 27 58 d8 07 f7 cb 8e 2e 92 71 13 b6   .Xn.'X.......q..
0120  14 40 5b 07 1b 77 a4 df 52 53 e9 e9 37 61 8e 6a   .@[..w..RS..7a.j
0130  a7 65 13 9f 52 d4 15 10 f0 3a 87 29 97 17 1f e5   .e..R....:.)....
0140  c8 18 ab f1 a1 1a 95 ef 33 0b 5e bf 04 13 92 dd   ........3.^.....
0150  e3 58 e8 87 2a 51 ef 96 81 c6 c5 6b 64 69 98 fe   .X..*Q.....kdi..
0160  ae 34 44 cd 14 84 82 6d f0 09 06 c4 b9 be 33 02   .4D....m......3.
0170  fa 60 96 53 34 06 38 43 0b a9 52 26 27 7d 50 32   .`.S4.8C..R&'}P2
0180  6b ca ba 55 70 45 b8 cc 09 34 8c 0d c4 f8 fd 31   k..UpE...4.....1
0190  8c 41 60 82 0f 1d 36 14 ce 91 e9 e5 f5 40 46 a2   .A`...6......@F.
01a0  5d 56 1b 37 00 8c 1c c2 47 18 d7 bc 9a 41 86 b1   ]V.7....G....A..
01b0  c1 07 0c 8c 9f ea 17 38 29 78 9d 51 ec 29 24 d3   .......8)x.Q.)$.
01c0  d4 7b 8c e5 87 3b 02 de 6b 4b d0 5c 52 c1 b1 1e   .{...;..kK.\R...
01d0  a1 c4 7e 0d 13 fe e2 6e 15 b7 23 1b c4 aa 61 a3   ..~....n..#...a.
01e0  18 df c8 5c 78 61 10 a7 b6 e4 ac 19 42 dc 32 63   ...\xa......B.2c
01f0  d9 b2 87 eb 39 64 26 3d 0a 94 6e 02 2b ff f1 f0   ....9d&=..n.+...
0200  13 c1 07 9b f9 b5 31 b9 3a d5 5c f6 91 f1 18 66   ......1.:.\....f
0210  22 8d 49 c8 8c 54 65 35 9f 89 f1 82 2f 03 9e 5a   ".I..Te5..../..Z
0220  8c 8e cc b6 16 2a 6b a3 0c 41 e0 f2 99 54 78 19   .....*k..A...Tx.
0230  80 f2 6e e5 d5 2c 12 34 11 ca 13 c8 1c cc 98 7c   ..n..,.4.......|
0240  10 63 3e ff 55 5a 7a da 59 47 52 ab 80 72 96 76   .c>.UZz.YGR..r.v
0250  b8 9f 8a 67 4c a7 81 b3 9b da 9f ac 1a 36 d6 27   ...gL........6.'
0260  f2 5e 3d a9 85 16 d3 0f 62 ec 5a d2 61 1e 88 4e   .^=.....b.Z.a..N
0270  1e ea d8 2c 1e 4e 63 8a 08 04 d5 e2 3e 95 88 8c   ...,.Nc.....>...
0280  49 62 e2 aa 0a 0e d3 ea 20 5f f0 a6 22 ee ba b2   Ib...... _.."...
0290  a8 57 72 8d 16 23 48 c5 05 5a 15 11 c8 5b d4 16   .Wr..#H..Z...[..
02a0  13 ff 68 56 48 ed 17 72 09 4f e2 42 72 91 aa 0e   ..hVH..r.O.Br...
02b0  d9 a6 f2 e1 3f d8 95 ff 13 12 6b 7c 30 6e 07 fc   ....?.....k|0n..
02c0  5d 65 85 b9 d7 b1 4b f2 d4 2e a2 7e 0b f2 ba af   ]e....K....~....
02d0  9c 44 cc c2 af 81 24 c4 ca 94 4e ee bb 4a 3a 5b   .D....$...N..J:[
02e0  0b 52 91 2c 7e 93 d2 b4 e4 5c be c5 17 25 6d 34   .R.,~....\...%m4
02f0  2d be 62 de 12 4e 22 3e 98 cb 16 ee c3 36 ba aa   -.b..N">.....6..
0300  3c a9 45 a3 d9 a4 8b 54 18 6e 95 74 92 fd 03 ca   <.E....T.n.t....
0310  e8 0f 80 51 7c d5 60 48 5c ba b8 5a 1c be db 08   ...Q|.`H\..Z....
0320  d6 fb 5b e1 b0 78 5a f0 c8 61 34 c7 12 79 db 08   ..[..xZ..a4..y..
0330  1d b2 bc fc 7c 99 09 0f b6 56 6a 6e d8 57 66 e2   ....|....Vjn.Wf.
0340  b7 49 e6 13 95 8e 9b 04 f9 41 3a c1 b6 04 83 a4   .I.......A:.....
0350  c7 66 99 62 02 9d fe 75 e5 64 34 12 0a 9b 5b bd   .f.b...u.d4...[.
0360  e8 16 34 cc de c1 c8 a1 cf 02 78 04 70 4a bd 48   ..4.......x.pJ.H
```

```
0370  08 52 0a 39 90 45 bb fc 0a 65 ae 3b 3a e8 62 f7   .R.9.E...e.;:.b.
0380  d0 44 6e c6 0b 00 aa 4e 89 d4 3a 04 65 a6 4a c1   .Dn....N..:.e.J.
0390  b6 67 95 d9 50 bf 50 16 02 0c 14 52 2d 64 34 1a   .g..P.P....R-d4.
03a0  09 8a 98 1e 38 47 0f a0 e5 f0 32 8e b6 5c 8c c1   ....8G....2..\..
03b0  1c e8 90 c2 3a 99 99 ee 02 0c 14 52 2d 64 34 16   ....:......R-d4.
03c0  09 96 98 1a 38 9e 02 66 71 f5 8b c6 b6 2e 9d c1   ....8..fq.......
03d0  b6 56 83 76 c7 d4 ca 6e 02 d3 14 8e 2d e8 de 12   .V.v...n....-...
03e0  3a 92 9e 16 5b e9 6d a2 d5 62 4d a0 fa a6 96 c1   :...[.m..bM.....
03f0  99 e8 8e ef 10 99 99 64 09 5c b9 d5 b2 04 34 c7   .......d.\....4.
0400  e0 56 42 c4 ec 61 2b bd 32 2b 25 ae b6 5c 8b c1   .VB..a+.2+%..\..
0410  1c e8 95 c1 f1 df 5c 16 51 5c cc 68 2d c2 34 a4   ......\.Q\.h-.4.
0420  e4 66 46 a2 e0 f8 8c 31 44 cf fe b3 15 e8 8c c1   .fF....1D.......
0430  1a e8 90 f4 09 99 99 91 dd 0e 22 4e f8 ca e8 c4   ..........."N....
0440  39 d6 f1 18 5e a2 9e 75 69 de 67 d9 d0 ae 5a 68   9...^..ui.g...Zh
0450  5b 3f 3c 61 e1 aa 82 c7 08 4e 2e af b6 62 6a ba   [?<a.....N...bj.
0460  70 03 a0 70 13 84 ca 8e f2 86 9b 84 3d 58 6c 63   p..p........=Xlc
0470  08 43 52 fd 46 0a 6e a0 c2 e7 8b da d0 65 4e e8   .CR.F.n......eN.
0480  19 06 29 ae d8 17 93 ea 0f c3 7f 1e 95 76 3b 47   ..).........v;G
0490  24 55 46 d6 a6 47 cb bc 39 18 bc a2 16 74 88 f1   $UF..G..9....t..
04a0  8a ba ac 84 b9 c2 a6 b5 a8 b6 98 e7 b2 81 2c 0f   ..............,.
04b0  0c 05 8e c7 14 1a dc 22 1c 1b 8a c9 ce 2c 52 3e   .......".....,R>
04c0  d8 15 8e a2 1a cb c3 0a 00 c7 8b 00 b9 9e 31 c5   ..............1.
04d0  d8 44 52 1d cb a1 af 82 cc 26 7c 2b f9 00 bb 4a   .DR......&|+...J
04e0  f0 ca 92 30 1f 71 59 33 89 fa 19 61 15 93 26 8c   ...0.qY3...a..&.
04f0  d0 96 5b 0b 0c 1c 74 d3 7c a2 fa                  ..[...t.|..

No.     Time        Source                Destination           Protocol Info
    631 1463.967129 E.F.G.H         A.B.C.D           TCP      9988 > mni-prot-rout [ACK] Seq=1 Ack=21166 Win=53376 Len=0

Frame 631 (54 bytes on wire, 54 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: 9988 (9988), Dst Port: mni-prot-rout (3764), Seq: 1, Ack: 21166, Len: 0
    Source port: 9988 (9988)
    Destination port: mni-prot-rout (3764)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 21166    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 53376 (scaled)
    Checksum: 0x445f [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    632 1463.974370 A.B.C.D           E.F.G.H         TCP      mni-prot-rout > 9988 [PSH, ACK] Seq=21166 Ack=1 Win=500000 Len=255

Frame 632 (309 bytes on wire, 309 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: mni-prot-rout (3764), Dst Port: 9988 (9988), Seq: 21166, Ack: 1, Len: 255
    Source port: mni-prot-rout (3764)
    Destination port: 9988 (9988)
    Sequence number: 21166    (relative sequence number)
    [Next sequence number: 21421    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 500000 (scaled)
    Checksum: 0xffc4 [correct]
    [SEQ/ACK analysis]
Data (255 bytes)

0000  e3 f1 a5 dc 4f b4 fe 16 1a bb 65 75 1a 4e 00 56   ....O.....eu.N.V
```

```
0010  e2 c1 44 f5 81 72 8e 7a 27 92 0a b0 3c 0d 00 a9   ..D..r.z'...<...
0020  98 d1 40 6a 70 df 4e d8 df e2 b9 cb e2 14 5a 1f   ..@jp.N.......Z.
0030  83 2b 13 ac b0 5e 98 9e 67 ee 37 1d ce 13 c0 d8   .+...^..g.7.....
0040  f3 aa 75 33 d0 8e e3 92 c4 79 db f7 b7 08 4b 40   ..u3.....y....K@
0050  f3 8d 75 ac af 2c 00 56 e2 14 7e 7f 1b 30 51 1c   ..u..,.V..~..0Q.
0060  a0 11 f4 2e d6 5c ac bb 58 bc 92 dc 26 1c ef 55   .....\..X...&..U
0070  38 53 7c 12 2a d8 26 d1 5d ee c1 cb 3e 00 36 8a   8S|.*.&.]...>.6.
0080  5a a7 f8 70 c5 fc 44 5c 98 83 6e 87 a2 a8 26 60   Z..p..D\..n...&`
0090  c1 b9 05 70 4e a4 ca 92 63 28 a9 4e 93 09 8e 1b   ...pN...c(.N....
00a0  e3 05 ce 9e e8 ba 92 aa df c8 b4 43 61 49 a6 82   ...........CaI..
00b0  03 08 df 41 00 f2 65 76 db 10 3a 38 f9 6d 57 22   ...A..ev..:8.mW"
00c0  67 7d 10 36 22 07 90 8c fc 39 0a 91 2e 93 cb a9   g}.6"....9......
00d0  37 7a c9 eb 59 1b 56 de c4 31 ba b2 e0 9e 04 80   7z..Y.V..1......
00e0  44 ec 38 95 af 94 db e7 d5 7c 8e b0 2a fa 90 98   D.8......|..*...
00f0  ec 8f b9 b0 a5 0c bd 96 f0 9d 0d 81 f2 eb 4d      ..............M

No.     Time        Source                Destination           Protocol Info
    633 1463.974375 E.F.G.H         A.B.C.D           TCP      9988 > mni-prot-rout [ACK] Seq=1 Ack=21421 Win=55936 Len=0

Frame 633 (54 bytes on wire, 54 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: 9988 (9988), Dst Port: mni-prot-rout (3764), Seq: 1, Ack: 21421, Len: 0
    Source port: 9988 (9988)
    Destination port: mni-prot-rout (3764)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 21421    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 55936 (scaled)
    Checksum: 0x434c [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    634 1463.997234 A.B.C.D           E.F.G.H         TCP      mni-prot-rout > 9988 [PSH, ACK] Seq=21421 Ack=1 Win=500000 Len=1275

Frame 634 (1329 bytes on wire, 1329 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: mni-prot-rout (3764), Dst Port: 9988 (9988), Seq: 21421, Ack: 1, Len: 1275
    Source port: mni-prot-rout (3764)
    Destination port: 9988 (9988)
    Sequence number: 21421    (relative sequence number)
    [Next sequence number: 22696    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 500000 (scaled)
    Checksum: 0x9ff7 [correct]
    [SEQ/ACK analysis]
Data (1275 bytes)

0000  34 9b 52 75 a8 a5 ec 65 3d c5 ba ed 0e 38 5b 49   4.Ru...e=....8[I
0010  bb f7 49 ba d3 4d e2 57 6a ee dc d8 26 a6 08 7f   ..I..M.Wj...&...
0020  3a 75 5a ba 12 f3 7c 4d b0 cf e8 ed a5 a4 39 b2   :uZ...|M......9.
0030  8c 06 d0 cd 90 ee db 1f c1 83 49 40 96 fc 9d 0d   ..........I@....
0040  81 1d ed 64 31 1e 09 fa bc 5a 1c d4 56 ea 97 6e   ...d1....Z..V..n
0050  90 60 5a 50 38 1e 8b ed 6e c4 e4 57 42 da a1 c1   .`ZP8...n..WB...
0060  8a 9b 4a a9 65 f2 5b 49 bb f7 49 ba d3 4d e2 57   ..J.e.[I..I..M.W
0070  6a ee ac f0 12 a7 12 97 c7 37 9d 4c bb f3 88 4d   j........7.L...M
0080  33 94 fa 38 3e 4d 5a b2 bc 36 82 86 d5 98 b0 29   3..8>MZ..6.....)
0090  1f f6 1e 8e 80 b2 9a a2 92 ca b3 02 62 c4 f4 b7   ............b...
00a0  f4 e7 08 a6 7c ca e6 4c bb ec 88 50 32 1e bc ed   ....|..L...P2...
```

```
00b0  67 ee e4 c2 50 65 ec ed 18 f2 5b 47 39 3d 9d d6   g...Pe....[G9=..
00c0  95 2e 09 12 23 3f 27 14 31 c7 e8 55 7e 86 b4 e7   ....#?'.1..U~...
00d0  8b ee 5a 08 12 f3 7c 4d e5 c5 d8 44 18 98 4b b1   ..Z...|M...D..K.
00e0  85 22 c4 26 af 14 22 05 27 1e a0 ca 92 5d ca 91   ."."&.."."'....]..
00f0  b0 99 09 92 1b 77 cb c0 71 f9 d7 ea 17 e4 e3 fa   .....w..q.......
0100  b8 98 52 47 57 b3 e2 5d 69 a7 d5 0e 95 ee 08 b2   ..RGW..]i.......
0110  44 87 88 4a bb 16 a4 99 5e 66 a6 74 c9 56 44 16   D..J....^f.t.VD.
0120  6d 72 5d ba 4e c3 07 8f 10 c0 d6 2a 8e 26 ec 04   mr].N......*.&..
0130  cb e7 fe bc 12 2c 08 17 98 e4 08 72 75 e4 00 54   .....,.....ru..T
0140  de ab 1c cf 96 76 f3 e7 22 cf d1 8a 48 06 6a c7   .....v.."...H.j.
0150  2d c7 af cf 17 b2 63 50 7f 1d 30 65 7e 46 1f c5   -.....cP..0e~F..
0160  a7 f6 c8 cb db e4 6c 43 72 33 0b 44 11 63 96 64   ......lCr3.D.c.d
0170  5c ae 55 12 93 ef 10 cf 0f 18 7f e5 89 c6 b0 6c   \.U............l
0180  17 36 17 c4 9c b8 1e 5b 03 fb fa 46 99 24 d9 be   .6.....[...F.$..
0190  9c 6f 30 c3 56 b0 f4 8e 05 8a 0e 6e 11 73 08 71   .o0.V......n.s.q
01a0  19 0c 7a d2 5e a4 f3 58 11 4e 03 ac d2 ef a7 ee   ..z.^..X.N......
01b0  17 f1 e6 af 4b 44 11 2e c4 f3 0d 7d af f1 17 cb   ....KD.....}....
01c0  77 3e 5a 76 80 37 f8 14 bf c9 8d 76 1a a2 9a 17   w>Zv.7.....v....
01d0  ee 6f 31 cb 4e f2 15 97 7b 8b 16 da 9a aa 90 13   .o1.N...{.......
01e0  13 6a 8d f2 34 ab f4 d2 3e eb 9c 29 ed aa 0e 92   .j..4...>..)....
01f0  72 d8 e5 d7 f2 38 57 aa 0c 6c 70 37 a4 f6 39 50   r....8W..lp7..9P
0200  57 b0 80 6a 13 b8 e8 af e6 ac 89 61 8a 0a 8a b6   W..j.......a....
0210  72 6f b0 13 71 fd bd 8e de ab 99 11 5b e4 a7 45   ro..q.......[..E
0220  75 f4 8e ea 2c 66 81 6d 58 37 e0 13 a3 fb 19 8c   u...,f.mX7......
0230  94 e3 54 7b 36 40 93 02 56 65 2a a6 99 90 48 69   ..T{6@..Ve*...Hi
0240  b0 5b 1e 6e ef b4 07 4f 9e e4 17 c2 a8 0a 5d 04   .[.n...O......].
0250  97 c6 1b 36 0f 67 f1 e7 2a 55 38 7b 0d 7e 38 75   ...6.g..*U8{.~8u
0260  48 e0 92 d7 4a 6a 59 6e 8f a3 f8 63 8a 9b 4a ce   H...JjYn...c..J.
0270  c1 f3 95 eb be 44 93 55 66 ca b5 c0 d8 48 ea a4   .....D.Uf....H..
0280  8c a5 b6 6f 35 8a 41 a5 91 c7 b7 e7 0a 37 c4 59   ...o5.A......7.Y
0290  0b c2 31 9b 0a b8 5f 98 7e ac 3c 99 0a 1a 91 62   ..1..._.~.<....b
02a0  42 fb 2d 79 5c 4f 0a cf 62 37 50 cf a9 2c 10 ce   B.-y\O..b7P..,..
02b0  e5 f2 3d 76 50 76 84 82 43 92 ca 03 18 77 28 93   ..=vPv..C....w(.
02c0  87 86 b2 4a 02 95 82 59 69 38 79 02 0b 47 2b df   ...J...Yi8y..G+.
02d0  3b fa bb 6b 0a 3c bc 6e c8 30 9d 41 96 73 cc 6c   ;..k.<.n.0.A.s.l
02e0  a2 f7 b7 a4 16 f7 c3 4d 12 31 61 df 9e 64 41 ae   .......M.1a..dA.
02f0  fc 83 77 47 99 6f 95 1a 8a 40 44 a4 78 e5 1c 0a   ..wG.o...@D.x...
0300  c8 fb 2a e0 d2 b5 e4 24 d0 fd f4 24 3b f7 2e 4e   ..*....$...$;..N
0310  1f b4 b0 b1 4e f3 32 ce f7 cf 8d 86 0e 24 d2 ce   ....N.2......$..
0320  0a b8 9d ef 3d c1 88 cd 12 27 c1 ef 96 4c 9d 82   ....=....'...L..
0330  58 8a b2 c0 c8 4d 6d e4 59 d0 5b ed d8 7a ea fa   X....Mm.Y.[..z..
0340  8f 8e 3f d2 27 7a a6 67 24 b0 91 61 25 ac 84 f2   ..?.'z.g$..a%...
0350  d2 c1 a0 3c 35 28 6d 50 89 6b ac 7e 13 27 d0 0e   ...<5(mP.k.~.'..
0360  33 94 52 c3 ab 4b a1 49 d2 4b a9 cb 2f ac 20 79   3.R..K.I.K../. y
0370  4b f5 1c c3 ad 88 6c d3 ae f4 b2 68 47 f2 95 fc   K.....l....hG...
0380  aa 52 30 1a 2c 6b 11 42 17 7c 6d 4f 58 71 90 4c   .R0.,k.B.|mOXq.L
0390  17 5d 27 18 dd 51 d0 df b7 ad 55 4c 9c 27 d8 4e   .]'..Q....UL.'.N
03a0  93 c2 90 5a 99 19 d2 77 c6 37 fa 6e ef 27 91 ca   ...Z...w.7.n.'..
03b0  0a 67 72 60 4b d6 1d 13 72 6b 1c 0c c1 c1 78 cc   .gr`K...rk....x.
03c0  93 58 3f b7 8b 0f d8 7d 58 c9 93 1f db c2 d1 57   .X?....}X......W
03d0  d2 f2 99 fb 9c b9 89 de ee c3 50 4a 5a 6c 58 f5   ..........PJZlX.
03e0  80 e5 9a 55 8a 64 19 56 51 e0 de 3d 16 ea 12 42   ...U.d.VQ..=...B
03f0  10 b3 ec 14 20 72 1b bd ff c1 f2 62 e0 56 3e 63   .... r.....b.V>c
0400  6d c8 d2 d2 d0 ca 9a ad d1 e9 2c 61 34 b7 e3 4f   m.........,a4..O
0410  f5 42 e9 83 e7 91 7d e6 df 5f 9c 53 8e af c0 e1   .B....}.._.S....
0420  1f 6b 09 02 27 02 c5 b8 89 22 39 04 ed df d0 93   .k..'....."9.....
0430  ef 77 31 5d 73 88 3c d3 92 26 ed d6 16 57 ab 49   .w1]s.<..&...W.I
0440  92 17 96 04 3a 49 39 e6 43 77 14 63 15 ae 21 9a   ....:I9.Cw.c..!.
0450  c9 cb d8 cf 6c d0 98 67 69 e8 09 b4 52 7a e7 56   ....l..gi...Rz.V
0460  16 6e 84 30 dc 73 39 4f 68 d9 21 d7 b3 a1 d8 62   .n.0.s9Oh.!....b
0470  6d 66 c1 75 d6 26 eb c8 d8 7e b7 67 02 3f 81 4a   mf.u.&...~.g.?.J
0480  bf 69 50 7f 46 b4 35 86 07 bc 9f 53 9e 23 e0 2a   .iP.F.5....S.#.*
0490  f4 bf 15 43 38 72 33 04 74 8a c7 c7 23 76 52 92   ...C8r3.t...#vR.
```

```
04a0  12 73 7c 84 84 85 d9 49 17 75 70 30 3e a3 8e ca   .s|....I.up0>...
04b0  9f d3 c0 db e8 04 47 82 cd 72 f6 a9 4e 83 8b 8c   ......G..r..N...
04c0  1f a5 b5 1f 2c 64 91 c2 10 22 3e c2 86 23 65 d2   ....,d..."..#e.
04d0  97 f6 fe 7f 7c 68 8b 32 df 72 92 72 38 a8 01 bf   ....|h.2.r.r8...
04e0  81 f7 67 4a 38 6a 81 a9 6f ec 39 ce cd db da 65   ..gJ8j..o.9....e
04f0  12 82 94 7d bb 77 88 63 66 6a 9c                  ...}.w.cfj.

No.     Time        Source                Destination           Protocol Info
    635 1463.997240 E.F.G.H         A.B.C.D           TCP      9988 > mni-prot-rout [ACK] Seq=1 Ack=22696 Win=58752 Len=0

Frame 635 (54 bytes on wire, 54 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: 9988 (9988), Dst Port: mni-prot-rout (3764), Seq: 1, Ack: 22696, Len: 0
    Source port: 9988 (9988)
    Destination port: mni-prot-rout (3764)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 22696    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 58752 (scaled)
    Checksum: 0x3e3b [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    636 1464.003228 A.B.C.D           E.F.G.H         TCP      mni-prot-rout > 9988 [PSH, ACK] Seq=22696 Ack=1 Win=500000 Len=255

Frame 636 (309 bytes on wire, 309 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: mni-prot-rout (3764), Dst Port: 9988 (9988), Seq: 22696, Ack: 1, Len: 255
    Source port: mni-prot-rout (3764)
    Destination port: 9988 (9988)
    Sequence number: 22696    (relative sequence number)
    [Next sequence number: 22951    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 500000 (scaled)
    Checksum: 0x68a1 [correct]
    [SEQ/ACK analysis]
Data (255 bytes)

0000  00 12 2d 94 53 f9 ae f7 83 60 7d 7b 57 0a ed ba   ..-.S....`}{W...
0010  c2 03 09 ee 4c be 66 c6 11 7e 66 31 4a 2c 62 bf   ....L.f..~f1J,b.
0020  a9 f5 d6 cb 53 1e 38 a4 c6 1f f6 94 cd 1e f3 8a   ....S.8.........
0030  0e 75 22 e3 2a 3b bf 12 d4 38 9a 81 a9 6d ec 3c   .u".*;...8...m.<
0040  3e 44 b1 fd 3e f6 09 64 c1 fe 7f 2a 63 85 44 21   >D..>..d...*c.D!
0050  10 e2 09 d3 3a 8f 27 5c 08 bb 20 1d 4e 66 63 89   ....:.'\.. .Nfc.
0060  bb ae 4b 25 2b 4d 14 01 86 9d 7e e8 3b dc 41 94   ..K%+M....~.;.A.
0070  d1 4e 2c c5 0d a8 27 90 f4 7c 2b 79 67 43 8d 5e   .N,...'..|+ygC.^
0080  1d cc 6e d9 59 71 79 fd 92 cd 72 8d 68 cd 90 09   ..n.Yqy...r.h...
0090  6d 93 f4 55 b6 b2 8e 6c cc cc a6 3f 5c 97 60 44   m..U...l...?\.`D
00a0  36 85 63 b8 9c 20 91 06 e2 09 f9 7d 36 01 e8 3f   6.c.. .....}6..?
00b0  32 ad 8c f5 c8 bc 5d 91 32 8c e1 8d 6e b6 a1 90   2.....].2...n...
00c0  52 0f 84 8c c7 7d a2 1c 03 67 b6 cd 20 b6 94 23   R....}...g.. ..#
00d0  01 92 31 72 ac b9 a0 52 16 c6 a3 cc 65 fd 2c cd   ..1r...R....e.,.
00e0  92 c1 0c 99 eb b8 8c 44 34 d7 c5 e1 17 f8 5f 1f   .......D4....._.
00f0  64 cf 17 5d 25 8b 8a 50 b1 b9 13 8a 2e 51 6f      d..]%..P.....Qo

No.     Time        Source                Destination           Protocol Info
    637 1464.003233 E.F.G.H         A.B.C.D           TCP      9988 > mni-prot-rout [ACK] Seq=1 Ack=22951 Win=61312 Len=0
```

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Frame 637 (54 bytes on wire, 54 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: 9988 (9988), Dst Port: mni-prot-rout (3764), Seq: 1, Ack: 22951, Len: 0
    Source port: 9988 (9988)
    Destination port: mni-prot-rout (3764)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 22951    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 61312 (scaled)
    Checksum: 0x3d28 [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    638 1464.032712 A.B.C.D           E.F.G.H         TCP      mni-prot-rout > 9988 [PSH, ACK] Seq=22951 Ack=1 Win=500000 Len=1275

Frame 638 (1329 bytes on wire, 1329 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: mni-prot-rout (3764), Dst Port: 9988 (9988), Seq: 22951, Ack: 1, Len: 1275
    Source port: mni-prot-rout (3764)
    Destination port: 9988 (9988)
    Sequence number: 22951    (relative sequence number)
    [Next sequence number: 24226    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 500000 (scaled)
    Checksum: 0x90cd [correct]
    [SEQ/ACK analysis]
Data (1275 bytes)

0000  ed 32 eb 45 95 b4 f2 ab 32 d6 f6 0a 89 c0 df c3   .2.E....2.......
0010  02 8e d7 c9 aa 2e c9 eb 5c 2a f5 be de a6 d7 18   ........\*......
0020  49 d5 eb a4 d2 40 a4 7d a2 14 13 97 ac f0 37 a9   I....@.}......7.
0030  24 85 b8 32 83 d7 d3 52 1d b5 97 bb 69 37 dd bd   $..2...R....i7..
0040  69 54 d2 e0 97 0e b9 82 dc 26 b1 14 78 70 dd 82   iT.......&..xp..
0050  b0 26 14 f7 fc 29 3a c7 7c 3a 71 90 4c 82 c3 e3   .&...):.|:q.L...
0060  32 f1 02 b3 a4 80 52 1d e8 91 9e 62 5a b5 12 ba   2.....R....bZ...
0070  7c b1 b2 be 9d 1a d8 6a 3d 1e ae 62 42 1a f5 98   |......j=..bB...
0080  c2 c8 d7 17 0e 1a a1 cc 39 df 34 2d 4a 55 fa a9   ........9.4-JU..
0090  9f b2 00 eb 31 74 48 cf 02 ae a4 9b aa 6e ec 1e   ....1tH......n..
00a0  48 5e 12 71 dc 95 0d 06 cf 43 3b 42 e4 d9 b6 c0   H^.q.....C;B....
00b0  04 17 73 b0 bb 50 88 6b 54 d6 66 b9 91 54 e4 93   ..s..P.kT.f..T..
00c0  5d 4e 36 57 87 fa 26 0e d7 8f 8a 17 23 ce ae 95   ]N6W..&.....#...
00d0  22 fb 37 e4 7e 1e 53 8a 1c bf 48 d0 9d 78 e1 f7   ".7.~.S...H..x..
00e0  4b 56 90 81 35 16 a5 72 2a 22 02 ee e1 ba 1b a4   KV..5..r*"......
00f0  1c ad 36 7e c9 cc 62 6e 09 e3 11 71 0c af 54 2f   ..6~..bn...q..T/
0100  11 b8 0f b6 99 3b 69 c0 7f 57 88 e4 71 80 a8 2d   .....;i..W..q..-
0110  10 f5 2a af 6e e8 55 94 78 82 5b 1f 1a 99 22 c2   ..*.n.U.x.[...".
0120  d9 81 19 89 99 b1 40 fd ca d5 80 52 bb 14 d8 fe   ......@....R....
0130  90 47 d6 e8 42 9a b0 70 d9 ea 95 a1 5e 83 4b 1f   .G..B..p....^.K.
0140  61 6b 83 a3 bb 26 f1 38 58 be 6a 75 d7 78 81 ab   ak...&.8X.ju.x..
0150  f5 0a 06 80 32 bf d6 66 d9 2b 62 42 36 4e c4 65   ....2..f.+bB6N.e
0160  f5 c0 3e 3f 03 8f 80 6f 4a 87 d1 fe 39 47 ac e8   ..>?...oJ...9G..
0170  bc 08 5b 27 45 13 67 b9 5e 53 4b 1e 35 a2 fc a3   ..['E.g.^SK.5...
0180  78 c9 f0 96 e1 cc 19 c3 14 b2 12 41 d0 54 6f 22   x..........A.To"
0190  34 4b 58 10 3c 9c 9e 11 95 a7 a5 f0 d1 8f c7 73   4KX.<..........s
01a0  3e be bf 90 9e 05 66 c5 f4 22 0b c4 e5 5f 63 ea   >.....f.."..._c.
01b0  f5 e3 d0 82 8d 64 66 ff f4 4a 62 60 5e ba 52 7f   .....df..Jb`^.R.
01c0  13 af 42 f7 bc 43 f1 c2 02 dc 4a c0 3c c5 89 06   ..B..C....J.<...
01d0  11 f5 7e 30 fb ad ce d8 53 1a df 3f 1a 76 d4 34   ..~0....S..?.v.4
```

```
01e0  bc a0 46 f2 0b 32 d6 76 fc 24 46 bd f3 80 94 8a   ..F..2.v.$F.....
01f0  a7 e5 39 1a 2b d9 73 4f ea 90 b1 0b 6a 43 13 48   ..9.+.sO....jC.H
0200  3e ad 96 9f 65 23 9e 94 8c 67 ce 27 f0 27 ad e2   >...e#...g.'.'..
0210  95 a4 0e 71 17 07 cf 34 7e ca 96 a3 98 60 89 f6   ...q...4~....`..
0220  55 47 0c 91 7b 92 76 4f 1e 92 3d eb 9b a6 e5 9f   UG..{.vO..=.....
0230  47 ec b9 40 38 b0 1b 6e f0 29 b8 44 10 49 ac 07   G..@8..n.).D.I..
0240  28 10 26 9e e4 a7 e2 f6 4c 97 8a ee 9c c0 a6 30   (.&.....L......0
0250  3e a7 27 c8 f5 cb ef 8e 03 4d 03 40 54 34 ed df   >.'......M.@T4..
0260  a8 4e cb 92 71 86 a4 c3 b9 ff 88 bc dd a0 36 22   .N..q.........6"
0270  37 aa dc 0a e7 e3 04 17 8d 79 b2 ec 15 6f d2 e2   7........y...o..
0280  16 d8 d0 8c 17 04 92 78 79 d6 96 41 80 22 8a cf   .......xy..A."..
0290  fe 5f 8e ec 61 c0 d8 fe 86 27 0a fa bf de fe c6   ._..a....'......
02a0  31 a0 83 c2 12 3f 1c a4 30 d8 fb 76 34 e1 02 82   1....?..0..v4...
02b0  28 6f 7c ff 2c 4c e3 60 5a 7e 04 87 88 7a 3d 7e   (o|.,L.`Z~...z=~
02c0  7c 06 b3 00 01 02 90 9f 9e a5 90 9c 9e 04 d6 78   |..............x
02d0  79 d6 ca 41 80 22 ce cf fe 5f c2 ec 61 c0 d8 ba   y..A."..._..a...
02e0  86 27 0a 86 bf de fe 82 31 a0 83 8e 12 3f 1c a4   .'......1....?..
02f0  74 d8 fb 76 68 e1 02 82 6c 6f 7c ff 60 4c e3 60   t..vh...lo|.`L.`
0300  5a 3a 04 86 f4 43 d0 66 3f 94 72 e3 e4 c7 5b b1   Z:...C.f?.r...[.
0310  14 e4 67 99 3f 44 a9 97 6a 79 b2 e7 15 6f d8 e2   ..g.?D..jy...o..
0320  16 d8 db 8c 17 04 92 78 79 d6 96 41 80 22 8a cf   .......xy..A."..
0330  fe 5f 8e ec 61 c0 d8 fe 86 27 0a fa bf de fe c6   ._..a....'......
0340  31 a0 83 c2 12 3f 1c a4 30 d8 fb 76 34 e1 02 82   1....?..0..v4...
0350  28 6f 7c ff 2c 4c e3 60 5a 7e 04 87 88 7a 3d 7e   (o|.,L.`Z~...z=~
0360  7c 06 b3 00 01 02 90 9f 9e 04 d2 78 79 d6 d6 41   |..........xy..A
0370  80 22 ca cf fe 5f ce ec 61 c0 d8 be 86 27 0a ba   ."..._..a....'..
0380  bf de fe 86 31 a0 83 82 12 3f 1c a4 70 d8 fb 76   ....1....?..p..v
0390  74 e1 02 82 68 6f 7c ff 6c 4c e3 60 5a 3e 04 87   t...ho|.lL.`Z>..
03a0  88 3a 3d 7d e9 16 58 b0 4f b3 2b f6 4a 3c 48 f7   .:=}..X.O.+.J<H.
03b0  1f 56 c5 b8 a5 aa 36 56 38 06 ca 56 98 f2 5c 5e   .V....6V8..V..\^
03c0  ef 24 64 ee f9 9a 98 04 a2 44 79 7e 1a a2 ec e4   .$d......Dy~....
03d0  fd 12 98 00 2a 44 7d f6 1a ae 39 e4 f1 db 98 0c   ....*D}...9.....
03e0  52 44 71 fe 1a aa 62 e4 f5 1d 9c 08 39 66 75 b4   RDq...b.....9fu.
03f0  7c b6 1b 17 50 b4 0b 15 3a b2 de 13 ee cf 6d f4   |...P...:.....m.
0400  e0 64 63 db 1c bc d2 1d 89 ba b8 1b 5d b8 a5 12   .dc.........]...
0410  26 f4 98 e4 95 0b 22 0e 20 17 c2 c8 9b 55 57 1a   &.....". ....UW.
0420  07 ce 4b f2 f0 e7 a4 33 52 0a 97 3f 3c f6 ce b7   ..K....3R..?<...
0430  df 87 8d 04 1b 14 cf 29 90 6e 2e d4 52 cf ab 13   .......).n..R...
0440  da 4e c2 36 14 1d cc 14 85 d0 62 01 c6 c3 9b 92   .N.6......b.....
0450  4d f9 b9 9f 57 1a 52 18 95 53 11 1b a1 24 9c ea   M...W.R..S...$..
0460  f0 58 8e ec 9d 4f 5a 92 1f fe ef 44 d0 ad a1 be   .X...OZ....D....
0470  34 fd 77 5a db 39 19 2d 1c dc 8c 9f ac f1 b1 70   4.wZ.9.-.......p
0480  6d 4a 94 b2 8e 53 13 67 99 47 71 3d 7c 1e 10 56   mJ...S.g.Gq=|..V
0490  7c 6b 12 ee 0a 01 e5 70 06 34 1b 78 a4 eb ca ce   |k.....p.4.x....
04a0  2f d3 8a 4d 7a cb 8e 37 9d 66 96 59 11 ed 0b 9e   /..Mz..7.f.Y....
04b0  8d 02 88 17 c5 2e de d7 04 53 19 5b 59 40 99 e9   .........S.[Y@..
04c0  ef 8a 72 45 88 5b a7 20 63 39 5d 9f 38 fa 7d bd   ..rE.[. c9].8.}.
04d0  ff 8e de e7 06 2c d7 66 1e 7d df eb 14 49 17 d9   .....,.f.}...I..
04e0  7f 07 9e 3a 49 38 13 43 11 1f 04 a9 4a ec e1 62   ...:I8.C....J..b
04f0  54 6c 72 8f 13 cf d8 07 5c af 93                  Tlr.....\..

No.     Time        Source                Destination           Protocol Info
    639 1464.032717 E.F.G.H         A.B.C.D           TCP      9988 > mni-prot-rout [ACK] Seq=1 Ack=24226 Win=64128 Len=0

Frame 639 (54 bytes on wire, 54 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: 9988 (9988), Dst Port: mni-prot-rout (3764), Seq: 1, Ack: 24226, Len: 0
    Source port: 9988 (9988)
    Destination port: mni-prot-rout (3764)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 24226    (relative ack number)
    Header length: 20 bytes
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```
    Flags: 0x10 (ACK)
    Window size: 64128 (scaled)
    Checksum: 0x3817 [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    640 1464.056827 A.B.C.D           E.F.G.H         TCP      mni-prot-rout > 9988 [PSH, ACK] Seq=24226 Ack=1 Win=500000 Len=1275

Frame 640 (1329 bytes on wire, 1329 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: mni-prot-rout (3764), Dst Port: 9988 (9988), Seq: 24226, Ack: 1, Len: 1275
    Source port: mni-prot-rout (3764)
    Destination port: 9988 (9988)
    Sequence number: 24226    (relative sequence number)
    [Next sequence number: 25501    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 500000 (scaled)
    Checksum: 0x2a19 [correct]
    [SEQ/ACK analysis]
Data (1275 bytes)

0000  cf cb 87 00 12 51 00 e5 ee 01 41 d4 72 f8 6b 92   .....Q....A.r.k.
0010  64 41 52 9b a3 2f 4d b9 36 eb 6a 25 33 44 5f db   dAR../M.6.j%3D_.
0020  41 60 68 93 53 26 b4 8a d7 d2 68 b3 76 23 80 18   A`h.S&....h.v#..
0030  fc ba 64 b8 a5 13 8e 26 d6 1d 13 8a 6e 14 44 fe   ..d....&....n.D.
0040  f9 6a 1b 20 82 85 72 b1 37 94 64 38 32 58 c8 42   .j. ..r.7.d82X.B
0050  e9 94 83 88 65 f0 5f 67 eb 65 a1 1b 9a 51 1e 42   ....e._g.e...Q.B
0060  e5 67 0b 5a 01 49 47 5b 1c 1f 54 12 73 00 72 8d   .g.Z.IG[..T.s.r.
0070  ae 0f 03 9a 2f 92 0e 9b 37 f9 f9 ae ac 9e 5d f8   ..../...7.....].
0080  6e 2a cc 17 69 35 66 d7 32 f3 ee 73 b9 bb 53 af   n*..i5f.2..s..S.
0090  d0 9d 80 98 f2 8c 17 8c 0f 63 ea fd b0 b4 1d a8   .........c......
00a0  d7 6c 5f 8a 18 3d 2e 88 fd 1f 44 4b 04 ec 4a 1e   .l_..=....DK..J.
00b0  60 3a f3 2f 65 0f c7 5c 70 01 57 17 5b 3c 1c 2c   `:./e..\p.W.[<.,
00c0  78 cd 91 18 e4 6d 74 29 49 aa 17 fa d0 4d 82 36   x....mt)I....M.6
00d0  6f 88 4e da ff d0 ca 02 52 48 5b 43 2a b4 62 da   o.N.....RH[C*.b.
00e0  c7 c8 6e 71 ff e1 ad a6 55 c7 6e 81 95 55 e7 b7   ..nq....U.n..U..
00f0  b3 d7 0e e5 f3 ea 65 d6 b4 a1 9f 38 ed a5 a2 a5   ......e....8....
0100  a5 08 30 68 24 c2 54 96 a1 31 d9 fc 90 b9 71 8e   ..0h$.T..1....q.
0110  f7 2b d3 31 7b ae de da bf c4 03 d1 a3 f2 cb b2   .+.1{...........
0120  fc 0a 8e 6d f7 e2 4e b3 1e 0c c3 b6 f4 73 be e3   ...m..N......s..
0130  ce 29 62 cb ea 88 2a aa 2e c8 55 72 cf 00 3e ee   .)b...*...Ur..>.
0140  f5 55 9b 50 11 51 34 10 53 1e cf 1e 64 ca 5f ed   .U.P.Q4.S...d._.
0150  d5 53 c8 12 49 55 10 44 c3 91 75 c1 b0 12 0b 45   .S..IU.D..u....E
0160  fe e1 63 8f 03 60 8b 79 bb 7a 88 8d a2 f9 79 bb   ..c..`.y.z....y.
0170  04 e1 aa 9a 0e c9 86 2e b9 bd 94 01 1b 8e 40 26   ..............@&
0180  62 e6 b3 de 31 de 7f 4e ce 96 63 db 3f 33 43 72   b...1..N..c.?3Cr
0190  d5 da 05 bf 02 c9 8f 5f 0b 24 3e 01 b7 37 e3 88   ......._.$>..7..
01a0  03 30 e4 17 41 8f ce 0e 77 76 ae 1c 84 5d a0 04   .0..A...wv...]..
01b0  c2 d2 68 1b 70 7a 03 7d 5a 0f c0 0f 58 26 7f 33   ..h.pz.}Z...X&.3
01c0  0d 78 02 72 cd d0 af e6 a5 f2 a4 76 e4 f8 97 17   .x.r.......v....
01d0  36 12 6d 53 56 e2 31 0a c4 c4 75 c5 2e aa 86 e4   6.mSV.1...u.....
01e0  34 31 4d 42 b6 44 a1 ab ad 2b 97 96 3a f6 8e 26   41MB.D...+..:..&
01f0  ef 57 50 51 3d 31 9b 3a 83 9d 7a 0c 6a 5b ce ed   .WPQ=1.:..z.j[..
0200  a5 8e 53 cf 38 3d e4 a9 12 09 84 cf 39 a6 5e 1c   ..S.8=......9.^.
0210  7e ac dd a3 4f fb 25 de 06 36 ce 7b 98 5b a4 68   ~...O.%..6.{.[.h
0220  0a 12 b6 84 27 24 06 cf 65 84 54 76 e1 50 9c cb   ....'$..e.Tv.P..
0230  3a 3b 99 e4 31 31 a7 89 dd 91 74 d8 16 d0 ec bf   :;..11....t.....
0240  16 0b 8c ad ea 91 d0 1d a4 fd ae 7c 61 fc a1 41   ...........|a..A
0250  0f 90 ad c3 0e 13 e4 73 f9 89 ac 22 06 9c ad 90   .......s..."....
0260  c6 bc 04 46 93 9f de 32 ad 2b 84 1c 47 ec 8f e5   ...F...2.+..G...
```

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0270  2b c8 65 13 6e c5 11 0a 38 e0 99 01 0f 41 a5 94   +.e.n...8....A..
0280  c7 f8 18 d9 07 fa a4 af 76 f0 db fb a2 84 4e 7e   ........v.....N~
0290  a8 a8 b5 3a f6 53 75 4b 28 fc af 52 b0 09 2f 86   ...:.SuK(..R../.
02a0  60 5a a3 72 00 9f a2 7d 3d f1 ce 71 97 f0 4d 38   `Z.r...}=..q..M8
02b0  0f 07 d7 70 5e f8 c2 71 ec 38 d2 d8 3a 6d c1 02   ...p^..q.8..:m..
02c0  7e 53 75 52 60 ba b6 d1 0f b4 e0 48 0d d0 ca c4   ~SuR`......H....
02d0  a1 88 ec 12 62 46 01 12 48 d3 d3 e7 cd 32 d1 4f   ....bF..H....2.O
02e0  f7 98 ac 68 6b c7 0c 75 03 c0 2d e7 7c 19 ab 41   ...hk..u..-.|..A
02f0  1b b7 10 ef ad 8d 98 20 bd e1 4a c7 07 f3 e4 0f   ....... ..J.....
0300  bb e0 a6 23 02 42 1b 60 83 a3 a1 4f 25 95 1a c6   ...#.B.`...O%...
0310  db f2 ea 0f 8d 78 69 2d 0b e4 73 1f b2 25 8c 6a   .....xi-..s..%.j
0320  3b 02 1e b5 09 eb 1b 0a aa f4 c3 f1 b6 37 fb 6c   ;............7.l
0330  b8 5b 02 78 ae 05 ee bc cc 8d 72 83 99 08 a3 b8   .[.x......r.....
0340  fb 0d cb a2 d8 66 f1 89 07 0a ce 1f da 2f 73 61   .....f......./sa
0350  b7 f4 77 e2 73 58 0a b6 b6 53 4a 46 21 3b 9a a7   ..w.sX...SJF!;..
0360  34 09 b3 59 43 36 84 af ba 8b 0a 88 a4 53 4e 53   4..YC6.......SNS
0370  44 94 54 cb ea 2e 96 80 0f 70 a9 cc d7 29 76 b5   D.T......p...)v.
0380  86 f4 0b 5e 6f 3b 0e 8f 74 5d 42 0e a4 01 fb 76   ...^o;..t]B....v
0390  61 4d 8a 58 b7 05 f7 be 36 1b 67 bf da 14 18 fe   aM.X....6.g.....
03a0  88 e9 d1 78 76 a3 cf 82 99 20 69 6e e7 92 3a c0   ...xv.... in..:.
03b0  9e 12 fe c4 11 8b 33 b1 89 29 7b ee 2b ce fb 46   ......3..){.+..F
03c0  89 44 e0 1b 9b 38 2a e5 c8 5f b3 1e a5 10 19 07   .D...8*.._......
03d0  31 10 f0 9b 51 f6 57 b2 e3 23 a2 b3 9b 17 ee 9b   1...Q.W..#......
03e0  b3 10 81 9e 6c 4a 65 47 b3 0d 45 2a a5 d9 a7 98   ....lJeG..E*....
03f0  46 c4 aa 95 cf 95 ff 1d c6 8c 27 99 64 92 44 12   F.........'.d.D.
0400  c9 fc d9 96 2b c8 4d da 3f 1b e9 dc 8e 66 57 95   ....+.M.?....fW.
0410  89 a6 6d 99 d6 64 53 ba f4 55 4e 63 df 67 4a 8a   ..m..dS..UNc.gJ.
0420  b3 02 ac aa 00 9d 72 d9 c4 06 27 8e a4 7e ce cd   ......r...'..~..
0430  a2 3d 24 db f2 5a 00 12 d1 53 93 ab 11 26 12 0f   .=$..Z...S...&..
0440  0a e5 a2 9e 47 e9 47 62 59 5d d8 cb a0 cb a4 a1   ....G.GbY]......
0450  a7 2c 4a 1b ed d2 09 bf a6 c3 cf 93 ea 9a af b5   .,J.............
0460  1f e3 61 7c 49 49 8a 9b dc f5 46 1e ea 5b a8 5d   ..a|II....F..[.]
0470  5f d0 62 c5 66 9b 81 93 6e 1f 01 32 28 eb e2 4d   _.b.f...n..2(..M
0480  cf b6 47 47 b5 f0 f2 35 41 76 1b 1c fd cb 6a 0f   ..GG...5Av....j.
0490  3e 5d 55 93 0e 3e ac 08 08 86 e7 8c e3 9b 85 ba   >]U..>..........
04a0  c2 d3 d1 66 34 7e 56 36 6b 19 61 cc 0a 48 c6 a5   ...f4~V6k.a..H..
04b0  fd 19 33 dc f7 c1 19 9f 1d 7c d2 e0 87 47 9e 4a   ..3......|...G.J
04c0  2b 9b af 99 ef 23 87 ef c2 48 46 75 e9 ae 71 11   +....#...HFu..q.
04d0  29 f0 8f 7b a4 45 07 ba bf 23 85 ef 84 1c f2 71   )..{.E...#.....q
04e0  f5 67 80 79 b4 14 41 bb e3 91 cd 4c 31 2a 94 a4   .g.y..A....L1*..
04f0  96 a5 3d fa ae 6a 66 4c f1 9b 80                  ..=..jfL...

No.     Time        Source                Destination           Protocol Info
    641 1464.081062 A.B.C.D           E.F.G.H         TCP      mni-prot-rout > 9988 [PSH, ACK] Seq=25501 Ack=1 Win=500000 Len=1275

Frame 641 (1329 bytes on wire, 1329 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: mni-prot-rout (3764), Dst Port: 9988 (9988), Seq: 25501, Ack: 1, Len: 1275
    Source port: mni-prot-rout (3764)
    Destination port: 9988 (9988)
    Sequence number: 25501    (relative sequence number)
    [Next sequence number: 26776    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 500000 (scaled)
    Checksum: 0xae14 [correct]
Data (1275 bytes)

0000  8a 12 63 ba 1c 0b 1f d9 7e 95 03 8b eb 16 92 4a   ..c.....~......J
0010  a3 dc 1a 9d 49 2d 90 25 88 f9 de 42 7e 62 eb 61   ....I-.%...B~b.a
0020  c0 4e 70 86 53 e1 f0 d6 ba 71 a3 fa ce e6 16 b1   .Np.S....q......
```

```
0030  55 27 e4 f8 c8 98 11 e7 67 c6 88 91 06 a2 e8 73   U'......g......s
0040  86 bf c8 06 be c9 b0 3f 8e 0e a3 8a 06 a0 58 d1   .......?......X.
0050  79 e2 8e bb d7 bd ae 94 c7 d4 99 02 90 1a 21 c9   y.............!.
0060  b2 91 0e b1 28 c8 0f 45 8b 4e 2d d8 7c 97 00 42   ....(..E.N-.|..B
0070  cf 0d c3 97 b7 56 44 37 50 df bc 51 e9 03 db 28   .....VD7P..Q...(
0080  57 0f 88 10 4b 30 e0 53 3f 6e 8d 7f 4a be c0 90   W...K0.S?n..J...
0090  3f 3b 66 54 3b 18 7f 5c c1 97 56 0f dc 5d c8 a6   ?;fT;..\..V..]..
00a0  bc c6 55 43 48 6c 09 87 78 70 95 0a 28 4b f3 64   ..UCHl..xp..(K.d
00b0  85 3c 3b 22 e0 49 48 e2 b9 e6 10 b9 9f 36 a6 07   .<;".IH......6..
00c0  7b 3c 91 c0 9e e6 b5 d6 1b 16 70 d6 32 2e 4b 10   {<........p.2.K.
00d0  66 a1 bc 89 8e 38 99 80 95 e4 91 33 66 5e 14 c6   f....8.....3f^..
00e0  8a ad 1c b1 7b 0c e0 20 cd ba 10 04 c8 c0 09 0e   ....{.. ........
00f0  24 fb 91 18 fe 6d 0b 4a 61 26 5e b3 11 a5 e9 39   $....m.Ja&^....9
0100  3e ce e7 9a fa 31 c8 fd b7 80 3f 69 c2 34 56 fb   >....1....?i.4V.
0110  7c 75 b7 69 79 a9 e2 3e 4a b1 c8 19 68 a6 36 97   |u.iy..>J...h.6.
0120  1e 99 b3 04 50 cc b2 6a d4 76 f2 6e 7a 95 a0 2d   ....P..j.v.nz..-
0130  f9 98 1e 00 ba e3 f4 33 dd d5 c3 26 34 0d 35 b9   .......3...&4.5.
0140  d1 90 a4 d7 1f 03 55 8b ca 0e 01 cb f1 e0 85 9c   ......U.........
0150  0a 2b 7a 54 a8 6c 20 14 9e 90 7d 09 db 5f 23 bd   .+zT.l ...}.._#.
0160  ef 29 58 59 83 5e 1a d6 75 f9 98 ad 97 f2 c8 63   .)XY.^..u......c
0170  a9 f6 9b 16 25 7f ed 03 d5 0e 98 b4 b9 9b 1e b9   ....%...........
0180  ee 20 30 ad 92 da c2 2a 24 99 7d 76 f8 b0 4f e2   . 0....*$.}v..O.
0190  aa 9d 10 01 d8 d5 e7 a7 01 e1 5f 4e 68 a9 08 04   ..........._Nh...
01a0  a3 74 2a 41 0c 37 4c 4b 13 6d 89 62 8e a3 e0 d6   .t*A.7LK.m.b....
01b0  0c b7 46 ba 02 f0 8c ed be 39 6f 1b 1b bd 47 18   ..F......9o...G.
01c0  95 91 6f 22 0b 87 53 40 2b ed 88 f6 d7 b4 1b 81   ..o"..S@+.......
01d0  e0 ff a6 d3 3b 7e bd f2 99 90 d2 12 48 cb 18 25   ....;~......H..%
01e0  7e aa 63 42 8a e7 1c c6 12 8d 67 a9 aa 13 22 99   ~.cB......g..."
01f0  f5 f4 06 52 82 3f 1d 00 65 91 04 a9 5b 5f 87 0a   ...R.?..e...[_..
0200  bc a0 3c 72 cc f9 1c 2b 48 03 8a dc 12 5c 16 fe   ..<r...+H....\..
0210  7f 26 1f c6 21 c6 93 ad 8d f7 61 54 a1 04 1c d3   .&..!.....aT....
0220  a3 3d 2a 61 0a ee e4 a2 8c 50 e7 2b b8 af 08 2c   .=*a.....P.+...,
0230  33 c5 9c 96 24 c2 7c bc 89 4c a2 cc aa ae 9a 62   3...$.|..L.....b
0240  cd d6 58 1d 9e 21 5b 17 b6 d2 26 f7 83 c1 53 6e   ..X..![...&...Sn
0250  c9 5e 9c 5c 47 4e 34 d7 71 b1 5c f6 dc 18 0e b3   .^.\GN4.q.\.....
0260  99 4c 3c 51 1b e8 f1 c9 19 97 95 43 61 79 14 f2   .L<Q.......Cay..
0270  1a da 1b 9a e5 c0 93 08 e5 ca 29 55 cc a3 1d 17   ..........)U....
0280  c8 b0 d5 b9 fa ca f0 d6 32 32 14 49 b5 f6 4e 36   ........22.I..N6
0290  7e 8c e6 e4 a7 37 39 12 9e 47 57 0d 76 99 de 61   ~....79..GW.v..a
02a0  30 c6 9a 62 8e fc 71 6b bf e1 9b 52 ae d9 99 ee   0..b..qk...R....
02b0  26 4f 91 51 cc f6 31 e3 45 25 d3 c4 c8 62 29 60   &O.Q..1.E%...b)`
02c0  ca ee 2d a8 a3 e6 14 5e d9 dd 05 50 ca 46 97 49   ..-....^...P.F.I
02d0  a5 64 7d 88 66 90 ec 4e 27 32 fc 7e fd dc 3f cc   .d}.f..N'2.~..?.
02e0  71 d6 aa 10 d9 32 09 98 3d 7c 06 7f 1c e1 4e e6   q....2..=|....N.
02f0  25 0b 3c 2a 56 43 4f 61 4d d1 49 27 f2 2e ba 78   %.<*VCOaM.I'...x
0300  22 e3 92 31 fd 74 2c c9 0a 2f 4b 74 1d 27 1c 6a   "..1.t,../Kt.'.j
0310  ac 56 8c 9f cb 0e e1 57 a7 0e 49 ff a2 28 55 0a   .V.....W..I..(U.
0320  09 f4 0a 14 1c 6d 51 0f 9a 7a 2e 74 c1 53 ea f4   .....mQ..z.t.S..
0330  fd fa 09 43 7d f0 9c 52 56 f0 16 e0 8c a5 1e 0e   ...C}..RV.......
0340  8c 2c 00 89 df b0 d1 79 de f7 a3 cb aa 20 13 63   .,.....y..... .c
0350  eb f3 99 38 96 80 f9 86 dd cb 61 d5 3e 64 46 d6   ...8......a.>dF.
0360  37 5e 4f dc 00 6c 12 52 33 c0 5d 52 2f 63 70 0e   7^O..l.R3.]R/cp.
0370  39 4d d5 7c 7e 66 c0 f3 e9 7d 11 8d 3c cb 90 72   9M.|~f...}..<..r
0380  9d 2f 2f 6d ab f2 99 a5 de b0 a6 82 8c f6 68 b6   .//m..........h.
0390  33 8d be 44 c9 be 59 d4 e5 87 f1 fe 9f 83 73 5c   3..D..Y.......s\
03a0  96 c5 10 2e da b6 70 f2 35 9b 89 08 c5 6f ff 5b   ......p.5....o.[
03b0  7a d9 a9 48 97 9d 19 4b f2 06 47 77 bb fb 09 40   z..H...K..Gw...@
03c0  fd a9 38 4c 3a 14 cd 03 1a c3 97 b0 9f 95 08 ec   ..8L:...........
03d0  46 c3 04 04 3d 39 12 fe d2 38 87 b6 1e db 08 e2   F...=9...8......
03e0  49 bd 03 5c cc 0e e1 e7 3f db 1f 9b ba c6 da bc   I..\....?.......
03f0  5a c5 58 45 62 65 27 d6 01 b3 f8 dc a4 55 78 95   Z.XEbe'......Ux.
0400  70 86 03 73 ca 26 dd 3c 72 9c 19 0c d7 f2 df 47   p..s.&.<r......G
0410  f2 5c 86 1f 82 f4 1b 53 b8 f1 0c 55 63 a3 14 84   .\.....S...Uc...
```

```
0420  03 f6 10 70 45 f5 b8 bb 71 cf 7c 58 49 f6 52 e3   ...pE...q.|XI.R.
0430  91 21 9d e2 c5 5c 5d 6c 90 b7 bc 36 c4 77 02 63   .!...\]l...6.w.c
0440  6c 05 8c e5 18 2f 08 9a f0 04 f3 43 4d 23 84 61   l..../.....CM#.a
0450  64 ab f5 e8 9b 41 d8 e4 8b 53 e1 e4 00 f4 9c 56   d....A...S.....V
0460  14 5b 7a 71 7d 6b 15 14 84 b5 49 6e 8e 3b 5f 65   .[zq}k....In.;_e
0470  b8 22 48 2e 8d 0e 57 87 22 5f d1 85 a6 86 ad 12   ."H...W."_......
0480  6a 1e 9a e2 59 c4 bb d7 dd d3 7b 9e 8f 4c ba b6   j...Y.....{..L..
0490  0b f5 6c cc 4f b5 e8 0e e7 72 a2 51 b7 e2 46 56   ..l.O....r.Q..FV
04a0  eb 5d b5 65 cf f1 e8 28 b4 45 c5 a5 c3 e8 03 f5   .].e...(.E......
04b0  ad 61 10 b4 42 ba ad 12 6a 3f a8 12 3b 94 cc 35   .a..B...j?..;..5
04c0  30 67 cd 61 44 cb 45 ce c3 45 d1 b1 57 b2 02 7f   0g.aD.E..E..W...
04d0  01 9b e9 12 79 82 bc a1 42 a0 00 19 d5 bd f0 ab   ....y...B.......
04e0  3f 4c bb 9b 22 e4 ce 33 30 67 c5 90 38 19 d4 65   ?L.."..30g..8..e
04f0  54 a1 09 e7 09 09 76 32 8a 55 ba                  T.....v2.U.

No.     Time        Source                Destination           Protocol Info
    642 1464.081069 E.F.G.H         A.B.C.D           TCP      9988 > mni-prot-rout [ACK] Seq=1 Ack=26776 Win=64128 Len=0

Frame 642 (54 bytes on wire, 54 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: 9988 (9988), Dst Port: mni-prot-rout (3764), Seq: 1, Ack: 26776, Len: 0
    Source port: 9988 (9988)
    Destination port: mni-prot-rout (3764)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 26776    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 64128 (scaled)
    Checksum: 0x2e21 [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    643 1464.085559 A.B.C.D           E.F.G.H         TCP      mni-prot-rout > 9988 [PSH, ACK] Seq=26776 Ack=1 Win=500000 Len=255

Frame 643 (309 bytes on wire, 309 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: mni-prot-rout (3764), Dst Port: 9988 (9988), Seq: 26776, Ack: 1, Len: 255
    Source port: mni-prot-rout (3764)
    Destination port: 9988 (9988)
    Sequence number: 26776    (relative sequence number)
    [Next sequence number: 27031    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 500000 (scaled)
    Checksum: 0x80c7 [correct]
    [SEQ/ACK analysis]
Data (255 bytes)

0000  f4 d7 d6 1f e5 1f 24 bf e5 80 33 49 93 42 a1 bb   ......$...3I.B..
0010  ea 59 8d 4d df cf a3 cd 0f 86 a6 39 26 64 42 f6   .Y.M.......9&dB.
0020  72 89 c2 19 0d 1b c4 6d 77 6e 3b 0d 87 62 67 de   r.......mwn;..bg.
0030  0e 3f d5 2f 9d 71 62 aa 7a 04 3b 40 01 ae 93 ee   .?./.qb.z.;@....
0040  df 9c 1f a1 42 ab e2 ef a7 19 0e 0c bc 06 02 c0   ....B...........
0050  d8 63 cb 99 44 13 7b 70 fd 05 fc ad 22 97 19 98   .c..D.{p...."...
0060  2f 8c d5 cf 77 5f d6 99 bc 20 6e 83 4f 02 d4 d3   /...w_... n.O...
0070  f9 13 3b 1b fd ab d8 3d 10 92 44 06 98 11 48 28   ..;....=..D...H(
0080  96 53 21 4d 0e 8f c7 2c 4b d5 6e f3 57 ee 2e 56   .S!M...,K.n.W..V
0090  42 90 35 da 47 0f f5 39 6b 0e 0d 8a f2 1e bc 07   B.5.G..9k.......
00a0  51 5a 21 2d 20 03 b3 b2 ac b8 fd e0 7d 63 4a 8e   QZ!- .......}cJ.
00b0  96 52 e0 10 52 96 b5 f9 ad 93 44 ce c7 1c a7 4e   .R..R.....D....N
```

```
00c0  b5 77 bd 3e 5c 8f 72 eb 9e 62 1f 9e d6 e0 06 e2   .w.>\.r..b......
00d0  c2 a5 9e 4a b9 3e ea 87 3a 26 72 67 a0 5d 37 f2   ...J.>..:&rg.]7.
00e0  67 78 e9 ae be 1a 24 fc cf 8f 73 e4 bf bb 20 58   gx....$...s... X
00f0  7a df 06 f8 c2 4a d6 50 1f 1e fc 19 cb 88 91      z....J.P.......

No.     Time        Source                Destination           Protocol Info
    644 1464.085590 E.F.G.H         A.B.C.D           TCP      9988 > mni-prot-rout [ACK] Seq=1 Ack=27031 Win=64128 Len=0

Frame 644 (54 bytes on wire, 54 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: 9988 (9988), Dst Port: mni-prot-rout (3764), Seq: 1, Ack: 27031, Len: 0
    Source port: 9988 (9988)
    Destination port: mni-prot-rout (3764)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 27031    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 64128 (scaled)
    Checksum: 0x2d22 [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    645 1464.113547 A.B.C.D           E.F.G.H         TCP      mni-prot-rout > 9988 [PSH, ACK] Seq=27031 Ack=1 Win=500000 Len=1275

Frame 645 (1329 bytes on wire, 1329 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: mni-prot-rout (3764), Dst Port: 9988 (9988), Seq: 27031, Ack: 1, Len: 1275
    Source port: mni-prot-rout (3764)
    Destination port: 9988 (9988)
    Sequence number: 27031    (relative sequence number)
    [Next sequence number: 28306    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 500000 (scaled)
    Checksum: 0x3cbb [correct]
    [SEQ/ACK analysis]
Data (1275 bytes)

0000  7f 4a a0 25 02 ab 3b df 9d 9b 2f fc 24 4a b3 94   .J.%..;.../.$J..
0010  e7 76 dc 7f 1b cf 6a bd 37 67 24 f0 c0 8e b6 65   .v....j.7g$....e
0020  49 c3 ae e1 e7 3c af c2 13 2e df bc 68 db b4 0e   I....<......h...
0030  01 bd fc f2 4c dd b5 57 3c c0 3b ba f9 52 16 a4   ....L..W<.;..R..
0040  c0 d8 e6 24 63 d4 16 6a 14 67 d1 ef dc 79 a8 1a   ...$c..j.g...y..
0050  00 35 cb 0b c6 74 47 05 55 f2 be e1 3c cd aa 0c   .5...tG.U...<...
0060  6f e2 82 6f 1c 05 cf a0 dd 0e 6d 1f 30 b2 81 f4   o..o......m.0...
0070  45 4a 5b fa c7 9a 79 3f 23 54 ee 89 ac 3d 13 16   EJ[...y?#T...=..
0080  e4 13 11 dd c3 c2 57 cc 5d 6f b8 c2 f4 57 e7 86   ......W.]o...W..
0090  6d f3 69 c5 1b 31 c8 12 d3 9c 96 e4 35 ae c0 92   m.i..1......5...
00a0  3f c2 4a cd cf c7 b7 5f 0c fa f7 6c d2 cf 17 cd   ?.J...._...l....
00b0  22 cd af 86 bc b8 0d 64 00 ce dc e5 6a 03 77 86   "......d....j.w.
00c0  fd 4e cb 8e 0b 47 74 c1 ec 47 19 21 32 03 12 0f   .N...Gt..G.!2...
00d0  f2 92 e6 94 6d 40 ac 6b 6a 08 b2 ee 8d be ad 74   ....m@.kj......t
00e0  31 a4 ba 3e da b4 99 7f f3 c0 17 eb db 97 63 c8   1..>..........c.
00f0  9c 94 d9 c4 0a c6 64 77 6e 77 aa 40 95 77 9f 9e   ......dwnw.@.w..
0100  37 cf ca cd e9 6f 9d 73 79 45 10 f7 8a 4c 9b 0a   7....o.syE...L..
0110  a9 26 96 e3 72 4c f2 b5 60 dc 8a 6b eb d9 08 0f   .&..rL..`..k....
0120  fc 96 1a b5 e2 70 b9 8e 6b ca ad ce f6 d7 9f de   .....p..k.......
0130  ea 35 b2 ee 2d d0 f4 17 9c f4 e6 bf 47 d0 96 ce   .5..-.......G...
0140  94 3c 71 ec 20 90 e9 d4 34 52 37 87 a0 80 b2 a6   .<q. ...4R7.....
0150  1d a1 13 83 b5 4a 68 05 14 ad ca c7 2a e6 3d b8   .....Jh.....*.=.
```

```
0160  1a 2c 97 8e b8 e2 b9 29 2f a8 e8 d4 01 44 df b1   .,.....)/....D..
0170  88 4f 25 f6 89 41 30 c7 af f4 64 6e 30 3a 08 e1   .O%..A0...dn0:..
0180  20 49 98 3a 14 a2 8f ac fd 78 d9 f6 5a b4 48 c5    I.:.....x..Z.H.
0190  6c ad 07 92 8b 83 42 64 b7 48 47 82 b0 17 0a a4   l.....Bd.HG.....
01a0  2c 45 d2 76 0f 78 9c 8e db 6c 8b d7 e5 1d 3a 62   ,E.v.x...l....:b
01b0  e9 40 be 6c e4 74 59 fb 33 24 02 24 41 bb 7f 56   .@.l.tY.3$.$A..V
01c0  51 d3 a5 6e 00 41 ea ea 1e c1 a2 9a 9f 4e ae a8   Q..n.A.......N..
01d0  ef a4 81 e0 2d 08 b2 16 41 ed 81 47 b1 43 85 71   ....-...A..G.C.q
01e0  12 96 17 fa 98 4f a2 2b 6e 44 a9 be c9 09 3e 61   .....O.+nD....>a
01f0  b7 a3 c9 7d 5c d5 b3 8b 81 0b 81 a6 14 75 94 ed   ...}\........u..
0200  13 2c 8a df 41 72 d7 52 e0 ad f9 57 73 24 b8 16   .,..Ar.R...Ws$..
0210  00 ad cb 4b 4b b6 7b 09 94 a3 91 f6 d7 a9 49 9c   ...KK.{.......I.
0220  18 8e 9e b9 7c a9 a4 c5 55 1f 75 ec ba 45 ac 1b   ....|...U.u..E..
0230  02 d5 17 5d 33 48 0f 6f 73 ba db 2d 95 8b e2 17   ...]3H.os..-....
0240  ef 05 1d 86 b2 58 4d 82 d2 66 81 dc ee 9e d4 e5   .....XM..f......
0250  9a f8 ec 36 6f 4b c9 0e d3 a8 ba 46 f4 7d 77 d7   ...6oK.....F.}w.
0260  7c 42 9d 6e 43 41 ca b6 33 b6 da df 19 f8 79 e2   |B.nCA..3.....y.
0270  c0 11 c9 0b bd 80 61 e5 b6 6e 73 78 12 6c dd ea   ......a..nsx.l..
0280  3c 02 56 e5 60 03 19 fd 8c b1 00 f1 d8 7f c7 1e   <.V.`...........
0290  6e 35 fb 6f 12 cd ad b0 5a 66 36 c9 7e b6 99 f2   n5.o....Zf6.~...
02a0  e9 b0 15 fe 08 52 c5 f6 90 82 09 df 68 ad 9d d5   .....R......h...
02b0  24 86 13 bf 59 35 c2 dd 45 6d 6e d9 19 ad ae 6d   $...Y5..Emn....m
02c0  1e ef 1e 37 98 33 be d4 7c 52 2d 84 f4 40 67 6a   ...7.3..|R-..@gj
02d0  cf 96 89 88 be c1 c3 e0 b8 8c 5d 27 06 52 75 16   ..........]'.Ru.
02e0  f6 e4 f1 38 63 cc c1 b9 d5 a3 b9 c1 59 f3 ed be   ...8c.......Y...
02f0  ee c4 4f 0b 98 81 9d 40 ee 05 dd f6 1b 1b 98 ab   ..O....@........
0300  e0 6d 51 b7 5c 52 b7 51 f5 3a 43 b0 8d 1a b7 a9   .mQ.\R.Q.:C.....
0310  c5 e2 c9 f6 6e 35 18 85 ee 17 7a 84 50 12 66 f7   ....n5....z.P.f.
0320  f0 81 a2 78 b7 42 31 43 1c 2e 7a 70 c9 ca df a6   ...x.B1C..zp....
0330  28 0a 9b 94 0b b0 9e 76 20 c7 0f ea f0 11 8a 3f   (......v ......?
0340  1e 4a 8d 7d 0e 6e 90 a6 0c eb 9c 1d 3d 35 68 b2   .J.}.n......=5h.
0350  34 1c c4 76 39 36 d1 bb 75 c5 d0 fb bf c5 e8 f2   4..v96..u.......
0360  1b de 8a dd d7 4b ec ee 33 38 8e 2a 14 ad 00 8f   .....K..38.*....
0370  42 6e d1 de fe 1b 5c 80 9e 15 d5 76 f7 33 0a b5   Bn....\....v.3..
0380  da b4 bd 84 bf 00 a6 98 6f f2 96 c4 e0 fe 43 d0   ........o.....C.
0390  14 8f 11 4e 14 d9 f2 d4 16 95 98 24 1b bc db dd   ...N.......$....
03a0  d0 92 18 fc e8 d3 4c 64 aa 16 1b 37 f1 59 ef 0b   ......Ld...7.Y..
03b0  2a 97 98 52 2b 40 4b 28 08 7b 15 93 40 64 92 d5   *..R+@K(.{..@d..
03c0  ff 78 84 5b 8a 1a 1e c1 1d ce 61 82 df 73 ef ec   .x.[......a..s..
03d0  aa c3 16 09 3b 35 e5 a4 ae 35 df ee ae d6 05 47   ....;5...5.....G
03e0  7a ad 88 3c 66 f2 dc dc b5 89 18 ae 4d ba 41 e2   z..<f.......M.A.
03f0  12 ac a1 64 22 e0 9d 9d 4b 18 94 5b ca a4 01 6f   ...d"...K..[...o
0400  1e 9e 87 f4 f0 fe 0d c5 67 97 5a 95 1d 73 e5 8f   ........g.Z..s..
0410  14 62 89 04 ed 8c 99 e3 d3 cd 5b 5f 2c 10 c5 62   .b........[_,..b
0420  1d 87 20 86 bd 46 11 e2 89 d9 91 e6 6d 23 7a 24   .. ..F......m#z$
0430  ec bf 9f 86 9a 1f 62 fe 32 0e 48 7b 51 2c aa ab   ......b.2.H{Q,..
0440  ed ee 47 74 7f 72 17 5b 50 6e 84 cb 80 1d 08 d2   ..Gt.r.[Pn......
0450  a9 1d 91 27 fa c1 f5 25 4e a6 90 ef 14 74 13 6b   ...'...%N....t.k
0460  7c 58 68 d6 eb f9 82 25 61 c7 dd 3c c7 05 6a ef   |Xh....%a..<..j.
0470  9c 33 54 87 e5 83 4a 83 4f d6 31 19 2f ae 79 b2   .3T...J.O.1./.y.
0480  de c1 04 49 15 a6 8b d9 f0 d6 6e 1b 68 d0 3f 5f   ...I......n.h.?_
0490  70 c6 bc fe 9e 00 9d 0c d2 b2 8a 9e 55 88 9a 04   p...........U...
04a0  01 07 c9 86 49 70 8e 0e d5 ac 28 54 60 1b f9 cf   ....Ip....(T`...
04b0  ce c7 e7 78 62 95 3b fc 0e 55 c6 03 0b 43 81 90   ...xb.;..U...C..
04c0  12 da 2b ac 7f 69 11 76 67 52 9a b9 4f 70 77 29   ..+..i.vgR..Opw)
04d0  68 2e 24 e2 07 ae 48 71 aa df 8b 62 cf 5a 13 e1   h.$...Hq...b.Z..
04e0  b4 60 b8 f1 a4 ac ba 4c 73 de 57 91 f4 eb 70 a0   .`.....Ls.W...p.
04f0  c8 4a ab 6e 3a a2 3c c7 5f 4e 0e                  .J.n:.<._N.

No.     Time        Source                Destination           Protocol Info
    646 1464.134536 A.B.C.D           E.F.G.H         TCP      mni-prot-rout > 9988 [PSH, ACK] Seq=28306 Ack=1 Win=500000 Len=1275

Frame 646 (1329 bytes on wire, 1329 bytes captured)
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Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: mni-prot-rout (3764), Dst Port: 9988 (9988), Seq: 28306, Ack: 1, Len: 1275
    Source port: mni-prot-rout (3764)
    Destination port: 9988 (9988)
    Sequence number: 28306    (relative sequence number)
    [Next sequence number: 29581    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 500000 (scaled)
    Checksum: 0x74e1 [correct]
Data (1275 bytes)

0000  e0 14 5e 12 ec a6 9d 76 54 5e 6e ee b6 8e 56 62   ..^....vT^n...Vb
0010  63 2c e3 d7 13 5d e1 66 e3 19 9b 84 ad 8b e0 ed   c,...].f........
0020  af 0a bd 8d 90 f1 6d ea 76 90 de 3d 62 5a be b8   ......m.v..=bZ..
0030  0c ba c1 98 9b 72 5b 09 ce dd a3 00 71 9e 04 a9   .....r[.....q...
0040  5a 7c b2 7a 8a e0 e3 8c f7 44 05 d5 d2 9f b5 a9   Z|.z.....D......
0050  a3 64 17 8d 27 64 2c be b9 88 32 39 8b 49 7f d4   .d..'d,...29.I..
0060  d8 1b dc d7 ea 95 d5 43 ec 96 56 cc b7 54 57 3a   .......C..V..TW:
0070  ae 08 54 93 a5 17 8c 82 2d fc 83 35 4d b8 60 61   ..T.....-..5M.`a
0080  f3 97 fc 8e 0e 04 98 0e 44 5a 48 8e 8e 58 8b 0c   ........DZH..X..
0090  b9 39 d7 73 8f bc 60 ae af a1 ad e4 ef 14 ba 9a   .9.s..`.........
00a0  53 1c 55 1a 98 a8 44 fa 93 f6 00 9d 0d 1b 95 90   S.U...D.........
00b0  42 e7 b9 b0 92 13 40 f5 fe de d8 4f f5 67 f4 bb   B.....@....O.g..
00c0  cf 1b d6 61 e1 c1 87 c1 d2 8f 4f 3e 60 48 f4 c7   ...a......O>`H..
00d0  49 47 d3 b3 db 62 b1 6a bc 90 75 8a 7e a9 23 6e   IG...b.j..u.~.#n
00e0  2a 1b 90 a3 ea 3e 05 9f 78 be 41 91 99 be 82 82   *....>..x.A.....
00f0  51 93 1f 48 27 e1 29 d8 1a db 40 a9 a7 70 c7 d2   Q..H'.)...@..p..
0100  3c 65 13 8e 99 a3 4b 3a dd ee 29 03 01 13 36 96   <e....K:..)...6.
0110  c4 60 ce 9c 99 80 dc 13 d7 05 00 19 a6 a3 a3 72   .`.............r
0120  1e a0 a3 a3 84 43 ba 0a 7f 8c 4a 55 d4 24 56 94   .....C....JU.$V.
0130  a6 5a fb 44 de 25 28 fa 2d a0 44 f3 9e cb 31 f9   .Z.D.%(.-.D...1.
0140  5a 25 6d cb 86 10 0f 99 65 e2 16 9b 00 90 6a 96   Z%m.....e.....j.
0150  d7 ff 75 8e e2 c9 4b bf cc 45 91 09 8e b8 8e 13   ..u...K..E......
0160  1a 29 e4 c0 86 5c 07 9b fe 50 4a dd 0c e8 49 bf   .)...\...PJ...I.
0170  63 6e 54 2e 90 9a 50 8a da 18 ae 0e 66 f1 96 ba   cnT...P.....f...
0180  1f 2b e0 b7 bb f2 57 53 fc 1e 52 25 2c 02 69 6a   .+....WS..R%,.ij
0190  00 16 1b 76 38 43 e9 cc 17 f7 92 65 0e 34 c2 b2   ...v8C.....e.4..
01a0  73 c0 da 6d 73 6c 5f 5e 08 42 76 67 8c 7f 39 5b   s..msl_^.Bvg..9[
01b0  2d 8d 2c 7c 22 2c 93 17 99 4c 00 cc ec f0 92 0e   -.,|",...L......
01c0  d1 0c 47 29 d2 82 03 21 43 d4 74 18 f6 64 a1 e0   ..G)...!C.t..d..
01d0  73 66 2d 76 5c b0 05 0e b7 4b fc 64 ed 68 cd 6a   sf-v\....K.d.h.j
01e0  16 59 51 1b 99 1c a8 dd 87 6d 12 7f f9 d9 fd f1   .YQ......m......
01f0  72 11 2e a4 79 18 6d 44 e5 e6 ad a2 4b 99 ae 2b   r...y.mD....K..+
0200  76 4f cc ce d3 0c b6 cc c1 1c a2 5b db 3e 45 50   vO.........[.>EP
0210  5c 57 c4 5e a6 04 2e ee a2 6a d6 b9 d1 03 73 fc   \W.^.....j....s.
0220  21 08 a1 94 a1 0e 22 90 61 6d e0 9c f3 59 44 09   !.....".am...YD.
0230  6c f0 31 bd 64 ce d5 5e 5a 2a b2 ae a9 f1 b1 df   l.1.d..^Z*......
0240  66 dd b2 43 96 67 24 d8 ed 50 5d b8 e7 ad 9f bb   f..C.g$..P].....
0250  74 0f b4 ee 99 67 55 18 ce 89 fc 88 8e f6 11 ee   t....gU.........
0260  e2 9b 12 7c e9 df 25 c8 a7 50 9f 13 9d 36 ef 6f   ...|..%..P...6.o
0270  ff f2 d4 b8 a6 2d 3d f5 c3 cf fd 57 18 62 4e bb   .....-=....W.bN.
0280  69 ac c8 1d db 35 19 e0 f1 02 42 c7 21 1e cf 97   i....5....B.!...
0290  07 5e a1 6c ee a7 34 f4 14 12 77 9b c6 e2 ae d3   .^.l..4...w.....
02a0  08 dc 2d 6f 2e 1e 42 5c c8 19 b9 92 96 1a 9c ad   ..-o..B\........
02b0  30 1c 40 9f d7 1f 47 a4 d6 dd c5 5a e0 7b 45 56   0.@...G....Z.{EV
02c0  80 91 20 e0 b8 13 40 55 be 6d fd 65 f6 dc 85 7f   .. ...@U.m.e....
02d0  d2 1b 5e 6a b8 5c 07 33 77 38 f5 f3 d8 18 8f e7   ..^j.\.3w8......
02e0  1a 33 b1 a0 6b 5e 96 67 17 b2 e7 5b 3e 70 3d 6f   .3..k^.g...[>p=o
02f0  a9 1d a8 73 71 11 ae 0b 1b c3 3e bf 93 9a 69 d5   ...sq.....>...i.
0300  e3 ce 62 bc ce 06 f1 98 fe 91 0d cc a6 7a 17 72   ..b.........z.r
```

```
0310  c9 df 75 c4 d8 7a ed 8c b3 8c 1d b2 0d 17 57 d9   ..u..z........W.
0320  7c 8a 83 b5 5c ae 09 09 f2 88 16 66 d6 94 65 33   |...\......f..e3
0330  f0 08 67 32 e2 5a a3 94 a3 48 0f cb 22 82 d7 f6   ..g2.Z...H.."...
0340  16 94 01 2d f6 1e a3 36 44 95 dd 63 35 61 30 08   ...-...6D..c5a0.
0350  ce 50 5e cd 3b b9 60 41 7d 50 63 74 ac 73 4e a5   .P^.;.`A}Pct.sN.
0360  a6 18 56 05 d7 19 44 95 c6 1f 15 94 c2 f5 02 9d   ..V...D.........
0370  ce 58 77 b6 e4 20 c3 43 85 29 d4 1c d5 30 2e c1   .Xw.. .C.)...0..
0380  a5 fc 15 c2 62 81 d7 f8 f6 0e 65 a3 1a 08 76 29   ....b.....e...v)
0390  e9 3c 52 ba bd 97 40 13 0b 9e 8f d2 b8 71 00 a8   .<R...@......q..
03a0  f7 55 53 6b da 0d 5d 0c 1c d7 56 c1 63 4a 37 86   .USk..]...V.cJ7.
03b0  d0 19 4a 5f 68 39 ac 79 bf 3d 5d 8b 3b 0d a6 8a   ..J_h9.y.=].;...
03c0  5e 06 df c3 7f 32 63 99 d5 69 67 9e e4 f8 b9 22   ^....2c..ig...."
03d0  a5 03 90 ab b4 0d 62 50 f1 00 1f 83 6e ac 5d 98   ......bP....n.].
03e0  6a 05 60 3c 65 bc 9b 50 cf 07 6a ff e1 3b 69 bb   j.`<e..P..j..;i.
03f0  f4 d2 65 f0 ef 39 1a 02 71 04 a5 1e 1b 8b ac 9f   ..e..9..q.......
0400  aa fc 4d 92 e5 fb d0 e2 e2 ad e4 91 86 28 4e 3b   ..M.........(N;
0410  f6 c8 50 52 eb 0a 74 90 fe 7e b1 a9 20 06 66 9c   ..PR..t..~.. .f.
0420  30 09 54 98 8c 0c 77 13 34 fa 01 d0 2a 04 2e ce   0.T...w.4...*...
0430  85 42 84 3e f6 bf df a2 c7 88 16 3a 1c a1 0e de   .B.>.......:....
0440  e0 90 dd ed 9b 1d 18 5c 4d 65 86 e4 04 58 d0 cd   .......\Me...X..
0450  6c 2d 3c b2 81 74 ca dd 59 09 c5 78 0f 45 26 cb   l-<..t..Y..x.E&.
0460  88 77 52 fd 3c 35 56 6e d7 51 48 7e 34 63 21 d8   .wR.<5Vn.QH~4c!.
0470  c2 8c 21 34 c5 00 73 c5 cc 7f 56 2f 07 bc e6 36   ..!4..s...V/...6
0480  6e 50 00 ff 40 02 2e 82 86 35 5d 92 f3 38 4a 8a   nP..@....5]..8J.
0490  80 14 5d 8c b2 e3 6e 5b 3f 6a 3a 89 e5 4b 5e dc   ..]...n[?j:..K^.
04a0  63 a2 c8 50 d1 9c 1c 63 6c 5e 67 c7 f9 ef 4f dd   c..P...cl^g...O.
04b0  e3 da 1a d0 04 e5 a2 a2 ac 51 d4 e6 f1 47 1f 20   .........Q...G.
04c0  e7 2b 86 1a d8 1d 77 67 33 66 b1 a9 40 11 4a 98   .+....wg3f..@.J.
04d0  69 d7 6b 11 0c 2d be 2b b2 86 32 85 76 14 5a bc   i.k..-.+..2.v.Z.
04e0  ff fe ff 25 ab d7 87 dc 21 0f 10 99 94 28 a1 66   ...%....!....(.f
04f0  c4 04 cf a3 2f 2a b6 81 78 37 0c                  ..../*..x7.

No.     Time        Source                Destination           Protocol Info
    647 1464.134541 E.F.G.H         A.B.C.D           TCP      9988 > mni-prot-rout [ACK] Seq=1 Ack=29581 Win=64128 Len=0

Frame 647 (54 bytes on wire, 54 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: 9988 (9988), Dst Port: mni-prot-rout (3764), Seq: 1, Ack: 29581, Len: 0
    Source port: 9988 (9988)
    Destination port: mni-prot-rout (3764)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 29581    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 64128 (scaled)
    Checksum: 0x232c [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    648 1464.141519 A.B.C.D           E.F.G.H         TCP      mni-prot-rout > 9988 [PSH, ACK] Seq=29581 Ack=1 Win=500000 Len=255

Frame 648 (309 bytes on wire, 309 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: mni-prot-rout (3764), Dst Port: 9988 (9988), Seq: 29581, Ack: 1, Len: 255
    Source port: mni-prot-rout (3764)
    Destination port: 9988 (9988)
    Sequence number: 29581    (relative sequence number)
    [Next sequence number: 29836    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
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    Window size: 500000 (scaled)
    Checksum: 0xc830 [correct]
    [SEQ/ACK analysis]
Data (255 bytes)

0000  56 a9 d8 ce 52 1d 71 04 ae 32 05 a4 85 68 8a d3   V...R.q..2...h..
0010  cd 97 aa d9 d8 83 a9 a7 44 14 1d cf 70 53 67 2d   ........D...pSg-
0020  26 e2 8e ed 12 fb f5 39 17 05 0a a8 da 58 e8 81   &......9.....X..
0030  e4 63 a5 10 2a 83 95 14 90 5d 94 92 2f 46 2b ae   .c..*....]../F+.
0040  4d 46 30 81 1f b3 c8 64 0b f5 ca 1c 48 5b 95 ef   MF0....d....H[..
0050  89 bb df a6 bb d6 09 f9 c0 09 2c 13 b8 f7 6a 6e   ..........,...jn
0060  12 a4 9d 0b b5 2b 4a 5b b1 5e fe 8b 8b 03 62 ee   .....+J[.^....b.
0070  63 68 1e 5a bb ae 12 d3 42 69 d2 cd 2c 83 91 ac   ch.Z....Bi..,...
0080  7e c1 95 ec b0 bc c7 96 a4 ef 80 42 72 a0 e3 7e   ~..........Br..~
0090  78 2e a7 17 2c eb d0 0a f2 f2 28 ee db 74 ba 61   x...,.....(..t.a
00a0  28 67 ed 27 9b 79 da f3 e8 0e 6c 1e 72 32 48 ca   (g.'.y....l.r2H.
00b0  e8 92 76 0c 39 4b 5d 66 e5 44 a7 22 a6 0a 3c 77   ..v.9K]f.D."..<w
00c0  f5 4a 94 5e 98 fa f3 75 17 8e 01 5d 1a df 9a be   .J.^...u...]....
00d0  8a c2 1f 30 b3 c7 3c 6b 11 2b 67 55 b3 4d 5b 59   ...0..<k.+gU.M[Y
00e0  91 0d 14 52 a6 e1 58 d9 af 1b 3a 00 5e d1 94 13   ...R..X...:.^...
00f0  52 69 62 37 55 ed c8 e3 30 04 ff 54 b1 6a 37      Rib7U...0..T.j7

No.     Time        Source                Destination           Protocol Info
    649 1464.141580 E.F.G.H         A.B.C.D           TCP      9988 > mni-prot-rout [ACK] Seq=1 Ack=29836 Win=64128 Len=0

Frame 649 (54 bytes on wire, 54 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: 9988 (9988), Dst Port: mni-prot-rout (3764), Seq: 1, Ack: 29836, Len: 0
    Source port: 9988 (9988)
    Destination port: mni-prot-rout (3764)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 29836    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 64128 (scaled)
    Checksum: 0x222d [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    650 1464.166516 A.B.C.D           E.F.G.H         TCP      mni-prot-rout > 9988 [PSH, ACK] Seq=29836 Ack=1 Win=500000 Len=1275

Frame 650 (1329 bytes on wire, 1329 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: mni-prot-rout (3764), Dst Port: 9988 (9988), Seq: 29836, Ack: 1, Len: 1275
    Source port: mni-prot-rout (3764)
    Destination port: 9988 (9988)
    Sequence number: 29836    (relative sequence number)
    [Next sequence number: 31111    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 500000 (scaled)
    Checksum: 0x15ce [correct]
    [SEQ/ACK analysis]
Data (1275 bytes)

0000  84 1e f3 94 79 1e 1b 93 3a 2a a1 93 33 7b f5 88   ....y...:*..3{..
0010  b2 eb 93 45 61 24 1a 90 04 11 fd 6c 54 23 4c 15   ...Ea$.....lT#L.
0020  03 80 68 f3 77 d3 c2 f9 ff ba a2 e3 74 e5 95 30   ..h.w.......t..0
0030  4d fe c6 4e ed 56 8e d7 d3 6c ad 7a 48 64 ef 48   M..N.V...l.zHd.H
0040  bc 29 25 d1 de ba fe e7 c8 dc 1e 34 52 b9 a4 da   .)%........4R...
```

```
0050  ba d4 a8 5c 03 11 15 4b c0 81 02 fc c0 66 7f 5f   ...\...K.....f._
0060  52 b3 f2 34 9e e7 fa 4b 1a df 23 91 1d 9e 61 48   R..4...K..#...aH
0070  1e a6 ca 5b c0 9d 9d 10 2c 41 9b 0a d0 5c e4 dc   ...[....,A...\..
0080  2f 5c 6f c0 3e 2a 6d 0a 04 96 6b 12 05 8b ef 34   /\o.>*m...k....4
0090  9b a2 b7 55 a6 8e 8c 43 26 d1 d7 90 c4 a3 85 c5   ...U...C&.......
00a0  4e 93 dd 0b 73 3e a8 89 2e 07 89 80 5c 96 f6 a7   N...s>......\...
00b0  5f dd 9e 36 ce ca b7 8d 82 99 b2 53 73 1f 42 ae   _..6.......Ss.B.
00c0  8e ea cd 50 4a d2 d9 b5 b0 d5 f1 a0 f4 c5 da 14   ...PJ...........
00d0  52 b2 cd 10 cc e4 62 83 06 af 37 72 76 d7 cc 1b   R.....b...7rv...
00e0  1c 18 63 ad 43 35 74 7d 05 00 96 3d 1b 89 97 48   ..c.C5t}...=...H
00f0  5e c4 1e 80 21 88 0e 43 ce d3 e5 65 e7 38 aa 93   ^...!..C...e.8..
0100  1b da 11 c3 32 ae 1d 5e a6 64 ba 3e 90 17 26 b1   ....2..^.d.>..&.
0110  e4 86 75 47 5e 06 32 6b 8b 48 39 79 f4 19 94 3a   ..uG^.2k.H9y...:
0120  6e c8 ea 86 4b 53 e9 60 11 f5 74 45 54 7f 4c 4f   n...KS.‘..tET.LO
0130  dd 33 95 b2 d4 8a 0c 97 96 f3 dd 55 06 0b 83 96   .3.........U....
0140  43 6b 62 5b 9a b1 c4 6b 05 92 d6 58 c6 72 d0 16   Ckb[...k...X.r..
0150  d0 a3 22 15 b3 26 ce 29 ce de ad 5c 5d a3 ef e4   ..".."..&.)...\]...
0160  23 90 f1 bc 50 a9 e5 d8 7f df f6 6c 49 a0 ec 00   #...P......lI...
0170  e6 90 9c 14 06 9f f2 48 33 dc fd 49 63 31 35 0c   .......H3..Ic15.
0180  57 95 fe 29 77 8b ea a0 76 b6 ba da c5 5a c3 48   W..)w...v....Z.H
0190  b0 da fd 05 e3 a6 02 1f ab c0 ae 7e 62 bf bb 3d   ..........~b..=
01a0  d5 f2 5c c3 55 7e 51 39 79 c1 25 7a e2 9c c6 69   ..\.U~Q9y.%z...i
01b0  cb 8c c5 0c 03 40 a4 d7 03 bd 1c 41 7f f8 67 90   .....@.....A..g.
01c0  5e 6e e7 9d cd bb 15 5e 5e 95 b9 93 49 cb 43 7a   ^n.....^^...I.Cz
01d0  ce 98 eb 35 30 c8 97 92 e1 f8 cf 60 67 0a 96 35   ...50......‘g..5
01e0  0d 82 c1 33 f0 3b e7 98 bf 01 38 2e 54 42 37 f9   ...3.;....8.TB7.
01f0  45 6f 5c 3e 63 cd 39 00 25 72 90 55 c1 41 90 7d   Eo\>c.9.%r.U.A.}
0200  3a 97 a6 a7 f6 88 95 be 4f 5e d8 4a 44 bd 7e b1   :.......O^.JD.~.
0210  d6 de f2 35 7a aa 44 08 19 48 e1 a5 be 96 5b 00   ...5z.D..H....[.
0220  c1 25 3c a7 56 8a 6f 21 d1 44 3a f1 11 53 56 90   .%<.V.o!.D:..SV.
0230  84 be 1e a7 e1 fc a4 11 08 5e de 3a 62 92 74 35   .........^.:b.t5
0240  30 d2 2a 16 4e 16 a0 14 6f 8a fa 09 52 10 fe 16   0.*.N...o...R...
0250  02 86 c2 4a 9f c3 2b a4 6c 97 b0 55 50 d9 f9 53   ...J..+.l..UP..S
0260  a9 a9 cb 04 07 4d 6c 14 fc 82 5a 48 94 47 3d a8   .....Ml...ZH.G=.
0270  e2 40 8f 3d ce 96 2a 5c 6a d5 ce fa a8 c5 e7 55   .@.=..*\j......U
0280  45 1a 05 e4 6c 28 84 0e 7c c9 09 95 ef 90 c0 3a   E...l(..|......:
0290  40 0a 90 ba af ed 47 18 74 5d a4 55 f2 7f 94 66   @.....G.t].U...f
02a0  e6 ac ea b4 6a 90 b4 f0 c1 43 3e 9f 85 96 6d 23   ....j....C>...m#
02b0  fa d1 73 0e d6 d2 72 58 b4 62 f8 39 39 43 f6 0c   ..s...rX.b.99C..
02c0  24 47 8e 54 3e e0 7e aa 0e 0e 62 02 2d 1e 78 47   $G.T>.~...b.-.xG
02d0  97 cb 0b 33 dc c2 d5 03 6f 76 92 ff 55 98 f0 0f   ...3....ov..U...
02e0  bc ce 9f 58 7d 10 fb 10 ce 23 02 14 4f 86 12 48   ...X}....#..O..H
02f0  6f ab 3a 6a 4c 52 86 1b 8f 90 fe 04 0c 39 43 dd   o.:jLR.......9C.
0300  c6 36 2b 5e ad 53 53 66 06 3b f6 88 9d 6e 59 af   .6+^.SSf.;...nY.
0310  46 c9 15 b9 8a 42 ac ab d4 64 2a 1f f3 ec 65 f7   F....B...d*...e.
0320  48 57 9c 17 65 94 34 f5 e9 e6 71 ee a5 cb fe 13   HW..e.4...q.....
0330  60 8e 8a e4 12 c9 9f 08 c4 4b 26 2a 66 88 cf 67   ‘........K&*f..g
0340  2d cc 62 d2 20 c6 84 53 bd f0 33 5e 1f 3b 1c cf   -.b. ..S..3^.;..
0350  1b 48 ea 41 ff d9 31 45 7f be bd 0e e3 65 d3 92   .H.A..1E.....e..
0360  22 8a eb 6c cd b5 1f 92 d7 70 4c 0e 2f 4d 92 4e   "..l.....pL./M.N
0370  34 0b ce 2a 98 4c c3 6d dd ea 7b 79 b4 f0 fe 4a   4..*.L.m..{y...J
0380  2d 93 49 07 d0 b3 e0 04 20 82 69 dc 45 e6 24 5f   -.I..... .i.E.$_
0390  90 cd 79 72 9a 3d 34 0f 11 78 4a ce 09 d4 f3 73   ..yr.=4..xJ....s
03a0  11 3f 8d e1 0f ef 0b d1 90 bd 1a 4e a8 0b ef 38   .?.........N...8
03b0  5e be e7 10 b1 47 73 1b ef 6b 24 cd 5c e2 75 ad   ^....Gs..k$.\.u.
03c0  12 b1 52 cd 09 de 95 7c ac 29 64 e4 56 1a de cd   ..R....|.)d.V...
03d0  a9 78 fb 52 00 e7 ee 09 93 73 73 a3 4e 60 99 66   .x.R.....ss.N‘.f
03e0  65 25 1c 3f 13 a7 24 52 c9 ef 6e 6c 92 6b d5 bf   e%.?..$R..nl.k..
03f0  67 cd fb 3a e0 02 ee db c6 6f ee c4 95 e8 93 69   g..:.....o.....i
0400  64 4c 4b 7f 6b cb 46 c8 33 92 7b 0b cc 4f 24 f6   dLK.k.F.3.{..O$.
0410  39 e3 15 18 06 11 e8 99 bf df fd 54 0f dc d4 29   9..........T...)
0420  6e a2 7f f3 68 3f c7 fa d9 9e f6 30 64 84 ed 52   n...h?.....0d..R
0430  6b 98 f6 50 47 b7 87 23 00 95 93 1e 66 c4 5e 85   k..PG..#....f.^.
```

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0440  a5 eb 76 36 68 2a 97 f9 4a 17 68 39 7c 49 bd cc   ..v6h*..J.h9|I..
0450  2a b7 a2 1d 0d 13 a8 00 45 0d f2 1b ab 3f a0 31   *.......E....?.1
0460  61 73 fb 1f 2d be 4d fa 39 5e e4 98 ff 64 17 ba   as..-.M.9^...d..
0470  ac 85 83 ac 89 8c 15 e7 8c 8a 37 a8 a5 ee 23 50   ..........7...#P
0480  ea 1e 04 96 94 8f 77 69 f7 1b e2 22 7b c6 72 1e   ......wi..."{.r.
0490  45 08 07 68 39 90 78 ba 8c fc ac 9d 3f d3 24 a7   E..h9.x.....?.$.
04a0  c6 8a e8 a0 32 17 5c dd 0a bf e4 ae 73 28 f2 1f   ....2.\.....s(..
04b0  da 1a c7 e8 38 ca 76 f1 c6 91 3d a4 46 57 db 70   ....8.v...=.FW.p
04c0  bc 7b 03 65 5a b2 3e 0b e8 3c e4 f9 29 67 b6 b1   .{.eZ.>..<..)g..
04d0  3d ed 96 70 24 e7 ee 64 b6 0b dd 9c ff 98 84 34   =..p$..d.......4
04e0  53 92 f2 c9 2f b3 87 c3 b6 92 4c 65 9f 61 f8 09   S.../.....Le.a..
04f0  50 4b 1b f5 45 91 14 1b 64 86 c6                  PK..E...d..

No.     Time        Source                Destination           Protocol Info
    651 1464.179393 A.B.C.D           E.F.G.H         TCP      mni-prot-rout > 9988 [PSH, ACK] Seq=31111 Ack=1 Win=500000 Len=255

Frame 651 (309 bytes on wire, 309 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: mni-prot-rout (3764), Dst Port: 9988 (9988), Seq: 31111, Ack: 1, Len: 255
    Source port: mni-prot-rout (3764)
    Destination port: 9988 (9988)
    Sequence number: 31111    (relative sequence number)
    [Next sequence number: 31366    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 500000 (scaled)
    Checksum: 0x79cf [correct]
Data (255 bytes)

0000  03 f1 92 84 3c 43 82 ce 5c d9 8c 11 dc 3c aa e5   ....<C..\....<..
0010  e0 bd 36 86 5f 96 55 78 48 ee a4 03 12 a7 f4 f8   ..6._.UxH.......
0020  00 14 dd e7 dc 07 9b c9 4b 26 e9 35 a4 e1 0a a9   ........K&.5....
0030  3a ae e8 93 74 50 05 02 78 f3 10 40 59 02 e9 09   :...tP..x..@Y...
0040  7a e6 cc 1e c3 d8 ac e4 f3 76 1b 1d 8a df 4f 69   z........v....Oi
0050  6e 59 90 e3 a7 4d bf ac c0 4b 32 33 25 77 8f 32   nY...M...K23%w.2
0060  03 69 d0 66 57 4d 9b 9b 1d b2 99 11 33 99 30 b6   .i.fWM......3.0.
0070  09 8a bc 26 1a 2a 1a 0e 3e a5 e1 fb 57 6d 9d 98   ...&.*..>...Wm..
0080  10 80 11 e8 af 57 3d ee 62 ee aa 1f 23 dd a1 62   .....W=.b...#..b
0090  60 3c b6 aa 94 67 56 9c b5 99 08 90 4c 27 f3 94   `<...gV.....L'..
00a0  7b 67 f3 9d 9c 59 11 1e f7 3a a0 eb 56 3d 69 d4   {g...Y...:..V=i.
00b0  88 57 88 f4 62 ed 50 9b 8e ea 7a 57 70 26 a4 31   .W..b.P...zWp&.1
00c0  5a ab d3 9c 1a 9c af be b1 11 3f 59 10 ba 44 20   Z.........?Y..D
00d0  21 50 3c 73 59 46 a7 a6 0d cf 96 79 2c 2e e2 b3   !P<sYF.....y,...
00e0  2c e4 b8 d2 98 6d e5 89 e3 7d cf cb d8 33 b7 42   ,....m...}...3.B
00f0  3b 03 df 86 fb 3e 53 08 1d 57 cc c3 26 be 40      ;....>S..W..&.@

No.     Time        Source                Destination           Protocol Info
    652 1464.179399 E.F.G.H           A.B.C.D         TCP      9988 > mni-prot-rout [ACK] Seq=1 Ack=31366 Win=64128 Len=0

Frame 652 (54 bytes on wire, 54 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: 9988 (9988), Dst Port: mni-prot-rout (3764), Seq: 1, Ack: 31366, Len: 0
    Source port: 9988 (9988)
    Destination port: mni-prot-rout (3764)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 31366    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 64128 (scaled)
    Checksum: 0x1c33 [correct]
```

```
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    653 1464.203249 A.B.C.D           E.F.G.H         TCP      mni-prot-rout > 9988 [PSH, ACK] Seq=31366 Ack=1 Win=500000 Len=1275

Frame 653 (1329 bytes on wire, 1329 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: mni-prot-rout (3764), Dst Port: 9988 (9988), Seq: 31366, Ack: 1, Len: 1275
    Source port: mni-prot-rout (3764)
    Destination port: 9988 (9988)
    Sequence number: 31366    (relative sequence number)
    [Next sequence number: 32641    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 500000 (scaled)
    Checksum: 0x3548 [correct]
    [SEQ/ACK analysis]
Data (1275 bytes)

0000  a5 dc 8a 3f db bb e6 aa 67 25 e4 c1 1c 18 63 ec   ...?....g%....c.
0010  ec 6f 57 6d 94 44 20 10 b5 61 dc 5b 18 f3 56 d9   .oWm.D ..a.[..V.
0020  c2 b5 42 47 23 3e 2b a4 43 32 15 19 da ca 59 8e   ..BG#>+.C2....Y.
0030  67 df 20 b6 5e 20 05 6d 05 b5 43 65 da 86 25 29   g. .^ .m..Ce..%)
0040  2d 65 c1 02 6d 9c 16 df 2c 76 cc df 70 b0 35 48   -e..m...,v..p.5H
0050  f5 03 4e 82 fa 96 5c 19 00 38 56 8c 0f 0b 58 b8   ..N...\..8V...X.
0060  e8 00 09 86 38 e5 62 01 36 e9 47 28 fb 64 56 fc   ....8.b.6.G(.dV.
0070  dd a5 c3 ba 90 cf 8d c3 74 75 13 6b b9 5a c6 80   ........tu.k.Z..
0080  ee de 62 a6 ff 31 74 19 49 1e ad ec c1 1c 96 cd   ..b..1t.I.......
0090  5f f2 5a e1 ad 3c 42 c4 c1 5d 44 a8 d7 87 ac 6b   _.Z..<B..]D....k
00a0  15 f9 2d 28 96 51 a6 24 c8 74 68 37 07 14 ad 7b   ..-(.Q.$.th7...{
00b0  fe 0d 04 57 54 6a 70 6f 40 65 bc 3f 3b 31 3b 16   ...WTjpo@e.?;1;.
00c0  1d 0c 45 05 20 21 83 ee 4c d4 cf 2c 14 04 a4 e3   ..E. !..L..,....
00d0  63 5a ce 7e ee 67 e2 38 a2 2f eb 04 f6 dc 3f 18   cZ.~.g.8./....?.
00e0  c2 6e 6c a8 8e dc c6 e5 79 98 83 81 e9 ae 51 a5   .nl.....y.....Q.
00f0  37 fa 74 58 f0 e2 d6 6b 92 13 51 f0 ee 4f a2 9f   7.tX...k..Q..O..
0100  a0 ce 8f 3b aa 63 62 5d 2d 38 c2 1b 22 f5 28 da   ...;.cb]-8.."(.
0110  42 4f 7f f0 d6 68 db 2a 9d f0 02 45 81 04 f3 88   BO...h.*...E....
0120  1a f2 8b 92 ee fc 77 3b f5 a6 6d 37 84 32 19 26   ......w;..m7.2.&
0130  b6 10 93 13 a7 60 e4 5c 21 8d 08 e4 d7 c5 8d dd   .....`.\!.......
0140  51 88 e4 2b 15 72 7a 95 da 35 bc 46 22 03 d3 9d   Q..+.rz..5.F"...
0150  d2 2c 19 a8 d6 4f 87 a2 e0 5b 51 96 82 51 bc cc   .,...O...[Q..Q..
0160  12 63 dd 53 63 47 4f 1e 1a 26 16 72 8c 56 49 0d   .c.ScGO..&.r.VI.
0170  57 60 4d 28 2d a0 18 94 8c fd e4 67 f2 ef 12 1b   W`M(-......g....
0180  59 dc 04 35 f1 29 ff 77 c3 05 14 9a ed a6 02 b3   Y..5.).w........
0190  0e 33 fd 8a c5 80 5f 0d 3f 8b 41 12 a2 32 ff 47   .3...._.?.A..2.G
01a0  82 81 72 1a 9a 20 c3 9d 1a da 6c 96 d8 4e 52 3b   ..r.. ....l..NR;
01b0  a1 7a 34 10 11 22 92 da 82 b9 8e c3 4a 9a 29 0e   .z4.."......J.).
01c0  ec d4 4e 0d 1a 08 77 ec bc b4 f3 f8 99 f0 65 32   ..N...w.......e2
01d0  dd ad 54 9b 1d 39 10 9d b7 2a 3f f2 30 d0 62 35   ..T..9...*?.0.b5
01e0  e9 4a ae 4e fa 96 1f af ac 48 18 ae a7 e7 d5 da   .J.N.....H......
01f0  12 aa 6d 8f 1a 0d 35 8c d5 ca b8 ab ab 99 a7 1a   ..m...5.........
0200  bd 98 3f 9f af 9b 8f 90 1e 59 17 23 dc 1c 1e b1   ..?......Y.#....
0210  2e b3 e4 69 67 9d 86 e3 e5 76 51 d8 5e 5d cf 96   ...ig....vQ.^]..
0220  b0 ba 45 92 c5 c8 32 33 54 19 77 52 56 9a 7b 12   ..E...23T.wRV.{.
0230  72 30 bb 3b 5f 50 98 27 a6 86 0a b2 5b c0 f0 17   r0.;_P.'....[...
0240  a1 09 72 13 20 1f 7a 2e ef 31 6d c6 42 1a 06 95   ..r. .z..1m.B...
0250  6a 44 3a 06 8c b4 58 ae 84 f6 d3 3b 8a 4a be d7   jD:...X....;.J..
0260  52 80 39 cc 81 fa 50 a9 26 e7 73 6d b4 1c 4c 62   R.9...P.&.sm..Lb
0270  ec 21 29 ff 9a f5 23 82 ea 77 6c 04 92 4e 76 3a   .!)...#..wl..Nv:
0280  52 12 c4 48 03 4c 37 92 95 0c e8 1b c2 64 fb 16   R..H.L7......d..
0290  0c 5a 4e 0e 1c 19 2c a2 8e 98 ef a4 b5 bc b6 9a   .ZN...,.........
```

```
02a0  52 88 ea b1 7c 1b c5 b1 af 8d cc 20 b0 f3 6f 02   R...|...... ..o.
02b0  d9 1c 5a e6 0f d5 53 19 27 92 12 b2 36 58 01 7d   ..Z...S.'...6X.}
02c0  cf 5d 3a 82 f9 fe e0 3c 9f 72 93 f7 f2 69 73 22   .]:....<.r...is"
02d0  4c a0 0b 5c 7e ac b7 9e ee 14 eb 80 72 9d 7a fe   L..\~.......r.z.
02e0  dc 75 6f 32 e2 09 00 e6 d4 80 7b de fe d2 55 1e   .uo2......{...U.
02f0  aa 0c 8d 8d 8e a0 d4 65 73 9e 50 c8 11 36 87 7b   .......es.P..6.{
0300  8e 15 4a d3 ab f2 44 99 2e 58 06 47 e4 9e ca 11   ..J...D..X.G....
0310  09 38 2c ec 6c 67 43 5a 0e 2b a6 96 f7 68 42 66   .8,.lgCZ.+...hBf
0320  98 4a f1 bc a4 df 66 62 00 92 d6 3d c7 1c ba a4   .J....fb...=....
0330  33 d2 79 ca 32 0c ce be bf dc 51 52 d1 be 97 ba   3.y.2.....QR....
0340  9a d7 1f 44 e7 91 6e 30 ee dc 03 61 39 db 12 fe   ...D..n0...a9...
0350  e9 e4 19 fc dc a9 62 08 e3 5c 64 71 ee b3 a2 1d   ......b..\dq....
0360  cd 8a f0 8e 36 d9 a4 36 d2 0c 1f a9 4a c9 50 88   ....6..6....J.P.
0370  63 4c 77 2b 73 3c 06 d9 0e b6 54 3d 72 38 25 27   cLw+s<....T=r8%'
0380  0c 0d 41 b5 6a 6d 62 ab 74 ec cc 6f ee 4c c8 b9   ..A.jmb.t..o.L..
0390  08 9c f9 4f 1c 3f dd f8 6e 0c 84 a0 38 4c f9 10   ...O.?..n...8L..
03a0  e0 64 97 3a 2f 1c 62 59 6f a1 4e 4c 6b 54 42 f0   .d.:/.bYo.NLkTB.
03b0  f8 a6 d2 b2 cd 31 45 48 dc 2e 66 ec a3 e1 3c 29   .....1EH..f...<)
03c0  fb 5d 26 29 c0 da b3 90 c1 d9 a7 99 d2 49 b0 8e   .]&).........I..
03d0  e4 b6 44 91 2c 8c 55 cf 11 5f 48 88 9e 93 06 ba   ..D.,.U.._H.....
03e0  48 f4 e2 29 a8 ec b4 a0 d7 33 56 22 e7 09 95 7a   H..).....3V"...z
03f0  9c fa cd ac e2 f5 f6 a7 e0 99 62 52 cd 5b 52 90   ..........bR.[R.
0400  ca 06 aa f0 dd 90 57 b9 24 08 f6 10 26 fb 1c 81   ......W.$...&...
0410  36 f4 54 8b 0a c8 d8 92 9a b7 ac 59 f7 29 14 8b   6.T........Y.)..
0420  99 b2 2e a9 66 86 b8 34 e5 88 12 ca f7 5e ca b1   ....f..4.....^..
0430  73 cc 05 7e 32 6f d6 5c 8c 38 2e cb be 9b 7d 23   s..~2o.\.8....}#
0440  a8 c6 57 2e b6 b6 f7 7b fe 38 8e aa 52 7a d3 7e   ..W....{.8..Rz.~
0450  aa d5 12 0e f9 05 1e 8b 6d ab be 95 21 92 ca b0   ........m...!...
0460  55 7b 5d 12 37 30 a2 a9 f7 d1 a5 a8 97 18 ad 10   U{].70..........
0470  62 31 d2 3c 63 c6 02 12 cc dc 94 df 69 90 83 67   b1.<c.......i..g
0480  7d 38 a3 17 f4 5a 0f 44 22 a9 45 1e ea fd 0b 8a   }8...Z.D".E.....
0490  03 8a 4c 2a 9e b6 08 ae f0 53 f4 8a bf e0 95 e8   ..L*.....S......
04a0  50 49 a3 9c f9 23 03 8e 9b 3e e4 86 b9 b9 94 b9   PI...#...>......
04b0  f9 34 4a 34 c6 e7 f5 a2 cf 11 e0 3f a1 23 27 8e   .4J4.......?.#'.
04c0  9a c2 6e a8 3e 04 4e 19 aa 20 df ad eb 5c cf be   ..n.>.N.. ...\..
04d0  ab 92 ef 24 8a 28 6d 9f 51 33 92 d1 aa 0a 75 1b   ...$.(m.Q3....u.
04e0  24 cc 23 90 6b 40 32 00 ea 8d ea 5a ff 49 e5 85   $.#.k@2....Z.I..
04f0  c7 4f e6 90 0e 22 58 f6 86 df 16                  .O..."X....

No.     Time        Source                Destination           Protocol Info
    654 1464.230849 A.B.C.D           E.F.G.H         TCP      mni-prot-rout > 9988 [PSH, ACK] Seq=32641 Ack=1 Win=500000 Len=1460

Frame 654 (1514 bytes on wire, 1514 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: mni-prot-rout (3764), Dst Port: 9988 (9988), Seq: 32641, Ack: 1, Len: 1460
    Source port: mni-prot-rout (3764)
    Destination port: 9988 (9988)
    Sequence number: 32641    (relative sequence number)
    [Next sequence number: 34101    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 500000 (scaled)
    Checksum: 0x2bad [correct]
Data (1460 bytes)

0000  18 a1 00 da 63 a3 08 6f b4 ec 33 56 d4 f6 ab 04   ....c..o..3V....
0010  06 ba 3d f6 9d 0e 72 0d 8f 87 06 74 5f e1 cc 56   ..=...r....t_..V
0020  2d 9c 08 b5 5e ad 2d 85 1d e7 ed 17 ed 1a d0 af   -...^.-.........
0030  de cd a5 90 57 83 e1 ba 15 ac 2c 6c cc 31 09 a0   ....W.....,l.1..
0040  5a 79 fd d7 b3 38 44 5d d7 66 d9 48 36 5a d6 70   Zy...8D].f.H6Z.p
0050  5a 9f a6 85 d3 fd 04 c3 26 77 54 87 8a 9b 3a 3d   Z.......&wT...:=
```

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0060  78 ab 17 4a 03 11 4c 8f 08 ed 42 4c 2b 1e a4 78   x..J..L...BL+..x
0070  33 9a 9a 56 e6 38 84 69 d0 fd 2a 58 26 e0 10 53   3..V.8.i..*X&..S
0080  3b 96 09 4c fe b6 fd e4 fb 78 f2 8b bd 8e 9a d4   ;..L.....x......
0090  56 23 f2 4f d9 22 d4 29 88 f2 70 c7 ad d1 a2 5c   V#.O."..)..p....\
00a0  58 7f 68 d4 61 e8 e0 72 95 a6 e3 5c 1c b0 10 79   X.h.a..r...\...y
00b0  52 e2 bb 19 13 1e e6 12 9c 80 7d 33 10 7c 6d cd   R.........}3.|m.
00c0  96 8f 9e 38 e2 5a 5d 4f f6 d6 5d 19 3a a8 47 0e   ...8.Z]O..].:.G.
00d0  a1 53 b8 ba fc 21 6d c2 39 f2 77 66 42 f8 39 57   .S...!m.9.wfB.9W
00e0  ef f2 41 45 44 7c 71 5c ab 38 6a 0c e5 3d 3c 52   ..AED|q\.8j..=<R
00f0  62 e4 c9 7a 99 ea 0f 66 10 e7 f8 d4 60 0a 4d a0   b..z...f....‘.M.
0100  1a c0 fa b9 e3 a7 09 49 2d 70 06 87 8f 9e 00 3a   .......I-p.....:
0110  85 a4 19 c5 a6 42 1a 5f 90 ea 7e b4 8a 1c 3c 4d   .....B._..~...<M
0120  d1 97 dc 62 b1 bf fb 75 4b 23 f3 45 80 fb 70 4b   ...b...uK#.E..pK
0130  ab ba 38 27 ef 73 ca 1f 0c 0c fc 7e cf 24 14 87   ..8’.s.....~.$..
0140  7a e5 4d 81 bd e3 c0 cf a3 b1 7b 7a b8 f2 c4 d3   z.M.......{z....
0150  ec da 2a 52 7a cf 4f 25 a6 c4 0c a2 8d 90 4c 74   ..*Rz.O%......Lt
0160  73 df 11 06 e4 cb 5c be ec de 9c 6b 24 e7 03 6d   s.....\....k$..m
0170  15 1f 03 26 df 36 ec c8 44 ea 58 cb f7 b4 19 6b   ...&.6..D.X....k
0180  e5 35 7a a8 11 20 1e 84 e2 af 8e 3c a5 ae 4c 38   .5z.. .....<..L8
0190  1e c0 64 af 0f 04 9d 3e dc 61 31 0a 58 74 aa 14   ..d....>.a1.Xt..
01a0  b2 f7 98 c2 e5 d1 67 72 12 da 4d 22 2a 34 02 6e   ......gr..M"*4.n
01b0  e2 62 d0 20 a2 83 27 72 8c 94 96 cf b9 bf f3 83   .b. ..’r........
01c0  9f d2 55 b6 94 68 fe 50 03 2e 0c 26 f8 c3 13 fa   ..U..h.P...&....
01d0  29 b7 4d 72 aa c1 a0 e8 ba 96 f3 cb 0a d3 89 83   ).Mr............
01e0  73 f9 8b 6f 36 d9 26 62 af b4 51 57 d3 86 40 57   s..o6.&b..QW..@W
01f0  46 6c 88 c8 58 e2 d2 8c d1 f3 dc a6 b8 ab 1f 87   Fl..X...........
0200  56 30 2e ea 8f a4 fc 66 df d4 d8 4a 3a c7 2a a7   V0.....f...J:.*.
0210  89 f3 5e 51 96 a5 f8 67 46 77 c0 0f d3 2f 92 45   ..^Q...gFw.../.E
0220  ec c2 e7 55 25 6e 1a 01 d9 27 f1 c5 1a 07 ee c1   ...U%n...’......
0230  67 97 53 f7 b2 f8 f2 56 ad ac 2a 17 a6 a3 1a ae   g.S....V..*.....
0240  82 76 33 04 99 5d e7 8f aa 9b 5c d7 d6 e5 0e 6f   .v3..]....\....o
0250  82 e9 1f 49 2c b2 fc 44 31 63 c1 a9 53 01 aa d3   ...I,..D1c..S...
0260  ba aa 78 db 5b 07 22 4e 91 b0 38 52 8e 77 04 77   ..x.[."N..8R.w.w
0270  92 f9 91 42 74 b5 8f 42 e6 55 41 9a 47 4a 96 16   ...Bt..B.UA.GJ..
0280  92 d9 1c 16 10 c0 5c 6d 0f 4a 3f 43 7d 6d 15 62   ......\m.J?C}m.b
0290  58 56 b8 e7 3c 36 8e e5 b9 39 3d c3 d6 eb 2a a8   XV..<6...9=...*.
02a0  d7 07 b8 45 bc f6 4e 6d cc a0 50 31 bb ec 11 4a   ...E..Nm..P1...J
02b0  99 7c af 85 fb 4a 99 61 f4 ec 14 e5 3a f7 72 41   .|...J.a....:.rA
02c0  3d cb 33 cc 90 0e 93 75 5e 02 2a f6 9e dd 6a a2   =.3....u^.*...j.
02d0  8b ed 56 6b d8 94 0d ae c2 d5 90 a6 fe 52 10 4e   ..Vk.........R.N
02e0  7e 06 3a 55 06 cb 9c 34 b1 0e 3d 75 8a 3a d0 fe   ~.:U...4..=u.:..
02f0  92 33 11 82 46 c2 22 8a 8b 14 11 f4 26 e4 ba 4f   .3..F."....&..O
0300  a5 6e a7 4f 43 26 19 29 93 f9 dc ca 93 8b f2 44   .n.OC&.).......D
0310  a6 ef 27 ce c3 ef c1 8e 98 ef 0d 02 bc 9e d4 c6   ..’.............
0320  4c ee 97 a4 69 ee 2e 06 4a 45 5f 4e 6b 26 10 5d   L...i...JE_Nk&.]
0330  ba 32 3b 36 92 1e 95 4e 17 76 c0 57 a7 ee e4 1c   .2;6...N.v.W....
0340  dc ee d0 9a 8a ec b2 65 bd 22 f8 42 4d e1 67 57   .......e.".BM.gW
0350  6e e1 aa a2 98 42 1f 79 12 27 1f 9f 72 e7 69 41   n....B.y.’..r.iA
0360  85 22 6b 41 f7 31 d8 df e3 64 7c 1c ea df 6c 74   ."kA.1...d|...lt
0370  4b e3 0f ce a1 e1 c1 fa d6 de 19 eb 4c f6 11 fa   K...........L...
0380  99 69 0c 8a a2 23 d1 40 a6 3d 15 c3 78 2d 1e 70   .i...#.@.=..x-.p
0390  77 aa 20 d7 14 6b f8 24 09 e0 2e 01 2a f7 41 40   w. ..k.$....*.A@
03a0  66 bd 5e 40 52 26 fa 67 9c d9 90 65 9c 3f c8 5a   f.^@R&.g...e.?.Z
03b0  73 17 07 82 71 e3 74 a6 14 9e a9 c9 78 55 1d 70   s...q.t.....xU.p
03c0  dd 52 6d b7 85 22 63 43 f7 0c 23 a1 12 18 3b 05   .Rm.."cC..#...;.
03d0  9f 82 cc 34 93 f3 5c 4d e2 02 96 65 4b e2 e0 95   ...4..\M...eK...
03e0  9e 6b 89 fe 47 77 1c ba 01 a0 1c 8e 52 04 79 42   .k..Gw......R.yB
03f0  a5 6e 7b 42 43 3e 04 6f dd e2 e9 6d 9e fd 3b ae   .n{BC>.o...m..;.
0400  04 17 fb be 58 e5 ab c6 7a 47 f3 9f f4 67 a1 a8   ....X...zG...g..
0410  84 a4 11 b7 10 e5 03 6f 56 de 89 c7 4c 8d 4e 57   .......oV...L.NW
0420  c8 e5 aa fa 03 de 51 5b 96 06 17 c3 78 fc 1b 89   ......Q[....x...
0430  1a 47 20 52 8b 06 b2 55 78 e4 65 e6 93 de c9 44   .G R...Ux.e....D
0440  c5 06 dc ec 98 8a cc c8 76 e4 97 a4 e8 e4 2e b3   ........v.......
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0450  86 8f 5f 44 6b dc 1a 71 3a 36 20 ce ab 0e f8 90   .._Dk..q:6 .....
0460  dd e4 90 f6 78 1f 19 79 12 2c 19 9f 4a fa d9 01   ....x..y.,..J...
0470  9b 17 8a 47 81 c5 d8 ce 13 e7 e6 68 c0 e7 78 bc   ...G.......h..x.
0480  8b de 49 5b 80 06 dd 64 9b 79 98 04 a2 cf 01 a6   ..I[...d.y......
0490  ce 96 f2 cb 0b 3e d6 a7 8b 1a aa a7 81 c5 d0 da   .....>..........
04a0  33 c5 e1 3c 58 29 98 e7 a2 f7 69 8e 46 43 d9 09   3..<X)....i.FC..
04b0  9b ab df 68 84 5d 4d 53 88 f8 55 b6 d0 eb f8 5d   ...h.]MS..U....]
04c0  0a 0a 58 08 19 b3 3d 1c 0b e8 c4 ce 7a 2e 71 e1   ..X...=.....z.q.
04d0  f4 40 ac ff 91 a2 95 23 30 e2 f6 cd 7f 5f e8 88   .@.....#0...._..
04e0  a9 8b 14 40 b0 85 f6 23 68 19 47 bc e2 08 cb 3a   ...@...#h.G....:
04f0  7a 03 f4 ff ba 7b 0a f4 cc 7f 9a 95 70 ed da f7   z....{......p...
0500  ab c5 1e 63 77 10 e9 03 a7 18 ff d3 8a 27 03 e2   ...cw........'..
0510  35 47 f9 e3 a1 21 93 02 96 b4 f9 cf b4 d4 8c 74   5G...!.........t
0520  15 ef e2 37 ee 41 50 60 f3 95 93 de 71 a3 14 cc   ...7.AP`....q...
0530  71 cd 3e 76 a0 13 af 40 c2 85 0c c5 e6 e0 15 c3   q.>v...@........
0540  5a 93 fd 7d 10 20 92 4c a1 df 77 72 2e fb 08 13   Z..}. .L..wr....
0550  82 95 99 94 9e b0 27 ad 13 06 36 42 9f 38 e9 64   ......'...6B.8.d
0560  96 54 96 57 6a 34 92 ec 4b 1c 92 f0 34 fb d9 5e   .T.Wj4..K...4..^
0570  1a 04 19 87 57 e0 b7 89 9c cd 59 50 90 1e 1a 4c   ....W.....YP...L
0580  4a fb 06 17 70 2c 23 cc d8 c9 3c c2 a7 e3 f0 49   J...p,#...<....I
0590  05 a9 52 44 f5 1f d3 4c 79 cc 25 7a d8 36 24 0e   ..RD...Ly.%z.6$.
05a0  76 66 85 1c c0 b4 1c 10 a9 b6 4c bc 43 ec d2 17   vf........L.C...
05b0  2c 6e 50 a8                                       ,nP.

No.     Time        Source                Destination           Protocol Info
    655 1464.230854 E.F.G.H         A.B.C.D           TCP      9988 > mni-prot-rout [ACK] Seq=1 Ack=34101 Win=64128 Len=0

Frame 655 (54 bytes on wire, 54 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: 9988 (9988), Dst Port: mni-prot-rout (3764), Seq: 1, Ack: 34101, Len: 0
    Source port: 9988 (9988)
    Destination port: mni-prot-rout (3764)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 34101    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 64128 (scaled)
    Checksum: 0x1184 [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    656 1464.231108 A.B.C.D           E.F.G.H         TCP      mni-prot-rout > 9988 [PSH, ACK] Seq=34101 Ack=1 Win=500000 Len=70

Frame 656 (124 bytes on wire, 124 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: mni-prot-rout (3764), Dst Port: 9988 (9988), Seq: 34101, Ack: 1, Len: 70
    Source port: mni-prot-rout (3764)
    Destination port: 9988 (9988)
    Sequence number: 34101    (relative sequence number)
    [Next sequence number: 34171    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 500000 (scaled)
    Checksum: 0xf91c [correct]
    [SEQ/ACK analysis]
Data (70 bytes)

0000  1d db 52 2a a4 e9 6b 87 63 fa 1c c7 9f fb f6 5d   ..R*..k.c......]
0010  2e ee 07 57 98 2e 1d 57 9c 38 f9 fd da d9 31 45   ...W...W.8....1E
0020  53 f8 88 40 b9 e1 a5 85 ec 67 67 14 95 e1 56 a4   S..@.....gg...V.
```

```
0030  3e bc 0e 96 be ee af 4c be 08 5e d5 56 4d 26 46   >......L..^.VM&F
0040  c1 38 48 65 25 f7                               .8He%.

No.     Time        Source                Destination           Protocol Info
    657 1464.231145 E.F.G.H         A.B.C.D           TCP      9988 > mni-prot-rout [ACK] Seq=1 Ack=34171 Win=64128 Len=0

Frame 657 (54 bytes on wire, 54 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: 9988 (9988), Dst Port: mni-prot-rout (3764), Seq: 1, Ack: 34171, Len: 0
    Source port: 9988 (9988)
    Destination port: mni-prot-rout (3764)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 34171    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 64128 (scaled)
    Checksum: 0x113e [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    658 1464.249472 A.B.C.D           E.F.G.H         TCP      mni-prot-rout > 9988 [PSH, ACK] Seq=34171 Ack=1 Win=500000 Len=1020

Frame 658 (1074 bytes on wire, 1074 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: mni-prot-rout (3764), Dst Port: 9988 (9988), Seq: 34171, Ack: 1, Len: 1020
    Source port: mni-prot-rout (3764)
    Destination port: 9988 (9988)
    Sequence number: 34171    (relative sequence number)
    [Next sequence number: 35191    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 500000 (scaled)
    Checksum: 0x9a80 [correct]
    [SEQ/ACK analysis]
Data (1020 bytes)

0000  bb 82 5f 55 33 63 b5 b5 49 03 22 5c 0f 24 69 b7   .._U3c..I."\.$i.
0010  d0 48 f3 b0 61 a2 9f ee 13 a0 95 57 9b e5 be c0   .H..a......W....
0020  1f fc 29 d3 0d 77 93 fb 37 51 a5 8c df dd d6 fd   ..)..w..7Q......
0030  1b 8f e4 f9 65 dd 77 c4 f4 58 e6 e5 ad 81 3e ed   ....e.w..X....>.
0040  44 26 cc b8 e0 ba 50 5b 01 c1 88 9c 30 3c 95 d2   D&....P[....0<..
0050  af 11 22 48 17 84 8b 0e de 18 1f 16 7a 4d 41 3b   .."H........zMA;
0060  aa 68 ab 1e fd 5e 21 68 3b 8b 28 1e d8 a2 1d b7   .h...^!h;.(.....
0070  10 2d 11 a9 33 57 63 0e ea 6b c1 9c 4e 65 98 54   .-..3Wc..k..Ne.T
0080  fa 06 c5 10 b0 be 7a 2f 8d a8 58 43 06 02 86 ca   ......z/..XC....
0090  00 db ec ba 08 77 10 62 1e d6 ca 2e 50 22 d6 d4   .....w.b....P"..
00a0  70 5e 92 d6 9c 03 96 c8 93 56 49 f5 41 ec 4a 52   p^.......VI.A.JR
00b0  f0 d8 2b 35 fc f5 f1 9d 8f b0 ba c1 69 66 e8 3b   ..+5........if.;
00c0  e0 5c ef b5 6d 0a cb ea bb a8 f9 18 30 3a ea 07   .\..m.......0:..
00d0  64 3e 6e cf e0 99 94 d5 c6 65 40 7b 97 45 47 07   d>n......e@{.EG.
00e0  30 cb 06 cd 36 aa b1 f2 d9 85 33 fe de 45 b2 24   0...6.....3..E.$
00f0  3b b5 7a 8f 1c a9 13 f0 e5 43 ed 85 10 ff 62 27   ;.z......C....b'
0100  cf 79 f8 24 1f bd a9 25 3b aa a8 ee c6 06 5b 13   .y.$...%;.....[.
0110  1d 9d ea c6 78 d2 6a ce d9 80 4c 98 df 29 6d d5   ....x.j...L..)m.
0120  28 71 96 e8 aa 93 9f bb c8 80 74 36 fe 84 fc f0   (q........t6....
0130  2b 90 12 9f 3b 88 a8 f6 e0 50 47 e3 8f 32 3f dd   +...;....PG..2?.
0140  b1 9e fe 02 0c 72 20 17 9c 5d fe c7 00 e3 4d 6e   .....r ..]....Mn
0150  7b 22 43 fa 15 68 26 a4 5e 22 52 c6 71 33 78 c7   {"C..h&.^"R.q3x.
0160  2e 22 d9 c2 53 e9 8b e6 7c f4 b2 fc 45 36 45 6b   ."..S...|...E6Ek
0170  7c d6 b6 34 f3 c2 24 8a 7c 76 1c 71 44 db b9 82   |..4..$.|v.qD...
```

```
0180  7c 72 ae 5c f9 3a 81 82 39 7e 3f 31 10 1d fe 3f   |r.\.:..9~?1...?
0190  24 4b b4 5e 22 04 fe c6 de e2 e9 2b 84 81 0d 43   $K.^"......+...C
01a0  d0 91 97 f1 d0 f1 0a 2a a1 6b 97 28 1e 73 0d 34   .......*.k.(.s.4
01b0  d0 ac 5c 12 d0 cd 3e d0 d6 4f 50 46 d5 75 58 71   ..\...>..OPF.uXq
01c0  bd 8e 4f 6b c9 8e 28 c4 d4 48 d9 3a 58 8b 2b 25   ..Ok..(..H.:X.+%
01d0  b3 e8 d1 20 b3 5d 37 20 7c 86 50 f2 8e 36 56 68   ... .]7 |.P..6Vh
01e0  7b d1 cc 6c 3b 25 0a ce ec fc 2b 81 b9 80 fa c6   {..l;%....+.....
01f0  b0 c3 f9 43 cd ce de 85 d2 92 bb 82 71 33 f8 c7   ...C........q3..
0200  21 22 be e9 53 ec 8b 18 7c 8e a2 9c 45 16 41 62   !"..S...|...E.Ab
0210  df 04 96 42 a2 e7 22 fa 7c 66 1d 43 cd 4c 0f cd   ...B.."."|f.C.L..
0220  50 85 2f 34 49 34 fe 34 f2 c2 e8 94 7c 4e 84 71   P./4I4.4....|N.q
0230  4c 09 ba 82 5a 5a 3e 5c b9 6a 97 82 1f 27 0b 0e   L...ZZ>\.j...'..
0240  3b ad 43 09 e4 07 aa 34 d5 ac 1e ed 4d 20 6f 74   ;.C....4....M ot
0250  3f e4 57 2f 33 ba 75 b4 eb 65 9e c2 76 09 00 23   ?.W/3.u..e..v..#
0260  4f be 49 42 32 0f 91 76 70 f6 fe ef 99 80 ef a7   O.IB2..vp.......
0270  ac 75 df 8e 50 b6 8a 8b 95 45 61 33 c6 8e 88 0e   .u..P....Ea3....
0280  99 84 70 60 87 5e 53 26 0f 6b 77 56 08 8d 70 67   ..p‘.^S&.kwV..pg
0290  db d1 ce 66 2e 7e 86 63 47 d6 8a 34 a7 82 fc d4   ...f.~.cG..4....
02a0  47 5a 8e 73 e6 01 bb b9 f2 fa 38 bb e5 42 35 17   GZ.s......8..B5.
02b0  28 e7 08 b9 88 72 3e 49 e9 55 80 b9 32 6f c4 73   (....r>I.U..2o.s
02c0  e4 be bb b8 88 4a 3e 49 f9 9f 81 b8 39 5e d3 b9   .....J>I....9^..
02d0  da 84 80 b8 15 1f 8c a4 2a 62 d0 fd 4f b6 3c 4b   ........*b..O.<K
02e0  03 d6 aa c3 1d 39 17 6e de 4a c4 da c2 fe 5a ef   .....9.n.J....Z.
02f0  46 19 58 8d 2e 18 d3 ee db 70 4f c2 a4 d3 66 b2   F.X......pO...f.
0300  31 3f 8a f1 14 c5 6a 19 db 6f e6 ed 89 99 3f 99   1?....j..o....?.
0310  10 72 fa f6 1e 06 83 3c 8a 4a e7 ed 89 a6 3f 99   .r.....<.J....?.
0320  10 53 f9 f4 12 56 66 fc 38 bd a4 de 13 8e 7b 34   .S...Vf.8.....{4
0330  a6 82 6c e1 7d 49 11 0c 02 77 4b f2 13 b0 fe a0   ..l.}I...wK.....
0340  ca 96 24 22 c0 4e f2 f3 4a 4e 2a 8f 71 19 f8 5f   ..$".N..JN*.q.._
0350  2c 2f dd ea 52 bd 8b 7c 71 e4 b2 dc 4f 9e e1 6b   ,/..R..|q...O..k
0360  71 57 9e 6f 1d 19 58 ba 2c 2e dd c6 52 bd 8b db   qW.o..X.,...R...
0370  70 e4 a6 dc 4f 9e 84 6b 70 57 82 34 a6 c2 65 8e   p...O..kpW.4..e.
0380  70 72 14 73 ec a6 b9 8e 5c 56 ee 49 b9 87 80 8e   pr.s....\V.I....
0390  3b 6a 3f 9b 10 e4 f2 37 10 5b b1 0e 9b 00 f2 6e   ;j?....7.[.....n
03a0  3c af c5 a4 7c 56 f2 a2 3c f7 19 c0 71 58 43 75   <...|V..<...qXCu
03b0  50 45 59 37 91 5e e6 e8 f2 16 5c f2 e9 1b 88 98   PEY7.^....\.....
03c0  14 21 ea d6 e1 a2 e2 18 9a e0 c1 bf 9d 2e 9b b3   .!..............
03d0  e4 53 58 de 19 4e 8a 50 23 72 52 ef 9e d2 92 a2   .SX..N.P#rR.....
03e0  c8 dc 13 64 0a a6 be 14 5c 44 a0 ee 08 d7 ba c4   ...d....\D......
03f0  2a 02 d8 b2 90 ea a3 42 58 15 42 ae               *......BX.B.

No.     Time        Source                Destination           Protocol Info
    659 1464.249505 E.F.G.H         A.B.C.D           TCP      9988 > mni-prot-rout [ACK] Seq=1 Ack=35191 Win=64128 Len=0

Frame 659 (54 bytes on wire, 54 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: 9988 (9988), Dst Port: mni-prot-rout (3764), Seq: 1, Ack: 35191, Len: 0
    Source port: 9988 (9988)
    Destination port: mni-prot-rout (3764)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 35191    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 64128 (scaled)
    Checksum: 0x0d42 [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    660 1464.264467 A.B.C.D          E.F.G.H         TCP      mni-prot-rout > 9988 [PSH, ACK] Seq=35191 Ack=1 Win=500000 Len=255

Frame 660 (309 bytes on wire, 309 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
```

```
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: mni-prot-rout (3764), Dst Port: 9988 (9988), Seq: 35191, Ack: 1, Len: 255
    Source port: mni-prot-rout (3764)
    Destination port: 9988 (9988)
    Sequence number: 35191    (relative sequence number)
    [Next sequence number: 35446    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 500000 (scaled)
    Checksum: 0xfe23 [correct]
    [SEQ/ACK analysis]
Data (255 bytes)

0000  08 80 af d4 c4 4f 76 c2 aa 0e 60 6e 12 70 8b c2   .....Ov...‘n.p..
0010  3a 7c de a8 78 cf ec f4 9e 62 0c ae aa d7 50 c4   :|..x....b....P.
0020  fa 02 68 ec 58 71 80 6f 30 55 14 d4 99 22 8b 8a   ..h.Xq.oOU..."..
0030  3e e6 93 80 6c 5f 1e ef 5c d6 3c 6f a0 54 56 c2   >...l_..\.<o.TV.
0040  cc 0e 7e 77 e0 6c 90 6a 7c 5c 93 ce 50 78 0b b2   ..~w.l.j|\..Px..
0050  3a 26 fd 98 99 3e 52 58 5d d7 93 7a 3a ee ba 4a   :&...>RX]..z:..J
0060  2c 02 04 86 d4 07 c8 ef 5c cf b6 f4 06 62 94 aa   ,.......\....b..
0070  e4 7f 76 2e 11 90 0b 2e 3a fe f5 be c9 bf 93 a2   ..v.....:.......
0080  0b 2a 8a 6f 9a 7d ad 74 11 8e 3a e7 2e 00 a3 a7   .*.o.}.t..:.....
0090  11 02 96 1a bb 2e be d7 04 6a 7f 86 2a 4e a4 7f   .........j..*N..
00a0  34 18 03 f7 9c ef e2 34 88 56 6e dc c1 2f 93 00   4......4.Vn../..
00b0  0a 88 bc e0 59 22 5c f7 30 0e 24 7f b6 4f 3e f4   ....Y"\.0.$..O>.
00c0  8e 62 12 ae 6e d2 94 86 7f 4f 40 2c 5c 00 be 7e   .b..n....O@,\..~
00d0  bd a2 02 74 01 c2 ab 23 10 b6 a8 ce 0c f2 32 72   ...t...#......2r
00e0  48 76 1b 46 53 52 b8 2a f9 54 72 f8 5c a8 d2 6e   Hv.FSR.*.Tr.\..n
00f0  e0 75 1d f3 4e 86 a8 be b9 52 0c 82 7c 30 b3      .u..N....R..|0.

No.     Time        Source                Destination           Protocol Info
    661 1464.264498 E.F.G.H         A.B.C.D           TCP      9988 > mni-prot-rout [ACK] Seq=1 Ack=35446 Win=64128 Len=0

Frame 661 (54 bytes on wire, 54 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: 9988 (9988), Dst Port: mni-prot-rout (3764), Seq: 1, Ack: 35446, Len: 0
    Source port: 9988 (9988)
    Destination port: mni-prot-rout (3764)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 35446    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 64128 (scaled)
    Checksum: 0x0c43 [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    662 1464.292694 A.B.C.D           E.F.G.H         TCP      mni-prot-rout > 9988 [PSH, ACK] Seq=35446 Ack=1 Win=500000 Len=1460

Frame 662 (1514 bytes on wire, 1514 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: mni-prot-rout (3764), Dst Port: 9988 (9988), Seq: 35446, Ack: 1, Len: 1460
    Source port: mni-prot-rout (3764)
    Destination port: 9988 (9988)
    Sequence number: 35446    (relative sequence number)
    [Next sequence number: 36906    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 500000 (scaled)
```

```
    Checksum: 0x55d7 [correct]
    [SEQ/ACK analysis]
Data (1460 bytes)

0000  92 52 ee a6 bf 70 15 16 ee 31 3f ae ce 7d 74 d6   .R...p...1?..}t.
0010  42 8c 17 86 43 0c d7 c8 c4 64 d5 3a 11 c8 24 98   B...C....d.:..$.
0020  e6 6f 35 ea 94 71 28 ee 80 49 07 52 26 5b 2e e6   .o5..q(..I.R&[..
0030  87 16 0a f5 91 7d f5 73 d1 2d 35 94 0c f8 af f6   .....}.s.-5.....
0040  05 83 5e 80 d2 a3 29 97 c6 50 27 f4 f8 c2 05 3e   ..^...)..P'....>
0050  9b 04 4b ea 9f 5e 2f 8c 7f 56 6b 82 94 c4 27 ee   ..K..^/..Vk...'.
0060  12 5d 3b ec 3f 90 2b aa ab 08 4e 84 d7 bd 48 04   .];.?.+...N...H.
0070  ab 04 36 e9 36 7f 65 d3 dd 94 0b ef ee 60 8e bb   ..6.6.e......`..
0080  a6 ff 16 f9 89 7b 85 e9 68 3d 01 dc ff 4c 2e 95   .....{..h=...L..
0090  82 8a 66 c9 f9 58 b2 1e 85 4e 25 19 a3 59 9e 07   ..f..X...N%..Y..
00a0  59 5e 30 7f 16 79 2a e1 b5 f3 ca 8a 89 76 0a 1a   Y^0..y*......v..
00b0  2b 28 3e bc eb 5e 87 1b b2 16 25 d8 69 77 ee 60   +(>..^....%.iw.`
00c0  f2 de 9a 8f 75 14 21 92 94 dd 32 bf b7 09 a4 88   ....u.!...2.....
00d0  ce 56 c8 1c f7 76 ed ba 14 1f 46 f2 b0 c7 c4 ed   .V...v....F.....
00e0  a9 7e c8 89 e8 d1 4c dd 66 38 b1 eb 8b 8a 45 f5   .~....L.f8....E.
00f0  aa 40 c8 cd ec c3 54 17 93 6a 86 60 5f 6c 9a d0   .@....T..j.`_l..
0100  f2 94 0f 60 0e b9 50 de a3 b6 45 b9 b2 61 36 ae   ...`..P...E..a6.
0110  5b ed 67 d4 8f 4b ca e0 52 e5 c2 b2 aa 79 ca fd   [.g..K..R....y..
0120  a3 76 29 a0 6a 04 47 f2 f6 ec 21 3e 3d 91 73 c9   .v).j.G...!>=.s.
0130  1c 53 e6 60 95 1d 41 9a fc 55 29 fe 93 74 d7 93   .S.`..A..U)..t..
0140  63 56 27 f7 c4 a4 4f 0e f0 b4 e6 52 cf 07 0e 1b   cV'...O....R....
0150  a9 96 22 a7 4f 81 7e b2 da 0a 71 c9 9f d4 a4 f7   .."O.~...q.....
0160  a2 92 bf a8 51 ce 9a c8 b4 b9 50 ce 72 cc 2d 40   ....Q.....P.r.-@
0170  ce 6d f4 52 aa 42 02 cc 64 43 35 d3 b6 5d 62 01   .m.R.B..dC5..]b.
0180  6d 24 47 d3 af 7d 07 13 f3 b1 6c f5 d3 96 7f d6   m$G..}....l.....
0190  60 74 8c f1 0a 7c 2b de cc b2 42 15 ec 5c d7 82   `t...|+...B..\..
01a0  95 5f 50 82 c6 8d 62 e9 a4 93 54 c8 a9 97 16 6f   ._P...b...T....o
01b0  0e 14 e5 9b aa 0e 30 35 b1 bc f4 ad d6 65 00 49   ......05.....e.I
01c0  07 7a 34 40 75 bb c5 30 89 39 07 c6 50 bd 5a dc   .z4@u..0.9..P.Z.
01d0  48 2f 00 36 f8 17 fc 09 b2 4c e2 6b 2d 19 a1 64   H/.6.....L.k-..d
01e0  30 8b 2a 58 11 19 ce eb f9 b0 06 fb e4 00 35 ef   0.*X..........5.
01f0  8b 2a 10 5c d6 1a ac 36 90 b3 79 b0 a7 29 56 c9   .*.\...6..y..)V.
0200  90 b6 73 ae fe 7b e2 db 0a 8a 39 f8 8f b2 35 88   ..s..{....9...5.
0210  d0 a8 50 ca 89 f3 0f 7f c3 82 e2 bf 83 fe 16 ca   ..P.............
0220  b2 77 8b e3 56 a0 9d b2 a2 92 36 51 ba dc 82 df   .w..V.....6Q....
0230  ac 8a 22 eb 88 d7 44 a3 80 75 e2 e8 0d 6b 44 1a   .."...D..u...kD.
0240  91 1a 13 f4 8b ae 80 aa 67 1a 5c e8 92 6d e3 68   ........g.\..m.h
0250  73 9b 56 0a 12 d7 c9 55 b1 43 8e 44 34 4d 15 7a   s.V....U.C.D4M.z
0260  62 44 09 f8 8c 8c 7e 1c 34 34 b9 de 24 d0 f8 ce   bD....~.44..$...
0270  be 77 10 be 8a 51 4b d8 9f d0 27 36 46 34 d6 01   .w...QK...'6F4..
0280  d3 20 78 2f 93 88 ba 67 c7 22 74 3e cf af 4a 92   . x/...g."t>..J.
0290  8b 68 d6 23 45 71 6f 80 5d 14 7b 52 90 92 fb 96   .h.#Eqo.].{R....
02a0  20 76 5c cf 59 14 f1 10 f1 1d 86 f8 ea 4f 4c 7a    v\.Y........OLz
02b0  da ef b5 64 03 3c 4b 5f e4 2b f6 9d f2 55 15 cc   ...d.<K_.+...U..
02c0  f2 5b 14 ce f0 93 44 32 b2 ba 54 f1 ef 11 2b 89   .[....D2..T...+.
02d0  72 cc db 10 30 9f b5 fd 21 70 e3 ea c4 3c 48 9f   r...0...!p...<H.
02e0  89 80 b6 dd b7 6d 81 58 02 2e 0a f5 9e fe 66 67   .....m.X......fg
02f0  f3 0b fc 91 f7 6b 57 6f 8a 79 6c 78 5f ee 12 20   .....kWo.ylx_..
0300  d7 7a 58 f1 ab 7a 24 23 ca 4d 0c 88 b5 36 3b 4b   .zX..z$#.M...6;K
0310  3c 87 96 12 aa a5 b3 9b c3 59 34 fd 90 4c 84 5e   <........Y4..L.^
0320  05 08 86 5b 44 45 ac ee 84 87 c7 ba 85 69 33 ff   ...[DE.......i3.
0330  c7 b2 1a 7a ae 60 68 04 cf 00 60 83 da ae 14 e5   ...z.`h...`.....
0340  6c d0 62 e2 29 ef 1c 09 3e 2a 6c 58 98 51 2c fd   l.b.)...>*lX.Q,.
0350  95 79 79 d1 2a 1c 6c 19 e8 9e 93 43 f9 96 cf df   .yy.*.l....C....
0360  f6 80 83 cc 47 cf 33 fe 43 95 e4 88 24 d1 cb 83   ....G.3.C...$...
0370  a7 2a 2a b2 7e 08 d7 5b c4 28 14 03 e8 c8 58 bb   .**.~..[.(....X.
0380  44 03 17 ea a5 ea 79 ea b7 b5 54 bf 9b 00 56 34   D.....y...T...V4
0390  6b 38 75 2a 44 74 47 85 e0 6a 1e ec 86 41 03 da   k8u*DtG..j...A..
03a0  6c 6d dc ea 76 9f bb ba 6e 71 d2 42 be 4f 15 c7   lm..v...nq.B.O..
```

```
03b0  a7 67 f4 a5 6b 0a 1d be 94 68 88 da b6 12 25 4b   .g..k....h....%K
03c0  a8 4e 62 56 eb fa 17 86 e1 f4 5f 8b 9c 4b 87 fd   .NbV......_..K..
03d0  7d 38 2e ae 34 7a 24 ba 2d 9e c5 c6 61 c7 bc ac   }8..4z$.-...a...
03e0  4e 5c 4e 29 28 46 c2 0d 80 be 19 40 05 a3 e2 c8   N\N)(F.....@....
03f0  ea 6c 99 a8 0a 02 70 82 70 e0 2a 3c b6 ba ad 53   .l....p.p.*<...S
0400  6f 6e da 56 80 2a 80 f6 6b 4f ea 09 f3 76 0b 98   on.V.*..kO...v..
0410  8f 09 b8 14 c0 74 36 b7 8c 99 2e fb 67 5a 3d ed   .....t6.....gZ=.
0420  0f 06 2d 58 7d 25 c1 75 c3 2a 19 b2 2e 30 e4 30   ..-X}%.u.*...0.0
0430  e2 c7 2e 39 30 45 5f 41 8e ca 31 32 0d 39 d4 b6   ...90E_A..12.9..
0440  2e c2 13 67 18 01 4e b2 ae b4 11 1b da 79 8c ec   ...g..N......y..
0450  6e 9d 81 9b 6d 52 0e aa aa 47 e3 86 90 36 80 91   n...mR...G...6..
0460  a3 69 65 14 a1 4d 8d de 64 9c 0b 7c 4f 6d 54 1d   .ie..M..d..|OmT.
0470  df f0 0b 52 e8 19 0d 20 3e 14 76 0f 36 26 d0 e4   ...R... >.v.6&..
0480  72 1c 42 56 ee 39 5e 52 ef 30 d8 4a 95 38 d6 b8   r.BV.9^R.0.J.8..
0490  ef 48 02 ea a7 d4 6f cb ef 7b cf ef f1 15 33 ba   .H....o..{....3.
04a0  2a 1b d6 a6 ab 75 fd bd 96 1e e5 ec e0 a5 9a 59   *....u.........Y
04b0  de 30 02 7d aa 5b e6 c2 ab 6f d2 a7 f4 56 56 b1   .0.}.[...o...VV.
04c0  f6 5d a0 ac c9 82 63 ff a0 0d 15 a2 a7 0a f8 f8   .]....c.........
04d0  30 0c d6 9b 18 f4 07 d1 82 04 5f 82 b1 0d 44 ca   0........._...D.
04e0  e1 5b 66 d4 a3 4c f7 d5 b4 53 a5 45 a8 d6 01 7d   .[f..L...S.E...}
04f0  a7 55 c7 ab c8 28 d8 aa aa 46 08 2e e0 51 4d cd   .U...(...F...QM.
0500  4c f2 a2 9e 95 38 20 5d 4f 57 de 92 8d 7f a9 60   L....8 ]OW.....`
0510  25 b7 40 84 d5 36 77 fb b7 79 0b d2 d4 40 76 5d   %.@..6w..y...@v]
0520  40 0e 5d d4 b2 38 5a 05 5b 36 da 82 ba 4e 6c 7b   @.]..8Z.[6...Nl{
0530  de d4 03 c8 89 4e 40 16 af d0 62 5c c2 7a 34 13   .....N@...b\.z4.
0540  4d eb b9 c1 eb 1a 4b 73 96 34 cf ee 44 08 26 36   M.....Ks.4..D.&6
0550  95 6e 35 f9 39 08 a7 ae d9 9c 5f 9a ee d0 09 a8   .n5.9....._.....
0560  ad 68 46 8c 35 19 54 e2 bc 5f f9 90 88 f9 ce 99   .hF.5.T._.......
0570  4b 98 06 d4 79 95 7b 3a e1 d6 57 15 8f 10 46 a4   K...y.{:..W...F.
0580  d6 1d 5d 03 47 18 2c b2 ff 21 4a 2b e8 c8 57 01   ..].G.,..!J+..W.
0590  4e 18 86 d5 3f 36 b3 3e 39 47 e6 f8 b0 d8 77 dc   N...?6.>9G....w.
05a0  ee 9a 46 9c 11 07 17 90 0e 28 41 87 8b 6c 4d 1f   ..F......(A..lM.
05b0  28 f1 cd 9b                                      (...

No.     Time        Source                Destination           Protocol Info
    663 1464.292950 A.B.C.D           E.F.G.H         TCP      mni-prot-rout > 9988 [PSH, ACK] Seq=36906 Ack=1 Win=500000 Len=70

Frame 663 (124 bytes on wire, 124 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: mni-prot-rout (3764), Dst Port: 9988 (9988), Seq: 36906, Ack: 1, Len: 70
    Source port: mni-prot-rout (3764)
    Destination port: 9988 (9988)
    Sequence number: 36906    (relative sequence number)
    [Next sequence number: 36976    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 500000 (scaled)
    Checksum: 0xd96e [correct]
Data (70 bytes)

0000  c5 3d 35 97 ec 94 4d ba ce 10 6f 31 55 40 4a f1   .=5...M...o1U@J.
0010  a6 b1 25 e0 dc f8 22 48 ee 36 b2 f3 d5 d9 96 ea   ..%..."H.6......
0020  b2 14 71 af ba 10 7c 4b 8a 16 8d d4 ef db 85 c0   ..q...|K........
0030  08 1a a6 e7 bf 59 cb 79 6d e7 5f a6 9b 82 43 ca   .....Y.ym._...C.
0040  94 e9 29 73 c1 93                                 ..)s..

No.     Time        Source                Destination           Protocol Info
    664 1464.292955 E.F.G.H         A.B.C.D           TCP      9988 > mni-prot-rout [ACK] Seq=1 Ack=36976 Win=64128 Len=0

Frame 664 (54 bytes on wire, 54 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
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Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: 9988 (9988), Dst Port: mni-prot-rout (3764), Seq: 1, Ack: 36976, Len: 0
    Source port: 9988 (9988)
    Destination port: mni-prot-rout (3764)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 36976    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 64128 (scaled)
    Checksum: 0x0649 [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    665 1464.310813 A.B.C.D           E.F.G.H         TCP      mni-prot-rout > 9988 [PSH, ACK] Seq=36976 Ack=1 Win=500000 Len=1020

Frame 665 (1074 bytes on wire, 1074 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: mni-prot-rout (3764), Dst Port: 9988 (9988), Seq: 36976, Ack: 1, Len: 1020
    Source port: mni-prot-rout (3764)
    Destination port: 9988 (9988)
    Sequence number: 36976    (relative sequence number)
    [Next sequence number: 37996    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 500000 (scaled)
    Checksum: 0x9bb0 [correct]
    [SEQ/ACK analysis]
Data (1020 bytes)

0000  06 ba 1b 7c 02 92 10 5c 4d d9 ea f4 57 72 2e 11   ...|...\M...Wr..
0010  a5 0b 3b 3a 90 de 28 dd cf 59 f4 d8 62 26 ae af   ..;:..(..Y..b&..
0020  d7 2b c4 b2 02 38 7f 91 c9 88 6e 3c c7 d2 9e 89   .+...8....n<....
0030  34 b8 8d 5c 20 f8 6f 44 54 c2 c2 49 0e d0 77 5b   4..\ .oDT..I..w[
0040  64 a5 a2 21 72 13 cc 0a 67 be fc 50 53 0b f7 3a   d..!r...g..PS..:
0050  4c de e7 e4 ef 06 15 89 4f 77 c4 fd 02 7a 38 91   L.......Ow...z8.
0060  9d 88 33 3c 89 d2 21 89 f8 b8 5e 5c f5 31 6f bd   ..3<..!...^\.1o.
0070  54 07 c2 8d 0e 0b 77 91 64 1e a2 65 30 13 89 0a   T.....w.d..e0...
0080  2c be 85 54 a9 4b bc 91 14 88 ad 37 b7 b8 db 5c   ,..T.K.....7...\
0090  7e ab 6f 33 54 be c2 07 0e 80 77 0c 64 9f c6 e5   ~.o3T.....w.d...
00a0  04 fe 13 11 b7 ca e7 fc ce 7d 91 c2 44 92 aa df   .........}..D...
00b0  98 7a dc 62 d7 e0 c1 96 23 69 ed b2 36 3c 55 6f   .z.b....#i..6<Uo
00c0  5a ce 82 17 77 31 e0 49 4d 7d 74 13 2a 5f ac 0f   Z...w1.IM}t.*_..
00d0  78 80 5e 40 96 cd 8a 77 64 95 87 e5 e3 90 7f 81   x.^@...wd.......
00e0  37 e6 5f 57 46 e5 96 6d 24 f6 8f 73 25 94 87 24   7._WF..m$..s%..$
00f0  27 25 a3 a6 29 04 93 61 78 63 42 40 13 fe e1 1e   '%..)..axcB@....
0100  98 fc 88 7b ca 95 88 0d 48 fd e8 7a d4 fe 9f 14   ...{....H..z....
0110  2a f1 23 12 23 ed c0 0c 56 50 ef 6c cf 2c ce cc   *.#.#...VP.l.,..
0120  bb d7 46 bd 57 13 3d da 00 ea 58 c6 5b 81 8f ee   ..F.W.=...X.[...
0130  d3 7b 4f e7 c3 28 eb 5a da f2 f4 b5 54 fb 22 69   .{O..(.Z....T."i
0140  a2 c2 89 f8 21 c8 93 a4 30 53 f4 40 ce 26 49 a9   ....!...0S.@.&I.
0150  4d fc 87 34 12 fd f7 7a 30 fd ea 9b d8 6d 6b ce   M..4...z0....mk.
0160  62 5d 94 c5 9f f2 27 9b ff fd 6b 0b 20 83 07 a3   b]....'...k. ...
0170  24 20 49 7e e2 fb ec 99 ec f1 87 c5 52 9d f7 fd   $ I~........R...
0180  c3 f2 1a 9e 5e e3 7c 6d 35 31 ec 54 4c 88 d1 70   ....^.|m51.TL..p
0190  0c 23 6a ac 4e f9 50 4b 0b 32 04 d9 a9 a9 25 cd   .#j.N.PK.2....%.
01a0  a4 76 a7 1f d0 92 93 3f 90 6f 97 07 d1 0e 8e d0   .v.....?.o......
01b0  2b 91 ba 5c 30 2f 84 ab e9 96 85 ad f4 2f a3 11   +..\0/......./..
01c0  b0 15 e1 ed 8e fa 63 2c 73 ac d1 33 7e a3 ec bb   ......c,s..3~...
01d0  4f bb ee b9 41 b8 e0 9b 43 f4 ef 1e 4c aa e7 76   O...A...C...L..v
01e0  53 92 41 12 40 c9 63 3f 42 91 d4 dd 49 36 e7 7c   S.A.@.c?B...I6.|
01f0  20 fd 8e db a3 8f 3e 23 39 62 90 34 3e f9 2a 5c    .....>#9b.4>.*\
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0200  66 59 9f 70 a5 fd 38 12 9b a4 5a 6f 6e aa df 9e   fY.p..8...Zon...
0210  af 61 08 00 c5 88 26 2a 71 ac d3 2b 7e 92 f9 ca   .a....&*q..+~...
0220  fd 2e 80 04 86 b0 aa 4b 0f c7 a2 3f 01 93 9a a6   .......K...?....
0230  59 d3 a0 d4 16 a9 72 63 59 bf d6 20 ca c2 cb 14   Y.....rcY.. ....
0240  72 34 e3 67 74 4a ef 11 e2 e2 e2 65 a6 a6 73 e5   r4.gtJ.....e..s.
0250  41 44 d8 13 c9 13 c6 57 04 d0 a3 5b 79 ce c6 d2   AD.....W...[y...
0260  c7 2c db 3a 6e 86 af 4f 30 24 43 9d 69 e2 cb a9   .,.:n..O0$C.i...
0270  1c 78 97 4f 5e b8 12 59 15 40 1f 5a 5f 19 dc 57   .x.O^..Y.@.Z_..W
0280  37 6a c4 26 7a c8 c9 71 3f 23 1a b9 88 94 cc 36   7j.&z..q?#.....6
0290  15 fd 28 fd 2e db e3 72 2d f6 9c 38 5a ec d0 7a   ..(....r-..8Z..z
02a0  28 89 ec 96 48 c9 8b 1f 2b f7 e2 6a 40 9a b5 57   (...H...+..j@..W
02b0  00 ce b1 59 14 8e a3 44 0b 31 b6 4e 35 02 ad 62   ...Y...D.1.N5..b
02c0  32 0c ca d7 54 2c 71 47 21 44 11 4a b9 0c 3f 03   2...T,qG!D.J..?.
02d0  c8 44 c6 37 d2 91 7a 03 64 0a 7b 31 48 a2 c9 ee   .D.7..z.d.{1H...
02e0  66 26 53 4a 9d 62 a7 55 15 de 40 50 65 8c a8 7a   f&SJ.b.U..@Pe..z
02f0  6d ba 7c 23 17 00 fd 7c 75 57 7f 36 9d e1 13 d3   m.|#...|uW.6....
0300  b8 eb f5 09 d3 ef cb ce 89 fa 09 55 19 58 5d 60   ...........U.X]`
0310  1c 88 bc 99 48 f4 a8 96 51 18 55 24 54 49 fa 04   ....H...Q.U$TI..
0320  84 b5 08 cd 1c 9e 1e da 74 97 ef 0c 62 be ad 2e   ........t...b...
0330  1b 7c d6 86 73 d2 e1 42 9d 9e a3 35 55 06 f8 7f   .|..s..B...5U...
0340  2e 31 c2 76 21 dc 42 9c 34 bf b3 5f c5 5e 84 36   .1.v!.B.4.._.^.6
0350  9a c6 05 1f 0d ca b3 36 31 db dc 6c 25 f2 dc 38   .......61..l%..8
0360  22 ff be 5c 86 11 b6 b3 26 d8 d8 11 9a db d7 72   "..\....&......r
0370  26 14 92 3c 12 f5 fe 0d 28 8f 36 fd 0e 13 8f 3a   &..<....(.6....:
0380  ce fb f7 f3 2a 3d 50 cb ed d2 44 29 ea 21 62 91   ....*=P...D).!b.
0390  0a c6 a6 c3 67 55 85 76 36 d2 a3 dc f7 a1 ae 81   ....gU.v6.......
03a0  28 dd ef 49 54 c4 c2 7f 0e e9 77 66 64 10 5a dd   (..IT.....wfd.Z.
03b0  3c 6b 17 75 53 fa 8a 6c e0 97 da 7e 2b b0 d6 11   <k.uS..l...~+...
03c0  52 ee 8e 6d a9 8f 90 6f 4a e3 aa 6b af 0b ed 76   R..m...oJ..k...v
03d0  52 40 04 02 51 eb f0 8f 33 17 df 69 e0 78 a2 95   R@..Q...3..i.x..
03e0  ed 5c 25 7d cb dc e9 71 20 8e 4a 07 0c 96 83 d7   .\%}...q .J.....
03f0  f5 9b b1 de 00 79 9b 3d 05 d7 fc 3e               .....y.=...>

No.     Time        Source                Destination           Protocol Info
    666 1464.310844 E.F.G.H         A.B.C.D           TCP      9988 > mni-prot-rout [ACK] Seq=1 Ack=37996 Win=64128 Len=0

Frame 666 (54 bytes on wire, 54 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: 9988 (9988), Dst Port: mni-prot-rout (3764), Seq: 1, Ack: 37996, Len: 0
    Source port: 9988 (9988)
    Destination port: mni-prot-rout (3764)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 37996    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 64128 (scaled)
    Checksum: 0x024d [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    667 1464.327679 A.B.C.D           E.F.G.H         TCP      mni-prot-rout > 9988 [PSH, ACK] Seq=37996 Ack=1 Win=500000 Len=255

Frame 667 (309 bytes on wire, 309 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: mni-prot-rout (3764), Dst Port: 9988 (9988), Seq: 37996, Ack: 1, Len: 255
    Source port: mni-prot-rout (3764)
    Destination port: 9988 (9988)
    Sequence number: 37996    (relative sequence number)
    [Next sequence number: 38251    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
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    Flags: 0x18 (PSH, ACK)
    Window size: 500000 (scaled)
    Checksum: 0x407d [correct]
    [SEQ/ACK analysis]
Data (255 bytes)

0000  5c 95 d4 04 9e de 1c 7f ea b1 58 22 5b fc 0a ca   \.........X"[...
0010  70 b7 f4 7c 32 76 8a d2 4e c5 c2 5d 72 97 0f 6b   p..|2v..N..]r..k
0020  d0 57 b4 01 67 e2 46 89 12 4d 2f 0e 3f 7d 52 20   .W..g.F..M/.?}R
0030  67 d9 2f ae 2a 30 45 a5 2e 0a 42 cd 12 18 f9 0b   g./.*0E...B.....
0040  23 c5 df 33 76 d9 e7 f4 fa 08 76 7c 8d 93 3c 50   #..3v.....v|..<P
0050  a1 0b 1b 08 4a d3 c4 07 02 b7 dd 91 08 88 8c 3c   ....J..........<
0060  c0 c8 94 7a 74 7b 06 73 8b e9 37 69 99 0c ba 18   ...zt{.s..7i....
0070  48 82 9a 9a c5 0a 27 db 46 5d 2e d1 8c 51 2a d7   H.....'.F]...Q*.
0080  97 9a 34 cb 92 4f 3e c1 9c 41 e6 c4 9b 44 dc 23   ..4..O>..A...D.#
0090  7a a7 d8 18 79 da a7 5a 05 de a3 50 4d ca b7 4a   z...y..Z...PM..J
00a0  15 9b 0a 40 1f 65 a4 b6 2b c6 af 7e 0f 89 7b 8e   ...@.e..+..~..{.
00b0  36 10 e9 10 88 40 f2 5d be b0 89 15 0e ca f3 49   6....@.].......I
00c0  1e 9f 19 8f 81 f5 f2 35 d5 29 33 8b 9f e0 87 d8   .......5.)3.....
00d0  b0 03 e0 5a 6a d3 ac 1a f7 fd 8e 71 af ea 8b 20   ...Zj......q...
00e0  6c af 97 64 54 89 f7 3d 51 49 a8 6c 40 8c 51 36   l..dT..=QI.l@.Q6
00f0  46 a8 c2 40 bb 56 a3 7c 46 d3 56 68 9b 34 92      F..@.V.|F.Vh.4.

No.     Time        Source                Destination           Protocol Info
    668 1464.327707 E.F.G.H         A.B.C.D           TCP      9988 > mni-prot-rout [ACK] Seq=1 Ack=38251 Win=64128 Len=0

Frame 668 (54 bytes on wire, 54 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: 9988 (9988), Dst Port: mni-prot-rout (3764), Seq: 1, Ack: 38251, Len: 0
    Source port: 9988 (9988)
    Destination port: mni-prot-rout (3764)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 38251    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 64128 (scaled)
    Checksum: 0x014e [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    669 1464.354044 A.B.C.D           E.F.G.H         TCP      mni-prot-rout > 9988 [PSH, ACK] Seq=38251 Ack=1 Win=500000 Len=1460

Frame 669 (1514 bytes on wire, 1514 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: mni-prot-rout (3764), Dst Port: 9988 (9988), Seq: 38251, Ack: 1, Len: 1460
    Source port: mni-prot-rout (3764)
    Destination port: 9988 (9988)
    Sequence number: 38251    (relative sequence number)
    [Next sequence number: 39711    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 500000 (scaled)
    Checksum: 0x7335 [correct]
    [SEQ/ACK analysis]
Data (1460 bytes)

0000  34 d0 90 34 78 18 97 fa fe 36 83 a2 1a 3a 49 f7   4..4x....6...:I.
0010  30 d7 1a de 8e b7 1b cc 55 88 8b 40 72 36 e4 49   0.......U..@r6.I
0020  0b 28 e8 12 3f 0a 61 63 a1 04 fa d2 15 b6 37 b6   .(..?.ac......7.
0030  a2 4e 32 de ec 4d 8a 36 1d 06 9e ab 0a 03 d5 b1   .N2..M.6........
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0040  bc 76 38 50 55 b6 a2 e5 ae 1b cc 81 b8 27 02 ac   .v8PU........'..
0050  09 04 9b f6 c7 20 3d 96 d0 e2 de 67 00 9e d7 8e   ..... =....g....
0060  10 de 9d 77 d1 3e 5e ce 68 8b ad 82 31 4e 90 c6   ...w.>^.h...1N..
0070  7d ff f6 92 b3 eb 8a 77 bd b4 3c d8 5f e2 52 4b   }......w..<._.RK
0080  e1 ec 85 a6 6c 26 52 ef 40 d7 0a c4 58 02 ba 0e   ....l&R.@...X...
0090  58 44 aa 5d d2 67 42 82 48 04 d5 50 90 11 ca 53   XD.].gB.H..P...S
00a0  ff 3a 0e 5d c9 26 13 ae 01 42 fc c6 f6 4f cc e4   .:.].&...B...O..
00b0  bc 8c 8a ca 6a 5e 92 9e 01 15 96 52 50 5a 3a 96   ....j^.....RPZ:.
00c0  c0 de e8 75 18 09 48 f7 b1 7b 24 b1 aa 95 bb 62   ...u..H..{$....b
00d0  3f 34 c2 66 5f ae 3b e7 d9 5e d9 f2 da 57 fa ab   ?4.f_.;..^...W..
00e0  1c 0c 62 c5 d8 a2 a1 c9 4e 5a fa e2 99 83 8d e5   ..b.....NZ......
00f0  1f c6 94 0f 52 df 8a 17 92 16 f5 f3 62 c3 98 02   ....R.......b...
0100  b1 49 72 a6 24 3e 7a 88 b0 5e 42 3c 4f 4b be ec   .Ir.$>z..^B<OK..
0110  38 69 96 ea fd 45 b7 ee 8a a4 c2 8b 30 98 03 66   8i...E......0..f
0120  36 60 d2 54 70 61 94 e1 e7 59 9d 6d 13 4c 0a 36   6‘.Tpa...Y.m.L.6
0130  46 47 3f ee 02 1a 9e c3 40 08 1e 66 49 4e 96 02   FG?.....@..fIN..
0140  79 42 5c f0 9a e8 56 06 e5 39 13 e2 45 15 55 93   yB\...V..9..E.U.
0150  4a 13 4e f4 6d bf c6 8c 11 2b be 43 9b 77 09 4f   J.N.m....+.C.w.O
0160  2b c5 ae 65 2d c3 7b 0c 03 44 53 c8 e8 81 ea 89   +..e-.{..DS.....
0170  54 25 7d 14 38 80 9d a5 35 48 12 cc 14 4d 98 de   T%}.8...5H...M..
0180  7f 6e 16 38 00 63 86 89 8c 79 45 11 90 db 89 3b   .n.8.c...yE....;
0190  ec b1 b6 a6 b6 ae 76 b4 1b 4e 08 cd a9 bc 4a e7   ......v..N....J.
01a0  f7 ac 4c 64 99 47 06 f6 19 20 1b 0a 04 41 65 02   ..Ld.G... ...Ae.
01b0  57 62 91 73 0c 06 5e c2 24 3a ea ac e6 99 8d a5   Wb.s..^.$:......
01c0  10 bf 39 6f 0c 38 86 9e 9d 55 9b 4d 43 e0 73 d7   ..9o.8...U.MC.s.
01d0  52 47 35 4f d9 eb b4 82 f3 4c 92 76 1a b9 4f 3f   RG5O.....L.v..O?
01e0  24 87 88 27 04 87 ef a9 38 88 1b e8 dc 48 65 eb   $..'....8....He.
01f0  f7 4f 06 e2 5c 5a 71 ff 1a 4f f1 99 9a af 63 4a   .O..\Zq..O....cJ
0200  0a 42 c9 5b f9 cd cc 8d db ae 11 64 74 13 9c f6   .B.[.......dt...
0210  00 57 f6 a3 b1 4a ce 5b 79 ed e2 d9 14 9c 4f ff   .W...J.[y.....O.
0220  52 ef 82 bc d9 66 06 c7 c5 54 79 4e 2a 75 d3 c7   R....f...TyN*u..
0230  2c c1 d2 7a ed 5f a9 6b e4 da 97 26 04 ea 86 de   ,..z._.k...&....
0240  04 a6 8d 92 e8 be 5b 06 d7 a6 97 2a 25 be 47 14   ......[....*%.G.
0250  f8 7d 7a 9a d2 ff 8e 40 8d a7 d2 9a 9e 21 fc ff   .}z....@.....!..
0260  14 43 d1 ae 0a 5a f6 f2 1c ef ce 23 55 ee 98 b4   .C...Z.....#U...
0270  47 b1 9d 47 45 41 c1 e3 91 0c 26 c2 06 f1 92 6c   G..GEA....&....l
0280  16 22 92 b6 0e cc 19 02 ab 5a 59 c3 41 2c ca 76   ."........ZY.A,.v
0290  68 1f fc 82 2d 5f 93 2c 68 4a 9c 77 04 75 81 ef   h...-_.,hJ.w.u..
02a0  63 23 d7 be f4 1b 8a 4c 78 36 ca 96 70 36 b4 b3   c#.....Lx6..p6..
02b0  7d ac 49 9e b5 ef 3e b1 8d 63 70 06 3c cc be 46   }.I...>..cp.<..F
02c0  c0 20 4c 43 1e 57 f6 93 2d 4a 4a 28 51 03 92 e2   . LC.W..-JJ(Q...
02d0  7e 9d df 96 3b 13 73 c2 1a 50 96 ff 96 6d 59 22   ~...;.s..P...mY"
02e0  16 03 22 f0 8d 86 53 02 3c ff c2 55 1c 17 fc df   .."...S.<..U....
02f0  38 74 43 8d 7c 53 c6 35 2c 5f 90 3a 4c 12 3a 6a   8tC.|S.5,_.:L.:j
0300  51 9e 1c 83 34 f0 ce 52 70 6d 7d b4 8d 56 8c 81   Q...4..Rpm}..V..
0310  38 3f 9c 20 10 c8 8c a5 00 7e f4 de 13 6e b5 40   8?. .....~...n.@
0320  9d e4 28 ee 19 63 98 ca bc 4e 34 38 99 44 22 b4   ..(..c...N48.D".
0330  00 61 3d 5e 98 40 6e f3 7e 16 7f 22 45 98 5a 4f   .a=^.@n.~.."E.ZO
0340  c2 d3 92 b4 37 e2 4a 85 68 36 cf 21 4a 44 dc be   ....7.J.h6.!JD..
0350  81 50 37 a2 ac 30 7c 83 9e 76 4b a7 78 96 d8 44   .P7..0|..vK.x..D
0360  fd e0 0a 60 10 c8 d8 2b d4 0b ae fa 96 17 54 c3   ...‘...+......T.
0370  4d 4f 82 7c 96 07 b6 18 2b 3c fe a6 c4 cb be 7d   MO.|....+<.....}
0380  20 f7 87 cd 14 15 c4 7f 4d 93 1f 7a d9 38 80 ec    .......M..z.8..
0390  dc 5f 82 e2 14 4a 7a 0d f8 a3 3f ce 8a 5e af 90   ._...Jz...?..^..
03a0  12 a4 d6 58 8c 9b e0 3c 41 58 38 33 39 90 54 7e   ...X...<AX839.T~
03b0  10 b8 0e e8 b8 f2 89 f2 11 5e 54 43 aa 26 ee f2   .........^TC.&..
03c0  be 2e 35 4a f3 a6 9c 4c 1c 17 ea 1c 49 2e ed b3   ..5J...L....I...
03d0  b7 2b ff 9a dc 45 00 4e b7 6c 96 50 91 cb 8e 1f   .+...E.N.l.P....
03e0  29 0c 9b 5c b4 3e 82 b1 2c 54 9e 2b b3 1d 75 0a   )..\.>..,T.+..u.
03f0  f9 c9 13 f1 38 7e c6 8a 6b 4f fb 94 68 25 c5 f1   ....8~..kO..h%..
0400  9a 63 ee 9e c2 13 5f 1e 3d 32 62 a1 73 d7 f8 92   .c...._.=2b.s...
0410  7f 8d 18 b5 e7 c6 e3 a9 4a 12 c5 de 2b 7e 19 df   ........J...+~..
0420  2c 73 fb d6 9f ff c7 f7 1d 05 4f 8f fb f9 f6 aa   ,s........O.....
```

```
0430  50 80 86 96 59 28 57 6f 79 58 8f e8 e7 34 4f a1   P...Y(WoyX...4O.
0440  4f ad 89 9e 44 0c d3 5b 83 c9 cf bd 16 51 06 b7   O...D..[.....Q..
0450  54 ba 26 7a 71 4a bf 98 eb 8a 8f a7 78 21 05 a5   T.&zqJ......x!..
0460  75 22 df 9e 60 e7 33 a8 9a 1a c9 8e 77 31 28 ac   u"..`.3.....w1(.
0470  17 e1 53 b6 47 c8 0b e1 4e 13 1d b4 1e 0f f0 88   ..S.G...N.......
0480  47 4c 4a 7d 07 4e 97 b1 59 0b 87 a9 ac 64 fa c1   GLJ}.N..Y....d..
0490  5c 0e d9 17 d8 11 d3 11 e1 66 25 ea ac 04 90 f9   \........f%.....
04a0  a7 98 a9 0e 7c d8 77 fa 27 3e 93 90 75 31 9d e8   ....|.w.'>..u1..
04b0  7d 44 b7 81 83 e6 25 ac 8f 05 ba a7 c3 32 e2 04   }D....%......2..
04c0  c6 92 fe f4 74 57 d8 73 e1 dd 28 f3 5f 13 fc d5   ....tW.s..(._...
04d0  e8 13 3e e9 9a f9 9b 54 74 29 ea 14 a2 6b 0e d9   ..>....Tt)...k..
04e0  db 66 8b 62 59 c5 82 c4 11 6f de d1 5d cf cd f4   .f.bY....o..]...
04f0  7e 62 e8 ae 64 d7 16 c4 84 c1 9b ff bb 67 32 77   ~b..d........g2w
0500  11 eb b8 54 5c fe 59 6f a6 54 50 c2 d7 0e 4f 77   ...T\.Yo.TP...Ow
0510  c2 64 7a a2 fc a0 13 0f 0a b6 bf 11 74 16 67 6e   .dz.........t.gn
0520  1e c3 1b e8 89 4f 82 c4 38 02 bd d5 92 5a 9b 96   .....O..8....Z..
0530  56 1d f5 ea 12 23 8f a2 92 13 79 26 9b 2f b7 c7   V....#....y&./..
0540  38 40 82 95 35 2a e8 eb 1a 01 43 f3 1c 28 c7 c2   8@..5*....C..(..
0550  e2 5f fd 7f 09 24 df 93 8d 5b f1 ca d4 07 bb 85   ._...$...[......
0560  f9 94 3c c8 51 4b fc 90 25 af af 28 bc 22 90 93   ..<.QK..%..(."..
0570  1e e7 fc ae 6e 52 d1 a8 c9 1a 10 02 00 f5 92 cb   ....nR..........
0580  9a 04 37 ee 70 66 c8 9c b3 18 b0 e4 4b 54 f6 8d   ..7.pf......KT..
0590  79 44 ce 3f 91 6e ee b4 2c a7 bd 9f 1e 20 a7 73   yD.?.n..,.... .s
05a0  c8 b2 56 d7 6b 23 f4 3f 35 5a 69 47 44 a2 01 83   ..V.k#.?5ZiGD...
05b0  31 d3 a9 70                                       1..p

No.     Time        Source                Destination           Protocol Info
    670 1464.354292 A.B.C.D           E.F.G.H         TCP      mni-prot-rout > 9988 [PSH, ACK] Seq=39711 Ack=1 Win=500000 Len=70

Frame 670 (124 bytes on wire, 124 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: mni-prot-rout (3764), Dst Port: 9988 (9988), Seq: 39711, Ack: 1, Len: 70
    Source port: mni-prot-rout (3764)
    Destination port: 9988 (9988)
    Sequence number: 39711    (relative sequence number)
    [Next sequence number: 39781    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 500000 (scaled)
    Checksum: 0x5f8f [correct]
Data (70 bytes)

0000  77 48 bb 8c 28 11 c2 ea de 83 ba aa df 23 d8 6b   wH..(........#.k
0010  79 16 bc 14 15 3a 9b 9f bd b5 ac af 6f 13 56 67   y....:......o.Vg
0020  d0 3f d1 54 32 23 fe 62 54 8a 8e 8e 81 2b 30 d2   .?.T2#.bT....+0.
0030  1e 10 7b 6f c3 1a d6 03 2c 68 f8 d2 f5 e9 dc b3   ..{o....,h......
0040  30 75 ee f3 74 06                                 0u..t.

No.     Time        Source                Destination           Protocol Info
    671 1464.354297 E.F.G.H         A.B.C.D           TCP      9988 > mni-prot-rout [ACK] Seq=1 Ack=39781 Win=64128 Len=0

Frame 671 (54 bytes on wire, 54 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: 9988 (9988), Dst Port: mni-prot-rout (3764), Seq: 1, Ack: 39781, Len: 0
    Source port: 9988 (9988)
    Destination port: mni-prot-rout (3764)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 39781    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
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    Window size: 64128 (scaled)
    Checksum: 0xfb53 [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    672 1464.383402 A.B.C.D           E.F.G.H         TCP      mni-prot-rout > 9988 [PSH, ACK] Seq=39781 Ack=1 Win=500000 Len=1460

Frame 672 (1514 bytes on wire, 1514 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: mni-prot-rout (3764), Dst Port: 9988 (9988), Seq: 39781, Ack: 1, Len: 1460
    Source port: mni-prot-rout (3764)
    Destination port: 9988 (9988)
    Sequence number: 39781    (relative sequence number)
    [Next sequence number: 41241    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 500000 (scaled)
    Checksum: 0x01cd [correct]
    [SEQ/ACK analysis]
Data (1460 bytes)

0000  93 7c 79 ed 84 cd 7c 23 aa be 06 42 e8 a4 6c 07   .|y...|#...B..l.
0010  cf a5 1e df 92 d4 0d 73 29 f7 28 59 69 d8 eb 7d   .......s).(Yi..}
0020  69 aa eb 71 fc f7 34 76 b3 81 2d 67 a2 0a 9c 72   i..q..4v..-g...r
0030  56 c3 24 5b a7 37 35 e0 cd 44 5a b4 0b 4e 90 27   V.$[.75..DZ..N.'
0040  40 4e 36 3c 7e 8f 34 0f 09 3c b3 d4 5e 87 95 8c   @N6<~.4..<..^...
0050  98 ec 7c ec dc 5c 5e 1f a6 40 20 e6 68 76 ee 36   ..|..\^..@ .hv.6
0060  88 f5 af f5 d2 ed d8 76 99 b9 f4 ab a8 fe 10 6b   .......v.......k
0070  69 8f 70 bb 12 ef 0f c0 8b c7 3a 05 de a9 6b cf   i.p.......:...k.
0080  e7 f4 87 62 31 ae cf d7 7d c4 f5 02 69 1b 90 65   ...b1...}...i..e
0090  1d 67 29 54 c3 c2 91 0e 3b 77 d1 64 43 c6 1b ce   .g)T....;w.dC...
00a0  de e9 35 cf af f2 22 47 35 e6 28 7e eb b1 72 24   ..5..."G5.(~..r$
00b0  b1 e8 73 21 c8 9e 98 13 ee d5 48 23 82 a9 61 0d   ..s!......H#..a.
00c0  be a0 6e 1e e9 ce 1b 25 ea de 40 13 31 9e 97 b6   ..n....%..@.1...
00d0  ac 9f 2c 75 e4 8e 18 35 b1 b6 4a 2f d2 b5 49 3e   ..,u...5..J/..I>
00e0  c2 12 74 46 d6 ab 21 0c ae 80 2f 6b 9a a4 75 3c   ..tF..!.../k..u<
00f0  ce 9f 59 27 aa e6 71 0d c8 8e 41 23 d4 b6 63 73   ..Y'..q...A#..cs
0100  ad bc 5c 40 2b a4 54 74 c4 8e 20 c6 c9 e7 f7 e6   ..\@+.Tt.. .....
0110  33 81 ab 46 72 e2 e5 e5 ec 7c 8a c6 9a 9e fc 9b   3..Fr....|......
0120  4b de 15 80 af e6 80 5e 6d 0a 74 05 ef d1 18 60   K......^m.t....`
0130  60 f5 8c 0e 68 36 93 46 aa 62 4c 99 b9 ff 43 7b   `...h6.F.bL...C{
0140  9a bf eb e8 38 64 7b 47 19 e6 36 9f cb 7d 64 e0   ....8d{G..6..}d.
0150  71 43 18 f8 8c ea fb 27 5a 6a 22 46 6f 95 34 63   qC.....'Zj"Fo.4c
0160  91 5d 56 cf 9a 8d 4b 2c 2e 17 f9 a0 27 e6 5d a4   .]V...K,....'.].
0170  6e 50 7e 8a 0f e5 18 10 4e fa 06 91 61 25 96 46   nP~.....N...a%.F
0180  2f 0f d7 f9 20 0c 6f 7f 9a 49 2b 8f f8 97 99 3f   /... .o..I+....?
0190  93 e6 b5 62 57 1f c0 a3 5f 5f 18 0b de ee 9e a1   ...bW..._______.
01a0  3b fb b2 46 77 e0 68 f4 48 a7 63 e6 9a f7 29 84   ;..Fw.h.H.c...).
01b0  bd 76 38 b0 fa e6 e7 d0 c6 57 b3 d8 06 b4 18 5d   .v8......W.....]
01c0  c5 75 12 a9 0b 63 51 46 74 cb 57 c9 a1 a1 9f 2b   .u...cQFt.W....+
01d0  9a a0 ce 78 f3 82 32 88 51 e6 37 ba 0d e3 62 ea   ...x..2.Q.7...b.
01e0  e5 33 18 5c d1 e8 bf 1c b2 f2 27 46 b3 6e 24 0a   .3.\......'F.n$.
01f0  98 5e c2 f6 9a f1 4d 59 10 9b 4f 81 17 e6 6c f1   .^....MY..O...l.
0200  5e 79 6a 38 8f c4 18 54 c2 e1 81 72 f4 b6 c6 46   ^yj8...T...r...F
0210  f2 83 a4 9d 62 2e b0 6d 9a a6 c4 b8 a8 42 d2 56   ....b..m.....B.V
0220  bb ed e8 95 c7 e9 98 df 07 d0 5a 0c 9a b8 d9 a6   ..........Z.....
0230  ef 15 de b2 41 f9 63 bd 52 e6 cb a0 f1 a3 65 ae   ....A.c.R.....e.
0240  9b ad ce 74 42 1b 2f 37 da 21 28 49 62 e6 03 c1   ...tB./7.!(Ib...
0250  60 e0 27 18 20 48 20 1d 10 e6 a4 db f7 27 a9 48   `.'. H ......'.H
0260  1a e6 45 94 4f 46 9c 41 8e 53 18 d6 b6 45 aa 35   ..E.OF.A.S...E.5
0270  d6 b2 8a 46 ee d0 49 7e 2a 5b 42 ba 9a 86 7a d0   ...F..I~*[B...z.
```

```
0280  f6 a4 ef 56 e6 e6 30 61 16 f5 8d da 5d c2 18 00   ...V..0a....]...
0290  a1 96 d2 a5 1f 2d 09 46 4a 75 a0 e0 19 c6 e7 d9   .....-.FJu......
02a0  9a 91 db 8a 99 89 10 f9 da e6 ff 6d 78 9f 14 ec   ...........mx...
02b0  18 a7 18 7c 70 5f fc dc 3e 71 66 42 40 9c 0f 20   ...|p_..>qfB@..
02c0  0e 66 1a 7b 6a 38 18 f5 91 94 bf 5a 75 37 4b 46   .f.{j8.....Zu7KF
02d0  a4 69 2b 60 c5 0a 6e 6c 9a af 99 ce 74 c7 dc 5c   .i+‘..nl....t..\
02e0  71 e6 c1 83 a3 7f d5 eb ab 6d 18 47 82 c5 c5 59   q........m.G...Y
02f0  d4 cb e1 46 d2 a9 ea 23 14 9e 44 1e 9a ff 95 a3   ...F...#..D.....
0300  02 b1 7f 39 9f e6 7c e9 f9 50 e6 b3 2d da 18 e3   ...9..|..P..-...
0310  54 0f 70 02 7a ab 5b 46 f3 cf 36 ea 8f bf b0 4c   T.p.z.[F..6....L
0320  9a 78 76 01 45 d2 2d 2c 55 e6 c4 64 53 26 83 cf   .xv.E.-,U..dS&..
0330  4e 0b 18 ed 88 44 15 14 21 e4 37 46 33 31 79 58   N....D..!.7F31yX
0340  2e b6 1c b0 9a 24 0e 63 1c b0 4d 4f 24 aa 89 42   .....$.c..MO$..B
0350  19 93 2a fa 12 15 39 aa 78 20 20 05 ba 68 ec 8f   ..*...9.x  ..h..
0360  29 c5 c3 45 40 6e 63 cd 98 04 e3 e5 35 6e d0 bc   )..E@nc.....5n..
0370  04 04 52 7e 76 2f 96 95 93 32 2a 48 b8 fe 24 88   ..R~v/...2*H..$.
0380  05 f8 3b 03 94 7e 90 3b a2 54 fa ae a2 34 be c8   ..;..~.;.T...4..
0390  d1 51 3e 65 4c b1 24 ce a8 6c 8b a4 42 de f6 c4   .Q>eL.$..l..B...
03a0  14 1b 80 14 b9 d1 cc 3d 11 97 b3 fd 12 17 8f 1d   .......=........
03b0  78 07 20 c5 dd 68 28 7a be c5 17 a4 cb 6e e0 80   x. ..h(z.....n..
03c0  20 04 03 7e 69 ac 96 c1 d2 59 3b bc ea eb 90 40    ..~i....Y;....@
03d0  29 56 fa 79 a2 38 6d c8 c4 1b ca 65 20 c6 65 ce   )V.y.8m....e .e.
03e0  34 d7 7e a4 c1 de bb 7c 14 6c 04 1f ae 7e 9b fa   4.~....|.l...~..
03f0  09 2b 90 db 7a fc fa 2b a2 ca b6 c8 5b 4d 67 65   .+..z..+....[Mge
0400  2b 21 33 ce 94 5f a6 a4 1a de b8 a6 14 bb 08 cc   +!3.._..........
0410  b9 34 4a 7d 12 33 a2 22 79 1a 90 9e 78 62 20 e3   .4J}.3."y...xb .
0420  7d 68 1f ae c5 c5 0c 57 81 6e ad 84 b6 04 88 7e   }h.....W.n.....~
0430  2e 1a ee 7e bd d7 96 e5 ff 66 3b f4 b0 95 04 44   ...~.....f;....D
0440  1b ea 5f 0a c5 9f 09 12 db 8d dc d4 98 97 53 5a   .._...........SZ
0450  ee 8f 4b 01 ac 69 8c 57 cb f9 9b 83 a2 03 32 82   ..K..i.W......2.
0460  2a 7a 69 82 86 5b d0 64 dd bc e0 93 89 1a db 91   *zi..[.d........
0470  2b 86 60 0e 5e 84 d6 0a 65 6a 04 41 d6 a1 74 31   +.‘.^...ej.A..t1
0480  db f7 5a a0 5d 22 ef 62 eb 0d 04 56 8e fa 5f 3a   ..Z.]".b...V.._:
0490  f9 bb 09 6e b8 d0 dc 61 5a 97 7f 5a 16 49 f1 01   ...n...aZ..Z.I..
04a0  89 1f 5c 57 0f 0c 0c 82 06 5d 69 b3 86 21 00 89   ..\W.....]i..!..
04b0  dd c2 35 79 8b a0 fb 86 5e dd c3 37 e8 fa 68 2a   ..5y....^..7..h*
04c0  ce a1 d2 0a b3 f9 ff 73 6a f7 9d b8 92 22 d3 51   .......sj...."Q
04d0  eb 20 04 57 d5 15 5f 96 7e 6a 09 d5 c3 42 dc fe   . .W._.~j...B..
04e0  0c 97 d2 5a 3c dd 70 09 19 ab 46 81 ba ce 20 57   ...Z<.p...F... W
04f0  65 c8 fd 82 05 b0 69 eb 86 91 9c 4d dd 25 05 8e   e.....i....M.%..
0500  8b 2a e7 df 5e e5 f5 37 c2 fa 77 dc 83 a1 10 4c   .*..^..7..w....L
0510  94 f7 a7 38 0f 22 58 16 eb 96 04 a1 aa 11 5f 6d   ...8."X......._m
0520  55 88 0f a4 ad f9 09 3f a7 53 dc 4a 95 97 11 5a   U......?.S.J...Z
0530  30 d2 79 01 18 f0 4f 57 db ed 87 82 a0 66 69 db   0.y...OW.....fi.
0540  86 0c 7c 57 dd 5f d5 63 81 e1 c0 e9 8b 7c 10 03   ..|W._.c.....|..
0550  5e 42 95 37 45 fa 8f 1a 39 a1 66 93 70 f7 c2 1e   ^B.7E...9.f.p...
0560  af 22 62 96 eb 0b 04 51 66 a5 5f 20 51 1e 09 d2   ."b....Qf._ Q...
0570  2b 1d dc e7 49 97 2f 5a 87 a6 e2 01 a7 8e da 57   +...I./Z.......W
0580  6a 2a ac 82 44 bb 69 74 86 55 69 da dd ed ff 10   j*..D.it.Ui.....
0590  8b 94 c2 a5 5e 41 78 37 1d fa 04 5d 8f a1 f7 7c   ....^Ax7...]...|
05a0  63 f7 c9 f9 f9 22 4b ef eb d2 04 78 1f 7c 5f c9   c....."K....x.|_.
05b0  d8 57 09 75                                       .W.u

No.     Time        Source                Destination           Protocol Info
    673 1464.383414 A.B.C.D           E.F.G.H         TCP      mni-prot-rout > 9988 [PSH, ACK] Seq=41241 Ack=1 Win=500000 Len=70

Frame 673 (124 bytes on wire, 124 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: mni-prot-rout (3764), Dst Port: 9988 (9988), Seq: 41241, Ack: 1, Len: 70
    Source port: mni-prot-rout (3764)
    Destination port: 9988 (9988)
    Sequence number: 41241    (relative sequence number)
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    [Next sequence number: 41311    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 500000 (scaled)
    Checksum: 0x0b09 [correct]
Data (70 bytes)

0000  4b 9a dc 60 01 97 90 5a c5 40 25 01 76 31 b9 57   K..‘...Z.@%.v1.W
0010  ec 39 fc 82 b0 72 69 c7 86 af 19 d7 e1 fa e3 49   .9...ri........I
0020  dc 6e b2 a8 98 de 79 50 14 c7 6b 91 b9 22 ed d1   .n....yP..k.."..
0030  12 fc b0 e3 78 0d 20 79 64 68 c1 f3 f7 c5 dd e8   ....x. ydh......
0040  e2 6d 21 31 96 fa                                 .m!1..

No.     Time        Source                Destination           Protocol Info
    674 1464.383484 E.F.G.H         A.B.C.D           TCP      9988 > mni-prot-rout [ACK] Seq=1 Ack=41311 Win=64128 Len=0

Frame 674 (54 bytes on wire, 54 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: 9988 (9988), Dst Port: mni-prot-rout (3764), Seq: 1, Ack: 41311, Len: 0
    Source port: 9988 (9988)
    Destination port: mni-prot-rout (3764)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 41311    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 64128 (scaled)
    Checksum: 0xf559 [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    675 1464.401269 A.B.C.D           E.F.G.H         TCP      mni-prot-rout > 9988 [PSH, ACK] Seq=41311 Ack=1 Win=500000 Len=1020

Frame 675 (1074 bytes on wire, 1074 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: mni-prot-rout (3764), Dst Port: 9988 (9988), Seq: 41311, Ack: 1, Len: 1020
    Source port: mni-prot-rout (3764)
    Destination port: 9988 (9988)
    Sequence number: 41311    (relative sequence number)
    [Next sequence number: 42331    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 500000 (scaled)
    Checksum: 0xe2e9 [correct]
    [SEQ/ACK analysis]
Data (1020 bytes)

0000  81 a3 87 a1 d5 e2 ec f7 b5 9a a4 22 29 21 eb 2d   ...........")!.-
0010  04 cd dd 50 5f 47 c1 09 09 5e 84 f4 dc 65 5f 97   ...P_G...^...e_.
0020  78 5a 47 56 72 01 85 10 55 57 d4 0f d6 82 b7 9a   xZGVr...UW......
0030  69 98 86 1f 85 13 dd ae 42 38 8b a9 aa 67 5e 14   i.......B8...g^.
0040  62 37 99 fa 7d 60 3a a1 96 5f c4 f7 60 20 c0 22   b7..}‘:._..‘ ."
0050  44 0d 67 1a 40 08 eb 84 e6 03 eb 1b 04 cb 6e e0   D.g.@.........n.
0060  5f a3 1c a6 09 de 24 14 dc 11 36 97 2b 5a fd 76   _.....$...6.+Z.v
0070  0f 00 e5 68 1d 44 a2 b8 f0 c8 fe 9b 57 65 35 8c   ...h.D......We5.
0080  91 ce f9 73 08 a4 2c de 37 32 14 18 6d 4c b9 13   ...s..,.72..mL..
0090  8a 1a 11 51 c3 dd 12 da 2b 6b 78 43 20 90 aa 68   ...Q....+kxC ..h
00a0  d6 0f b4 c1 f1 cf c4 25 70 34 dc 6e 5c 13 ed 04   .......%p4.n\...
00b0  f8 7e 42 4e 96 0b 9e 70 3b 05 27 ce 95 c5 eb 4f   .~BN...p;.’....O
00c0  97 75 e3 3f 90 68 0b 60 fa ea a2 61 c9 c8 8f ac   .u.?.h.‘...a....
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```
00d0  ec 68 c3 48 95 65 32 64 ce ce 90 5a a1 a4 04 de   .h.H.e2d...Z....
00e0  15 04 14 88 d9 b0 b9 a1 a0 69 12 39 1e 9b 78 d2   .........i.9..x.
00f0  20 7f b9 68 2d 24 56 c5 72 82 6b 6e d7 54 5b 04    ..h-$V.r.kn.T[.
0100  c4 7e 71 63 96 64 04 69 3b 8f 3b 97 90 86 6a 76   .~qc.d.i;.;...jv
0110  fa dd a2 b5 b2 c8 13 17 19 65 4e 07 93 ce 77 6a   .........eN...wj
0120  56 a4 31 de 77 c8 42 5a 6e a9 57 d8 ff 96 97 b2   V.1.w.BZn.W.....
0130  fe a4 c8 de ea 9d 13 5d 63 d4 19 25 ae f1 12 c9   .......]c..%....
0140  d2 2f 78 4f 20 9f a3 68 cf 4a 49 c5 79 65 3d 6e   ./xO ..h.JI.ye=n
0150  06 eb 38 04 ac 7e 03 25 bf 16 e6 d6 1f 42 9f e1   ..8..~.%.....B..
0160  0b b0 e5 51 69 84 dc c1 dc 50 3d 97 b4 5a bf 90   ...Qi....P=..Z..
0170  c8 01 1c f5 48 57 cc 11 c4 82 cf fc 69 c2 86 ef   ....HW......i...
0180  49 a7 dd 58 3d 3c 8b 77 f7 55 5d f4 9c 9f 33 e2   I..X=<.w.U]...3.
0190  0a d6 fd 67 f2 37 29 86 ca 94 f8 0e 6c 43 9e 26   ...g.7).....lC.&
01a0  de de 67 56 22 62 ff 45 de 4f 45 90 9a 7c 92 7c   ..gV"b.E.OE..|.|
01b0  d8 74 98 74 a8 30 be 46 98 1c 93 80 60 c4 d4 3b   .t.t.0.F....`..;
01c0  fc 07 10 56 ce 26 98 59 c9 f6 a0 ce 2e 7e 0c c8   ...V.&.Y.....~..
01d0  4c 4b a0 ec 5b 80 4c ef 7a 73 98 84 a6 de da 48   LK..[.L.zs.....H
01e0  06 5e 2a cc 3e 62 6d e0 13 91 76 e4 22 31 f6 a6   .^*.>bm...v."1..
01f0  3e fb d9 5e 7a 68 a8 93 0e 4f 4e d1 9a 64 01 c0   >..^zh...ON..d..
0200  d8 bc ea 1c a8 74 bc 1f 0b 34 93 57 8c 44 24 bc   .....t...4.W.D$.
0210  50 06 20 9c ea f6 94 c2 fc 96 74 ed 5f cd 18 cc   P. .......t._...
0220  24 76 5a 2c bd c2 2a 40 3c 07 ce c8 11 40 45 e4   $vZ,..*@<....@E.
0230  ee 83 b9 a6 da 03 83 5e 0e 60 39 bd 8e 4f f2 db   .......^.`9..O..
0240  13 1c 91 39 1a ec bb 15 f8 6c ab 48 88 54 bc d8   ...9.....l.H.T..
0250  ba a8 93 f0 9a 44 20 73 7b 26 bc bd 19 f6 d8 c2   .....D s{&......
0260  55 c5 1c ef 89 68 19 b4 ad 9f 55 44 07 17 da ac   U....h....UD....
0270  4b dd 2a 4c 34 25 e6 b8 11 7d 3c 64 72 79 71 a6   K.*L4%...}<dryq.
0280  d2 90 3f 46 ea 63 24 76 16 6a 3d f0 36 4d 95 ea   ..?F.c$v.j=.6M..
0290  1c d4 af 21 cc f4 b9 87 5b 30 48 26 d8 80 35 6a   ...!....[0H&..5j
02a0  a8 74 be 66 22 bc 91 74 ed c4 b0 67 6b a6 a0 c1   .t.f"..t...gk...
02b0  34 d6 a8 c0 6e 63 60 ef ff 4d 98 88 63 fd fa 94   4...nc`..M..c...
02c0  f1 08 0a 70 36 b7 13 18 11 d9 f1 65 ee ef c9 31   ...p6......e...1
02d0  aa 82 f0 a6 72 df 2e 5e fa 3d 0d 66 9b a7 0e fc   ....r..^.=.f....
02e0  0f a0 99 d8 d0 fb 02 6f 16 03 fb 74 28 d1 29 04   .......o...t(.).
02f0  d1 0a 6e a8 0e 69 2c e3 42 8d fc 67 da b9 56 96   ..n..i,.B..g..V.
0300  06 ac c2 73 de 54 77 e5 1c 38 6d b0 99 9c 7b 32   ...s.Tw..8m...{2
0310  78 00 81 ae 04 e8 88 4b 06 45 20 ea cf a4 13 cd   x......K.E .....
0320  e3 26 70 fb 54 85 20 f1 01 c8 9e 5c da f3 5b 8c   .&p.T. ....\..[.
0330  91 af aa fc 0a 1e 55 0c 16 38 25 9b 3d 66 20 67   ......U..8%.=f g
0340  de 22 70 96 16 c2 c2 91 3a 55 f7 df 1d ec f0 49   ."p.....:U.....I
0350  99 2c 4b d5 28 68 3b 51 c8 e8 86 28 7a fd c4 d1   .,K.(h;Q...(z...
0360  f4 18 91 1d 99 c4 98 db 61 06 48 b7 11 f6 a0 c8   ........a.H.....
0370  c4 eb e4 ed 35 62 98 a0 bc 8b 5a f8 85 bf eb 64   ....5b....Z....d
0380  3e a8 42 1c 13 c0 7f e4 7a e8 5f 06 12 8b 23 7e   >.B.....z._...#~
0390  ae 60 9e ab da 4d cf a2 9a 0c 90 ee 78 48 89 60   .`...M......xH.`
03a0  a0 00 38 89 78 b0 49 47 98 06 87 5e 26 60 ae 4c   ..8.x.IG...^&`.L
03b0  6a 41 16 0b a8 54 29 e0 fa f0 ed a5 da ce b0 54   jA...T).........T
03c0  23 a4 c8 ba ca 08 94 ed 59 44 b9 6d 63 9e 13 6e   #.......YD.mc..n
03d0  b8 36 20 a9 40 57 00 c2 7f 58 a2 7b 5e 84 21 5d   .6 .@W...X.{^.!]
03e0  d8 fe 66 71 ac d6 9e 50 30 66 5a 8c 67 b0 d2 04   ..fq...P0fZ.g...
03f0  60 1a fa 58 16 68 65 aa 3d 41 0c 66               `..X.he.=A.f

No.     Time        Source                Destination           Protocol Info
    676 1464.401302 E.F.G.H         A.B.C.D           TCP      9988 > mni-prot-rout [ACK] Seq=1 Ack=42331 Win=64128 Len=0

Frame 676 (54 bytes on wire, 54 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: 9988 (9988), Dst Port: mni-prot-rout (3764), Seq: 1, Ack: 42331, Len: 0
    Source port: 9988 (9988)
    Destination port: mni-prot-rout (3764)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 42331    (relative ack number)
```

```
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 64128 (scaled)
    Checksum: 0xf15d [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    677 1464.404139 A.B.C.D           E.F.G.H         TCP      mni-prot-rout > 9988 [PSH, ACK] Seq=42331 Ack=1 Win=500000 Len=255

Frame 677 (309 bytes on wire, 309 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: mni-prot-rout (3764), Dst Port: 9988 (9988), Seq: 42331, Ack: 1, Len: 255
    Source port: mni-prot-rout (3764)
    Destination port: 9988 (9988)
    Sequence number: 42331    (relative sequence number)
    [Next sequence number: 42586    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 500000 (scaled)
    Checksum: 0x36f6 [correct]
    [SEQ/ACK analysis]
Data (255 bytes)

0000  66 0d c6 cd fa 81 d6 57 a6 50 f5 4d 1b 44 97 78   f......W.P.M.D.x
0010  ed cf 21 7a 28 fc 68 de 4a 0c 0d 15 03 43 b8 40   ..!z(.h.J....C.@
0020  47 87 60 bf 8b 26 84 5a 44 4c d0 c0 22 c4 23 7a   G.‘..&.ZDL.."#z
0030  89 4e d4 18 9d fb 11 e7 51 c4 b8 87 f6 86 40 9a   .N......Q.....@.
0040  35 f6 48 c8 aa 09 cc e1 5a c9 e8 f4 c3 7d 5a dc   5.H.....Z....}Z.
0050  a0 01 eb 59 04 0e 1d 48 5f 6a f7 26 09 a5 dc da   ...Y...H_j.&....
0060  dc 11 4c 5e 6e 6a 1f d8 62 d0 f3 e3 a6 3b fe 27   ..L^nj..b....;.’
0070  7e d2 b0 86 ba 0f a2 28 de d0 8d 2d 1b 54 50 c9   ~.......(...-.TP.
0080  a5 cf 59 1a 68 a0 c6 be 8f 98 8d b8 1d 43 78 36   ..Y.h........Cx6
0090  62 c7 0c 61 b4 a1 4a 68 67 22 78 5c 44 93 ec e8   b..a..Jhg"x\D...
00a0  b0 5c bc c5 af 0d 24 6f a1 48 ea 28 78 7e 3d 33   .\....$o.H.(x~=3
00b0  96 be c0 d0 3b 64 b2 fd 90 57 8e 93 fa 98 c2 d9   ....;d...W......
00c0  d2 51 e3 cf 1d ef 30 6e 99 bc a9 da f3 9f c5 aa   .Q....0n........
00d0  78 20 2c de 1a 8c 14 70 a0 73 b9 be c2 82 12 7a   x ,....p.s.....z
00e0  a8 05 78 1a 40 51 a4 f1 02 13 99 60 ee 59 c3 6e   ..x.@Q.....‘.Y.n
00f0  04 cc 28 04 20 1a e7 b4 16 ea cd 29 3d 5e 5d      ..(. ......)=^]

No.     Time        Source                Destination           Protocol Info
    678 1464.404167 E.F.G.H         A.B.C.D           TCP      9988 > mni-prot-rout [ACK] Seq=1 Ack=42586 Win=64128 Len=0

Frame 678 (54 bytes on wire, 54 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: 9988 (9988), Dst Port: mni-prot-rout (3764), Seq: 1, Ack: 42586, Len: 0
    Source port: 9988 (9988)
    Destination port: mni-prot-rout (3764)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 42586    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 64128 (scaled)
    Checksum: 0xf05e [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    679 1464.434356 A.B.C.D           E.F.G.H         TCP      mni-prot-rout > 9988 [PSH, ACK] Seq=42586 Ack=1 Win=500000 Len=1020

Frame 679 (1074 bytes on wire, 1074 bytes captured)
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Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: mni-prot-rout (3764), Dst Port: 9988 (9988), Seq: 42586, Ack: 1, Len: 1020
    Source port: mni-prot-rout (3764)
    Destination port: 9988 (9988)
    Sequence number: 42586    (relative sequence number)
    [Next sequence number: 43606    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 500000 (scaled)
    Checksum: 0x06c6 [correct]
    [SEQ/ACK analysis]
Data (1020 bytes)

0000  26 7e b2 17 b5 fa 2f 20 dc fe f1 22 04 04 b3 5e   &~..../ ..."...^
0010  4b 5f 10 05 05 09 9c e8 0c dc 93 e4 5e 0e 6a d0   K_..........^.j.
0020  f3 fe 4d 04 c4 3d 8c 88 26 8e 08 c2 b9 fb 27 fd   ..M..=..&.....'.
0030  86 f6 a3 c6 7f 16 51 a3 d2 1d 58 5b 88 98 f4 de   ......Q...X[....
0040  b6 2a a4 c7 ba c6 24 8d 94 70 45 5c c0 7d 8b 12   .*....$..pE\.}..
0050  75 a4 9c 78 e5 20 9d 20 68 de be 04 c3 e2 8e 5a   u..x. . h......Z
0060  a8 9a ee f4 04 d7 7e b1 96 8f 16 da e3 2a ad 46   ......~......*.F
0070  26 be 33 64 75 fa cc a2 d4 c7 c8 17 42 31 65 d6   &.3du.......B1e.
0080  2c 04 ce 8e f6 cf a4 e9 de 39 f2 14 2a e8 92 b9   ,........9..*...
0090  ef cb cc 15 15 45 17 13 04 17 7f d2 de 01 c8 00   .....E..........
00a0  89 02 65 7a 7b 8c ce 15 d0 df a4 7c de 5a 8f 14   ..ez{......|.Z..
00b0  0a 52 94 b9 1b 46 39 13 4d d9 36 50 3e 16 a6 a8   .R...F9.M.6P>...
00c0  5a 6d 05 bb 0a eb d6 d9 c6 de a2 53 df ab b2 94   Zm.........S....
00d0  e5 c2 9d d9 6d 1a 3d 0a cd fa bd 7e 1c 21 d8 52   ....m.=....~.!.R
00e0  e8 f4 8f d0 a5 11 92 49 76 73 5e 7c 02 87 30 84   .......Ivs^|..0.
00f0  02 16 7f 02 a3 16 7e 28 9b 5b 94 3c 0e 88 f1 bc   ......~(.[.<....
0100  ad fc 11 a3 da ce 48 10 75 2a 05 74 64 c0 d6 02   ......H.u*.td...
0110  b4 e5 a2 4e d7 63 71 9e 5d 69 8e 0d bd 6a b7 86   ...N.cq.]i...j..
0120  65 5f a7 1d da 3c 76 bb 04 49 49 52 20 a2 34 62   e_...<v..IIR .4b
0130  fa eb 0c 81 61 50 f9 1d c7 68 4b 60 2e ab f6 e8   ....aP...hK`....
0140  e0 04 98 ef d9 9f bb 48 b8 39 66 e7 5c d0 77 fc   .......H.9f.\.w.
0150  94 b6 5a 39 dc 43 c2 86 bf 92 b4 9a e8 8b 8b 26   ..Z9.C.........&
0160  a5 f8 5c 07 76 34 e8 f7 02 b3 7f e5 27 16 81 b1   ..\.v4......'...
0170  57 5b ff 24 e8 88 e6 7a 66 fc 56 a3 6c 45 48 c8   W[.$...zf.V.lEH.
0180  dd ca 05 20 82 cd d6 12 3e b8 a2 3f df ff c2 94   ... ....>..?....
0190  0e 47 41 d9 f7 03 52 0a 24 34 f3 7e 52 21 ba 0a   .GA...R.$4.~R!..
01a0  f8 3f 77 e3 e8 7d c6 39 a4 32 35 28 96 e7 ad 50   .?w..}.9.25(...P
01b0  e1 54 6e 86 b2 b8 34 08 67 6c 8c 9d d0 30 5a cb   .Tn...4.gl...0Z.
01c0  46 6a 7e 1b 56 d2 41 27 ce 04 1c 3a 9f e4 c7 fa   Fj~.V.A'...:....
01d0  2c 1f 24 b2 fa 8e e6 e8 8a 99 04 50 e1 ef 6e 86   ,.$........P..n.
01e0  f6 b8 34 e6 67 30 8c 9d c1 30 5a 16 46 6a 55 1b   ..4.g0...0Z.FjU.
01f0  73 d2 41 06 ce 04 81 3a 94 3c c7 dc 2c 1f 7d b2   s.A....:.<..,.}.
0200  fa 68 e6 e8 2c 99 a5 50 e1 9d 6e 86 2d b8 34 8b   .h..,..P..n.-.4.
0210  67 c8 8c 9d 75 30 5a 22 46 6a e0 1b 65 fe 41 ba   g...u0Z"Fj..e.A.
0220  ce 04 b9 3a 94 87 c7 ed 2c 1f 85 b2 fa d4 e6 e8   ...:....,.......
0230  e5 99 29 50 e1 10 6e 86 59 b8 34 da 67 ff 8c 9d   ..)P..n.Y.4.g...
0240  cd 30 5a 78 46 6a 3f 1b ea d2 41 30 ce 04 c4 3a   .0ZxFj?...A0...:
0250  94 59 c7 a0 2c 1f ac b2 fa a1 e6 e8 02 99 dc 50   .Y..,..........P
0260  e1 bc 6e 86 71 b8 34 e4 67 c2 8c 9d 9c 30 5a 8d   ..n.q.4.g....0Z.
0270  46 6a 20 1b 72 d2 41 3b ce 04 5b 3a 94 25 c7 6a   Fj .r.A;..[:.%.j
0280  2c 1f 98 b2 fa ab e6 e8 ed 99 34 50 e1 bf 6e 86   ,.........4P..n.
0290  fa b8 34 75 67 c9 8c 9d b5 30 5a a4 46 6a c9 1b   ..4ug....0Z.Fj..
02a0  d5 d2 41 bc ce 04 19 3a 94 f4 c7 ec 2c 1f 6c b2   ..A....:....,.l.
02b0  fa 51 e6 69 2c 1c ce c7 9f 58 67 7f e5 dc d2 94   .Q.i,....Xg.....
02c0  fc 48 7f 71 a6 c1 a3 99 23 8c 48 a3 56 21 df da   .H.q....#.H.V!..
02d0  2b fd 45 37 72 16 77 ca df 93 06 9b 03 1b 5e 0e   +.E7r.w.......^.
02e0  e8 3b 16 a3 3b 58 59 7f e5 56 d2 94 cb 48 7f 63   .;..;XY..V...H.c
02f0  a6 50 a3 99 a9 8c 48 68 b6 21 23 da 68 fd 45 e2   .P....Hh.!#.h.E.
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0300  72 17 1a 2a df 40 06 83 03 1b cb 0e e8 fd 16 a3   r..*.@..........
0310  7e 58 11 7f e5 7f d2 92 99 a2 b4 1b 82 d2 41 35   ~X............A5
0320  ce 04 25 3a 94 ae c7 64 2c 1f b3 b2 fa af e6 e8   ..%:...d,.......
0330  da 99 e3 50 e1 d6 6e 87 0f f8 34 f2 67 5c 8c 9d   ...P..n...4.g\..
0340  06 30 5a d7 46 6a 05 1b 8f d2 48 46 46 6a 68 1b   .0Z.Fj....HFFjh.
0350  4a d2 41 8f ce 04 1f 3a 94 b0 c7 90 2c 1f d8 b2   J.A....:....,...
0360  fa 76 e6 e8 a1 99 99 50 e1 2c 6e 86 d3 b8 34 f0   .v.....P.,n...4.
0370  67 d7 8c 9d 3a 30 5a b8 46 6a 8f 1b 26 d2 41 01   g...:0Z.Fj..&.A.
0380  ce 04 cf 3a 94 cc c7 77 2c 1f ed b2 fb 0a 26 77   ...:...w,.....&w
0390  08 1f 4b b2 fa 4a e6 e8 5d 99 44 50 e1 37 6e 86   ..K..J..].DP.7n.
03a0  4f b8 34 4d 67 79 8c 9d f8 30 5a 2e 46 6a 16 1b   O.4Mgy...0Z.Fj..
03b0  e2 d2 41 6c be 04 84 3a 94 0e c7 bf 2c 1f c0 b2   ..Al...:....,...
03c0  fa 4e e6 e8 b3 99 4f 50 e1 a6 6e 86 77 83 9f 1c   .N....OP..n.w...
03d0  7c 88 05 89 7c 69 05 71 7c ca 85 49 7d 1d 35 ec   |...|i.q|..I}.5.
03e0  be 80 81 e9 be 7d 7d e9 ae c7 81 e9 aa 10 7d e9   .....}}.......}.
03f0  be 1a 75 e9 be b8 31 e9 ae 7e 1d e9               ..u...1..~..

No.     Time        Source                Destination           Protocol Info
    680 1464.434412 E.F.G.H         A.B.C.D           TCP      9988 > mni-prot-rout [ACK] Seq=1 Ack=43606 Win=64128 Len=0

Frame 680 (54 bytes on wire, 54 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: 9988 (9988), Dst Port: mni-prot-rout (3764), Seq: 1, Ack: 43606, Len: 0
    Source port: 9988 (9988)
    Destination port: mni-prot-rout (3764)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 43606    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 64128 (scaled)
    Checksum: 0xec62 [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    681 1464.451492 A.B.C.D           E.F.G.H         TCP      mni-prot-rout > 9988 [PSH, ACK] Seq=43606 Ack=1 Win=500000 Len=255

Frame 681 (309 bytes on wire, 309 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: mni-prot-rout (3764), Dst Port: 9988 (9988), Seq: 43606, Ack: 1, Len: 255
    Source port: mni-prot-rout (3764)
    Destination port: 9988 (9988)
    Sequence number: 43606    (relative sequence number)
    [Next sequence number: 43861    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 500000 (scaled)
    Checksum: 0xab4e [correct]
    [SEQ/ACK analysis]
Data (255 bytes)

0000  aa c5 09 e9 ae a8 cd e9 aa a7 45 e9 be 2e 7d e9   ..........E...}.
0010  b7 4c d1 57 a5 69 7d 57 84 5f 91 ae 58 9f 25 ae   .L.W.i}W._..X.%.
0020  f8 9f e9 af c2 9f 6d ae 31 df 41 af 91 9f 7d ae   ......m.1.A...}.
0030  5b 9f 61 af d4 df 25 af 32 df 51 ae 7d df 65 af   [.a...%.2.Q.}.e.
0040  96 9f bd af 1f 9f 75 ae 57 df 35 ae bc 9f f9 ae   ......u.W.5.....
0050  9c 9f fd af 02 9f 49 ae a1 9d a9 1f ca 9f 6d af   ......I.......m.
0060  43 9f 8d af a7 9f e1 ae e0 9f 69 ae 23 9f b1 ae   C.........i.#...
0070  a3 9f 85 af 45 df 51 ae 8e df d1 ae f3 9f 1d af   ....E.Q.........
0080  c7 df ed af d7 df 6d ae d8 9f 55 ae f0 df a9 ae   ......m...U.....
0090  73 9f fd ae bd df 61 af ab 9f 05 ae 77 9f c1 ae   s.....a.....w...
```

```
00a0  53 df 15 af f9 9f 91 ae b5 9f 0d af 85 9f ed af   S...............
00b0  dd 9f 19 ae d9 df 2d ae 30 9f 8d af c3 04 b5 48   ......-.0......H
00c0  41 04 49 4c e9 04 69 4c d3 04 d5 48 c5 04 71 61   A.IL..iL...H..qa
00d0  ae 6f 3f c2 49 df 35 c2 66 2b 35 d2 74 e3 35 c6   .o?.I.5.f+5.t.5.
00e0  67 33 35 c6 c1 23 35 d2 90 2b 35 d6 01 e3 35 d2   g35..#5..+5...5.
00f0  9d 77 35 d6 0f 6b 35 d2 17 8f 35 c6 79 e7 35      .w5..k5...5.y.5

No.     Time        Source                Destination           Protocol Info
    682 1464.451543 E.F.G.H         A.B.C.D           TCP      9988 > mni-prot-rout [ACK] Seq=1 Ack=43861 Win=64128 Len=0

Frame 682 (54 bytes on wire, 54 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: 9988 (9988), Dst Port: mni-prot-rout (3764), Seq: 1, Ack: 43861, Len: 0
    Source port: 9988 (9988)
    Destination port: mni-prot-rout (3764)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 43861    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 64128 (scaled)
    Checksum: 0xeb63 [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    683 1464.477977 A.B.C.D           E.F.G.H         TCP      mni-prot-rout > 9988 [PSH, ACK] Seq=43861 Ack=1 Win=500000 Len=1460

Frame 683 (1514 bytes on wire, 1514 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: mni-prot-rout (3764), Dst Port: 9988 (9988), Seq: 43861, Ack: 1, Len: 1460
    Source port: mni-prot-rout (3764)
    Destination port: 9988 (9988)
    Sequence number: 43861    (relative sequence number)
    [Next sequence number: 45321    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 500000 (scaled)
    Checksum: 0xa477 [correct]
    [SEQ/ACK analysis]
Data (1460 bytes)

0000  d6 4f ef 35 d2 22 a7 35 d2 7f 73 35 c6 71 fb 35   .O.5.".5..s5.q.5
0010  db 65 d4 2d 7c 95 00 1a 52 d9 6b 5a 94 a3 80 90   .e.-|...R.kZ....
0020  f4 fa 8b 81 53 12 ab 72 b5 21 57 73 51 61 43 73   ....S..r.!WsQaCs
0030  65 61 db 73 70 21 07 73 77 61 df 72 6d 61 67 72   ea.sp!.swa.rmagr
0040  7b 61 c3 73 81 61 5f 72 37 61 b7 72 96 61 a3 77   {a.s.a_r7a.r.a.w
0050  b1 1d fa 8b 87 87 f3 8b 83 d7 a3 8b 58 97 a3 8b   ............X...
0060  13 d7 73 8b 88 d7 03 8b e4 87 f3 8a ba 5c 6b 3b   ..s..........\k;
0070  c2 82 df 35 c6 62 17 35 c2 8b 3b 35 d6 8c b3 35   ...5.b.5..;5...5
0080  c2 37 73 35 d6 47 37 35 c6 28 87 35 ed d1 6b fd   .7s5.G75.(.5..k.
0090  c2 1d 47 35 c6 db 1b 35 d2 b7 cb 35 c2 3a 23 35   ..G5...5...5.:#5
00a0  c6 cb 67 35 c2 42 5f 35 c2 7b 07 35 86 08 c0 c4   ..g5.B_5.{.5....
00b0  49 60 04 bd 4c 48 04 25 4d 2b 04 4d 49 e2 04 f1   I‘..LH.%M+.MI...
00c0  49 b3 04 85 4d ec 04 0d 49 f5 04 49 4d d6 04 01   I...M...I..IM...
00d0  4c 35 04 b1 4a a6 6b 1a ae d9 6b 0a 16 95 6b 5a   L5..J.k...k...kZ
00e0  29 e0 a8 91 f6 fa af 81 b0 54 6b 77 c8 34 23 8b   ).........Tkw.4#.
00f0  91 97 57 8a 11 9d 6b 44 86 6e b8 9e 4d a9 04 fd   ..W...kD.n..M...
0100  4c 81 04 dd 49 a0 0e 11 86 07 e5 35 86 52 88 ba   L...I.......5.R..
0110  4d ce 04 f1 49 99 04 2d 5d 9e 78 0e af c8 df f9   M...I..-].x.....
0120  ab e1 8e 0a 57 ad 79 39 56 21 a9 35 b1 aa 77 f9   ....W.y9V!.5..w.
0130  e9 be 15 45 e9 fa a3 da 6f 35 ea 5a 21 21 eb 5d   ...E....o5.Z!!.]
```

```
0140  d0 d3 be 81 b9 d3 41 81 61 d3 a4 c1 85 d4 22 a9   ......A.a.....".
0150  e2 e7 58 d7 64 a6 9d 47 da af 79 06 74 9a 58 6b   ..X.d..G..y.t.Xk
0160  28 a6 57 04 da 69 c3 06 a1 5e 58 01 d2 a6 9f 6a   (.W..i...^X....j
0170  da 8b fb 06 dc b1 58 90 1f a6 26 6f da 8f 65 06   ......X...&o..e.
0180  fe 72 58 6c d3 a6 d6 51 da 2d d2 06 b5 25 58 ba   .rXl...Q.-...%X.
0190  c6 a6 8f 18 da e3 c8 06 e0 61 58 ea 14 a6 67 fc   .........aX...g.
01a0  da 33 b0 06 80 51 58 0d 23 a6 16 26 da 41 e0 06   .3...QX.#..&.A..
01b0  c0 c4 58 6e 8b a6 0c 98 da d9 61 06 b3 4c 58 ce   ..Xn......a..LX.
01c0  a9 a6 24 19 da aa ae 06 98 70 58 fe c2 a6 c2 da   ..$......pX.....
01d0  da 56 e4 06 8d fc 58 13 6c a6 07 5a da 6c 20 06   .V....X.l..Z.l .
01e0  e7 4a 58 11 82 a6 df b2 da 6b 71 02 ee 51 98 b3   .JX......kq..Q..
01f0  5e 66 4e d9 1a 3c 6a c6 4f 98 98 0c 8f 66 86 64   ^fN..<j.O....f.d
0200  1a 44 0a c6 d4 be 98 ae 9d 66 fd df 1a df 2c c6   .D.......f....,.
0210  5b 88 98 02 ca 66 45 98 1a 94 70 c6 bc 83 98 d5   [....fE...p.....
0220  26 66 1b 9d 1a 20 e0 c6 60 2e 98 c4 32 66 d7 6d   &f... ..`...2f.m
0230  1a b6 58 c6 71 3a 98 33 64 66 92 74 1a 6b bc c6   ..X.q:.3df.t.k..
0240  d6 2c 98 52 8a 66 6b 67 1a 2a e8 c6 93 35 9b bc   .,.R.fkg.*...5..
0250  c7 e4 fa 49 94 f7 08 dc f5 f6 f8 db 8a 69 2e 56   ...I.........i.V
0260  7c a4 08 aa d0 f6 e5 18 8a 4d d9 56 42 06 56 c9   |........M.VB.V.
0270  8a f0 c8 d8 39 d7 2c da 8a 94 14 a2 be e7 a7 9f   ....9.,.........
0280  df 41 88 ab cb 77 b0 b9 59 f6 ca 06 19 76 3a 4f   .A...w..Y....v:O
0290  5a 34 1a bd b1 cf 5b 66 1c c6 cb 4e b1 ea 19 62   Z4....[f...N...b
02a0  d2 c6 69 16 89 36 31 4f 9b ae 42 74 9b 9b fd 8f   ..i..61O..Bt....
02b0  f3 13 a4 40 49 d0 f7 31 86 bf ed d5 6b 7d 60 ab   ...@I..1....k}`.
02c0  35 7e 62 0b 67 3b 6d 78 3c 24 70 04 bd ae 3a 2e   5~b.g;mx<$p...:.
02d0  91 bd 2c d8 f9 ba 2c 60 b0 a5 88 47 9f 84 77 32   ..,...,`...G..w2
02e0  f2 80 96 4a 80 93 6a 10 f5 31 fe 81 05 96 32 f1   ...J..j..1....2.
02f0  c8 c9 68 2a cb b5 5c 6c 9f f5 36 77 ec ed 4c 39   ..h*..\l..6w..L9
0300  f5 c1 71 24 44 1b 57 a5 fb 9c 61 8f fd 93 cb 54   ..q$D.W...a....T
0310  00 68 87 4a 41 74 11 d1 13 7b 0a e2 be 55 50 f8   .h.JAt...{...UP.
0320  0b 21 33 47 9b b7 14 2c ec 5b 57 75 5e 44 10 9d   .!3G...,.[Wu^D..
0330  5e 87 dd e7 68 42 00 4f e6 26 e1 4d 12 0d 86 99   ^...hB.O.&.M....
0340  b9 f7 39 78 75 b4 28 cc 6d fe 7c 62 e8 05 23 04   ..9xu.(.m.|b..#.
0350  e2 d6 90 b5 e4 67 00 a1 86 09 96 11 b0 7a 33 9d   .....g.......z3.
0360  d2 82 53 0c 23 fe 43 81 12 22 4e 3b 94 9e 31 f3   ..S.#.C.."N;..1.
0370  82 81 a1 8e e9 02 24 87 10 a2 4e 24 0f f7 28 e4   ......$...N$..(.
0380  44 75 6e d9 c3 fd 2c 4f 60 2e 0c 01 9c b2 53 16   Dun...,O`.....S.
0390  fb 81 08 09 db 1e d4 e7 ba a3 39 b9 d8 18 6b cd   ..........9...k.
03a0  90 91 8a c9 35 20 2e a9 fe 9b d2 63 29 bc 2a a9   ....5 .....c).*.
03b0  c5 ef 7f 62 f5 a9 91 d2 19 04 bb 81 6a f2 d8 4a   ...b........j..J
03c0  57 36 08 5a 82 f6 d2 57 ba ea 7c 7e d2 76 fc e2   W6.Z...W..|~.v..
03d0  d2 16 f5 5c 8d 30 50 80 d2 f7 4b 16 82 cf 6c 4e   ...\.OP...K...lN
03e0  0e ee 4c 23 7d 16 89 1a 90 32 ca 5f 6e 91 28 f9   ..L#}....2._n.(.
03f0  8e 06 a6 ce 87 02 a7 6b ce 97 c5 43 80 46 59 9d   .......k...C.FY.
0400  ca 9e 58 93 72 c5 0c 44 c2 df ce c7 99 7f 11 96   ..X.r..D........
0410  cb 02 07 73 d4 ed 96 e6 16 66 79 ca 52 ef 8d d7   ...s.....fy.R...
0420  3b c4 b5 68 91 e7 88 9a 1d a6 03 a5 c3 20 11 10   ;..h......... ..
0430  71 8a dd c0 93 dc 28 64 6a b0 f7 6a 5e 78 31 e0   q.....(dj..j^x1.
0440  fa 57 38 91 0f ee ed 76 28 92 c5 a6 5c 8b 6a 09   .W8....v(...\.j.
0450  fd 1a 93 e3 41 46 d4 c6 1b 4a d0 4f 26 5e 18 04   ....AF...J.O&^..
0460  f6 ea 91 83 4a f7 28 df 00 d0 57 90 cf b0 f9 76   ....J.(...W....v
0470  94 21 5c 62 ba 9e 4e 72 88 6d c7 57 a2 b6 12 c7   .!\b..Nr.m.W....
0480  cc d6 08 3c 1d 66 2b 94 28 e2 19 12 8e c2 00 2e   ...<.f+.(.......
0490  97 f4 db cd 65 ec 6d fe 90 f6 b3 d7 8e 9f 0c b2   ....e.m.........
04a0  3f be 15 52 1b ee 16 47 5a 56 5c 8f 2b aa 9b 2e   ?..R...GZV\.+...
04b0  ce 3d ab 1a 4e 21 b5 e5 9b d7 c9 44 a8 0e 1b 75   .=..N!.....D...u
04c0  98 92 1c 70 e6 e3 2f d8 2a 8f 4a 4f d4 ac 4a 72   ...p../.*.JO..Jr
04d0  82 2f 7a f1 ce 47 2c 83 02 59 d2 94 1f ae 1a f9   ./z..G,..Y......
04e0  41 ce 1f 0d df b4 56 79 6c 09 6a 54 ea 50 54 62   A.....Vyl.jT.PTb
04f0  f0 fa 78 42 f5 f9 1c 80 c2 ef 39 b9 ba fa 1d 63   ..xB......9....c
0500  79 bf 99 6c 92 77 10 10 fe de 12 1b b8 22 10 19   y..l.w.......".."
0510  b8 e2 1e 65 83 ce 13 f6 8b ee 63 5a 96 06 9b ae   ...e......cZ....
0520  94 06 1d a8 95 06 e4 6e ba f4 ac 7e 85 f5 2a c8   .......n...~..*.
```

```
0530  93 5a 3a 1f b9 e1 4b 01 83 e2 e2 09 40 6a 04 56   .Z:...K.....@j.V
0540  be 47 1c 5b 5a 78 38 bd 5b 2c d5 61 5a 85 3a 20   .G.[Zx8.[,.aZ.:
0550  b0 df 25 6f 44 ef 03 06 8b da 10 d1 a9 a3 81 1c   ..%oD...........
0560  a2 ef 44 4b 89 ee 45 fe 49 42 41 4e 14 17 47 f7   ..DK..E.IBAN..G.
0570  8b ee 17 4b 98 f3 34 5e fa 06 62 8e 93 62 af 6e   ...K..4^..b..b.n
0580  52 58 7c 27 f3 27 28 3f e1 26 6e db 52 ee f2 c3   RX|'.'(?.&n.R...
0590  52 79 64 25 7b ee 2b 44 8a e0 1f c6 9b e4 1b 7d   Ryd%{.+D.......}
05a0  9f e0 ea 8e 8b e2 a8 68 8a fe 30 f6 08 b7 38 51   .......h..0...8Q
05b0  9d f6 e8 4f                                       ...O

No.     Time        Source                Destination           Protocol Info
    684 1464.477984 A.B.C.D           E.F.G.H         TCP      mni-prot-rout > 9988 [PSH, ACK] Seq=45321 Ack=1 Win=500000 Len=70

Frame 684 (124 bytes on wire, 124 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: mni-prot-rout (3764), Dst Port: 9988 (9988), Seq: 45321, Ack: 1, Len: 70
    Source port: mni-prot-rout (3764)
    Destination port: 9988 (9988)
    Sequence number: 45321    (relative sequence number)
    [Next sequence number: 45391    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 500000 (scaled)
    Checksum: 0x9087 [correct]
Data (70 bytes)

0000  90 ed 14 46 97 e8 17 56 8b f4 0b 52 9a f3 0e 51   ...F...V...R...Q
0010  82 ff 02 5d 86 e2 05 58 85 a1 be ed 83 c2 11 10   ...]...X........
0020  88 b8 3e 19 3f bc 1a f9 df 1a ef 96 f8 ef c0 85   ..>.?...........
0030  ef 8e 0a 5e 35 c5 11 d6 5a 44 f0 7e 5b 06 9d 65   ...^5...ZD.~[..e
0040  88 76 d8 e4 52 f2                                 .v..R.

No.     Time        Source                Destination           Protocol Info
    685 1464.478017 E.F.G.H         A.B.C.D           TCP      9988 > mni-prot-rout [ACK] Seq=1 Ack=45391 Win=64128 Len=0

Frame 685 (54 bytes on wire, 54 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: 9988 (9988), Dst Port: mni-prot-rout (3764), Seq: 1, Ack: 45391, Len: 0
    Source port: 9988 (9988)
    Destination port: mni-prot-rout (3764)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 45391    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 64128 (scaled)
    Checksum: 0xe569 [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    686 1464.504838 A.B.C.D           E.F.G.H         TCP      mni-prot-rout > 9988 [PSH, ACK] Seq=45391 Ack=1 Win=500000 Len=1020

Frame 686 (1074 bytes on wire, 1074 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: mni-prot-rout (3764), Dst Port: 9988 (9988), Seq: 45391, Ack: 1, Len: 1020
    Source port: mni-prot-rout (3764)
    Destination port: 9988 (9988)
    Sequence number: 45391    (relative sequence number)
    [Next sequence number: 46411    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
```

```
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 500000 (scaled)
    Checksum: 0x92fd [correct]
    [SEQ/ACK analysis]
Data (1020 bytes)

0000  4f 96 93 37 2e 8c 62 12 3d cc 95 78 01 fe 44 e0   O..7..b.=..x..D.
0010  a9 63 88 67 d8 4c bb 0e 5c a6 b2 2e 9d 56 6a 44   .c.g.L..\....VjD
0020  c0 7f 6d 5a 74 2b 9f e0 77 4b 1d e5 a9 c3 90 e9   ..mZt+..wK......
0030  ae 86 a9 ef a6 8b e8 29 f8 d2 42 b7 f0 62 9d 67   .......)..B..b.g
0040  fd 49 90 4a 1c 4f de 42 30 ea 69 ae 49 cb cd 66   .I.J.O.B0.i.I..f
0050  ba 3f c9 a6 2e 52 11 26 11 8e 99 b7 33 4c bb d5   .?...R.&....3L..
0060  5c 4d b2 c5 9d 56 1f a5 9f 36 f2 80 98 4f f4 16   \M...V...6...O..
0070  ba 6d 8e a4 2b ce 91 b7 3b 4c f3 66 0c 96 c3 67   .m..+...;L.f...g
0080  19 47 ba a5 53 00 de a3 29 b3 45 9f 15 b3 98 a1   .G..S...).E.....
0090  0b ac db 72 1a d6 b0 df 5d 0b a0 b6 7e 7a d8 f7   ...r....]...~z..
00a0  75 0f 8e b6 d3 bb a3 c6 76 f5 99 70 f6 37 c8 d4   u.......v..p.7..
00b0  28 f6 98 ec 29 7f af 4b 0a 79 21 c8 4d f8 37 b6   (...)..K.y!.M.7.
00c0  c4 d8 4c 08 51 2d d9 f8 45 6e e5 f9 d7 d2 82 cf   ..L.Q-..En......
00d0  2b 5f e3 d5 76 b1 55 70 f6 7f 28 ef 0e b1 60 d7   +_..v.Up..(...`.
00e0  c5 a0 27 6c 16 54 fb 3b df 8a ae e4 a7 68 d7 82   ..'l.T.;.....h..
00f0  1a 79 be a3 04 63 e9 7c e4 39 fd b6 5a 03 c4 e6   .y...c.|.9..Z...
0100  1c 1b 12 6c f3 44 86 2f 09 d9 72 ee 58 eb 8a ae   ...l.D./..r.X...
0110  31 26 98 c2 d8 7f ab cf 39 46 83 f7 11 47 a0 d4   1&......9F...G..
0120  32 64 9a fc 0a 4c 98 dd 2b 6d b9 e6 03 55 91 e5   2d...L..+m...U..
0130  24 72 b6 c2 18 79 ad c9 3f 59 8d e9 1f 46 a4 d0   $r...y..?Y...F..
0140  36 60 84 f0 16 40 9f db 2d 6b bf fb 98 cb 9f fa   6`...@..-k......
0150  0c 79 96 e2 1f 57 91 fe 19 e1 99 56 17 40 8f ec   .y...W.....V.@..
0160  2a 51 89 c6 02 86 eb e1 03 46 8e eb 1a 6f ae f9   *Q.......F...o..
0170  3d 69 9b d1 06 6e a9 cb 39 76 b1 e2 eb 7e b8 67   =i...n..9v...~.g
0180  5a 6c a8 96 00 66 36 86 9a 1e 92 a6 4c 86 da de   Zl...f6.....L...
0190  28 6e b6 c6 00 84 bb 6e 50 c6 c8 d4 74 52 1e be   (n.....nP...tR..
01a0  38 8f 49 82 d3 9f 57 d0 d7 0b 4b 75 7c 95 43 33   8.I...W...Ku|.C3
01b0  2a 91 f2 ba 96 71 b2 51 14 a1 8b 76 17 51 80 e3   *....q.Q...v.Q..
01c0  28 54 85 14 10 5e 94 e6 38 5d 99 ef 0b 4b 84 e0   (T...^..8]...K..
01d0  18 50 91 e2 01 6e 92 d6 08 46 a2 fe 58 66 bd e1   .P...n...F..Xf..
01e0  37 49 9a d1 0f 79 85 c0 1e 68 94 e6 2e 50 a4 f8   7I...y...h...P..
01f0  3d 43 b7 eb 18 73 8f db 05 62 9e ca 14 46 ae f2   =C...s...b...F..
0200  24 5a b9 e5 33 4d 9a d5 0b 7d 81 c4 1a 6c 90 e6   $Z..3M...}...l..
0210  2a 54 a0 fc 39 47 b3 ef 13 77 8b df 01 6e 8c e7   *T..9G...w...n..
0220  bb 41 9f e8 1c 4b 0a de 13 4e 99 e3 12 40 96 e3   .A...K...N...@..
0230  11 e9 8a aa ab 16 be e4 c1 6e 85 ed e6 07 b2 ee   .........n......
0240  ef 32 de 1b e9 44 68 b8 30 5f 9d ae 1d fa a4 99   .2...Dh.0_......
0250  a8 26 19 09 ff ec 71 f4 16 c7 ec eb 17 ab 92 05   .&....q.........
0260  ae 5e 56 c0 1f 2c 96 5e 16 3c 90 0b f7 94 95 60   .^V..,.^.<.....`
0270  ad 48 82 20 9f 4f 91 84 ed b9 35 7b d1 a2 92 ea   .H. .O....5{....
0280  d5 58 99 32 f3 81 75 7b e3 73 9e 44 00 57 c5 e8   .X.2..u{.s.D.W..
0290  11 9a 12 10 98 64 6e e7 c3 3a c8 8e 36 9e 18 d1   .....dn..:..6...
02a0  56 c3 9c bc e0 7c 97 64 a4 f1 62 50 a6 af 99 27   V....|.d..bP...'
02b0  e4 44 d9 46 12 20 00 4a 15 aa 4a c2 bd 78 95 d0   .D.F. .J..J..x..
02c0  1b fa b2 15 e7 2b 8a c5 b2 ee f9 bb 75 42 5b ca   .....+......uB[.
02d0  e7 f1 97 60 1f d6 77 be af 87 a2 eb 88 b0 32 4e   ...`..w.......2N
02e0  a8 72 c4 fd d7 90 f6 ba 42 0a 93 13 ac 19 d2 fc   .r......B.......
02f0  f3 2e 90 2b 8f 5d 9c 9a 75 72 2e 86 d3 98 bf b3   ...+.]..ur......
0300  1f f6 9e 0c 03 8a 4a 99 e4 b1 de 26 08 d3 19 9a   ......J....&....
0310  c8 b8 32 89 5a f8 28 8a 19 40 97 2f c1 fe 12 e5   ..2.Z.(..@./....
0320  af 8d ac 1b 66 87 97 74 fe 48 c5 f0 b2 9a 1b 3c   ....f..t.H.....<
0330  11 f1 c2 2e e2 f3 80 e5 c8 ca 77 09 14 b5 d9 31   ..........w....1
0340  1c 2e 75 36 99 79 f7 db a0 af 94 58 f6 b6 3b 09   ..u6.y.....X..;.
0350  1c f0 7a a2 09 8a 08 ef 64 4c 40 8b 72 49 46 93   ..z.....dL@.rIF.
0360  a2 79 99 c2 14 68 ba 66 ed dd d8 eb 65 b8 2a 2b   .y...h.f....e.*+
0370  d1 43 4f 5a 06 29 b2 29 1f 13 3b a7 9f f9 f6 b3   .COZ.).)..;.....
```

```
0380  cc 45 16 ed 32 24 93 06 f9 13 06 c0 7a 26 ce e2   .E..2$......z&..
0390  b6 4d 19 b2 78 13 9b 45 a3 03 ce 10 5e 42 32 af   .M..x..E....^B2.
03a0  10 b4 f5 dc 63 a6 7e fa 27 a6 d3 ad 5f 15 bb e8   ....c.~.'..._...
03b0  58 65 be c3 0c 47 21 1e 08 8a 9c 1a 17 59 a3 d6   Xe...G!......Y..
03c0  3d 7c 1f dd 93 7a 0b db bf 78 4e d9 fa 79 72 e8   =|...z...xN..yr.
03d0  22 77 da b9 22 7d 59 da f7 7b 6e d8 e3 48 93 d4   "w.."}Y..{n..H..
03e0  08 08 b2 68 24 89 d9 e9 4f 09 fd 69 6d 89 66 2d   ...h$...O..im.f-
03f0  14 48 0d a8 24 c8 d6 29 4b 49 c4 a9               .H..$..)KI..

No.     Time        Source                Destination           Protocol Info
    687 1464.504866 E.F.G.H         A.B.C.D           TCP      9988 > mni-prot-rout [ACK] Seq=1 Ack=46411 Win=64128 Len=0

Frame 687 (54 bytes on wire, 54 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: 9988 (9988), Dst Port: mni-prot-rout (3764), Seq: 1, Ack: 46411, Len: 0
    Source port: 9988 (9988)
    Destination port: mni-prot-rout (3764)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 46411    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 64128 (scaled)
    Checksum: 0xe16d [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    688 1464.507834 A.B.C.D           E.F.G.H         TCP      mni-prot-rout > 9988 [PSH, ACK] Seq=46411 Ack=1 Win=500000 Len=255

Frame 688 (309 bytes on wire, 309 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: mni-prot-rout (3764), Dst Port: 9988 (9988), Seq: 46411, Ack: 1, Len: 255
    Source port: mni-prot-rout (3764)
    Destination port: 9988 (9988)
    Sequence number: 46411    (relative sequence number)
    [Next sequence number: 46666    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 500000 (scaled)
    Checksum: 0xe785 [correct]
    [SEQ/ACK analysis]
Data (255 bytes)

0000  7f c9 e2 29 67 89 1f 29 b3 89 2d 29 a6 89 79 29   ...)g..)..-)..y)
0010  f2 89 6c 21 1c 72 64 a8 58 c8 dd 29 4e 49 f4 a9   ..l!.rd.X..)NI..
0020  6d c9 09 29 b8 89 3d 29 aa 89 21 29 df 89 54 29   m..)..=)..!)..T)
0030  f6 89 69 29 e1 89 64 25 10 73 88 75 56 e5 c1 55   ..i)..d%.s.uV..U
0040  9c 85 0e 35 85 a5 3c 15 a0 b5 5a 15 dd b5 51 15   ...5..<...Z...Q.
0050  fe b5 6c 16 7d 70 e7 02 87 ae 7a 0a eb b6 b1 df   ..l.}p....z.....
0060  2f 75 a0 a6 23 00 a6 aa 25 3b a4 7c 27 e0 a5 57   /u..#...%;.|'..W
0070  27 f8 a5 2f 27 94 a5 3b 27 b1 94 e9 20 72 d4 b3   '../'..;'... r..
0080  96 1d 55 93 17 3d d5 7b 97 e5 55 33 d7 9d 55 1e   ..U..=.{..U3..U.
0090  d7 b8 59 c3 21 78 09 aa bb 23 29 92 db 38 49 7b   ..Y.!x...#)..8I{
00a0  fb ed 69 58 eb 93 6a ec 22 d4 7e 1b 18 7d 77 db   ..iX..j.".~..}w.
00b0  29 78 82 d9 7a a2 5b 0f 27 b2 00 9e b0 ba 33 d6   )x..z.[.'.....3.
00c0  04 5b ab c3 85 18 87 3c 96 7b a8 3a 85 b1 9d 2e   .[.....<.{.:....
00d0  2b a3 bb e0 2e 2c 53 2f c9 9b 42 c6 2f 34 fa 92   +....,S/..B./4..
00e0  7d 30 e5 9e 9c 49 4c de 37 7f 26 7b 25 5b db 7f   }0...IL.7.&{%[..
00f0  5e f3 c8 17 40 bf f8 1f 74 bf ef 1e 99 7a e8      ^...@...t....z.

No.     Time        Source                Destination           Protocol Info
```

```
    689 1464.507862 E.F.G.H         A.B.C.D           TCP      9988 > mni-prot-rout [ACK] Seq=1 Ack=46666 Win=64128 Len=0

Frame 689 (54 bytes on wire, 54 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: 9988 (9988), Dst Port: mni-prot-rout (3764), Seq: 1, Ack: 46666, Len: 0
    Source port: 9988 (9988)
    Destination port: mni-prot-rout (3764)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 46666    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 64128 (scaled)
    Checksum: 0xe06e [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    690 1464.534687 A.B.C.D           E.F.G.H         TCP      mni-prot-rout > 9988 [PSH, ACK] Seq=46666 Ack=1 Win=500000 Len=1460

Frame 690 (1514 bytes on wire, 1514 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: mni-prot-rout (3764), Dst Port: 9988 (9988), Seq: 46666, Ack: 1, Len: 1460
    Source port: mni-prot-rout (3764)
    Destination port: 9988 (9988)
    Sequence number: 46666    (relative sequence number)
    [Next sequence number: 48126    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 500000 (scaled)
    Checksum: 0xd1f2 [correct]
    [SEQ/ACK analysis]
Data (1460 bytes)

0000  6b 6c dc ec 4e 60 a4 86 39 26 a2 1d e4 27 4a bd   kl..N`..9&...'J.
0010  f0 5f 72 fd ad 9f 12 3d bc df 20 7d 8a ff 37 7d   ._r....=.. }..7}
0020  98 ff cc 7d 69 ff 9f 7d 04 ff a8 7e 1f ad 6f b2   ...}i..}...~..o.
0030  32 3a 6e e2 dc 62 1a e6 87 66 de 9d 83 29 1b a8   2:n..b...f...)..
0040  75 3f d8 df 4c a0 e6 a7 0d 16 4b a9 be 56 2e 14   u?..L.....K..V..
0050  70 c1 05 ca 7e 1e 5a 95 92 2f 34 e3 92 d2 30 73   p...~.Z../4...0s
0060  fa 10 7e 30 61 3e 78 22 c1 fd 00 84 6a 7e 26 aa   ..~0a>x"....j~&.
0070  6e 21 5a d7 d6 6d db e5 f4 20 08 36 ba 96 b3 59   n!Z..m... .6...Y
0080  f8 2a 09 09 40 b8 64 a9 ae 8a d2 f9 62 9c 72 b9   .*..@.d.....b.r.
0090  75 24 e5 ce 55 73 84 19 ae 6c 89 af 94 fc 5a c6   u$..Us...l....Z.
00a0  d0 69 db 7f fb e1 c5 88 d1 cc 7f 2d c7 1b 7c 94   .i.........-..|.
00b0  2f 0d 97 80 3f 5f a7 1c 0f fb b6 a2 dd 6a 22 ee   /...?_.......j".
00c0  99 6e ee e2 37 62 aa 86 c6 24 25 07 8c 05 29 04   .n..7b...$%...).
00d0  7a 06 fb 1d fc 25 33 bd 4f 51 41 ac 14 99 7c a4   z....%3.OQA...|.
00e0  83 d1 dd 4b 16 c0 5f a5 94 55 32 0b 90 8e 14 44   ...K._..U2....D
00f0  2a 38 36 ba 8a 19 79 93 d6 ea 32 0e 90 a5 3e 6b   *86...y...2...>k
0100  fa 54 77 e9 7b 66 54 10 b2 56 0c 94 b6 2b 1b d4   .Tw.{fT..V...+..
0110  84 9b ec ae 52 8b f8 39 2e ab 94 59 3a cb b2 79   ....R..9...Y:..y
0120  1b e8 58 af c2 fc 76 72 ab f4 1f 6a 96 ec 3a 62   ..X...vr...j..:b
0130  75 e4 ee 66 59 8a b2 e4 12 66 bf 86 eb 2e 5d 07   u..fY....f....].
0140  cc 05 1d 04 9d 06 d3 08 53 57 c6 4e 26 86 71 be   ........SW.N&.q.
0150  de 36 a2 a9 0e 25 aa d8 16 f7 b2 60 1e e7 ba 9e   .6...%.....`....
0160  df 21 67 a0 c0 3c 7a 12 78 98 fb 06 dc 5e db d5   .!g..<z.x....^..
0170  fb 47 d8 f4 f8 6b d9 18 f9 9f d9 0c 79 83 d9 30   .G...k......y..0
0180  79 a8 d9 23 79 db c1 bc dd 6a 61 19 a7 ec 7a 60   y..#y....ja...z`
0190  2d 99 7b 9c 2f 14 97 88 3f 00 a7 84 0f 3c b7 b0   -.{./...?....<..
01a0  1f 28 bf ac 1f 24 bf d8 1f 50 bf d4 1f 4c bf c0   .(...$...P...L..
01b0  1f 78 bf fc 1f 74 bf e8 1f 60 bf e4 1f 9c bf 10   .x...t...`......
```

```
01c0  1f 88 bf 0c 1f 84 bf 38 1f b0 bf 34 1f ac bf 20   .......8...4...
01d0  1f d8 bf 5c 1f d4 bf 48 1f c0 bf 44 1f fc bf 70   ...\...H...D...p
01e0  1f e8 bf 6c 1f e4 be 98 d8 6a 4e ee e8 6e 52 e2   ...l.....jN..nR.
01f0  fc 62 66 0a 70 66 6a e4 d4 66 7e 55 e4 5c 89 d0   .bf.pfj..f~U.\..
0200  29 48 89 cc 29 44 89 f8 29 70 a9 f4 29 6c 89 e0   )H..)D..)p..)l..
0210  29 98 89 1c 29 94 89 08 29 80 89 04 29 bc 89 30   )...)...)...)..0
0220  29 a8 89 2c 29 a4 89 58 29 d0 89 54 29 cc 89 40   )..,)..X)..T)..@
0230  29 f8 89 7c 29 f4 89 68 29 e0 89 64 25 1c 79 90   )..|)..h)..d%.y.
0240  74 08 2f d8 fa f9 64 73 ce e9 68 ae ac 22 ba da   t./...ds..h.."..
0250  1a 5e ba d6 1b 23 ca d7 52 90 d2 ab 94 81 32 5b   .^...#..R.....2[
0260  90 de 60 e3 d3 0e 50 54 a8 10 90 55 3c 17 98 d5   ..‘...PT...U<...
0270  04 97 a0 55 0c d7 a8 55 14 d7 b0 55 1c d7 b8 59   ...U...U...U...Y
0280  e4 20 40 09 ec bb 48 29 f4 db 50 49 fc fb 58 68   . @...H)..PI..Xh
0290  c4 7b 7a 68 cc 51 0a a8 1f 2e bc db 0b 26 62 ca   .{zh.Q.......&b.
02a0  a0 e4 0c 66 a8 e4 14 66 b0 e4 1c 66 b8 e4 24 66   ...f...f...f..$f
02b0  80 e4 2c 66 88 e4 34 66 90 e4 3c 66 98 e4 c4 66   ..,f..4f..<f...f
02c0  60 e4 cc 66 68 e4 d4 66 70 e4 dc 66 78 e4 e4 66   ‘..fh..fp..fx..f
02d0  40 82 c6 e4 48 66 f4 e4 50 66 fc e4 58 66 84 e4   @...Hf..Pf..Xf..
02e0  20 66 8c e4 28 66 94 2a fc 66 9c e4 38 66 a4 e4    f..(f.*.f..8f..
02f0  00 66 ac e4 08 66 b4 d3 10 b0 0a 18 e8 1a 7f 9c   .f...f..........
0300  b4 0e 2e 76 4c 53 bd d5 01 47 0c 90 28 85 14 87   ...vLS...G..(...
0310  90 86 dc 8c 58 44 4c 83 46 30 a2 1d d7 1e 76 b0   ....XDL.F0....v.
0320  c1 24 01 c0 81 74 c3 e4 35 98 df 68 4a 71 02 4b   .$...t..5..hJq.K
0330  1f fc bf 6f 1e 49 77 e8 9e 4c d9 7c 0b e8 52 a3   ...o.Iw..L.|..R.
0340  d4 23 7c f8 dd 91 38 6a 27 ec 91 62 0a e4 b5 66   .#|...8j’..b...f
0350  e1 21 75 87 99 f0 00 76 ba e8 37 6e ec 21 72 fb   .!u....v..7n.!r.
0360  dc 64 7d 00 da ad 7b 50 e8 39 73 a6 a8 42 c8 ef   .d}...{P.9s..B..
0370  29 92 49 7b a9 e4 c1 80 d0 e6 08 d0 68 b9 89 26   ).I{........h..&
0380  e9 c2 09 6f 6d 17 61 dc 61 5f e4 fe 26 8a 72 73   ...om.a.a_..&.rs
0390  af 38 2e c9 0e 89 e5 35 55 a5 85 42 35 f5 a4 cd   .8.....5U..B5...
03a0  0c 34 07 ca 78 c1 ea 7b 21 f1 9a fa 04 22 34 ce   .4..x..{!...."4.
03b0  92 77 0b 17 a8 25 f0 a4 36 16 5b a1 d9 56 fb 14   .w...%..6.[..V..
03c0  2d d7 a0 99 e2 24 54 09 cb bb 04 29 69 db f7 48   -....$T....)i..H
03d0  c8 71 02 cd 82 04 c5 6a 78 ec f5 3a 0e 26 64 7e   .q.....jx..:.&d~
03e0  79 a5 c2 72 2e 8a 8a 95 18 28 60 6c f2 8b a2 ba   y..r.....(‘l....
03f0  56 ed 56 8b d6 07 a3 fa 0a 40 aa fc 16 99 b2 f0   V.V......@......
0400  e8 29 61 a8 19 5b 62 a9 af 8b 28 38 9f dc a2 d0   .)a..[b...(8....
0410  36 d4 72 ed ba 28 c6 99 0f 2a 73 a9 8a 8a 9d ca   6.r..(...*s.....
0420  a6 0a 7b ae 2a 9b 64 f5 1e 5f 70 ca 02 dc ae 57   ..{.*.d.._p....W
0430  4f a6 b8 72 a8 2f 34 11 92 c9 0f 97 26 48 fc d2   O..r./4.....&H..
0440  0a 4b d4 2e af 7d f6 a5 6b 3c dd 0e 74 dd 06 e8   .K...}..k<..t...
0450  64 21 3d a7 68 82 dc 86 eb 26 6e 07 a5 05 18 04   d!=.h....&n.....
0460  9e 0b cb d5 88 db 8c 4c 74 be f6 86 b3 85 35 87   .......Lt.....5.
0470  71 8c e2 0e c6 f8 02 a6 5c 21 76 57 f4 5d 77 94   q.......\!vW.]w.
0480  82 99 c8 09 29 bc 49 4e a9 fe c5 d7 d4 4d d5 e9   ....).IN.....M..
0490  45 8f f1 75 ef 68 06 2a e1 2e 5a 2b d1 de c2 f1   E..u.h.*..Z+....
04a0  de 61 96 90 e8 21 44 94 da 81 78 69 ba 0a b6 ff   .a...!D...xi....
04b0  2a 9a 86 98 06 a8 72 02 02 6a 0a ac ce 15 6b a3   *.....r..j....k.
04c0  0e 87 26 9b a2 cc 69 0c df 0c 7c b3 dd 29 7a a1   ..&...i...|..)z.
04d0  c8 4e c6 05 60 87 ca 05 47 87 e8 05 2b 87 a2 05   .N..‘...G...+...
04e0  17 9f ed ac 55 39 7a a2 7e 2c 78 7d 0a 04 7f a3   ....U9z.~,x}....
04f0  96 50 1c 91 f8 23 8a 19 8c 26 b0 d2 4a ea 0e 46   .P...#...&..J..F
0500  6b 08 ce 57 e4 1f b5 aa a9 8b 22 39 9f ab d6 59   k..W......"9...Y
0510  70 cb da 79 44 04 5e ab 8a 8f 33 d5 b6 91 49 15   p..yD.^...3...I.
0520  a9 8d c9 39 29 ac 89 26 29 da 89 52 29 ce 8f 7d   ...9)..&)..R)..}
0530  87 82 b3 96 fc a0 b4 0e 7a 0a 68 5e 78 3b 82 c1   ........z.h^x;..
0540  15 79 b5 f5 15 98 b5 12 15 96 b5 0e 15 ba b5 29   .y.............)
0550  14 a3 2f a2 21 e1 93 63 00 e1 a8 63 12 e1 bc 62   ../.!..c...c...b
0560  ee 2b 34 83 92 39 30 bd b2 35 ec d6 1e 4c ba c0   .+4..90..5...L..
0570  1a 78 d4 14 98 67 38 1d 98 95 12 09 52 aa ba 20   .x...g8.....R..
0580  1a d8 ba 5c 1a cc d0 92 f9 f5 d9 69 79 e1 c1 9d   ...\.......iy...
0590  d2 00 61 ba a1 3e 21 b6 61 22 e2 d1 4c 17 60 c3   ..a..>!.a"..L.‘.
05a0  29 47 89 f7 29 66 89 1c 29 94 8f 08 87 c2 f7 63   )G..)f..)......c
```

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05b0  5f e1 f9 63                                       _..c

No.     Time        Source                Destination           Protocol Info
    691 1464.534693 A.B.C.D           E.F.G.H         TCP      mni-prot-rout > 9988 [PSH, ACK] Seq=48126 Ack=1 Win=500000 Len=70

Frame 691 (124 bytes on wire, 124 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: mni-prot-rout (3764), Dst Port: 9988 (9988), Seq: 48126, Ack: 1, Len: 70
    Source port: mni-prot-rout (3764)
    Destination port: 9988 (9988)
    Sequence number: 48126    (relative sequence number)
    [Next sequence number: 48196    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 500000 (scaled)
    Checksum: 0x219c [correct]
Data (70 bytes)

0000  23 e1 95 63 0f e1 b7 63 11 6c a2 91 aa 2d ca a0   #..c...c.l...-..
0010  cf 23 69 ff e4 5b 95 72 87 eb 21 69 8b eb 3d 69   .#i..[.r..!i..=i
0020  77 e3 df 69 79 eb e3 69 55 eb 8f 69 37 eb 91 69   w..iy..iU..i7..i
0030  3b eb ad 6a e7 2e 4f 02 7a f0 53 76 c5 e9 26 b5   ;..j..O.z.Sv..&.
0040  a7 e1 66 68 ab 8c                                 ..fh..

No.     Time        Source                Destination           Protocol Info
    692 1464.534751 E.F.G.H         A.B.C.D           TCP      9988 > mni-prot-rout [ACK] Seq=1 Ack=48196 Win=64128 Len=0

Frame 692 (54 bytes on wire, 54 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: 9988 (9988), Dst Port: mni-prot-rout (3764), Seq: 1, Ack: 48196, Len: 0
    Source port: 9988 (9988)
    Destination port: mni-prot-rout (3764)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 48196    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 64128 (scaled)
    Checksum: 0xda74 [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    693 1464.560308 A.B.C.D           E.F.G.H         TCP      mni-prot-rout > 9988 [PSH, ACK] Seq=48196 Ack=1 Win=500000 Len=1460

Frame 693 (1514 bytes on wire, 1514 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: mni-prot-rout (3764), Dst Port: 9988 (9988), Seq: 48196, Ack: 1, Len: 1460
    Source port: mni-prot-rout (3764)
    Destination port: 9988 (9988)
    Sequence number: 48196    (relative sequence number)
    [Next sequence number: 49656    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 500000 (scaled)
    Checksum: 0xc03d [correct]
    [SEQ/ACK analysis]
Data (1460 bytes)

0000  46 bd 3e 63 ba e5 1a 9d ba 09 1a b1 d6 12 1a af   F.>c............
```

```
0010  ba 27 1a d3 ba 7b 1a f1 ba 75 7c 12 5a 99 d1 01   .'...{...u|.Z...
0020  db bb fb 3f d8 b7 f8 23 d9 cb f9 41 d4 c5 25 b8   ...?...#...A..%.
0030  35 69 6f eb d7 69 71 eb db 69 4d ea 87 ea fa 66   5io..iq..iM....f
0040  89 e4 33 66 a5 e4 1f 04 47 a2 e1 be 74 87 fd 86   ..3f....G...t...
0050  77 84 df 87 79 89 a3 57 70 f3 29 69 89 ed 29 65   w...y..Wp.)i..)e
0060  89 11 29 b9 8f 33 41 e6 f3 7d 25 ff 9f 7e 07 8c   ..)..3A..}%..~..
0070  d0 59 e2 e3 b3 7b bf d1 59 4b c3 c1 75 7b af f1   .Y...{..YK..u{..
0080  17 68 27 0c 1b 63 8d e1 c7 63 6f e1 c9 63 73 e1   .h'..c...co..cs.
0090  e5 63 5f e1 87 fe f8 d5 ba 41 1a e9 d0 a4 f9 e7   .c_......A......
00a0  c1 9f dc 0b 61 b3 a1 29 21 ad 61 25 e1 d1 21 79   ....a..)!.a%..!y
00b0  a3 f3 75 2c 33 69 65 eb df 69 47 eb e1 69 4b eb   ..u,3ie..iG..iK.
00c0  fd 69 37 eb 9f 69 39 eb a3 69 15 e8 4f a1 f7 fc   .i7..i9..i..O...
00d0  51 73 86 52 6d 6a a7 ec 0f 62 a9 e4 13 66 85 e4   Qs.Rmj...b...f..
00e0  3f 66 67 e4 c1 66 6b e4 dd 66 57 e4 fc 66 25 82   ?fg..fk..fW..f%.
00f0  56 e4 33 66 9d e4 04 66 af e4 16 f8 66 18 a2 74   V.3f...f....f..t
0100  5a 9e d6 12 db 8a fb 0e d8 86 f8 3a d9 b2 c3 59   Z..........:...Y
0110  d6 da 77 28 ae 94 87 29 37 d3 77 bf 54 03 61 85   ..w(...)7.w.T.a.
0120  e1 3b 21 bd a1 33 01 b5 a1 2b 01 ad a1 23 02 a5   .;!..3...+...#..
0130  e6 86 23 e4 8f 66 2b e4 97 66 33 e4 9f 66 3b e4   ..#..f+..f3..f;.
0140  a7 66 03 a8 1a 28 ae 55 b7 aa d9 e1 79 67 e8 19   .f...(.U....yg..
0150  74 9f b5 16 70 97 29 09 49 8f a9 01 c9 87 29 39   t...p.).I.....)9
0160  89 bf 29 31 89 b7 2d 29 49 1a 29 21 89 a7 29 59   ..)1..-)I.)!..)Y
0170  89 df 2f 51 e2 d6 b7 cb 08 c3 14 45 2f ca 83 e1   ../Q.......E/...
0180  2f 63 8b e1 37 a6 1e 27 3f a5 9b 27 c7 b4 63 96   /c..7..'?..'..c.
0190  d9 17 79 89 d9 0f 79 81 d9 07 79 b9 d9 3f 79 b1   ..y...y...y..?y.
01a0  d9 37 79 a9 d9 2f 79 a1 d5 27 a9 76 83 55 2f d7   .7y../y..'.v.U/.
01b0  8b 53 37 bf 32 43 01 c5 a7 de d1 50 7a 26 dd 48   .S7.2C.....Pz&.H
01c0  7a ce ae 92 7f 85 dc 3b 7d bd da 33 63 b5 69 cc   z.......;}..3c.i.
01d0  b9 3e a8 04 8d 07 29 05 95 08 31 57 12 45 69 fb   .>....)...1W.Ei.
01e0  89 7d 29 f3 89 75 29 eb 94 0e 0a 10 ae 1e 42 26   .})..u).......B&
01f0  5a dd 7b 53 5b d5 78 4b 50 cd 65 30 19 68 85 71   Z.{S[.xKP.e0.h.q
0200  0c f1 f5 67 b5 19 15 9f b5 11 14 97 36 da 98 8f   ...g........6...
0210  0b 01 b0 27 e5 a5 41 27 ed bc 49 44 d9 2d 75 a3   ...'..A'..ID.-u.
0220  c5 ca 29 ea 95 f3 84 c3 bf 45 1f fb cf 1e de 57   ..).......E.....W
0230  63 66 b1 b8 6e c5 12 7b be fd 1b 78 9e f5 1a 6b   cf..n..{...x...k
0240  dc 92 98 63 38 e5 98 9b 0b 1d e8 27 c9 a5 75 36   ...c8......'..u6
0250  d1 d6 70 87 c5 de 41 ea ed f1 fc 0f bd 0a e7 28   ..p...A........(
0260  6a 7a db f0 a2 76 0e ec fc 7e 94 88 0d 0e e9 de   jz...v...~......
0270  f6 93 52 f9 c0 26 1f c8 6a 24 d9 c0 63 46 67 d8   ..R..&..j$..cFg.
0280  9d a5 39 d1 a5 4b 01 c1 ad 7b 09 f1 b5 6b 11 7a   ..9..K...{...k.z
0290  96 b8 46 ff 44 84 af a0 60 b2 02 48 fc ac 72 1c   ..F.D...`..H..r.
02a0  60 44 f9 5a d9 dc 79 56 d9 c8 74 4e c4 6e b8 48   `D.Z..yV..tN.n.H
02b0  54 e4 8c 66 28 e4 94 52 30 95 18 9a 89 1c 29 92   T..f(..R0.....).
02c0  8d 14 c1 e0 dc 7f 78 8b bc 3c 15 b6 b5 28 15 ae   ......x..<...(..
02d0  b3 59 4c a6 b5 5c 15 d2 b5 54 15 ca b5 4c 14 c6   .YL..\...T...L..
02e0  9e 06 98 fe 38 70 98 f6 38 6c 98 e2 1a 64 6c 04   ....8p..8l...dl.
02f0  77 9c 7b 16 5b 88 78 0e 58 80 79 06 59 bc 79 32   w.{.[.x.X.y.Y.y2
0300  e3 59 4f eb 70 69 d8 ea 04 fd e8 87 96 05 3e 87   .YO.pi........>.
0310  9a 05 02 87 ae 0c 16 db 88 66 11 13 c8 9e a8 14   .........f......
0320  c8 8e 29 00 49 ba a9 3c c9 b6 2d 20 e1 a6 a6 ff   ..).I..<..- ....
0330  86 7f 22 a9 9e 5a d5 1c a3 ea c4 14 aa ba 16 3c   ..".Z.........<
0340  b2 b2 1e 34 ba aa 1a 2c ba ca 5c 3e 0d c2 f0 76   ...4...,..\>...v
0350  4d b2 82 59 da f6 1f 68 bf 0a 1f 8c bf 02 1f 84   M..Y...h........
0360  bf 3a 92 32 82 66 2e e4 8a 66 16 e4 b2 66 1e e4   .:.2.f...f...f..
0370  ba 56 86 2c 44 a2 52 60 58 da f8 5c ea 5e fa 9b   .V.,D.R`X..\.^..
0380  db 1d fb 93 e9 8d 19 ce 86 9a b5 7d 02 ff 84 6d   ...........}...m
0390  21 ca 94 71 30 f3 8a 7d 21 ff e6 18 46 9a e6 18   !..q0..}!...F...
03a0  46 9a e6 18 46 9a e6 7d 3e ea 8a 77 34 ff 94 36   F...F..}>..w4..6
03b0  23 e2 83 18 01 f6 89 7a 27 f6 ba 29 05 d1 b6 4d   #......z'..)...M
03c0  16 ca e6 5f 2a f5 84 79 2a c6 d4 7f 2c f1 81 6b   ..._*..y*...,..k
03d0  2c eb 81 69 46 9a e6 18 46 9a e6 18 46 9a e6 18   ,..iF...F...F...
03e0  46 9a e6 18 46 9a e6 18 46 9a e6 18 46 9a e6 18   F...F...F...F...
03f0  46 9a e6 18 46 9a e6 18 46 9a e6 18 46 9a e6 18   F...F...F...F...
```

```
0400  46 9a e6 18 46 9a e6 18 46 9a e6 18 46 9a e6 18   F...F...F...F...
0410  46 9a e6 18 46 9a e6 18 46 9a e6 18 46 9a e6 18   F...F...F...F...
0420  46 9a e6 18 46 9a e6 18 46 9a e6 18 46 9a e6 18   F...F...F...F...
0430  46 9a e6 18 46 9a e6 18 46 9a e6 18 46 9a e6 18   F...F...F...F...
0440  46 9a e6 18 46 9a e6 18 46 9a e6 18 46 9a e6 18   F...F...F...F...
0450  46 9a e6 18 46 9a e6 18 46 9a e6 18 46 9a e6 18   F...F...F...F...
0460  46 9a e6 18 46 9a e6 18 46 9a e6 18 46 9a e6 18   F...F...F...F...
0470  46 9a e6 18 46 9a e6 18 46 82 e6 18 46 56 14 59   F...F...F...FV.Y
0480  46 99 e6 18 46 43 14 59 46 f1 83 6a 28 ff 8a 2b   F...FC.YF..j(..+
0490  74 b4 82 74 2a 9a 87 7c 30 fb 96 71 75 a8 c8 7c   t..t*..|0..qu..|
04a0  2a f6 e6 4a b5 db e6 73 b5 db e6 62 b5 db e6 90   *..J...s...b....
04b0  b5 db e6 8d b5 db e6 b9 b5 db e6 a8 b5 db e6 db   ................
04c0  b5 db e6 ce b5 db e6 fb b5 db e6 f7 b5 db e6 e3   ................
04d0  b5 db e6 1f b2 db e6 01 b2 db e6 31 b2 db e6 2f   ..........1.../
04e0  b2 db e6 59 b2 db e6 4c b2 db e6 7a b2 db e6 6a   ...Y...L...z...j
04f0  b2 db e6 9d b2 db e6 89 b2 db e6 85 b2 db e6 be   ................
0500  b2 db e6 af b2 db e6 d5 b2 db e6 c6 b2 db e6 5b   ...............[
0510  34 ff 87 6c 23 ce 89 77 2a f2 83 74 36 a9 d4 4b   4..l#..w*..t6..K
0520  28 fb 96 6b 2e f5 92 18 16 e8 89 7b 23 e9 95 2b   (..k.......{#..+
0530  74 dc 8f 6a 35 ee e6 48 34 f5 85 7d 35 e9 d5 2a   t..j5..H4..}5..*
0540  08 ff 9e 6c 46 cc 8f 6a 32 ef 87 74 07 f6 8a 77   ...lF..j2..t...w
0550  25 9a a9 68 23 f4 b6 6a 29 f9 83 6b 35 9a b0 71   %..h#..j)..k5..q
0560  34 ee 93 79 2a db 8a 74 29 f9 a3 60 46 d9 94 7d   4..y*..t)..`F..}
0570  27 ee 83 4a 23 f7 89 6c 23 ce 8e 6a 23 fb 82 18   '..J#..l#..j#...
0580  11 e8 8f 6c 23 ca 94 77 25 ff 95 6b 0b ff 8b 77   ...l#..w%..k...w
0590  34 e3 e6 4a 23 e9 93 75 23 ce 8e 6a 23 fb 82 18   4..J#..u#..j#...
05a0  05 f6 89 6b 23 d2 87 76 22 f6 83 18 10 f3 94 6c   ...k#..v".......l
05b0  33 fb 8a 5e                                       3..^

No.     Time        Source                Destination           Protocol Info
    694 1464.560315 A.B.C.D           E.F.G.H         TCP      mni-prot-rout > 9988 [PSH, ACK] Seq=49656 Ack=1 Win=500000 Len=70

Frame 694 (124 bytes on wire, 124 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: mni-prot-rout (3764), Dst Port: 9988 (9988), Seq: 49656, Ack: 1, Len: 70
    Source port: mni-prot-rout (3764)
    Destination port: 9988 (9988)
    Sequence number: 49656    (relative sequence number)
    [Next sequence number: 49726    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x18 (PSH, ACK)
    Window size: 500000 (scaled)
    Checksum: 0xcbac [correct]
Data (70 bytes)

0000  34 ff 83 18 03 e2 8f 6c 16 e8 89 7b 23 e9 95 18   4......l...{#...
0010  01 ff 92 5b 33 e8 94 7d 28 ee b6 6a 29 f9 83 6b   ...[3..}(..j)..k
0020  35 9a a1 7d 32 d9 89 75 2b fb 88 7c 0a f3 88 7d   5..}2..u+..|...}
0030  07 9a a1 7d 32 cc 83 6a 35 f3 89 76 03 e2 a7 18   ...}2..j5..v....
0040  2a e9 92 6a 25 f7                                 *..j%.

No.     Time        Source                Destination           Protocol Info
    695 1464.560344 E.F.G.H         A.B.C.D           TCP      9988 > mni-prot-rout [ACK] Seq=1 Ack=49726 Win=64128 Len=0

Frame 695 (54 bytes on wire, 54 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: 9988 (9988), Dst Port: mni-prot-rout (3764), Seq: 1, Ack: 49726, Len: 0
    Source port: 9988 (9988)
    Destination port: mni-prot-rout (3764)
    Sequence number: 1    (relative sequence number)
```

```
    Acknowledgement number: 49726    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 64128 (scaled)
    Checksum: 0xd47a [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    696 1464.570677 A.B.C.D           E.F.G.H         TCP      mni-prot-rout > 9988 [FIN, PSH, ACK] Seq=49726 Ack=1 Win=500000 Len=451

Frame 696 (505 bytes on wire, 505 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: mni-prot-rout (3764), Dst Port: 9988 (9988), Seq: 49726, Ack: 1, Len: 451
    Source port: mni-prot-rout (3764)
    Destination port: 9988 (9988)
    Sequence number: 49726    (relative sequence number)
    [Next sequence number: 50177    (relative sequence number)]
    Acknowledgement number: 1    (relative ack number)
    Header length: 20 bytes
    Flags: 0x19 (FIN, PSH, ACK)
    Window size: 500000 (scaled)
    Checksum: 0x9fc7 [correct]
    [SEQ/ACK analysis]
Data (451 bytes)

0000  96 71 07 9a a5 6a 23 fb 92 7d 00 f3 8a 7d 0b fb   .q...j#..}...}..
0010  96 68 2f f4 81 59 46 d7 87 68 10 f3 83 6f 09 fc   .h/..YF..h...o..
0020  a0 71 2a ff e6 4d 28 f7 87 68 10 f3 83 6f 09 fc   .q*..M(..h...o..
0030  a0 71 2a ff e6 5f 23 ee ab 77 22 ef 8a 7d 00 f3   .q*.._#..w"..}..
0040  8a 7d 08 fb 8b 7d 07 9a a5 6a 23 fb 92 7d 00 f3   .}...}...j#..}..
0050  8a 7d 07 9a a1 7d 32 dc 8f 74 23 c9 8f 62 23 9a   .}...}2..t#..b#.
0060  b4 7d 27 fe a0 71 2a ff e6 5f 23 ee ab 77 22 ef   .}'..q*.._#..w".
0070  8a 7d 0e fb 88 7c 2a ff a7 18 0a f5 89 73 33 ea   .}...|*......s3.
0080  b6 6a 2f ec 8f 74 23 fd 83 4e 27 f6 93 7d 07 9a   .j/..t#..N'..}..
0090  a9 68 23 f4 b6 6a 29 f9 83 6b 35 ce 89 73 23 f4   .h#..j)..k5..s#.
00a0  e6 59 22 f0 93 6b 32 ce 89 73 23 f4 b6 6a 2f ec   .Y"..k2..s#..j/.
00b0  8f 74 23 fd 83 6b 46 9a e6 18 46 9a e6 18 46 9a   .t#..kF...F...F.
00c0  e6 18 46 9a e6 18 46 9a e6 18 46 9a e6 18 46 9a   ..F...F...F...F.
00d0  e6 18 46 9a e6 18 46 9a e6 18 46 9a e6 18 46 9a   ..F...F...F...F.
00e0  e6 18 46 9a e6 18 46 9a e6 18 46 9a e6 18 46 9a   ..F...F...F...F.
00f0  e6 18 46 9a e6 18 46 9a e6 18 46 9a e6 18 46 9a   ..F...F...F...F.
0100  e6 18 46 9a e6 18 46 9a e6 18 46 9a e6 18 46 9a   ..F...F...F...F.
0110  e6 18 46 9a e6 18 46 9a e6 18 46 9a e6 18 46 9a   ..F...F...F...F.
0120  e6 18 46 9a e6 18 46 9a e6 18 46 82 c1 58 46 88   ..F...F...F..XF.
0130  c1 58 46 9a e6 18 46 9a e6 18 46 9a e6 18 46 9a   .XF...F...F...F.
0140  e6 18 46 9a e6 18 46 9a e6 18 46 9a e6 18 46 9a   ..F...F...F...F.
0150  e6 18 46 9a e6 18 46 9a e6 18 46 9a e6 18 46 9a   ..F...F...F...F.
0160  e6 18 46 9a e6 18 46 9a e6 18 46 9a e6 18 46 9a   ..F...F...F...F.
0170  e6 18 46 9a e6 18 46 9a e6 18 46 9a e6 18 46 9a   ..F...F...F...F.
0180  e6 18 46 9a e6 18 46 9a e6 18 46 9a e6 18 46 9a   ..F...F...F...F.
0190  e6 18 46 9a e6 18 46 9a e6 18 46 9a e6 18 46 9a   ..F...F...F...F.
01a0  e6 18 46 9a e6 18 46 9a e6 18 46 9a e6 18 46 9a   ..F...F...F...F.
01b0  e6 18 46 9a e6 18 46 9a e6 18 46 9a e6 18 46 9a   ..F...F...F...F.
01c0  e6 18 46                                         ..F

No.     Time        Source                Destination           Protocol Info
    697 1464.575010 E.F.G.H         A.B.C.D           TCP      9988 > mni-prot-rout [FIN, ACK] Seq=1 Ack=50178 Win=64128 Len=0

Frame 697 (54 bytes on wire, 54 bytes captured)
Ethernet II, Src: MAC_ROUTER (MAC_ROUTER), Dst: MAC_SENSOR (MAC_SENSOR)
Internet Protocol, Src: E.F.G.H (E.F.G.H), Dst: A.B.C.D (A.B.C.D)
Transmission Control Protocol, Src Port: 9988 (9988), Dst Port: mni-prot-rout (3764), Seq: 1, Ack: 50178, Len: 0
```

```
    Source port: 9988 (9988)
    Destination port: mni-prot-rout (3764)
    Sequence number: 1    (relative sequence number)
    Acknowledgement number: 50178    (relative ack number)
    Header length: 20 bytes
    Flags: 0x11 (FIN, ACK)
    Window size: 64128 (scaled)
    Checksum: 0xd2b5 [correct]
    [SEQ/ACK analysis]

No.     Time        Source                Destination           Protocol Info
    698 1464.647014 A.B.C.D           E.F.G.H         TCP      mni-prot-rout > 9988 [ACK] Seq=50178 Ack=2 Win=500000 Len=0

Frame 698 (62 bytes on wire, 62 bytes captured)
Ethernet II, Src: MAC_SENSOR (MAC_SENSOR), Dst: MAC_ROUTER (MAC_ROUTER)
Internet Protocol, Src: A.B.C.D (A.B.C.D), Dst: E.F.G.H (E.F.G.H)
Transmission Control Protocol, Src Port: mni-prot-rout (3764), Dst Port: 9988 (9988), Seq: 50178, Ack: 2, Len: 0
    Source port: mni-prot-rout (3764)
    Destination port: 9988 (9988)
    Sequence number: 50178    (relative sequence number)
    Acknowledgement number: 2    (relative ack number)
    Header length: 20 bytes
    Flags: 0x10 (ACK)
    Window size: 500000 (scaled)
    Checksum: 0xe085 [correct]
    [SEQ/ACK analysis]
```

References

[1] H. Debar, D. Curry, and B. Feinstein. The Intrusion Detection Message Exchange Format (IDMEF). RFC 4765 (Experimental), March 2007.

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