
Looking Ahead

Section Nine

“Finding the fine line between now and then”

Introduction

GENERAL

When I was growing up, Star Trek was the great expectation that my friends and I looked at as the divine future. We saw a future with computers and people all working together on a star ship that crossed the galaxy each week showing us that there was a great purpose to everything and that we could be a part of it. Computers were the key to everything. Those small square plastic cards that held so much data; talking computer terminals and that integration between console to console that made everyone work as one. This was the future for us in the 60's and it still remains our future today.

The moral to the story is that “what makes for a great future today will remain the foundation for a great future tomorrow”. In fact many of the props used in that 60's show have become the tools we use today. Cell phones that open like the communicators on the show, mini disks that look very much like the data blocks on the show, computer terminals that work together on a network that combine our efforts to accomplish goals.

It is this thought that helps us to look ahead and visualize the way things will be for our future. Judging our future is much the same...We simply have to look at those things that have not changed and balance the future with the things that have. In other words, the base line objectives will always be the foundation to a good network infrastructure, only those things that have the ability to change rapidly are the things we must focus on as the variables for the future. Sounds fairly simple when you put it like that.

Baseline

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What is baseline?

- Provisioning
- Infrastructure
- Logistics

Taking the time to look at all of the angles and determine *what is needed* as opposed to *what is wanted* will help you to create a foundation for your network. Provisioning resources so that all of the basics are covered with the most sound technologies. Looking into new technologies but balancing those technologies with investment and the ultimate “total cost of ownership” (TCO). And most importantly, staying away from the bleeding edge of technology.

PROVISIONING

Provisioning (as we discussed before) is the process of preparing a communication circuit for use (as we had stated with T1 technology). We can look at a network as a circuit in the same way. We determine:

- What it will be used for?
- How much traffic will be applied?
- What will we expect to gain from it?

Also as importantly, how quickly will it grow and what will need to be the capacity?

This is the important phase since all else will be determined by the answers you give in the provisioning phase. These are the things that will most likely stay constant. If we were looking at this like a programmer we would put this information into our program library and access the results when we needed to apply variables against the constant. The provisioning you apply to your network will base its’ stability and usefulness. Remember this above all else you may get from this book - “if the network is not sound people will complain loudly.”

Documentation from the very beginning will become your friend through to the end. If you simply write down why you did what you did as you did it, well then you will have the answers at hand for any questions that may come from your network operation critics. Further you will have a baseline for any changes that need to be made as you develop your system. Any receipts, proposals, RFCs, whatever -- these are the things you will come to call on when someone asks the simple question “why?” If you collect the information now, you will be grateful in the future.

INFRASTRUCTURE

Throughout each section, we covered a growing infrastructure that allowed us to reuse hardware and expand in a logical and methodical way keeping our options open to incorporate new technologies. There are many exciting technologies on the rise. Networking over power lines¹⁵¹ has opened the door to providing high speed networking

151.<http://www.cybertelecom.org/power.htm>

Baseline

for homes without requiring an expensive infrastructure. While offices will basically maintain a more traditional wired infrastructure (like gigabit Ethernet and T1/T3 technologies) and improved wireless roaming communities as well, alternative technologies are constantly being examined for viability. The key element is security. Any infrastructure without proper security will remain experimental as far as business is concerned.

Infrastructure also binds technologies together. Phone and network technologies can share the same media (CAT5) as either a blend of network and voice over IP or IP/Phone communications. An integration allows for the low cost migration of infrastructure without dramatic up rooting of hardware and software. The integration of technologies may not promote cutting edge technologies but they will provide stability and security with a known sense of structure and predefined rules.

Many houses deploy CAT5 as the technology of choice for phone lines today. This ensures that the technology supports networking and alarm technologies as well. Smart contractors find that the cost is about the same as using traditional materials with added advantages that can extend the cost of any given home. Wireless is becoming a cheap and easy alternative as well. Beacons can be installed above the ceiling (out of sight) and completely available to the home network.

LOGISTICS

Support for materials and professional services has almost become a commodity. With the downfall of dot coms came the drop in networking expenses. Resources once highly valued have become retail in cost. EBay.com¹⁵² and many other others promote Internet auctions that put high priced networking hardware to the chopping block. The problem with on-line auctions is that you end up with pile of junk that may or may not standardize with your companies infrastructure. People starting out with a new company may find value in on-line auctions but ultimately successful companies must out grow this form of acquisition.

It is also the case that many computer technology manufacturers work to maintain a low inventory of product that cycles technology as quickly as they can make it. This process adds to the problem of standardization in that a computer you purchased a month or more may not be anything like the one you purchase tomorrow -- forcing the company the expand their inventory of replacement parts, software drivers, etc.

Future logistics must somehow incorporate this knowledge so that interpretations of manufacturing trends are fully integrated with their support model. In other words, company Intranet libraries of hardware drivers and technical documentation must become integrated with their manufacturer's most current products reducing the need for research in resolving hardware driver and firmware versioning. Much like Microsoft's deployment of Security Update Services Server¹⁵³ software as a gateway server in your company is just one way that manufacturers are realizing the need for IT to manage and

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153. <http://www.susserver.com/> provides an excellent resource for understanding and deploying SUS software in a company or institution.

administer the distribution of hot fixes, software patches, and hardware drivers without user intervention or outsiders touching every computer on your LAN. By allowing the IT personnel to obtain and redistribute updates and drivers from a local server, inventory and an audit trail can be maintained to further the troubleshooting process and reduce the maintenance load that users find themselves having to support. The end result is a centralized management system for deploying a logistics support model.

SUMMARY

The baseline for what will come is driven by what has proven to work best. Future baseline technologies will not change greatly from what they are today except that they will get better, more practical and less expensive. Infrastructure will be driven by fiber optics and wireless technology while provisioning and logistics will become more streamlined -- rooting out the most practical way to support infrastructures as they are put in place. As each technology matures, it will end up as a commodity for everyone to purchase and use. As these technologies become commodities their documentation and support model will become more compact and require less human intervention in order to install and maintain. Resources will truly become generic and mobility accessible making our conduit to information immediately available no matter where we are in the world.

The End Game

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Lost in all this technology and organization is the real goal for why there are LANs, WANs, MANs and the Intranet:

To make the *person* more productive, knowledgeable and valuable.

We fail to make people more productive when we burden them with:

- Extraneous computer maintenance duties.
- Complicated processes driven by operational requirements and downtime when systems fail.
- We make it painful to provide the essential services that the person needs to do their job.

THE GOAL

1. To provide the ultimate network experience for an average person in which the person doesn't even notice that their on a network performing daily functions.
2. To provide the ultimate workstation configuration based on the ability for every person working with their computer to easily find, analyze and process information so that they can accomplish what they have been tasked to accomplish.
3. To provide the ultimate empowerment a network can give to any single person - the ability for that person to do their job unabated by technology or the need to learn someone else's job so that they can do their own job.
4. To make it so that the average person on the network doesn't need to call IT in order to make their computer do what it was supposed to do.

TECHNOLOGY IN THE WORKPLACE

While workstations have steadily become more and more powerful, software (including the operating systems) have become more and more power hungry. The more that's put inside the box, the more stuff inside the box will be used up by new releases of software people have become dependant on -- this is the order of things in computer technology. For the common person, one word processor would work as good as any other and there is little compelling reason to upgrade every time a new version is released. Marketing, more then anything else, drives us to upgrade, re-train and spend more to continue to do our job functions. Every once in a while some value added resource drives us to upgrade hardware so that our software will perform new improved functions (which will help us to do our work better), but that is less common with every new technology release.

An obvious cycle in technology is currently underway - our *independant personal computers* have become less personal and less independant. We have come full circle back to a centralized computer environment where servers store your data and network applications manage the performance of your workstation. Taking your PC and making it less personal so that when it fails it can be replaced quickly thus reducing downtime. Essentially, we have taken independant (self contained) computeing systems and made them into members of a collective information system which places less importance on the PC and greater importance on conectivity and redundant failover systems. In other words, PC technology has matured to the point that we can once again focus on the importance of data, and less on the personal computer sitting on your desk.

Cost has helped to drive down the inflated importance of the desktop computer as well. Since the cost of more powerful computers has gone down, more money is becomming available for training and fine tuning the person behind that computer, which in turn make for a more productive employee. Much like the calculator did for the accountant and engineer in the seventies, computers are becomming the essential tool for average people to do their business in todays marketplace.

THE VIRTUAL OFFICE SPACE

In even greater elements of cost cutting and re-sizing infrastructure and resources, the move to have people telecommute is growing every day. As DSL, Cable Modem, and Satelite open the floodgates to high speed/low cost networking to the home, they have also expanded the walls of the business network. It is that concept that makes what is learned from this book so important.

The home business network has become a candidate for future enterprise network expansion. The importance to understand the basics of each level in networking offered throughout this book will help you to be ready for the next level of network integration. Knowing how to build, secure and expand a virtual network based upon the home network environment is the key to the next enterprise level.

For the company the benefits to virtual networking are enormous:

- Lower cost in providing infrastructure
- Less office space to rent, own and maintain
- Lower cost in hardware
- Greater uptime by allowing more flexible work hours
- No child care required
- Lower insurance costs

Conclusion

The list can go on and on.

For the employee it can also be a win/win situation:

- Don't have to commute to work every morning
- Can own their own equipment making it easier to move from job to job.
- Reduce the cost of going out to lunch every day
- Don't have to dress up for work (an enormous cost savings for many)
- You can work from anywhere in the world

While there are great advantages to the virtual network, there are many concerns that still linger.

- People still feel the need to have face-to-face interaction at work.
- Businesses don't completely trust employees to be doing what they are paid to do at home without supervision.
- What is the real security of intellectual property if employees can easily access it from home?

The fact is that all of these benefits and concerns will be worked out over time. The one thing you really learn from studying technology is that whenever there's a problem there will always be a solution. Virtual networking offers too many advantages to simply let it go.

SUMMARY

What we see in the future may very well not fully subscribe to a total virtual network concept, it will have major elements of the virtual network in place. We already see the movement to incorporate the Intranet as our fundamental networking infrastructure. We see the use of terminal services throughout companies so that employees can more quickly resolve issues without having to be at work in order to fix things. We see that people are becoming less reliant on large technical staffs in order to maintain systems local or remote. The vision of having computers work for the people instead of the opposite happening has driven us full circle in how we deploy technology. And for that reason, the boundaries of networking will continue to expand -- as far as we wish to take it

Conclusion

We have looked at networking from the simplest topology to enterprise technologies vast and complex. We have looked at the expansion of our hobby network inside a home using a modem to access the Internet. And we have looked at corporations accessing our networking resources at home to expand their network. While the examples provided in this book may not be exactly how your company exploits network technology it offers you the basis for why they do what they do.

Understanding the terminology as well as the basic concepts will help you to use the technology to your advantage. Throughout this book every new term has been footnoted giving you the industry definition for each word or concept so that you can more easily

Conclusion

grasp what is being said to you. What I have come to find over time is that although networking technology is in a constant flux (growing every day and encompassing more and newer technologies), the basis for networking remains the same:

To make people more productive and communicate better...

Conclusion