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# Citrix Solution for the Great Plains Corporate Accounting System for US Bioenergy Corporation

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**CITRIX SOLUTION FOR THE GREAT PLAINS  
CORPORATE ACCOUNTING SYSTEM FOR  
US BIOENERGY CORPORATION**

A graduate project submitted to  
Dakota State University in partial fulfillment  
of the requirements for the degree of

Master of Science

in

Information Systems

December, 2006

By

Nathan W. Anderson

Project Committee:

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Xinwen Fu, PhD

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## PROJECT APPROVAL FORM

We certify that we have read this project and that, in our opinion, it is satisfactory in scope and quality as a project for the degree of Master of Science in Information Systems.

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Master's Project Title: CITRIX SOLUTION FOR THE GREAT PLAINS

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## ABSTRACT

US BioEnergy is a fairly new corporation in the business of providing various services in the ethanol industry. The corporation currently consists of an executive office in Brookings, SD; operations center in Wichita, KS; corporate office in Inver Grove Heights, MN; ethanol manufacturing facilities in Woodbury, MI; Albert City, IA; Central City, NE; and Ord, NE.

The scope of the project is to provide US BioEnergy with a secure Citrix solution that will centralize and standardize the Great Plains accounting system throughout the organization and allow for sufficient usability, scalability, and manageability for the entire company. Citrix is a fast, secure and cost effective solution for many organizations. Citrix helps users who need mobile and remote access on demand, and those that have extensive regulatory requirements governing access to data.

A great deal of research was performed to make sure the Citrix platform was the right solution for US BioEnergy. After careful planning and various discussions, the Citrix solution was built and configured for the company to use. The company now has a centralized Great Plains accounting system, which allows secure access for all users within the corporation any time they wish. By having all of the Great Plains users connect to a centralized database, this allows the accounting department to consolidate financials very easily for each location. All the financial data is now housed in a central location on a Microsoft SQL server platform. The company is also one step closer to SOX compliance, because security and change management controls can now be easily controlled and reviewed on a regular basis. The Citrix solution also provides US BioEnergy the opportunity to centralize more business applications without adding much cost at all. This project will prove to be very beneficial for the company both now and as the company continues to grow.

## DECLARATION

I hereby certify that this project constitutes my own product, that where the language of others is set forth, quotation marks so indicate, and that appropriate credit is given where I have used the language, ideas, expressions or writings of another.

I declare that the project describes original work that has not previously been presented for the award of any other degree of any institution.

Signed,

---

Nathan W. Anderson

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# CHAPTER 1

## INTRODUCTION

### **Background of the Problem**

Some key individuals of US BioEnergy Corp. have had the opportunity to review the current workflow processes and the financial accounting system within the entire company. The purpose of the review was to perform an IT review and assessment of the current system applications and make recommendations to improve day-to-day operations and workflow processes. The corporation currently consists of a corporate office in Brookings, SD; operations center in Wichita, KS; operations center in Inver Grove Heights, MN; ethanol manufacturing facilities in Woodbury, MI; Albert City, IA; Central City, NE; and Ord, NE.

After a great deal of brainstorming and various group discussions, it is obvious that US BioEnergy needs to improve their workflow processes and their financial accounting system by implementing some corporate-wide changes. As it stands now, each location in the corporation is utilizing their own servers locally and each location is essentially isolated from the other. Accounting functions are also being performed locally as well with no easy way to consolidate them to the corporate level.

It is essential that US BioEnergy management and staff in every location have a way to share information and resources using a secure connection over the Internet. It not only has to exist, but it must be fast and secure for the organization to work efficiently and flawlessly. US BioEnergy would benefit greatly by proposing a project to implement a Citrix solution for the Great Plains corporate accounting system within the corporation. This project is being proposed

for many reasons. First of all, Citrix has the ability to centralize and secure all data and network access from anywhere in the world. By centralizing the Great Plains accounting system, this will allow local and remote access for all users within the corporation any time they want. This project will also eliminate the need for managing separate servers at each location which makes it very cost-effective. By having all of the Great Plains users connect to a centralized database, this allows the users to consolidate financials very easily for each location. Centralizing and secure financial data is critical for SOX compliance as well which is another goal for US BioEnergy. The Sarbanes-Oxley Act of 2002 (often shortened to SOX) is legislation enacted in response to the high-profile Enron and WorldCom financial scandals to protect shareholders and the general public from accounting errors and fraudulent practices in the enterprise. The act is administered by the Securities and Exchange Commission (SEC), which sets deadlines for compliance and publishes rules on requirements (Spurzem, 2006). This project will help the corporation become SOX compliant by keeping financial data secure and in a centralized location, ensure business continuity, and make change management processes much easier to manage.

### **Statement of the problem**

Some key problems exist within US BioEnergy that pertains to information technology and financial application utilization. The company is currently using various financial applications in each location throughout the company. Current applications being used for financials at each location include Microsoft Great Plains, Intuit QuickBooks, and Microsoft Excel. This is a problem since there is currently no standardization for a financial application solution and makes it difficult to view and consolidate financials for each location. The financial

applications are also being utilized locally on a server at each location. This is a problem because each system will require local maintenance and support. Another problem is that the financial data for each location is segregated from all the other locations making it difficult for financial consolidation. SOX compliance will also be very difficult to achieve the way the systems and financial applications are currently being utilized. In summary, there is no easy way to consolidate and manage the financials within the corporation and be SOX compliant as they exist today.

In the past, Ethanol companies struggled to find a strong financial application package that fit all the needs it had since it was a unique and a fairly new industry at the time. Some application packages were strong in grain contracts and commodities, but weak in Accounts Payable, Accounts Receivable, and General Ledger. Others were visa verse. Today there have been a few applications custom developed for the ethanol industry. One of the top financial packages out there today is the Great Plains accounting system, which is owned by Microsoft Business Solutions. E-Markets an e-commerce solution provider found at <http://www.e-markets.com> states, "Until now, ethanol plants were forced to either write their own system or use "best of breed" approach. Ethanol plants were forced to integrate a grain accounting package with an accounting package. Process manufacturing was ignored. Real-time inventory was not possible. The patched together systems just don't work." Ethanol companies struggled for years trying to find a solution the met all the needs of an ethanol company.

Today there are a few applications that do fit the needs of an ethanol company. E-Markets states, "The Ethanol Package created by IRD Technologies, a subsidiary of E-Markets, Inc. (IRD) is a complete Enterprise Resource Planning (ERP) system for Ethanol Production Facilities. The system is comprised of Grain Accounting, Process Manufacturing, Sales,

Shipping and Risk Management, all built on top of Microsoft Business Solutions (MBS) Great Plains edition world-class enterprise accounting system.” Microsoft Great Plains is a complete financial solution with over 130,000 customers and is a proven leader in financial software. US BioEnergy would benefit greatly by standardizing its financial application by using Microsoft Great Plains throughout the entire corporation.

### **Objectives of the project**

The purpose of this project is to provide US BioEnergy with a secure Citrix solution that will centralize and standardize the Great Plains accounting system throughout the organization and allow for sufficient scalability in the future. The first objective will be to standardize the corporate accounting system by using the Great Plains application in all locations. This will involve working with each location to determine the time and resources needed to begin using the new accounting application and stop using their current accounting application. If a location is already using the new accounting application, a plan to migrate the data to the new accounting environment will be created.

The second objective is to utilize a Citrix farm in the Inver Grove Heights, MN data center as the primary means for accessing the Great Plains application for all locations. Hardware and software will need to be purchased and configured in order to utilize this Citrix farm. The installation, configuration, and rollout of the Citrix application will be completed in-house and secured using an SSL certificate from a trusted Certificate Authority (CA). There will be a new 10MB Internet circuit ordered from Qwest to handle the bandwidth requirements for all locations to connect to the data center.

The third objective is to utilize Microsoft SQL Server 2005 in the Inver Grove Heights, MN data center to house all of the Great Plains financial data for all locations. Hardware and software will need to be purchased and configured in order to utilize this SQL server. The installation and configuration will be completed by a combination of in-house staff and third-party Great Plains consultants. The third-party consultants will be responsible for configuring the data sets for each company location. Each company location will have a separate database in Great Plains. This makes it easier to setup security access for each location as well as keeps the data more organized for financial reporting.

The last objective will be to prepare US BioEnergy for SOX compliance by centralizing and securing all financial data into one location. US BioEnergy has recently filed an S-1 registration statement to list their company into the public market. SOX compliance will become a critical factor because of this change. SOX compliance is very heavily weighted on financial data access and security controls, as well as change management procedures. By centralizing and securing all the financial data to one location, it makes it much easier to implement security controls and change management practices. Citrix is also great for SOX compliance because it uses server-based technology and the end users essentially connect by means of a dumb terminal. This is important because no financial data is actually stored on the end users pc.

There will be four major deliverables for this project. The first deliverable will be to provide a network diagram for the Inver Grove Heights, MN data center. This will show the current locations as well as the data connectivity between them and how the financial information is accessed. The second deliverable will be to provide the hardware and software schedule of the project costs. This will show the budgeted and non-budgeted hardware and software costs of the project. The third deliverable will be to provide a secure and redundant

Citrix application for all of the company locations to access at anytime from anywhere as long as the user has access to the Internet. The last deliverable will be to provide a centralized and robust Microsoft Great Plains accounting application and database for each location. A separate database for each location will provide the company with better measures of data security and data segregation between business units.

This project will provide US BioEnergy with many benefits over many years. One of these benefits will be the overall cost savings by consolidating hardware and support to one location. The current infrastructure requires hardware and application support at every location. Most of the hardware and application support will occur at the data center after the project is complete rather than in each location. Another benefit to the company is that financial consolidation will be much easier with all of the financial data residing on one SQL server in one location. The corporate accounting department will be able to run reports and queries themselves for all locations rather than waiting for each location to consolidate their own financial data and send it to corporate. Another benefit to the company is that the corporate-wide implementation of Citrix and Great Plains will strengthen the company's current workflow processes as they relate to overall business operations. Citrix will not only be able to provide access to the Great Plains application, but many other company applications as well. This solution could potentially eliminate the need for the installation and support of most local applications that reside on an employee's workstation. Another important benefit to the company is that change management and SOX compliance will be easier to achieve as all financial data will be in one location secured by multiple layers of security. SOX compliance will be critical to US BioEnergy as the company enters into the public market and anything that allows easier manageability of compliance and specific regulations will be a huge benefit to the company now and in the future. One last major

benefit to the company is that this project is one more important step to help aid US BioEnergy in being one of the most efficient and cost-effective leaders in the industry.

## CHAPTER 2

### LITERATURE REVIEW

The first phase of the project included a thorough search of literature to determine the most efficient and cost-effective way to centralize the storage and access of financial data and within the organization. Upon review, there were a number of solutions to store and access financial data from a central location. The three solutions that were reviewed were: the implementation and use of Citrix Access Suite, the implementation and use of Virtual Private Network (VPN) technology, and the implementation and use of point-to-point T-1 lines.

#### **Citrix Access Suite 4.0**

The first review was Citrix Access Suite. Citrix is a fast, secure and cost effective solution for many organizations. It provides well-managed access to business information wherever it resides. Citrix can help organizations with only a few users, to organizations that have thousands of users. It helps users who need mobile and remote access on demand, and those that have extensive regulatory requirements governing access to data. Citrix technology uses an enhanced form of dumb terminals where all the applications and processing is done on the server. This allows for less maintenance on the client side, and more user and application manageability from the server side.

There are various ways to configure and deploy the Citrix Access Suite. It mainly depends on the company's size and number of employees using it. US BioEnergy is considered



a medium-sized company according to the Citrix Access Suite deployment guide found at

<http://support.citrix.com/servlet/KbServlet/download/8467-102->

[14169/SuiteDeploymentGuide.pdf](http://support.citrix.com/servlet/KbServlet/download/8467-102-14169/SuiteDeploymentGuide.pdf). The deployment guide contains a diagram of a typical Citrix

deployment using a single data center which is what US BioEnergy current has.

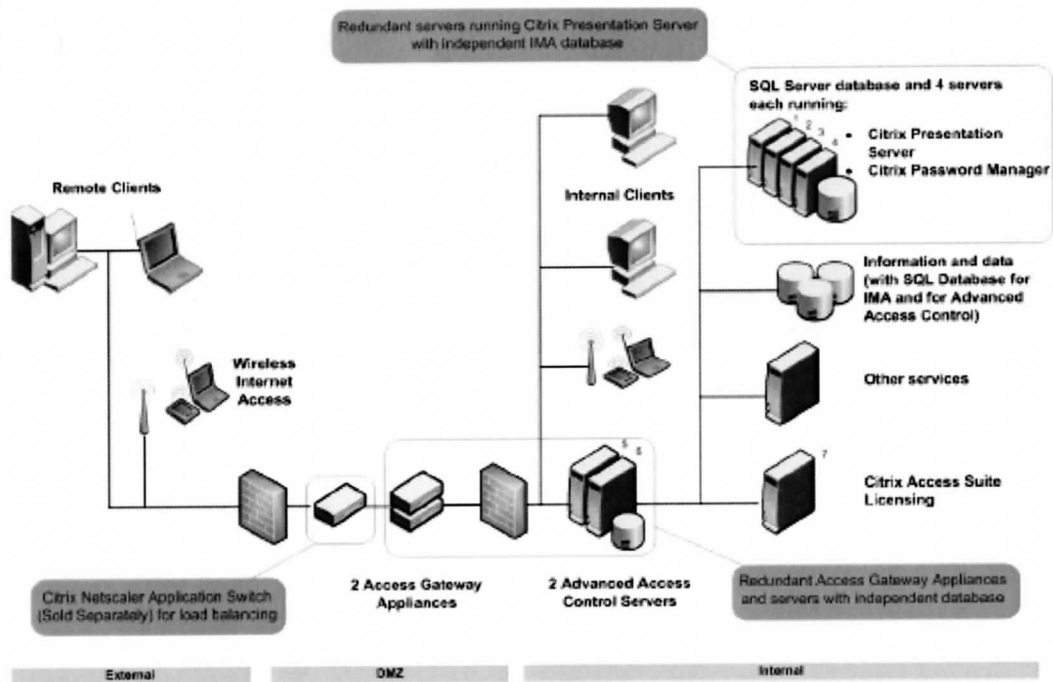


Figure 2-1: Typical layout for a medium-sized organization (Citrix Systems Inc., 2005)

Some of the key features and benefits that Citrix Access Suite provides are: universal application hosting, secure and single point of access, LDAP integration for corporate authentication, broad access options with built-in reliability, integrated access delivery system, and scalability and redundancy. An interesting analyst report by Doculabs found at <http://www.citrix.com/English/ps2/products/documents.asp?contentid=186#top> explains how they took a very close look at the Citrix product and what they found. The report states, “Overall, Citrix’s technologies provide organizations with the ability to improve their users’

experience while enabling them to be more productive. This is especially true of users that do not have high-bandwidth connections – such as mobile workers using low-bandwidth leased lines or accessing powerful corporate applications from their PDAs or notebook computers over wired or wireless modems” (Doculabs, 2003).

After further review it was discovered that the Citrix platform can provide a large number of benefits to a company that deal with IT controls and security, which is one major step in becoming SOX compliant. An interesting article by ReymanGroup Inc. found at [http://www.citrix.com/English/ps2/products/documents\\_onecat.asp?contentid=186&cid=White+Papers#top](http://www.citrix.com/English/ps2/products/documents_onecat.asp?contentid=186&cid=White+Papers#top) lists many benefits that Citrix can provide by addressing a large number a CobiT controls. The figure below shows how Citrix helps address many compliance issues. These Citrix capabilities can be directly linked to detailed control objectives of CobiT and provide a foundation for regulatory compliance.

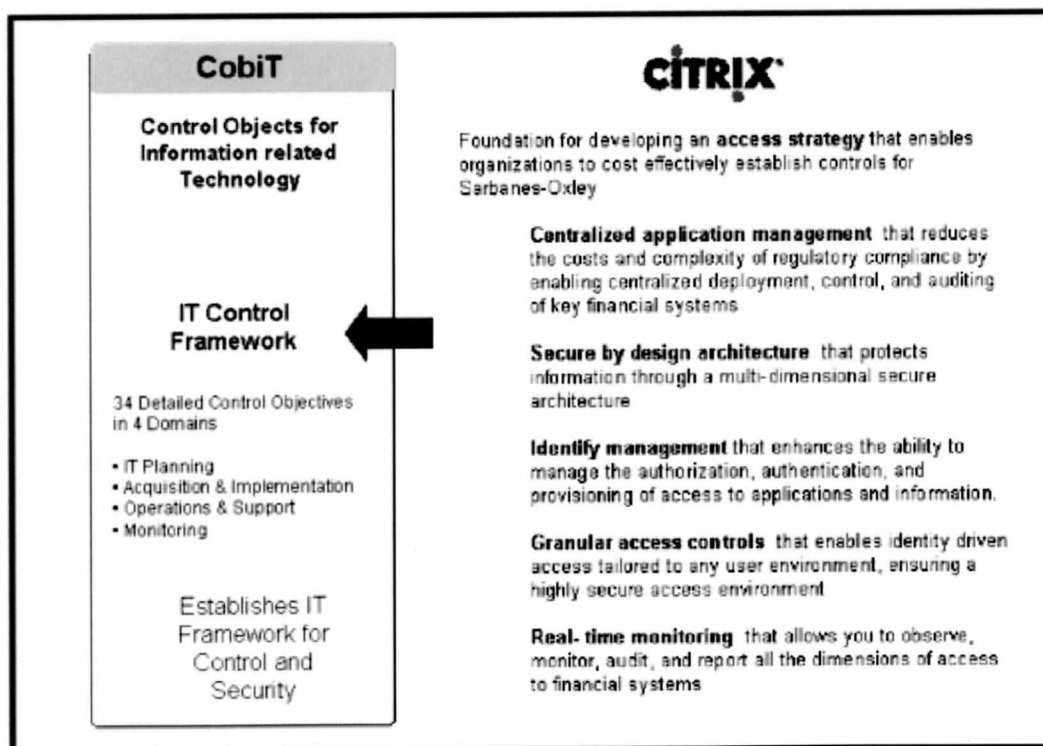


Figure 2-2: Citrix addresses CobiT controls (ReymanGroup, 2005)

The Citrix system offers an efficient and effective way to help meet audit requirements while significantly reducing compliance costs. Regulatory compliance mandates accountability and control throughout the enterprise, primarily through process discipline and good business practices. The CIO's compliance role is to assure that IT has the necessary controls to ensure the availability, security, and reliability of information technology in the process of reporting corporate financials. With Citrix access infrastructure solutions, CIOs can develop an access strategy that enables their organization to cost effectively establish controls for Sarbanes-Oxley (ReymanGroup, 2005).

Server consolidation, centralized applications, secure access, real-time monitoring and auditing are all huge benefits that a Citrix solution can provide. This thorough evaluation of the Citrix Access Suite has provided excellent information that was needed during the review process of this solution to help make a decision in which direction the company should be moving forward.

### **Virtual Private Network (VPN) Technology**

The next solution that was evaluated was the implementation and use of Virtual Private Network (VPN) technology. A VPN can be found in workplaces and homes, where they allow employees to safely log into company networks. Telecommuters and those who travel often find a VPN a more convenient way to stay "plugged in" to the corporate network (Mitchell, n.d.). One of the main features of a VPN is that it has the ability to utilize public Internet connections rather than having to pay for expensive private leased lines. After further review, it was determined that there are four popular VPN protocols to choose from. These protocols are PPTP, L2TP, IPSec, and SSL. All the protocols of course have their own advantages and

disadvantages. The figures below show an example of a typical VPN infrastructure. The first figure shows a site to site VPN and the second figure shows a remote/mobile user VPN.

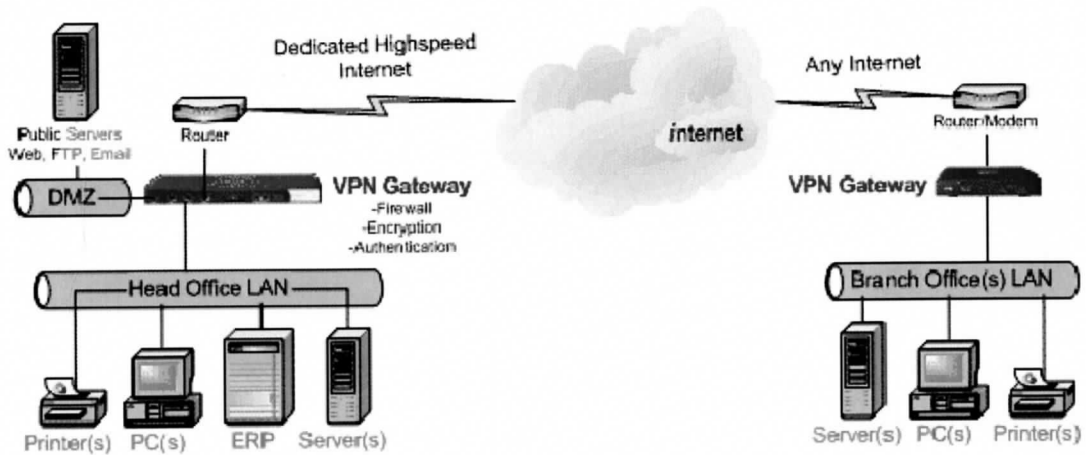


Figure 2-3: VPN – Site to Site (Solucom Inc., n.d.)

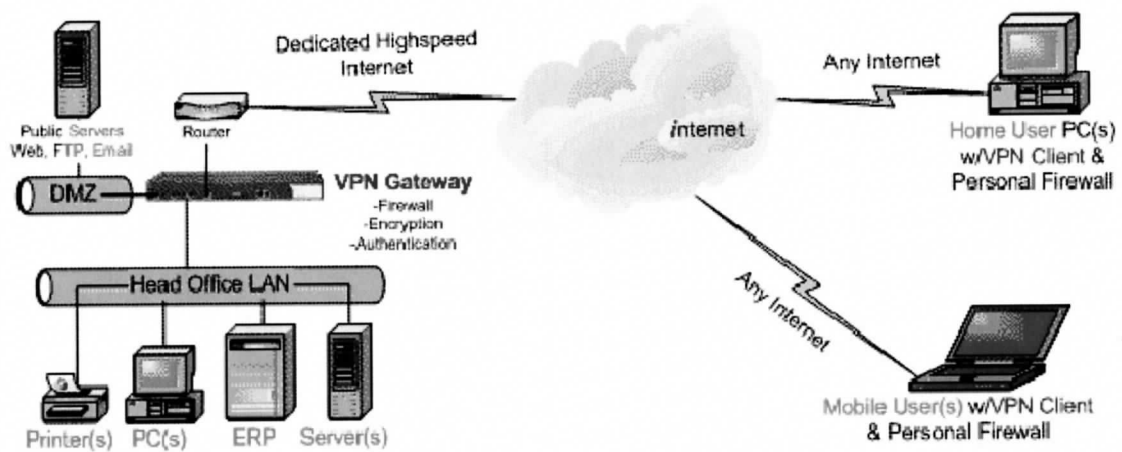


Figure 2-4: VPN – Remote/Mobile Users (Solucom Inc., n.d.)

The first protocol researched was PPTP, which stands for Point-to-Point Tunneling Protocol. The Point-to-Point Tunneling Protocol (PPTP), developed by Microsoft in conjunction with other technology companies, is the most widely supported VPN method among Windows clients, and it is the only VPN protocol built into Windows 9x and NT operating systems. PPTP is an extension of the Internet standard Point-to-Point protocol (PPP), the link layer protocol used to transmit IP packets over serial links (Shinder, 2005). The advantage to PPTP is that it is

typically faster than other VPN methods because it has low overhead. This is because PPTP establishes a tunnel but does not provide encryption. This protocol was ruled out for the project because the financial data must be encrypted and secure.

The second protocol researched was L2TP, which stands for Layer 2 Tunneling Protocol. L2TP was developed in cooperation between Cisco and Microsoft, combining features of PPTP with those of Cisco's proprietary Layer 2 Forwarding (L2F) protocol. One advantage of L2TP over PPTP is that it can be used on non-IP networks such as ATM, frame relay and X.25. Like PPTP (and as its name implies), L2TP operates at the data link layer of the OSI networking model. L2TP VPNs are supported by many major firewall products, including ISA Server, CheckPoint, Cisco PIX, and WatchGuard (Shinder, 2005). L2TP has a number of advantages over PPTP such as data confidentiality and data integrity. The disadvantage to this protocol is that it involves more overhead and this can result in slower performance compared to others.

The third protocol researched was IPSec. IPSec can itself be used as a tunneling protocol, and is in fact considered by many to be the "standard" VPN solution, especially for gateway-to-gateway (site-to-site) VPNs that connect two LANs (Shinder, 2005). IPSec has the ability to secure packets that are transmitted between two gateways. Similar to PPTP and L2TP, IPSec requires that the VPN client computers have client software installed. IPSec is a newer protocol that is supported with Windows 2000/SP/2003, but not older versions. IPSec is the most widely accepted protocol from many different vendors which is a major advantage. Like most other VPN solutions, IPSec also requires the management of client software to function which can be a disadvantage for a company with many different locations.

The last protocol researched was SSL. The SSL VPN uses the Web browser as the client application. Thus, SSL VPNs are known as "clientless" solutions. This creates a big advantage

for SSL VPNs because special VPN client software on the VPN clients is no longer needed. A disadvantage to this is that the protocols that can be handled by an SSL VPN are more limited (Shinder, 2005). SSL VPNs typically utilize digital certificates for server authentication. This is preferred because it is the most secure method.

In summary, VPNs can provide many advantages and disadvantages to an organization. Two main advantages VPNs have are cost savings and scalability. One way VPNs lower costs is by eliminating the need for expensive long-distance leased lines. Another way VPNs reduce costs is by lessening the need for long-distance telephone charges for remote access. A third, more subtle way that VPNs may lower costs is through offloading of the support burden. One scalability advantage is that VPNs that utilize the Internet can potentially avoid the growth problem of requiring more leased lines every time a location is added to the network. This is done by simply tapping into the geographically-distributed access already available. Compared to leased lines, Internet-based VPNs offer greater global reach, given that Internet access points are accessible in many places where dedicated lines are not available (Mitchell, n.d.).

There are some disadvantages to using VPNs as well. One of the main concerns with VPNs is that VPNs require an in-depth understanding of public network security issues and taking proper precautions in VPN deployment. Another disadvantage is the availability and performance of an organization's wide-area VPN (over the Internet in particular) depends on factors largely outside of their control. Another disadvantage is that VPN technologies from different vendors may not work well together due to immature standards. Another disadvantage is that VPNs need to accommodate protocols other than IP and existing ("legacy") internal network technology. Generally speaking, these four factors comprise the hidden costs of a VPN solution (Mitchell, n.d.). All of the information that was reviewed pertaining to VPN technology

was very beneficial in trying to find the best solution to address a secure and centralized connection to the company's corporate data center.

### **Point-to-Point T-1 lines (leased private lines)**

Dedicated lines can be fairly expensive, but have now almost become a business need in recent years because of the importance of secure and reliable connectivity. There are various types of point-to-point links available today. A point-to-point link provides a single, pre-established WAN communications path from the customer premises through a carrier network, such as a telephone company, to a remote network. Point-to-point lines are usually leased from a carrier and thus are often called leased lines. For a point-to-point line, the carrier allocates pairs of wire and facility hardware to your line only. These circuits are generally priced based on bandwidth required and distance between the two connected points. Point-to-point links are generally more expensive than shared services such as Frame Relay. Figure 2-5 illustrates a typical point-to-point link through a WAN (Cisco Systems Inc., 2006).



Figure 2-5: Typical Point-to-Point Link through a WAN (Cisco Systems Inc., 2006)

A T-1 circuit consists of 24 discrete channels, each with 64 Kbps of throughput, to total a bandwidth capacity of 1.536 Mbps. T-1 Internet access is the choice of most businesses, as it provides a highly scalable and reliable Internet access solution which is a major advantage compared to other types of circuits. A major disadvantage to a T-1 circuit is the costs associated with leasing a private line. The average cost of a dedicated T-1 circuit is anywhere from \$500/month on up. These costs are usually high if the business unit is located a long distance

from the central office. The local loop costs are a major factor in the price of T-1 circuits as well. These costs are significant to the company because most of the remote sites are located in rural America. The costs must be justified for the needs of the business which will be evaluated later on. The point-to-point circuits may be a tough sell for the company at this point in time, but the information has be reviewed and evaluated if the need to increase bandwidth at each location arises in the future. All of the information reviewed pertaining to point-to-point circuits as well as T-1 lines has been very beneficial is deciding whether the costs could be justified for the company at this time.



## CHAPTER 3

### SYSTEM EVALUATION

After completing the in-depth literature review of the selected solutions and after significant discussions with the various hardware and software vendors involved, the field was narrowed to one solution. The Citrix Access Suite solution was chosen to provide centralized and secure access to the corporate datacenter financial application from all of the company's existing and future sites. There were many factors that were carefully evaluated in determining which solution to choose.

The Citrix Access Suite was thoroughly evaluated and was determined that it will fit the needs of the company both now and in the future. The plan is to use an IBM blade center to host the Citrix servers as well as the Great Plains accounting application. For hardware, the company would need to purchase an IBM blade center as well as six IBM blades. Four of the blades will be dedicated Citrix servers, and two blades will host the SQL 2005 application in a clustered environment. All of the company databases will reside in a clustered environment on the company's existing Compellent SAN. The purchase of the IBM blade center and blades will take care of the hardware for this project.

The software costs will involve a variety of different applications and licenses. The company will need to purchase four licenses of Windows Server 2003 Standard for each Citrix server and two licenses of Windows Server 2003 Enterprise for each SQL server. The company will also need to purchase two licenses of Microsoft SQL Server 2005 Enterprise for each SQL

server. The company will need to purchase thirty licenses of Citrix Presentation Server 4.0 Enterprise edition. Along with each Citrix license purchased, a Windows Server 2003 TS CAL is needed. So the company must also purchase thirty Windows Server 2003 TS CALs. All of the described software and licenses should be sufficient to complete this project.

All known hardware and software costs that were associated with this project were quoted from various vendors. The table below shows the actual quotes that were received for the hardware and software costs.

Table 3-1: Hardware and software quotes for Citrix solution

Unit Description	Qty	Unit Cost	Ext Cost	Quote Reference	Item
<b>Hardware</b>					
IBM Blade Center Blades	6	\$1,605.00	\$9,630.00	CHS Quote	Hardware
IBM Blade Center	1	\$11,893.05	\$11,893.00	IBM Quote-online	Hardware
<b>Subtotal</b>			<b>\$21,523.00</b>		
<b>Software</b>					
Microsoft Windows Server Ent	2	\$2,071.00	\$4,142.00	Insight Quote 22863192	Software
Microsoft Windows Server Std	4	\$638.00	\$2,552.00	Insight Quote 22863192	Software
MS SQL 2005 Ent	2	\$7,528.00	\$15,056.00	Insight Quote 22863192	Software
Citrix Presentation Server 4.0 Ent	30	\$307.00	\$9,210.00	Choice Solutions Quote	Software
Windows Server 2003 TS Cals	30	\$78.00	\$2,340.00	Choice Solutions Quote	Software
<b>Subtotal</b>			<b>\$33,300.00</b>		
<b>Total</b>			<b>\$54,823.00</b>		
Budgeted Hardware Costs			\$26,000.00		
Budgeted Software Costs			\$32,500.00		
Contingency (10%)			\$ 5,850.00		
<b>Total Budgeted Costs</b>			<b>\$64,350.00</b>		

The WAN connectivity at each site also plays an important role in how each location connects to the data center. The Citrix solution has the ability to perform well on even a slower WAN connection. The bandwidth utilization for one active Citrix user is typically around 30kbps. If the company has five active users in Citrix, it will use about 150kbps of bandwidth. Typical DSL connections provide speeds between 512kbps and 1.5Mbps. This shows that there

is adequate bandwidth at each location at by using a cheap broadband connection. One drawback to using a cheap broadband connection is that each location is coming in through the public Internet which can sometimes have a number of hops and latency. At the present time, the smallest circuit the company has is a 768k wireless circuit. The company feels this is adequate for the current project. If more applications are accessed via Citrix in the future, the WAN infrastructure will be revisited at that time. The Citrix solution will be thoroughly tested on the planned infrastructure. It will not be implemented to production until the Great Plains accounting application is running effectively and the end users have accepted the expected level of performance as well as the ease of use in the new environment.

## **CHAPTER 4**

### **CASE STUDY (RESULTS AND DISCUSSION)**

At the conclusion of the evaluation process, the Citrix Access Suite solution was clearly the direction the company wanted to pursue. After the final solution was chosen, the next step was to create a workable hardware and software platform for the planned project. The order was placed and equipment arrived over the next couple of weeks. The systems implementation team began meeting once a week on a regular basis to discuss the overall plan and assign tasks accordingly. After the project kickoff meeting was held, everyone involved got busy and started completing the tasks according to the plan.

The entire project consisted of seven main phases. These phases included: project setup, conception, commencement, construction, testing and troubleshooting, implementation and rollout, and completion. The project setup, conception, and commencement portion was completed on time as planned with no issues or concerns. The planned network diagram for the Inver Grove Heights, MN data center which was completed in the commencement step can be found in Appendix B.

The construction phase took the longest out of all of the phases. The construction phase can be broken down further into three separate parts: the setup and configuration of the servers, the installation and configuration of Citrix, and the installation and configuration of the Great Plains application. The setup and configuration of the servers went well. While the team waited for all of the hardware and software to arrive, a great deal of strategic planning was

accomplished. All of the hardware and software arrived a little early and the Qwest 10MB Internet circuit was installed during this time as well. The 10MB Internet connection was ordered because the company was currently sharing an Internet connection with another company in the same building and it wasn't enough bandwidth for hosting a data center moving forward. The installation of Windows Server 2003 on the blade servers went well. The installation and configuration of Microsoft SQL 2005 Enterprise took a little longer than expected. A network diagram of the SQL cluster can be found in Appendix B. This was due to the newness of the product and the unfamiliarity of clustering the databases. The project was still on track though because the hardware showed up early so the team was able to start a little early.

Once the servers were loaded and prepared, it was time to install Citrix Presentation Server 4.0 Enterprise edition on the blade servers. The plan was to install and configure the software on one of the blades and then clone the rest from that one. The installation of Citrix Presentation Server 4.0 was completed using a 260 page installation document provided by Choice Solutions, LLC. Choice Solutions is a platinum Citrix reseller as well as a Citrix certified consultant firm. The Citrix installation documentation is very detailed and walks the user through the installation from start to finish. The document also provides information on recommended updates and hot fixes after the installation is complete. After the installation was complete, an SSL certificate was purchased and installed on the Citrix Secure Gateway which redirects all inbound Citrix traffic to port 443 which secures and encrypts the data. This allowed the team to create a DNS entry for all of the remote sites to access the Citrix servers. The application can be accessed by going to <https://citrix.usbioenergy.net>. Once the first IBM blade server was configured and completed, it was ghosted to the other three blade servers. Each

server was named USBCTX01, USBCTX02, USBCTX03, and USBCTX04 respectively. The main reason for the four Citrix servers is to load balance the users for performance optimization. Another reason is that one server can be taken offline for repair or testing while the other three function normally.

The next major task was to install and configure the Great Plains application on the Citrix servers and on the SQL servers. Christianson & Associates was responsible for installing the Great Plains application on the servers. C & A is the vendor that Great Plains was purchased from and part of the support agreement includes the installation and upgrades to the Great Plains software. The Great Plains installation was completed on time and went pretty well. The next task was for the accounting department to work with C & A to setup the chart of accounts, general ledger, and prefix codes for each company location. This task took longer than expected as there was a great amount time involved because each location will have its own information. A test company was created to use as a template and each company location was created from the template.

After the construction phase was complete, it was time to move onto the testing and troubleshooting phase. The testing phase was critical to the success of the rollout so there were many users involved in this process. The two locations that were very helpful in testing were USBio Platte Valley and USBio Ord. The reason they were helpful is because those two locations had already been using the Great Plains software before the project was started. Those two locations were acquired by US BioEnergy in early 2006. The two companies could basically run in parallel and test many different functions within the application. The issues with the new Great Plains system decreased every week as modifications continued to be made. Testing took

a little longer than expected but the system seemed to run effectively after the testing phase came to an end.

After the users had approved the completion of the testing phase, the application was ready to be rolled out to production. The project was right in line with the planned timeline after some tasks were finished early and others took longer than expected. The plan was to cutover at month-end and start a new month in the new application. The next closest month-end happened to be October 31, 2006. The team then prepared for a cutover at the end of October.

Christianson & Associates assisted with the cutover. C & A was available for any Great Plains issues or support calls that came in after the cutover. The users were informed to no longer use the old Great Plains application as of November 1<sup>st</sup>, 2006. The cutover went fairly smooth.

There were some minor issues that came up but C & A was able to assist with those issues. The users that had the most problems were from USBio Platte Valley. This was more than likely due to changing the Great Plains application slightly to the corporate level rather than on-site like it was. Most of the problems were security related. Some users didn't have access to certain areas anymore, which was mainly due to corporate policies.

The last part of the project was the completion phase. The support issues were monitored and they were pretty minor for the most part. The team discussed the closing of the project. The weekly system calls still occur though. The calls were kept because it allows regular updates to how the systems are running and if there are any concerns or updates with the performance or functionality of the accounting system. The Great Plains application is still fully operational today and users seem pretty pleased with the application. Corporate really likes the idea of having all of the financial data stored in one location for security and ease of financial consolidation between locations.

## CHAPTER 5

### CONCLUSIONS

The project was an overall success. All four primary objectives were achieved within the scope of the project. The main objectives of this project were to standardize the corporate accounting system by using the Great Plains application in all locations. Utilize a Citrix farm in the Inver Grove Heights, MN data center as the primary means for accessing the Great Plains application for all locations. Utilize a SQL server in the Inver Grove Heights, MN data center to house all of the Great Plains financial data for all locations. Prepare US BioEnergy for SOX compliance by centralizing and securing all financial data in one location.

All four deliverables were completed within the scope of the project as well. The project deliverables consisted of creating a network diagram for the Inver Grove Heights, MN data center. Provide a hardware and software schedule of the project costs. Rollout a secure and redundant Citrix application for use with corporate applications. Provide a centralized and robust Microsoft Great Plains accounting application and database for each location.

Throughout the duration of the project, a great deal was learned about how important information technology is to all aspects of the organization. The project allowed the IT department and the accounting department to work closely together. The project manager was able to learn more about the accounting workflow processes as well as how important it was for the accounting staff to have a centralized and secure financial data platform. The accounting



department seemed very pleased with the project and how beneficial it was for the whole company.

The project manager also learned quite a bit about the technology that Citrix can provide and all of the benefits it can bring to organizations. The world is evolving and user demands are higher than ever. Citrix is a very viable solution because it provides exactly what people are looking for; a safe and secure way for people to access company applications and files from anywhere at anytime. The benefits that Citrix can provide IT users are just as great. Some of these benefits include server consolidation, centralized applications, secure access, real-time monitoring and auditing, and various types of compliance and regulatory issues. The cost of implementing Citrix is also very reasonable considering all of the benefits it can provide.

After speaking to many of the controllers at each location, there was very positive feedback received that the new system was working the same if not better than when the accounting platform was at each location. The users did notice some intermittent delays while working within the application. After further review, it was caused by some disruptions in the locations Internet connection. During the research process, this potential problem was identified because the current WAN connections are dependent on the public Internet traffic. This problem would be fixed by leasing private lines and installing point-to-point T-1 lines. The users and IT department felt it didn't happen enough to justify the cost of private lines at this time.

The implementation of the Citrix solution will very beneficial for the future of US BioEnergy. The Great Plains application at US BioEnergy was setup to easily add company locations to it. If the company were to acquire or build new sites, the new company locations could easily be setup from the template company and another database would be created for that company. In the future, US BioEnergy may decide to host more company applications on the

Citrix platform. If this is the case, the company will need to evaluate the data infrastructure needs as well as the pros and cons of moving the applications to a server-based system with thin clients rather than client-based software with fat clients. The Citrix platform was designed and built for easy scalability. So if the company decides to host more applications it should be a fairly smooth process. There is also plenty of storage available on the company's SAN in case the company databases were to grow rapidly over the next few years.

A number of benefits will be achieved now and in the future through the implementation of a Citrix solution at US BioEnergy. The company now has a centralized Great Plains accounting system, which allows secure access for all users within the corporation any time they wish. This project also eliminated the need for managing separate servers at each location which makes it very cost-effective. By having all of the Great Plains users connect to a centralized database, this allows the accounting department to consolidate financials very easily for each location. Centralizing and securing financial data is critical for SOX compliance as well, which will be very important for US BioEnergy in the near future. This project will prove to very beneficial for the company now and as the company grows over time.

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# APPENDICES

## APPENDIX A: USERS' MANUAL

There are two ways to access the Great Plains accounting application via Citrix. If accessing the application using the Citrix Program Neighborhood Agent, then the application icon will already be published to the users desktop. If accessing via the Citrix Web Interface, then the user must go to <http://citrix.usbioenergy.net> and the user will be redirected to a secure site where the user must enter a username and password.

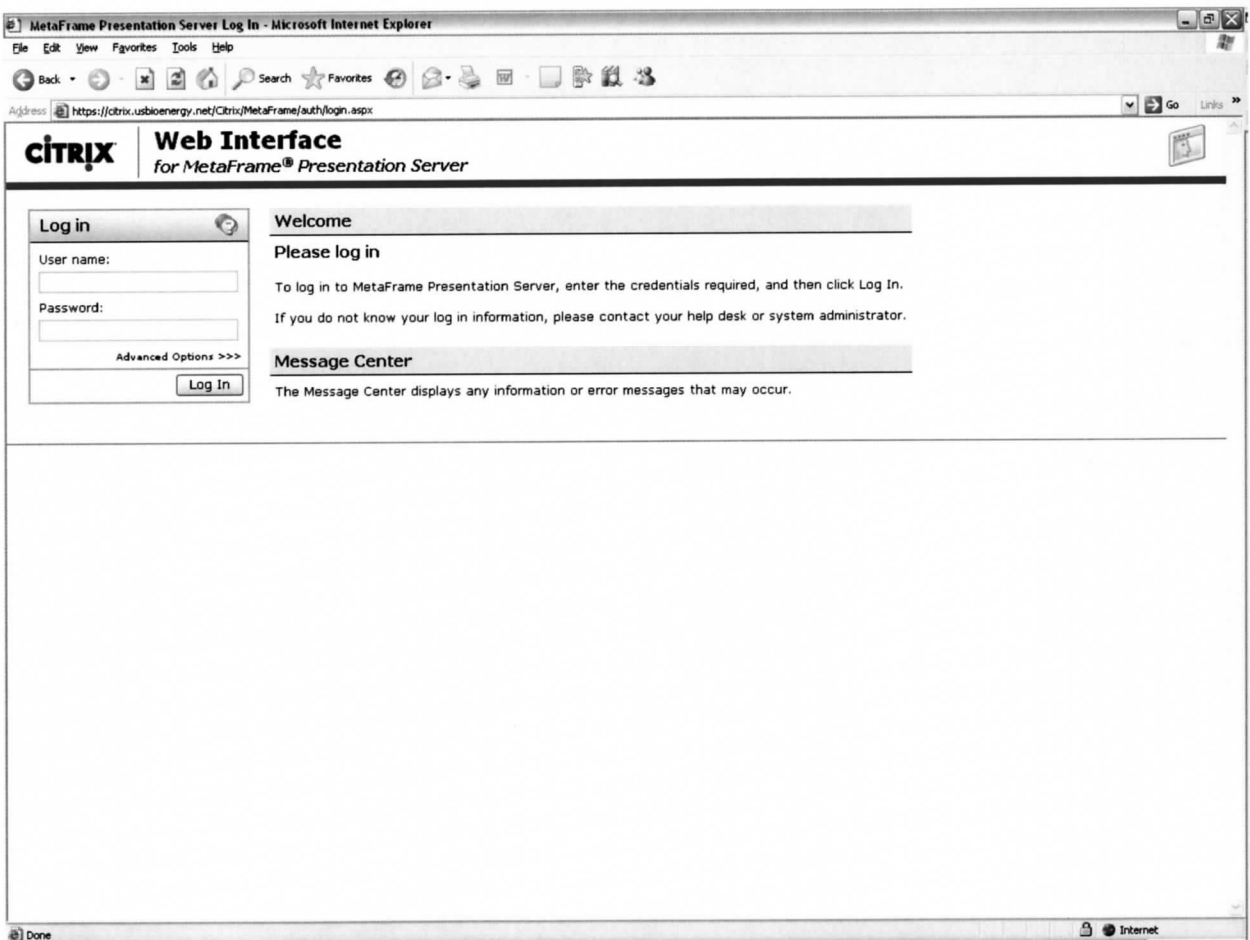


Figure A-1: Login page for Citrix Web Interface

Once logged into the Web Interface, the user will now see the Great Plains application icon just as it would be on the desktop if the user was accessing the application using the Citrix Program Neighborhood Agent. The administrator is able to see all applications. Typically a user is only allowed to see the applications that they have access to.

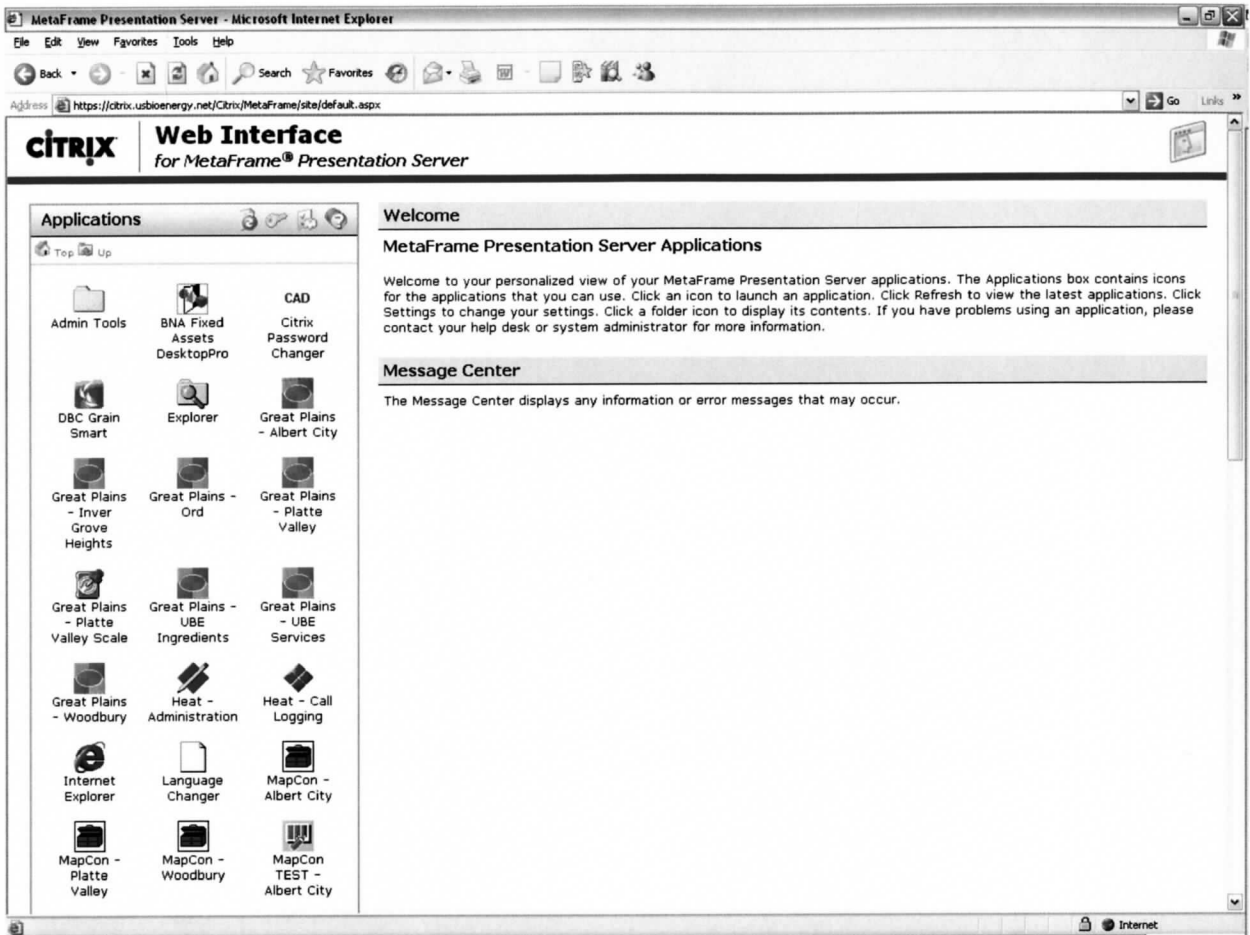


Figure A-2: List of applications after successfully logging into Citrix

After launching the Great Plains application another login screen will come up asking for a username and password. The user must enter the Great Plains username and password they were assigned.

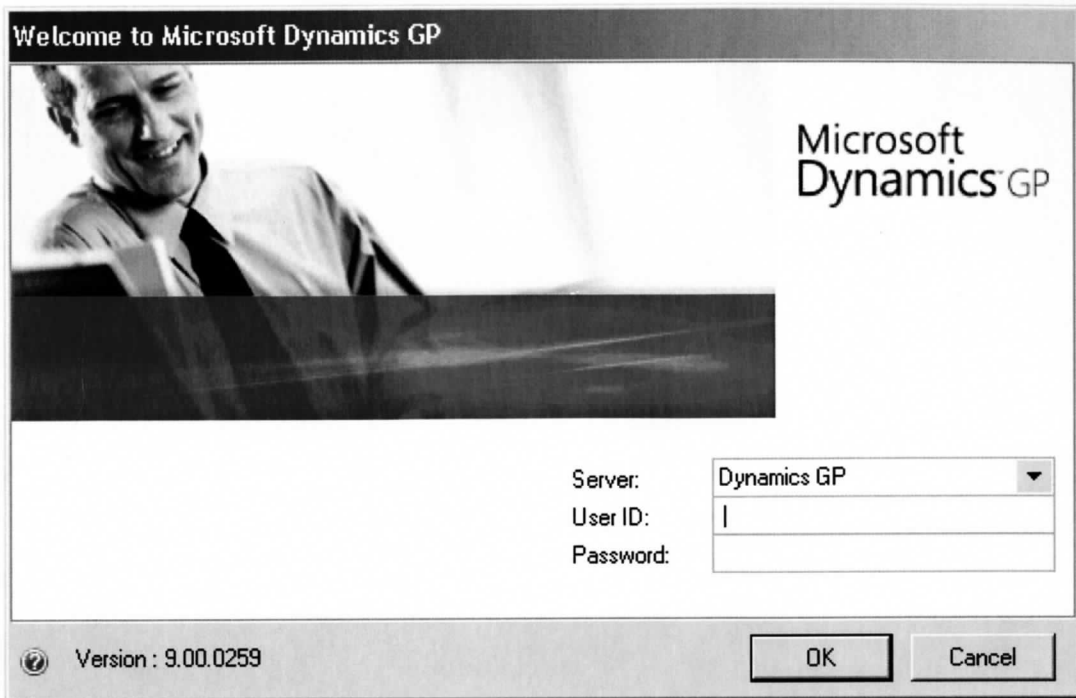


Figure A-3: Great Plains login screen

After successfully logging into the Great Plains application, another screen will prompt the user to select a company. The administrator has the ability to see all and log into all companies with Great Plains. Typically a user only has access to the company that they are assigned to with the exception of corporate. The corporate accounting department has the ability to view all companies within Great Plains.

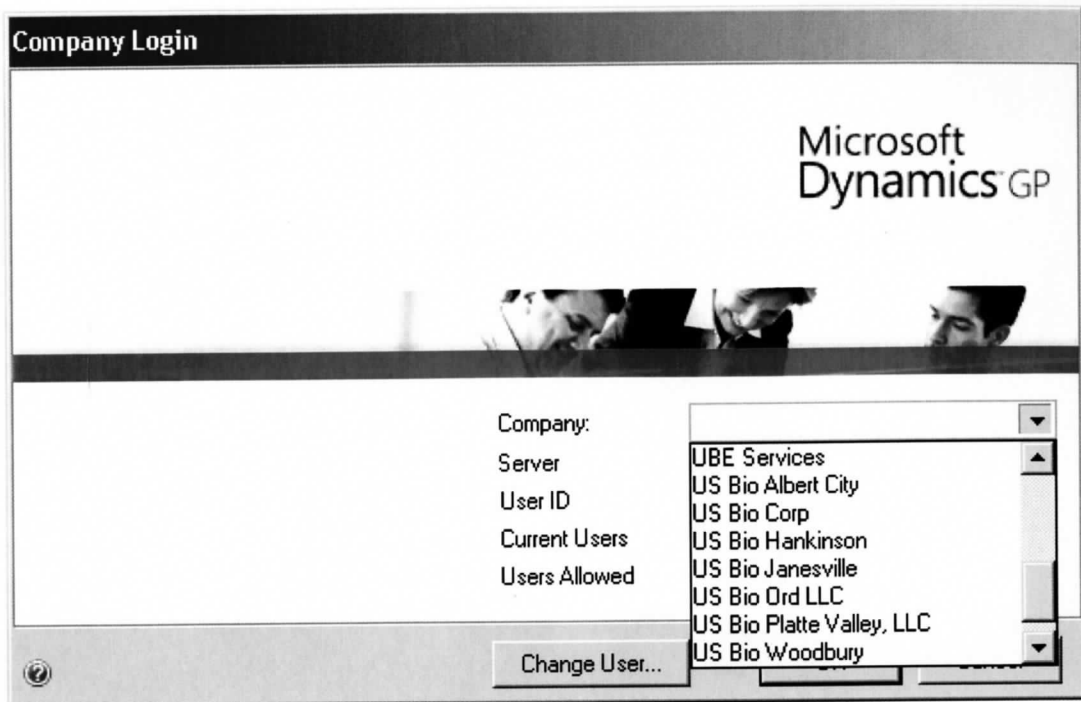


Figure A-4: List of companies that the current user has access to

After selecting a company to login to, the Great Plains application will open that desired company. Once the application is open, users have the ability to switch companies as long as that user has access to those specific companies.



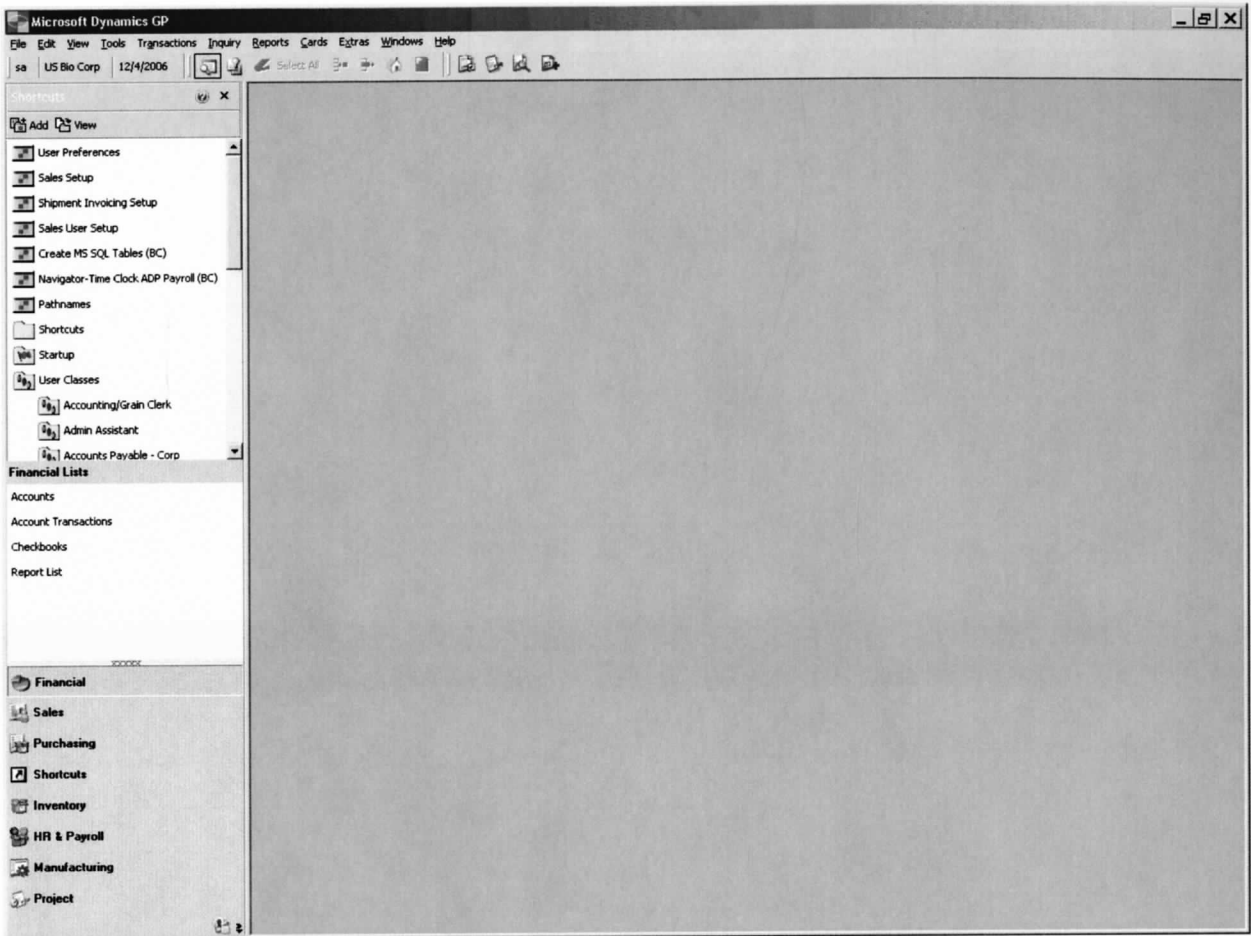


Figure A-5: Great Plains application in a production environment

When finished with the application, users can close the application by clicking on the “File” menu and choosing “Exit.” Once the application has closed the user should be taken back to the Citrix Web Interface. Once the user is finished with the Citrix Web Interface the user can click on the “Log Off” button at the bottom of the page.

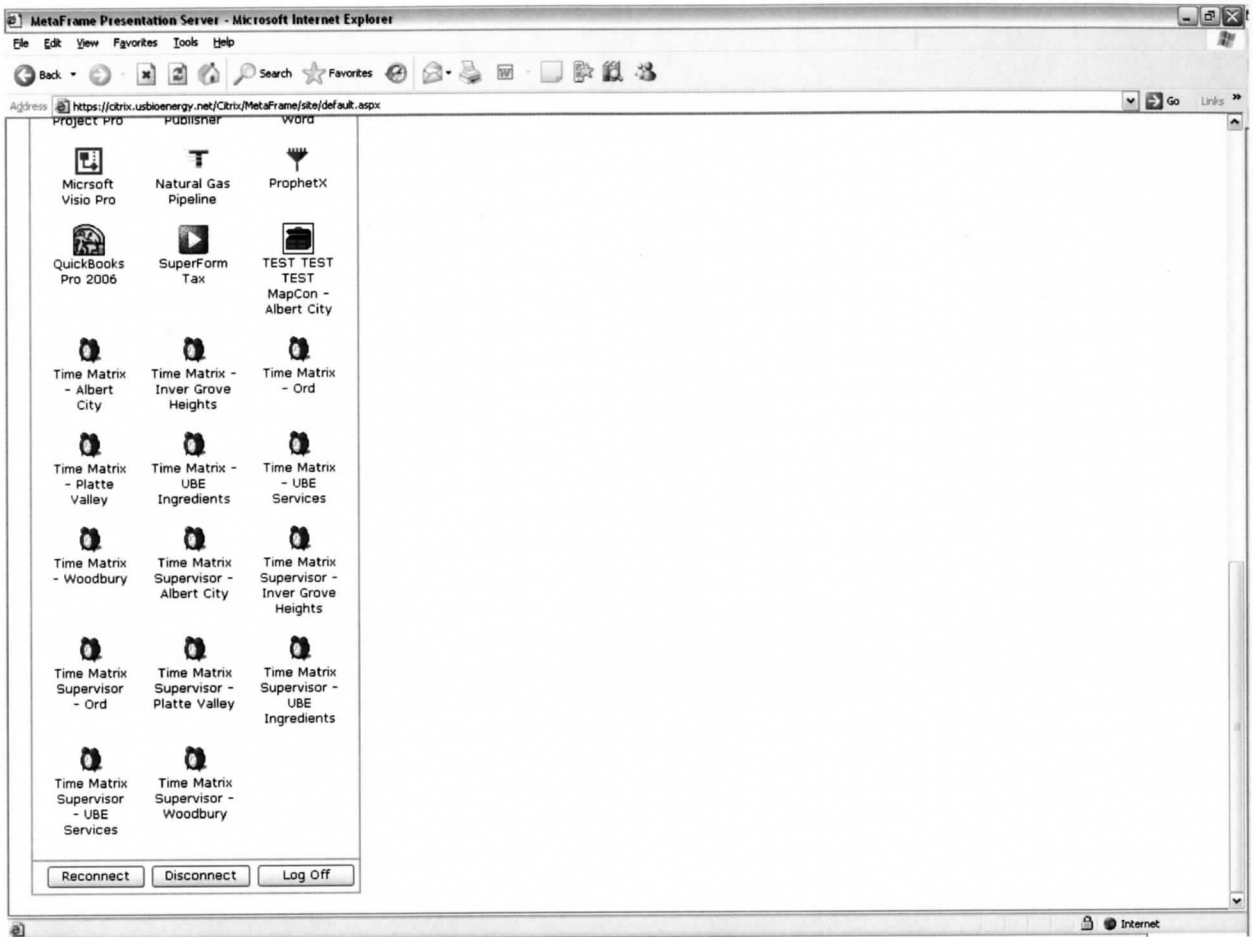


Figure A-6: Log off button is located at the bottom of the page

Once the user is logged off the user has the option of logging back into the MetaFrame Presentation Server or simply closing the browser.

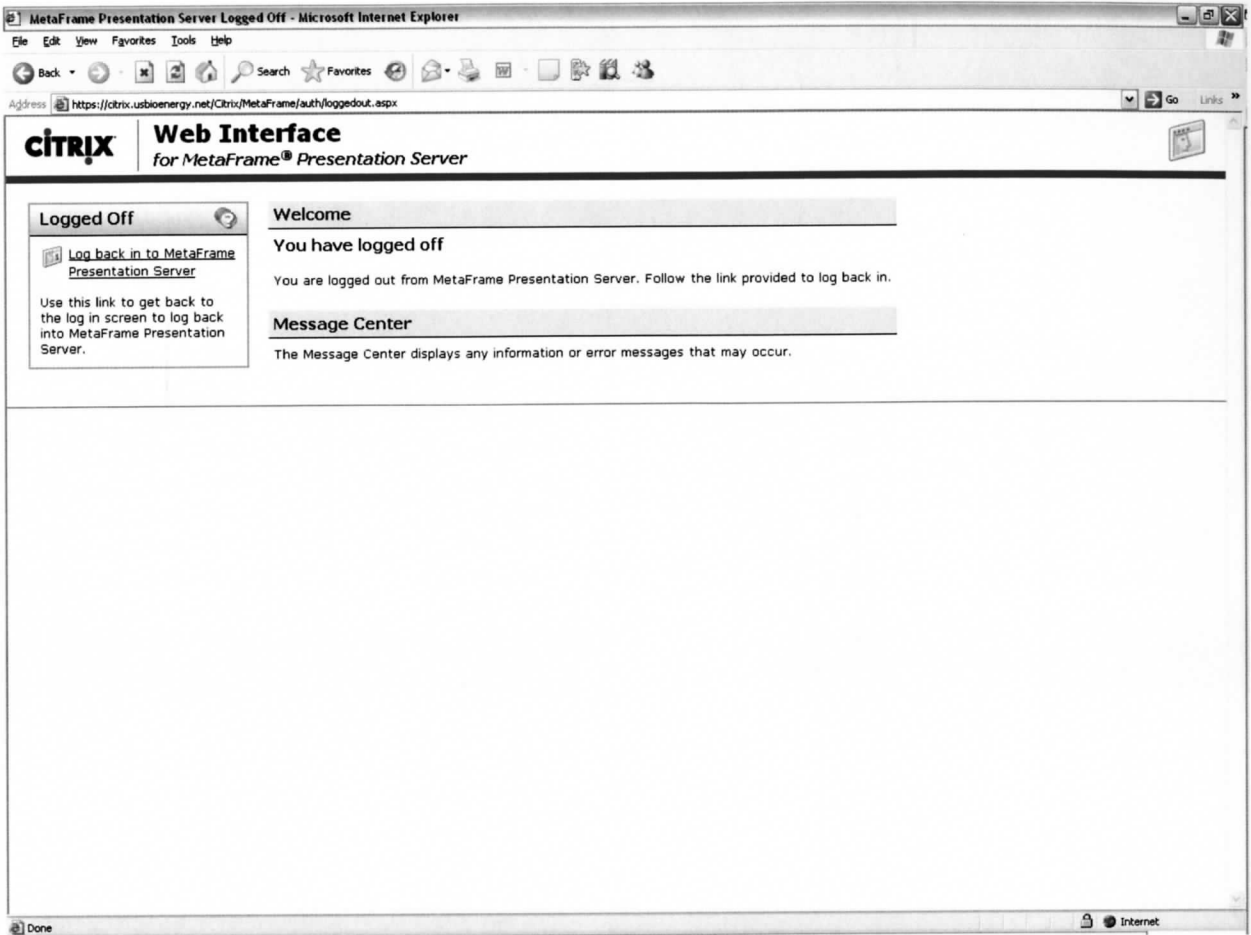


Figure A-7: Log off screen for the Citrix Web Interface

# APPENDIX B: SYSTEM TECHNICAL DOCUMENTATION

**US BioEnergy Corporation**  
*(Confidential)*  
 Last Revised 7/20/06

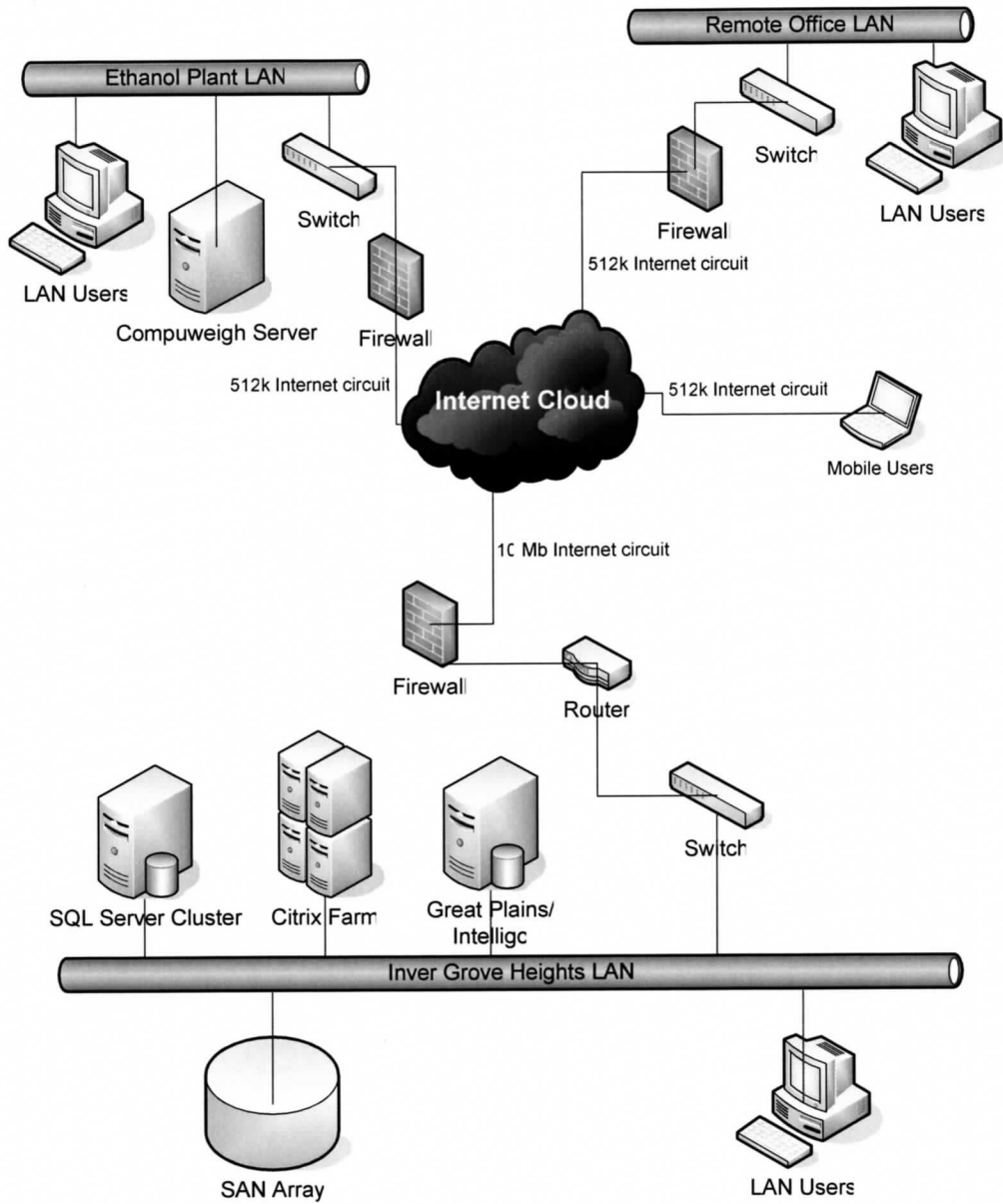


Figure B-1: Network diagram for the Inver Grove Heights, MN data center

**US BioEnergy Corporation**  
**(Confidential)**  
 Last Revised 9/25/06

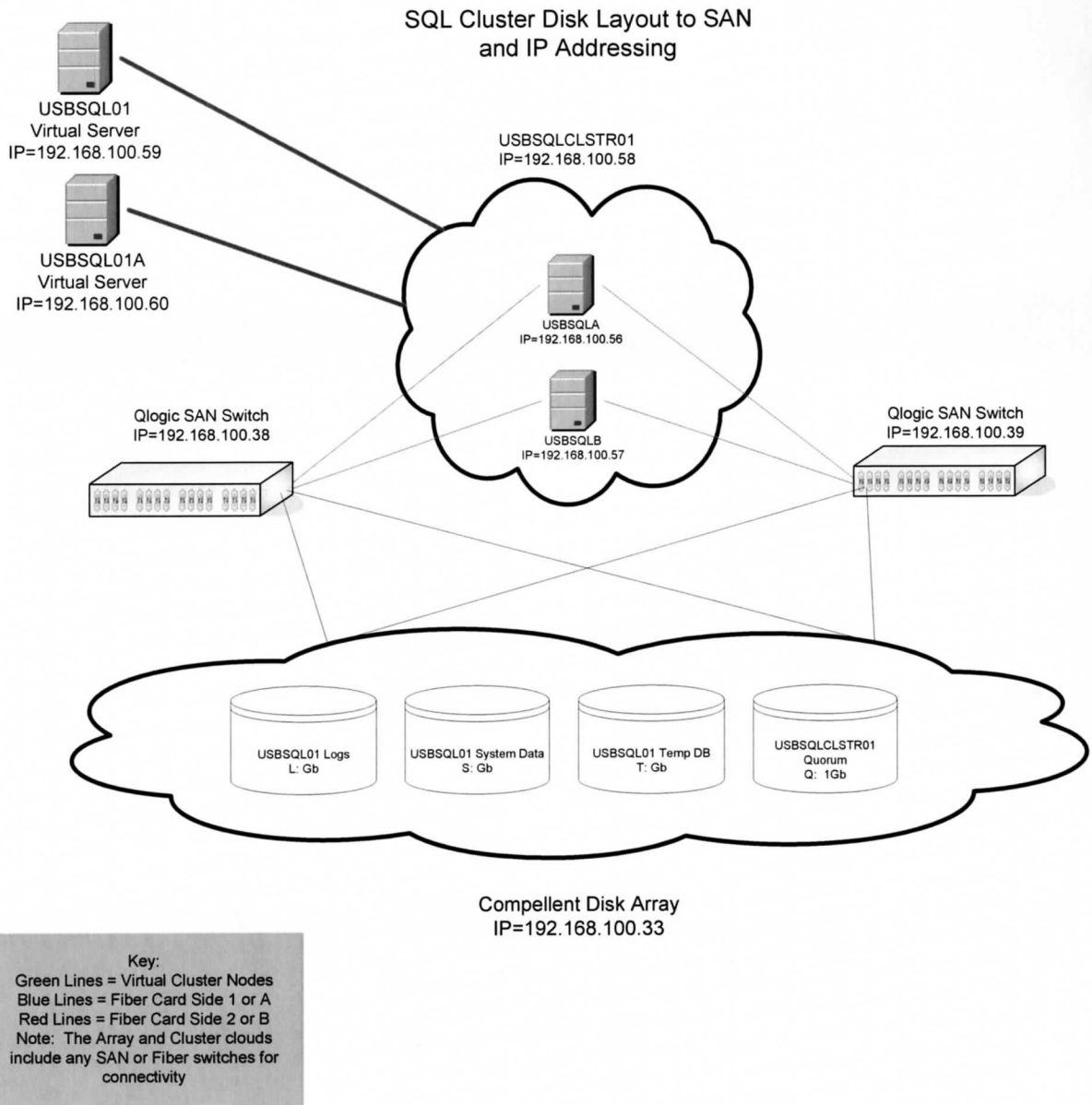


Figure B-2: Network diagram of the SQL cluster

## APPENDIX C: PROJECT MANAGEMENT DOCUMENTATION

Table C-1: Project Team – Roles and Responsibilities

<b>Role</b>	<b>Name</b>	<b>Responsibilities and Expectations</b>
Project Sponsor	Rich Atkinson	<ul style="list-style-type: none"> <li>• Sponsor the project</li> <li>• Provide guidance and set direction</li> <li>• Provide and approve project funding</li> <li>• Helps resolve major issues</li> <li>• Approve project resources</li> <li>• Cancel project</li> </ul>
Project Manager	Nate Anderson	<ul style="list-style-type: none"> <li>• Create major project documents</li> <li>• Maintain control of the project</li> <li>• Lead project communications</li> <li>• Bring major issues to Project Sponsor</li> </ul>
Technical Lead – Storage and Server Environments	Shawn Tol	<ul style="list-style-type: none"> <li>• Bring technical items to Project Manager</li> <li>• Provide technical leadership for the project</li> <li>• Impact analysis on integration of the project with the current application portfolio</li> <li>• Understand business requirements</li> <li>• Execute unit tests</li> <li>• Work with DBA to understand data design</li> <li>• Bring user items for consideration</li> <li>• Define test criteria and procedures</li> <li>• Present security concerns</li> </ul>
Technical Lead – Infrastructure Applications	Fred Gould – Christianson & Associates	<ul style="list-style-type: none"> <li>• Bring technical items to Project Manager</li> <li>• Provide technical leadership for the project</li> <li>• Impact analysis on integration of the project with the current application portfolio</li> <li>• Understand business requirements</li> <li>• Execute unit tests</li> <li>• Work with DBA to understand data design</li> <li>• Bring user items for consideration</li> <li>• Define test criteria and procedures</li> <li>• Present security concerns</li> </ul>

<b>Role</b>	<b>Name</b>	<b>Responsibilities and Expectations</b>
Database administrator	Fred Gould - Christianson & Associates	<ul style="list-style-type: none"> <li>• Determine database design and size requirements</li> <li>• Create database specifications</li> <li>• Understand business requirements and data rules</li> <li>• Ensure database is incorporated in the backup schedule</li> <li>• Ensure the database is optimized for performance</li> <li>• Assist with data conversions and testing</li> <li>• Ensure appropriate security is applied</li> </ul>
Network Services	Nate Anderson	<ul style="list-style-type: none"> <li>• Work on LAN/WAN activities</li> <li>• Design network topologies</li> </ul>
Security Services	Shawn Tol	<ul style="list-style-type: none"> <li>• Configure Firewall, IPS and reporting</li> </ul>
Business Lead	Mike Schuster	<ul style="list-style-type: none"> <li>• Helps determine impacts to business unit</li> <li>• Good understanding of business processes</li> <li>• Liaison between project team and business unit community</li> </ul>

Table C-2: Project Risks

<b>Risks and their potential effect on project success</b>	<b>Impact (1/2/3)</b>	<b>Probability (1/2/3)</b>	<b>Score</b>	<b>Recommended Risk Response</b>
Purchased equipment not delivered on time	3	1	3	Find appropriate suppliers to ensure timely delivery, evaluate different manufacturer
Communication circuits not delivered on time	3	1	3	Order early in the project
Resource conflict with other projects or daily responsibilities	2	2	4	Evaluate need for external augmentation and obtain if necessary
Christianson & Associates not able to provide necessary resources	1	2	2	Evaluate other third parties with expertise in Microsoft Great Plains implementation and support
Communication Bandwidth not large enough to meet business unit expectations	2	2	4	Evaluate larger bandwidth or IP acceleration appliances. Purchase one or the other.

<b>Risks and their potential effect on project success</b>	<b>Impact (1/2/3)</b>	<b>Probability (1/2/3)</b>	<b>Score</b>	<b>Recommended Risk Response</b>
Performance on virtual server platforms not acceptable	3	1	3	Purchase additional hardware
Architecture of in-scope applications not consistent with proposed network configuration	3	1	3	Meet with project team to modify architecture to meet the needs of the in-scope applications

Table C-3: Estimated Project Cost/Labor

	<b>Budgeted Hours</b>	<b>Budgeted Capital \$</b>	<b>Budgeted Non-Capital \$</b>	<b>Total Budget \$</b>
<b>Project Management</b>	<b>200.0</b>	\$0.00	\$10,000.00	\$10,000.00
<b>Internal IT Labor</b>	<b>800.0</b>	\$0.00	\$24,000.00	\$24,000.00
<b>External IT Consulting</b>	<b>80.0</b>	\$0.00	\$12,000.00	\$12,000.00
<b>Software</b>		\$22,500.00	\$10,000.00	\$32,500.00
<b>Hardware / Equipment</b>		\$20,000.00	\$6,000.00	\$26,000.00
<b>IT and User Training</b>		\$2,500.00	\$0.00	\$2,500.00
<b>Contingency (10%)</b>		\$0.00	\$0.00	\$0.00
<b>Total</b>	<b>1080.0</b>	<b>\$45,000.00</b>	<b>\$62,000.00</b>	<b>\$117,000.00</b>

### **Work Breakdown Structure (WBS)**

1.0 Citrix Solution for the Great Plains Corporate Accounting System

1.1 Project Setup

1.1.1 Preliminary Project Discussions

1.2. Conception

1.2.1 Create Preliminary Project Plan

1.2.2 Create Project Team

1.2.3 Review Methodology with Project Team

1.3 Commencement



1.3.1 Design network diagram for the Inver Grove Heights, MN data center

1.3.2 Complete hardware/software cost worksheet

1.3.3 Complete project cost estimate worksheet

1.3.4 Complete project plan

1.3.5 Obtain project approvals

#### 1.4 Construction

1.4.1 Conduct project kickoff meeting

1.4.2 Schedule 10 weekly meetings with project team

1.4.3 Create systems implementation team

1.4.4 Make hardware and software decisions

1.4.5 Order hardware and software

1.4.6 Order 10MB Internet Circuit from Qwest

1.4.7 Install Windows Server 2003 Standard on new servers

1.4.8 Install SQL Server 2005 on the new servers

1.4.9 Install Citrix MetaFrame Presentation 4.0

1.4.9.1 Configure four IBM blade servers for the Citrix server farm

1.4.9.2 Install SSL certificate for the Citrix Secure Gateway

1.4.9.3 Create another volume on the servers for Citrix applications

1.4.10 Install Microsoft Great Plains 9.0

1.4.10.1 Install application on all four Citrix servers

1.4.10.2 Create a Citrix published app for Great Plains 9.0

1.4.10.3 Install application on SQL server

1.4.10.4 Setup Great Plains databases on SQL server for each location

1.4.10.5 Setup users and class ID's

1.4.10.6 Setup COA, GL, and prefix codes for each location

## 1.5 Testing and Troubleshooting

1.5.1 Create test users for the new Great Plains application

1.5.2 Install Citrix client on pc's for the test users

1.5.3 Test the Great Plains application using Citrix

1.5.4 Troubleshoot user and system issues

## 1.6 Implementation

1.6.1 Create punch list of open items/issues

1.6.2 Production cutover meeting

1.6.3 Great Plains corporate-wide rollout

## 1.7 Completion

1.7.1 Monitor Great Plains application support issues

1.7.2 Conduct closeout interviews

1.7.3 Complete the project closeout report

1.7.4 Conduct closeout meetings

1.7.5 Share lessons learned

1.7.6 Obtain closeout report signatures

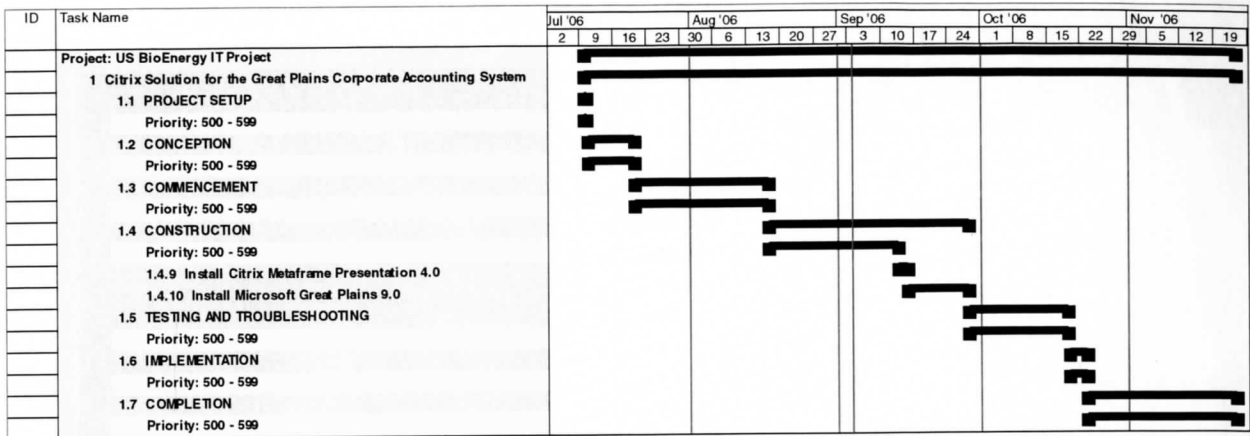


Figure C-1: Gantt Chart

Table C-3: Project Time Estimates

WBS	Duration	Start	Finish	WBS	Duration	Start	Finish
1	98.5 days	7/10/2006	11/23/2006	1.4.9.3	1 day	9/13/2006	9/14/2006
1.1	0.5 days	7/10/2006	7/10/2006	1.4.10	9 days	9/15/2006	9/28/2006
1.1.1	4 hrs	7/10/2006	7/10/2006	1.4.10.1	2 days	9/15/2006	9/19/2006
1.2	8 days	7/10/2006	7/20/2006	1.4.10.2	1 day	9/19/2006	9/20/2006
1.2.1	1 wk	7/10/2006	7/17/2006	1.4.10.3	2 days	9/15/2006	9/19/2006
1.2.2	2 days	7/17/2006	7/19/2006	1.4.10.4	1 day	9/19/2006	9/20/2006
1.2.3	1 day	7/19/2006	7/20/2006	1.4.10.5	1 day	9/20/2006	9/21/2006
1.3	20 days	7/20/2006	8/17/2006	1.4.10.6	5 days	9/21/2006	9/28/2006
1.3.1	1 day	7/20/2006	7/21/2006	1.5	15 days	9/28/2006	10/19/2006
1.3.2	5 days	7/21/2006	7/28/2006	1.5.1	1 day	9/28/2006	9/29/2006
1.3.3	2 days	7/28/2006	8/1/2006	1.5.2	1 day	9/28/2006	9/29/2006
1.3.4	5 days	8/1/2006	8/8/2006	1.5.3	14 days	9/29/2006	10/19/2006
1.3.5	7 days	8/8/2006	8/17/2006	1.5.4	14 days	9/29/2006	10/19/2006
1.4	30 days	8/17/2006	9/28/2006	1.6	2 days	10/19/2006	10/23/2006
1.4.1	1 hr	8/17/2006	8/17/2006	1.6.1	1 day	10/19/2006	10/20/2006
1.4.2	10 hrs	8/17/2006	8/18/2006	1.6.2	1 day	10/19/2006	10/20/2006
1.4.3	2 days	8/17/2006	8/21/2006	1.6.3	1 day	10/20/2006	10/23/2006
1.4.4	2 days	8/17/2006	8/21/2006	1.7	23 days	10/23/2006	11/23/2006
1.4.5	14 days	8/21/2006	9/8/2006	1.7.1	2 wks	10/23/2006	11/6/2006
1.4.6	14 days	8/21/2006	9/8/2006	1.7.2	3 days	11/6/2006	11/9/2006
1.4.7	2 days	9/8/2006	9/12/2006	1.7.3	1 wk	11/9/2006	11/16/2006
1.4.8	1 day	9/12/2006	9/13/2006	1.7.4	3 days	11/16/2006	11/21/2006
1.4.9	2 days	9/13/2006	9/15/2006	1.7.5	1 day	11/21/2006	11/22/2006
1.4.9.1	2 days	9/13/2006	9/15/2006	1.7.6	1 day	11/22/2006	11/23/2006
1.4.9.2	1 day	9/13/2006	9/14/2006				