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TECHNOLOGY A Special Report

A Tale of Two Buildings

Moving to a new office wasn't just a headache—it was an opportunity.

BY E. PETE KARELIS

Every office move is a critical time for an information technology department. Unsuccessful office relocations can mean work disruption, angry clients, and lost billings. Successful moves, on the other hand, will go unnoticed by your clients.

Office moves can also be a good opportunity to revisit your IT infrastructure, and ensure that your technology is ready to meet the future needs of your firm.

Venable recently relocated our D.C. office to our new flagship facility at Terrell Place on 7th Street, N.W. The move took place during the last two weekends of September 2003.

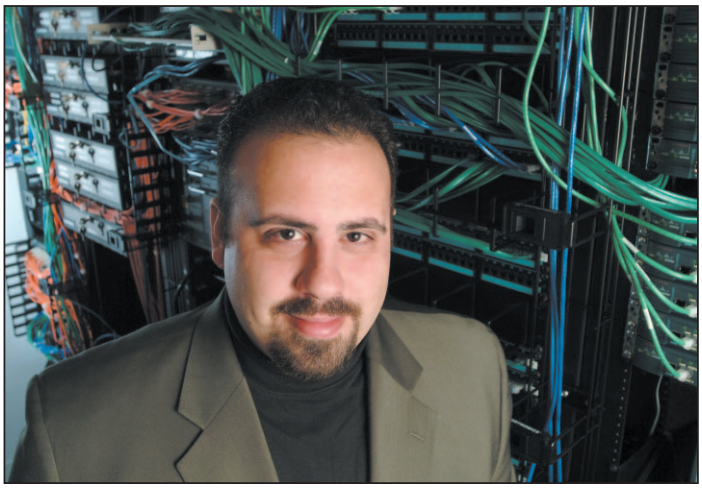
More than 290 employees moved on the first weekend, with the remaining 195 employees moving on the second weekend. And being a law firm, all systems absolutely needed to be 100 percent available on both Monday mornings following the moves.

More than two years of IT planning went into the new office infrastructure, and a multimillion-dollar budget was earmarked with the goal of performing a seamless office relocation and preparing our network for future growth and emerging technologies.

Every successful project begins with a complete and accurate identification of requirements. Our office relocation project began with a definition of the firm's growth estimates. The investment in the infrastructure needed to allow for 10 years' growth.

We were able to identify the firm's growth factor by taking the current rate of growth and the amount of resources each user consumes (the user's footprint), and extrapolating that data out 10 years. This data was used to set the requirements for the data center, network, and cabling plant. Furthermore, system availability and uptime desires were evaluated.

Using our growth metrics, the data center requirements were determined. To discern our space, power, and cooling requirements, we multiplied the current number of servers by our growth factor. This allowed us to appropriately size our air-conditioning system, battery backup and generator, and the square footage of our data center to allow for 10 years worth of growth.



ROBERTO WESTBROOK

ON THE MOVE: Venable Network Architect E. Pete Karelis oversaw efforts to revamp the firm's technology infrastructure when it moved to new offices in downtown D.C. Now, the office is wired for growth for the next 10 years and beyond.

Establishing an architecture that can scale for 10 years' growth can be quite a challenge. Determining the network requirement for unknown, future applications is impossible, but based off of current trends, we were able to make several assumptions:

- Desktop bandwidth will increase tenfold within the next five to six years. This is based on what we have seen in the mid- to late-1990s as network speeds have increased because of new software requirements and technologies.
- Multimedia network applications will be commonplace.
- Voice-over IP technologies (Internet phones) are maturing rapidly and are becoming viable alternatives to conventional phones.
- Video teleconferencing is becoming a more-accepted way of communicating.

- Video broadcasting and distance learning applications are becoming more common.
- Electronic communications will be used more.
- E-mail use has grown and will continue to grow exponentially.
- Instant messaging is gaining in popularity and, when standards are finalized, will be a very functional communications standard.
- Live deposition broadcasting (DepoCast) and Web-based seminars (Webinars) are becoming more common.

Based on these assumptions, the network needed to be highly available, adaptable, and scalable, or able to grow as needed. To realize these requirements, Cisco's three-tiered switch-block architecture was employed.

This tiered approach to network design allows the network to scale easily to accommodate our future growth while providing for a highly available, resilient, and fault-tolerant network. To further accommodate the adaptability of the network, a modular network switch was required. This allows us to add network modules, which connect workstations, as needed to support growth or swap out modules for future technologies.

We decided to use a single platform (the Cisco 6509 chassis) across the whole network. This allowed for a lowered total cost of ownership since managing a single platform is easier.

The cabling plant is always a significant investment, but it can pay dividends if done correctly. Many times, cabling plants are installed using the current minimum required cable types. For the majority of today's Ethernet networks, this is sufficient, but for future networking requirements, it's not.

In order to support current and future networking technologies, both single-mode and multi-mode fiber were installed for connectivity between the data center and the wiring closets. In order to minimize duplicated infrastructure, the latest standard in cabling (Category 6) was installed for voice, video, and data connectivity from the closet to the wall jack.

The only replicated infrastructure is the voice, video, and data backbone cabling from the data center to the wiring closet, but it all merges onto the same end-user cabling. This way, we are capable of supporting all necessary services, but without the added overhead of three completely separate infrastructures. Also, this "future proofs" our cabling plant. For example, if and when we switch to Internet-based phones, we will have an infrastructure capable of supporting them, since the voice connections can be switched to network connections without any issues.

Seeking Synergy

After we completed the main infrastructure requirements, we decided to look at how we can use technology to streamline other business needs while synergistically integrating with the firm's culture. Two items came to mind immediately: wireless technologies and video broadcasting.

Venable actively uses wireless technologies in our day-to-day business, from standard cell-phones to wireless BlackBerry e-mail devices. During the construction process of our new facility, it came to our attention that public wireless signals were virtually nonexistent towards the interior of the building. This was a significant problem. Not only do our attorneys need to use their BlackBerries and cellular phones, but visiting clientele would need to do so as well.

After contacting several wireless providers, we were informed of a product that can amplify outside wireless signals within our facility. Additionally, the equipment we selected could be used to disperse our wireless network signals (WiFi).

This created an interesting proposition: not only could we fix the commercial wireless signal problem, but we could set up wireless network coverage for 100 percent of our office space.

Since the equipment is repeating our wireless access point signal, we needed to purchase only 18 access points as opposed to the 34 to 40 access points that would have otherwise been required. The wireless access points are used to connect a wireless computer or laptop to the main "wired" network.

This essentially sets up the entire office as one giant "WiFi Hot Spot." This added mobility allows our attorneys to remain productive while working wirelessly from any location within our facility (i.e. any conference room, the library, the café, or on the terrace). Also, after being provisioned by our IT staff, any clients visiting the office can use their laptops equipped with a wireless card to access the Internet without being able to access the secure network.

Although wireless network access is not within the scope of this article, please be aware that there are a number of security risks that need to be mitigated before implementation. Without getting into great detail, unless your firm has the ability to address all of the security risks (by using enhanced authentication and encryption), I would recommend waiting for the 802.11i standard for wireless security before implementation.

Venable has a large legislative group that spends a good amount of time keeping up to date with events on Capitol Hill. A portion of that work is made up of watching cable programming such as C-SPAN. By utilizing Cisco's IP/TV we were able to integrate the TV programming with the network, which allowed us to lower the monthly recurring costs for cable TV from $35 per month per seat to $5 per month per seat.

IP/TV's ability to transmit DVD-quality video to the desktop is a powerful tool that allows us to offer distance learning using the Video on Demand feature; schedule recordings of any TV program available on our system; and transmit live, officewide presentations to the users' desktops.

For individuals who weren't amenable to viewing TV on the computer, we used Lynx Broadband's line of products to send traditional TV signals through the standard data cabling, allowing us to maintain a single cabling infrastructure. We were able to accommodate current culture requirements, while offering new outlets for information delivery and lower training costs.

With the infrastructure in place, we were able to concentrate on the formidable task of relocating our 23 servers and more than 500 workstations. As mentioned previously, this was a bifurcated move with 60 percent of the users moving on the first weekend, and the remaining 40 percent moving on the second weekend.

Maintaining Connectivity

This posed a huge challenge from the network's perspective. We needed to maintain connectivity to all servers from all users located at two different buildings without any performance degradation. Because of the large number of workstations, a huge amount of network bandwidth was needed between the offices.

We investigated several cost-effective technologies, such as line-of-site laser communications, wireless radio communications, and traditional telecommunications connections. Unfortunately, due to distance and obstructions between offices, neither laser nor wireless was viable.

To our surprise, Verizon had a new offering that suited our needs perfectly. We used a one-gigabit-per-second Transparent LAN Service (TLS) connection between our old location and new office. This connection was so fast that the end-users couldn't tell where the server was located.

Due to the speed of the Verizon TLS connection, we were able to move the servers at our discretion. In planning for the downtime weekends, we decided to move beforehand eight servers that were not mission-critical and didn't affect day-to-day work.

After a good full backup, the servers were shut down, unracked, and sent over to the new location, where they were set back up again. Upon booting up, one server decided to lose its drive configuration—and with it, all its data.

Fortunately, we had the foresight to complete a full backup before the move. With a quick restore of the drive configuration and data, the server was as good as new. The remaining servers were moved over the next two weekends without incident, and the user community was truly oblivious of the fact that half their servers were located at a different facility.

Relocating a large amount of sensitive computer equipment in such a short period of time posed many logistical challenges that weren't covered in this article. Teams of people were needed to disconnect, reconnect, and reconfigure every desktop computer and printer as it moved to the new office building.

In the end, aside from some minor issues such as missing mice and keyboards, the firm came through unscathed. With the appropriate planning, project management, and insight into the firm's culture, we were able to build a technological foundation to support the growth of the firm as well as facilitate a successful relocation.

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