

Technical Disclosure Commons

Defensive Publications Series

December 15, 2017

Automated network component drain management

N/A

Follow this and additional works at: http://www.tdcommons.org/dpubs_series

Recommended Citation

N/A, "Automated network component drain management", Technical Disclosure Commons, (December 15, 2017)
http://www.tdcommons.org/dpubs_series/1013



This work is licensed under a [Creative Commons Attribution 4.0 License](https://creativecommons.org/licenses/by/4.0/).

This Article is brought to you for free and open access by Technical Disclosure Commons. It has been accepted for inclusion in Defensive Publications Series by an authorized administrator of Technical Disclosure Commons.

Automated network component drain management

ABSTRACT

Network management requires quick and efficient draining of links and other network components during maintenance operations. This disclosure describes an automated network drain service that allows users to perform the task of draining of links and other network components while also providing network-wide visibility into the actions undertaken. The service includes a live topology service, a network removal tool, a resolution tool, a workflow execution service, a network state recalculation service, and a traffic monitoring service.

KEYWORDS

- Network management
- Routing protocol
- Production traffic
- Link draining

BACKGROUND

For effective network management, one advantageous feature is the ability to perform network configuration changes with minimal disruption to active users of the network. This is usually implemented by network protocols in the case of accidental traffic interruption. However, for planned network operations maintenance work, there is often a need for significant manual work on the part of network engineers to actively modify the parameters of those protocols. Such manual intervention and programming of multiple devices is necessary to prevent use of a set of network elements that are being worked on. Network operations additionally require the ability to quickly drain (e.g., prevent from use) links during network maintenance.

DESCRIPTION

This disclosure describes a network drain service that provides a unified approach to drain network components such as network links while providing visibility to the network operation team members, e.g., on-call and maintenance engineers. The network drain service facilitates coordinating various types of drains, network maintenance, and netdeploy interactions. The network drain service also provides network-wide visibility of an individual network team member’s actions for typical network actions such as turnups, turndowns, link migrations, optical migrations, and link moves.

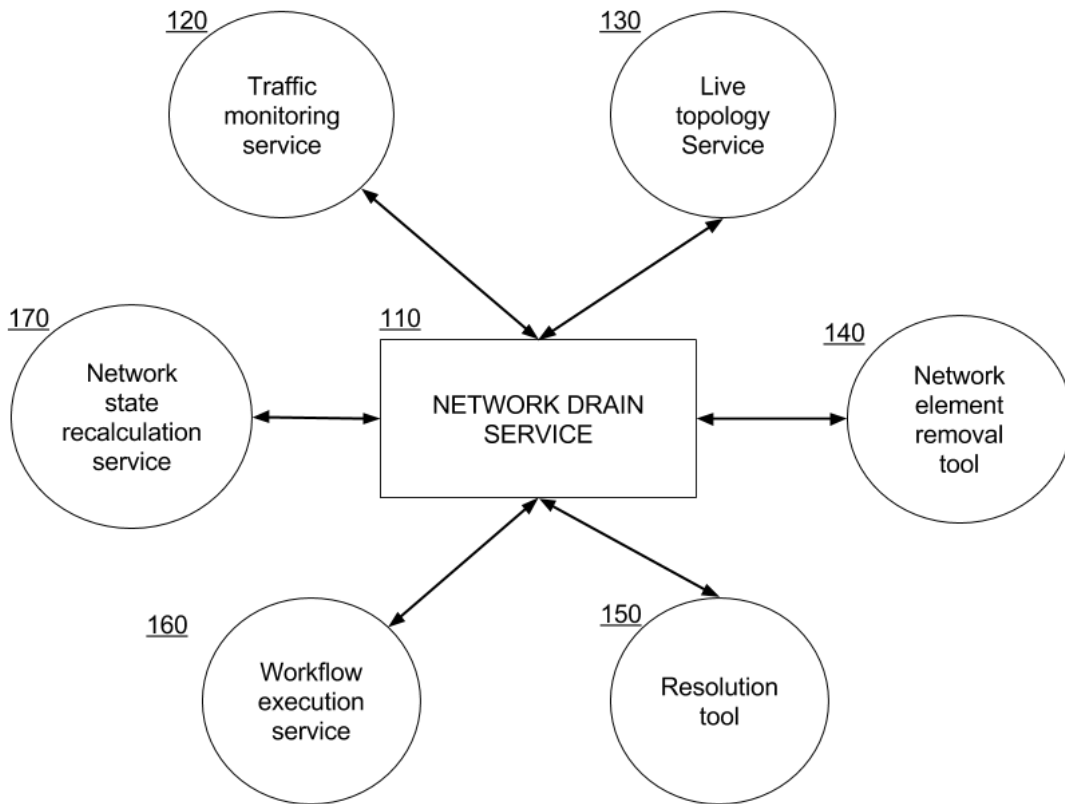


Fig. 1: Components of the network drain service

Fig. 1 illustrates components of a network drain service. The network drain service (110) comprises multiple components that act in concert. A live topology service (120) is

deployed and is used to query a current state of routing protocols used on any given network component and to obtain its parameters. The parameters include, e.g., configured link cost, status of associated protocols, interfaces included on the link, etc.

Another tool, a network element removal tool (130), allows a user to specify one or more network elements that are to be taken out of service. The network elements can include, e.g., links, devices, points of presence (POP), and Metropolitan area Ethernets (Metros). This tool incorporates a command-line interface (CLI), an application programming interface (API), and an automated client interface. The CLI allows an operator to use a command-line to specify the network links to be drained. The API allows for programs running within the network to drain links remotely. The automated client interface allows business processes to be transformed into link drain requests.

The resolution tool (140) is used to analyze the topology and a given network element removal request to generate a set of actions that can be implemented in the network. The tool evaluates a range of different scenarios and uses knowledge of past network behavior to generate a set of actions to be taken for the different scenarios, for the different network elements and links. A workflow execution service (150) then executes the set of actions at the network elements and links.

A network state recalculation service (160) is used to request the network state to be recalculated on devices such as multiprotocol label switching (MPLS) tunnels that are unrelated to the components being drained, and however, can still influence the production traffic flows. A traffic monitoring service (170) verifies that the drain service is functioning as expected, and that network traffic is being redirected such that traffic is not passing through the specified network components to be drained.

The network drain service described herein can be used, e.g., by operators of large computer networks, telecom providers, and cloud and hosting service providers to quickly perform network management tasks in an automated manner.

CONCLUSION

This disclosure describes a network component drain service that can be used to automate draining of network components during network maintenance operations. The service allows for a quick and efficient way for network management operations to drain links while also providing full visibility across the network into specific actions performed.