Network documentation at wake island airfield essay examples

Business, Management

Capstone Proposal Introduction

This document is an IT project proposal created for Chugach Alaska Corporation’s Wake Atoll contract and for XXX University to satisfy the requirements for the TWA1 Technical Writing course, one of the final requirements in the Bachelor of Science in IT.

Wake Island Atoll is a small cluster of islands located between Japan and Guam just across the international dateline. United States acquired possession after its victory over Spain in the Spanish-American war . Later in WWII, the Japanese invaded and took possession until the Japanese surrendered. Today, the island is a somewhat sleepy place. Other than occasional stopover from flights to and from Japan, nothing much happens.

Chugach Alaska Corporation, the company in charge of managing the island, was formed in 1972 as part of Alaska Native Claims Settlement Act . It is headquartered in Anchorage, AK with over 2, 200 shareholders . As a minority owned corporation, Its 8(a) status has given it a large competitive edge in bidding for government contracts.

Capstone Proposal Summary

Chugach has requested me to setup a network documentation project tentatively for October of 2012. The project is to document the civilian network used by the Base Operations and Services (BOS) contractors and not the military networks—classified or otherwise. The project is to include but not limit itself to cabling identification, network diagrams, disaster recovery documentation records and procedures, as well as setup a basic network

monitoring solution. The primary focus of this project will be to provide a detailed account of the benefits drawn through the successful implementation of the documentation Project and to provide a fair idea about the possible solutions that will be offered. There are multiple reasons behind the client's decision to upgrade the network, whether it is an increase in the number of customers or an increase in the number of employees within a site, it is an important task for Network Manager to plan and implement an adequate network system. On one hand, it is important to choose the right equipment and it is important to manage the prices accordingly, so that everything can fit into the budget, forecasted at the time of planning the upgrade. In this proposal, a completely documented upgrade through standard operating procedure is proposed in order to upgrade LAN with advanced machines that can be used in high-end defense IT environment (CISCO, 2008).

The project will encompass formal project management methodology and documentation to include this formal project proposal. A formal review of previous work done in similar Department of Defense contracts as well as outside work will be conducted, to provide a genuine overview of the solutions that are offered and the benefits drawn. This review will assist in generating ideas and lessons learned that will become the foundation for this project. A rationale (the reasons why) and a complete systems analysis is included. The systems analysis will cover the current state of the network and the design of the network in its completed state. Goals and objectives will be formulated and documented to increase the project’s chances of

success. Project deliverables are also included among as a complete plan. This project will provide quick and efficient IT and networking documentation services to the Base Operations, resulting in saving of crucial time and optimal utilization of resources.

Review of Other Work

Every good IT professional has learned the value of reusing or retooling previous work. I am no exception. Some may see it as dishonest or perhaps lazy. We see it as just good sense and it is only dishonest when credit is not duly given. Therefore, I have begun to search in my favorite location for all things IT. Best practice sharing between different lines is an important aspect of a successful IT Project manager and therefore; below mentioned are a few examples of the clients that have been benefited through my expertise, and through the experience that has been gained during the various projects that have been successfully completed, I will be able to provide the required value add to the Capstone Project.

Techrepublic

Techrepublic is a website with a great many articles for the IT professionals. Techrepublic has articles of interest for the lowly Tech all the way up to CIOs and CTOs. So almost without thinking, I turned to this wonderful source of sage wisdom for a skeleton—a framework on how best to proceed circumventing the blind groping of trying to reinvent the wheel from scratch.

Without too much searching, I quickly came across the article conveniently titled “ How to Tackle a Network Documentation Project”. The article was a

perfect place to begin. According to the article these was a list of must-haves for documenting a network.

1. Network Topology- Here we will include an inventory of networking equipment and logical and physical diagrams. This inventory will provide a detailed account of the networking equipment that will be used as a part of the project and would comment about the actual diagrams according to which the network has been arranged.

2. Server Information- An inventory of servers, spare parts, hardware and physical configuration would be beneficial not just for disaster recovery but accounting. A continuous management, regular upgrade and security management are important aspects of managing information on a server, and documentation of the details will provide a strong command on the server thus resulting in the safety and security of the same.

3. Router and switch port assignments- This would aid in teasing out purely networking issues. There are various times when the network requires an upgrade in terms of the Routers and switches in order to avoid a situation where network failure happens, therefore it is important to keep documentation of the above in order to track the life and maintenance statistics of these devices.

4. Network services- This includes critical network services such DHCP, DNS, email and printing. Once again, security of an organization or an individual may face a great impact if the critical network services as mentioned above are not managed adequately, and this is the reason behind the need to

ensure proper documentation related to the network services so that in case of any issue a backup plan can be immediately implemented.

5. Domain policies and profiles- Here we would focus on AD configuration such as group policy objects (GPO). IT resources keep on changing, and there may be situations where the entire team moves on to handle a different role; due to which it is important to ensure that there is a proper documentation of domain policies and profiles. Any new individual handling a particular role, should be easily able to refer to the documents and become aware about the policies and profiles that were existing previously.

6. Mission-critical applications- Wake Island is a very small operation; however, it does run a computerized maintenance management system that is also an ERP.

7. Standard operating procedures- Chugach projects normally based themselves after the military, their clients. They use what they term continuity books to maintain their documentation and for ISO 9000 documentation requirements. After looking at this list, I added a few more items derived from my own professional experiences.

8. Important contact information- Alternate contact information is terribly useful for elevating issues to 2ndand 3rd tier support.

9. Record management plan- Knowing where all your information is located is critical in a disaster response.
Balsam and Balsam Travels Pvt. Ltd.

The primary requirement of the network in case for the firm was to upgrade the bandwidth from 10- MBPS to a higher bandwidth and to completed documentation about the overall upgrade. According to the requirements, the bandwidth would exceed the 10-MBPS capacity and therefore UTP was a clear need, however by using CAT 5 UTP the business goal was expected to be achieved. It is important to understand here that the CAT 5 requires 100Base VG Ethernet and therefore the system required that were supposed to be upgraded. The future growth did not only depend upon the equipments related to the cabling and the Ethernet and considering the fact that the spread could be higher, it was also important to arrange the right support for a 100 Mbps speed.

We understood that with a growth of the business the requirement of speed and the spread would also be enhanced, hence it was important to look into the combinations and find out if the conditions as laid down were met. The twist here was that Star Topology was possible with 10BaseT only and the same supports up to 10 Mbps, due to which the primary requirement was not fulfilled. On the other hand, this type of setting was cost effective however; the limitation of the same was only 5 meters, which means that this was definitely not the right option when the options were explored in order to achieve a setting that can support a given expansion at any given time.

Hence, we see that due to a support of 100 Mbps (maximum) with upgraded topology, the primary goal was met and secondly the growth provided the coverage distance of the transmission. Lastly, the speed for managing is ideally controlled by the support available however increasing the memory

definitely improved the server response time, thus meeting the optional requirements of the client as well.

Eareckson Air Station – Shemya, AK

Splitting the Bering from Pacific is a chain of islands to the west of Alaska known as the Aleutians. The islands were populated by a people known as the Aleuts until the advent of WW-II. The Aleuts had migrated back into some of the islands in recent years. The third from the last island on the chain is the island of Shemya. It was never populated but evidence points to it being used as a fishing camp by the natives. During WWII, the US military commandeered and created an airbase. Afterwards, the island failed into times where it was abandoned and then recommissioned. In 1993, the base was renamed Eareckson Air Station in honor of Colonel Eareckson—the military commander of the facility during the 1941-1943 wartime operations. In 1994, the facility was closed and the last of the Air Force stationed there left. In 1995, the facility was relegated to contractor operations.

In 2005, I arrived on the scene as my second tour of duty with Chugach. I was hired as their network manager. The main tasking of our contract involved stemming the tide of entropy for the possible day in the future when Shemya was once more needed by the military. The department was miniscule. It consisted of a technician and me. The budget was nonexistent. One had to learn to stretch a dollar until it begged for mercy and to be creative with problem solving. These circumstances were virtually identical to the ones at Wake Island. I decided to implement my Wake Island solution using what I learned at Shemya.

At Shemya, we experimented with various open source software applications. In particular, we looked at some of the Linux-based network management systems. OpenNMS was very promising. Zenoss looked very sophisticated and easy to use. In the end, we did not choose either solution. After a brief trial, the OpenNMS software was difficult to troubleshoot as our expertise lay in Microsoft operating systems. Although the price was ideal—free, expending the money for training proofed an insurmountable obstacle to implementation. Zenoss, although easier to use, the free version was very limited and the paid version was much too expensive for our operation. In the end, we chose Spiceworks, an ad-supported software that had everything we needed and more.

One of the major issues which were identified at Shemya was that, there was a complete lack of documentation due to which it was not possible to identify the details related to the network management system. There were no standard operating procedures which were documented due to which the resources were not sure of their role, and also the software upgrades are not done in time considering the fact that a track of the software and related adequate documentation was not present. Hence, apart from the technical solutions related to software upgrade and implementation, a document project was also initiated and implemented to achieve the desired outcome and to avoid any such situations in future.

Rationale and Systems Analysis

There are numerous reasons to document a network. The following are perhaps the top five:

1. Change management- According to the ITIL library web site, the goal of change management is to “ Ensure that standardized methods and procedures are used for efficient and prompt handling of all changes, in order to minimize the impact of Change-related incidents upon service quality, and consequently to improve the day-to-day operations of the organization”. Hence, the documentation of a network should involve a methodology to track every single change that takes place in the network so that in case if there is any issue, the changes leading to the same can be tracked back.

2. Transfer of knowledge- Network documentation is a critical component of the military’s Continuity Books. Continuity books are the military’s way of transferring critical knowledge associated with duties and responsibilities of positions within each of the branches. Chugach has made a conscious decision to mirror, at least in part and whenever it makes sense, many of the processes used by its client. After all, the contractors assigned to Wake Island Airfield maintain the facilities and its operations in the eventuality that this base may one day be critical to the defense of the USA once again. At that time the military will need to take over from the civilians and have documentation in a format familiar to it will facilitate the process of transferring the operational knowledge of the site.

3. Troubleshooting- One of the best aids in troubleshooting any piece of equipment specially a complex system such as a modern computer network is detailed, well written documentation. This is even more true when details of configurations a clearly available for reference and accessible. Standard

operating procedure for each activity which is done on a particular network should be documented to ensure that any new resources that join a particular role, are able to handle and troubleshoot it without any major requirement of training.

4. Security- Having a clear understanding of the network will generally give administrators and security professionals tasked with guarding it an understanding of its strengths and weaknesses—clearly valuable for incident response.

5. Professionalism- Perhaps somewhat a less important item but still one of value is that documenting a network is a clear sign of professionalism.

Although, all the components that will be a part of this documentation project are already discussed over here, it is important to ensure, that the new components can easily be created in future if there is an expansion of the network again. Considering the fact that for the servers we are using i7 generation processors, it will be easy to add further speed and memory in case if it requires so on to an expansion of the network. The use of Windows 7 and Windows server 2008 would enable adequate security on the network and the use of Norton server security and network security applications would help to provide a completely secure network to the client. Since all the computers on the network will be using Windows operating system, there might be compatibility issues if there is any specific software that can be used only on Linux. The documentation will help to keep a track of all the

updates and will equip the above changes to be take place in a timely and proper manner.

Systems Analysis As Is

The Wake Island business network consists of approximately 50 workstations, 5 servers, 7 wireless links, 20 switches, and 1 router. It has one full time network administrator with part time assistance from three other techs in the communications department. It has 67 users with varying levels of computer literacy—mostly foreign nationals from Thailand. The network has grown piecemeal over the years so it is composed of equipment from a plethora of different manufacturers. The network as it stands is almost completely undocumented. Formal policies and procedures are nonexistent.

The island civilian network also has a network segment that services the island residents' personal internet use. It is composed of eight wireless links that support service to 24 buildings with 134 permanent residents and the occasional island visitor. It suffers from many of the same problems that plague the business side. The network is not documented, and it suffers from the fact that it has grown piecemeal with little preplanning making it arduous to troubleshoot and maintain.

A recommendation related to a customized network documentation plan seems to work for the client, which will enable the users to access the network only through pre-decided SSL enabled security and would allow all the users to access the data related to their profile from any given system. A roaming profile to all the users would help to manage any downtime

effectively, and in case if there is an issue with a system the user will be able to login from any other system and would be able to carry on with the work without any disruptions.

Systems Analysis Post-Project

Spiceworks is an ad-supported network management system developed by the company of the same name. It comprises asset management, help desk, and network management as an all-in-one package. The Spiceworks solution targets primarily small and medium sized networks. The solution is simple to install, operate, and maintain. Even relatively inexperienced network administrators would find it not only extremely useful but also quick to learn.

Spiceworks installs easily on any MS Windows computer with Windows XP SP2 or newer operating system with a 1. 5 GHZ Pentium 4 or faster and 2. 0 GB of RAM. It can scan and inventory MS(Windows 2000 and newer), Macintosh, and Linux clients and works well with up to 1, 000 network devices. It supports SNMP versions 1 through 3. Spiceworks works with an embedded Apache server and supports Firefox, Chrome, and Internet Explorer 7. 0+.

Spiceworks provided 3. 5 MM LAN cabling in order to connect the entire network. Kerberos will be used to secure the network, and an authentication will be required from all the clients in order to access the network while no external machine would in any manner be allowed to access the network. All external drives will be disabled after the documentation of the existing plans and the latest anti-virus from Norton were used in order to conduct regular

scans and avoid any kind of threats. It is important to create a plan for business continuity, and to format the external drives while saving the data on servers after every day operations, which will be later locked for access under intrusion detection systems.

Among the reasons why Spiceworks was chosen, besides those just stated, is that with Spiceworks a great deal of the network documentation will be recorded automatically. In addition, that which is not done automatically by the periodic scans will be done on a daily basis as a matter of course by the network administrator(s) and users as they place and update helpdesk tickets. The system will automatically add and remove equipment from its inventory as they are added and removed from the network.

Microsoft SharePoint Services is free software that provides, among its capabilities, enterprise portal and document management. The software is already in wide use at the Wake Island project site. As such, it will be leveraged by this documentation project. Network documentation not maintained within the Spiceworks application will be stored within the SharePoint Services portal. Processes, procedures and other documents will be developed in MS Word and uploaded within the Communications SharePoint department site. Logical and physical diagrams of the network will be created in Microsoft Visio. They too shall be uploaded to the SharePoint site for the purposes of version control, collaboration, and dissemination.

The users on the network would be provided with an access to the Systems however they will only be able to login to their username and passwords in order to access the required applications that they are enabled to use based on their profile which is created individually. The users will have restricted their profile that will have limited space to save the data on the systems however they would be allowed to do so on the data servers, so that systems can be saved in order to maintain good speed (MSU, 2010).

Strong anti-virus solutions accessed only business applications and restricted stock profiles will help to enhance the speed of the systems for faster performance and quicker output. The configuration of the system will be decided as per the speed requirements and the same as discussed in taking care of in the coming sections. There will be in total to servers, which will be related to data and file management, and there will be an additional server, which would be related to the management of printout requests.

Backup

Backup will be taken on hardware storage external drives (5000) GB apart from the server which will be secured in a library for use in case of any business continuity requirement.

Security would be enabled with the help of Microsoft server 2008 and related adequate firewalls which would be securing the network. Printer will be added through the print server so that the print commands and any problems related to print access may not hamper the speed or functionality of any other servers.

The entire node will have one print server, which will be connected to a printer and will be expandable in case if required. The print server would also have the functionality to add a scanner in future in case if the same is required by the defense base.

Considering the fact that if there there are two different servers that would be serving the entire network, there will be a use of Routers, switches and hubs in order to build a good network and provide multiple channels and networking options. Network monitoring solution would also be implemented where all the system activities would be tracked and effectively reported through Microsoft Network monitor 3. 4.