

Campus Ethernet Solutions

1. Ethernet Bandwidth Revolution

Today, my company's facing many of the tough challenges confronting other organizations. My user base is increasing, we need more sophisticated applications and employees across the board are demanding multimedia among other advanced services. My old network lacked the bandwidth to meet these needs and we suffered from network congestion and latency. Instead of being a solution, the network was a problem.

Fortunately, Ethernet technologies are evolving and it's really working in our favor. Using 3Com systems, my company migrated from 10 megabits per second Ethernet connectivity to 100 megabits per second Fast Ethernet, and now to Gigabit Ethernet. The best news is that though bandwidth has increased by a factor of one hundred, the cost of Ethernet continues to drop. With bandwidth so affordable, switched end-to-end connectivity made sense, allowing us to cost-effectively offer services like telephony, an intranet and videoconferencing. In fact, 3Com, the company that pioneered switching, has driven the cost of switched Ethernet to under a hundred dollars per port.

For us, 3Com made high-speed Ethernet technologies even more practical. Flexible product designs like 10/100 autosensing ports and optional Fast and Gigabit Ethernet downlink modules protect my investment in legacy equipment. I also can leverage much of my existing cabling, as well as my staff's familiarity with Ethernet.

Moreover, I can actually afford to over-provision my network with bandwidth. With fat pipelines, I can even deliver next-generation applications without latency or congestion, future-proofing my network. I no longer invest valuable resources to tweak the network for better performance, and I'm offering true Quality of Service and Class of Service capabilities where they're of critical importance. 3Com's experts even helped me to determine how much bandwidth my company required. Above all, 3Com showed me

how to add intelligence to my network so it can sustain time-sensitive, business critical applications, even during the highest periods of network usage.

2. Breaking Barriers With Advances in Switching

I want the highest networking performance my company can get, which is why I've turned to 3Com Ethernet Campus Solutions. They give me the four Cs, which meet every aspect of my firm's connectivity needs. They are capacity, control, continuous availability, and cost of ownership that is outstanding. At the heart of 3Com Ethernet Campus Solutions are 3Com's industry-leading switching technologies.

Since 1992, 3Com's Layer 2 switches have played an increasing role in my network, giving me outstanding speed and functionality at decreasing prices. Even better, my Layer 2 switches today feature ASICs, or application specific integrated circuits, which provide greater port density and even higher performance. They let me control broadcast traffic and efficiently deliver multicasts. I also can prioritize traffic, making sure mission-critical applications are delivered in plenty of time. No wonder I refer to my Layer 2 switches as "smart" switches.

However, I still used routers to create subnetworks on my LAN and I needed to protect that investment. That's where 3Com's Layer 3 switches came in. I integrated Layer 3 switches into my architecture and even used them to replace some routers. They give me the control of routers, but with wirespeed performance and higher port density. I'm also avoiding the cost and complexity of some vendors' proprietary systems. In ways noticeable to users, I enhanced performance between my subnetworks and access to my server farms. Thanks to my combination of 3Com Layer 2 and Layer 3 switches, I've optimized my network, simplified its management and prepared it for future applications.

With 3Com's advanced network interface cards, I can further leverage the "smarts" in 3Com's Layer 2 and Layer 3 switches. 3Com's Dynamic Access software in its NICs

enables me to provide further control and lower the cost of ownership for my network AND the PCs and servers that connect to them.

Capacity, control, continuous operation and unparalleled cost of ownership – these are what 3Com Ethernet Campus Solutions deliver and why I've remained a 3Com customer over the years.

3. 3Com Approach

The power and scalability of 3Com Ethernet Campus solutions lie in the recognition that each part of the LAN has unique capacity requirements.

For desktops, 3Com advocates using high-density connections to meet current and future needs. This means installing switched 10, shared 10/100 or switched 10/100 connectivity in wiring closets. Downlinks to the data center should be Fast Ethernet or Gigabit Ethernet. In this way, the edge of the LAN can deliver strong, cost-effective networking performance.

In the data center itself, 3Com's approach is simple – wirespeed switching, aggregating links to increase switch-to-switch and server-to-switch capacity. This design calls for switched Gigabit Ethernet or aggregated Gigabit Ethernet downlinks to the campus interconnect. The interconnect features massive backbone capacity with switches delivering wirespeed links to enterprise servers.

3Com's approach to network designs ensures that each part of the LAN has the capacity it needs to meet any organization's foreseeable needs.

4. Bandwidth Hierarchy

3Com Ethernet Campus solutions recognize that the capacity needs of enterprise networks are determined by their users' requirements. Moreover, bandwidth must be provisioned in a hierarchical structure to avoid bottlenecks between the edge and core. So for a mainstream network with typical users, desktops get switched 10 or shared

10/100 links. Connections between the wiring closets and the data center are switched 100 and the campus interconnect is switched 1000.

For power user networks, switched 10/100 is required at the desktop. Aggregated switched 100 or switched 1000 provides connectivity between the wiring closets and the data center, and the campus interconnect delivers aggregated switched 1000 for maximum throughput.

A well-designed bandwidth hierarchy is essential for smooth, congestion-free performance, particularly in today's any-to-any traffic flows.

5. Link Aggregation

One way 3Com Ethernet Campus Solutions allow me to increase capacity is through link aggregation, or trunking. This strategy works at Layer 2 for point-to-point configurations, such as between two switches or a switch and a server. With link aggregation, I combine multiple physical links, like Fast Ethernet or Gigabit Ethernet connections, into a single logical link. 3Com's hashing algorithm distributes traffic across the physical links.

Link aggregation is a low-cost method to incrementally increase bandwidth between devices without changing existing modules or cabling. If a port within the link fails, traffic is rerouted across the remaining ports, providing my network with an additional measure of availability. Moreover, I can extend my Fast Ethernet connections up to two kilometers for a true campus solution.

I also like how 3Com is leading the development of the 802.3ad standard for link aggregation, which its solutions will support. In the meantime, 3Com's link aggregation interoperates with technologies from such vendors as Sun Microsystems and Cisco Systems. Thanks to 3Com, I'm ensured of a simple and cost-effective way to scale my throughput to meet any future demands.

6. Wire Speed Switching

When I invest in Fast Ethernet and Gigabit Ethernet technologies, I want what I pay for. That's maximum throughput or wirespeed performance. However, some switches and routers can't support wirespeed performance, and they bog down even more when delivering features like security, multicast control and prioritization.

That's why I turned to 3Com's Ethernet Campus Solutions with their advanced ASIC technologies. They give me true wirespeed throughput at Layer 2 and Layer 3, even when supporting advanced services. By combining wirespeed switching with over-provisioned bandwidth, I'm getting end-to-end capacity that eliminates congestion and the need to segment my network.

7. Continuous Operations / 3Com Approach

3Com understands that network availability is critical to me and that each part of my LAN has different availability requirements. That's why 3Com's strategy is to provide solutions tailored for the different parts of my network.

In my wiring closets, 3Com offers stackable as well as chassis-based devices. With these technologies, I can achieve high availability through resilient links, link aggregation and shielded twisted pair cabling.

For my data center, 3Com offers high-speed switches in both stackable and chassis designs. Moreover, I have effective options for delivering availability. These include resilient links, link aggregation, and MPLA, or multi-point link aggregation.

For my campus interconnect, 3Com again features both stackable and chassis solutions. For availability, I have the same options as in my data center, but I also can use OSPF – Open Shortest Path First – or VRRP – the Virtual Router Redundancy Protocol.

Additionally, to complete its solutions, 3Com lets me customize technical support and my staff's training to precisely meet my needs, further ensuring reliability throughout my campus network.

8. The Four 9s

I use to think that a goal of 99 percent uptime was unattainable for my network. Then 3Com explained the four 9s to me. One nine, for example, is 90 percent availability. Two nines are 99 percent availability. Two nines translate to 5,256 minute or 87.6 hours of annual downtime – a goal I've since learned is reachable, but totally inadequate for my company's needs.

Four nines, or 99.99 percent availability, mean only 52.56 minutes of annual downtime. This is realistic and what 3Com helped me to achieve. I began by monitoring my network to establish baselines and then I deployed appropriate strategies until I reached this level of availability. Thanks to 3Com, my services are interrupted for less than one hour each year, which means my users can confidently depend on the network to realize their objectives.

9. Device Level Availability

My network is critical to my company's success, and my job is to ensure its availability. That's why I've turned to 3Com's Ethernet Campus Solutions, which industry experts consistently cite for their quality and dependability. These solutions are designed for reliability at the device level and come in two forms:

Chassis-based products, like the CoreBuilder family of switches, do the heavy lifting at my data center, my building gateways and the interconnects between my campuses. They feature backup power supplies and management modules and a distributed architecture that eliminates single points of failure. Plus they're smart -- they can take actions locally to prevent faults from disrupting my service.

3Com's SuperStack products are compact and stackable, making them ideal edge devices for my wiring closets. There, I can stack the systems conveniently on top of each other and add or remove one without disrupting the others. They also offer redundant power supplies and are smart like the CoreBuilders.

Both chassis and stackables share the highest quality engineering and construction, giving me the most trustworthy products I can buy. Thanks to 3Com's Ethernet Campus Solutions, I've streamlined my management and ensured that my network is always available to meet my users' needs.

10. Network Level Availability / Active & Stand-by Resiliency

In addition to device-level availability, 3Com Ethernet Campus Solutions give me network-level availability. This protects my network if an individual device or link fails by diverting traffic to alternative paths. As a result, failures don't affect my users or any business processes.

I can achieve network-level availability using Layer 1, Layer 2 and Layer 3 technologies, and to implement these high-availability designs I can use active and stand-by resiliency mechanisms.

With active resiliency, the network always maximizes available bandwidth -- failure or no failure. There are no inactive back-up links or a primary/secondary scheme. When a failure does occur, my remaining links continue to handle the traffic flow.

With stand-by resiliency, there are back-up or secondary links held in reserve during normal operations. Should a failure occur on a primary link, the pre-configured back-up link becomes active and handles the traffic flow.

Both methods feature fast fail-over times, though active resiliency can be slightly quicker. Either maintains normal operations with hardly any disruption to services.

11. NLA / Resilient Links

Resilient links are a feature unique to 3Com Ethernet Campus Solutions. They safeguard against device or link failure. Resilient links provide secondary back-up links that take over traffic should a primary link fail. They are available for Ethernet, Fast Ethernet and Gigabit Ethernet. And the switch-over time is less than one second, which means my users will hardly notice a problem. Moreover, I get additional peace of mind knowing I'll be automatically notified whenever a secondary link is activated.

Resilient links provide effective protection in critical areas of my LAN, such as between the switches in my wiring closets and the data center. Additionally, 3Com Fast EtherLink Server NICs provide resilient links between switches and my key servers.

Depending on the protection I need, I deploy resilient links in either single-homed or dual homed configurations.

In a single-homed configuration, there is a primary link and a secondary link between two switches or a server and a switch. This protects against failure of the primary link or an interface, but not against device failure.

For additional security, I use a dual-homed configuration. Here, the secondary link is installed on a third device. Should one of the first two devices fail, traffic is automatically routed to the third over the backup link. As a result, I'm ensured that any problems will not disrupt my users or their traffic.

12. NLA / Link Aggregation

3Com's link aggregation does more than let me scale capacity between devices in my LAN; it additionally boosts my network's availability. Also known as trunking, link aggregation works on Layer 2. It consists of multiple, physical, load-sharing links that act as one logical path. 3Com's highly-efficient algorithm distributes traffic across the links as if there's a single connection. Should any link fail, traffic is automatically distributed over the remaining links. This process takes less than a second, ensuring communications are uninterrupted.

Link aggregation is a powerful way to enhance availability in critical sections of the LAN, such as switch-to-switch and switch-to-server connections in the data center or the campus interconnect. Since I can't afford downtime in the core of my network, I use link aggregation for extraordinary levels of protection.

13. NLA / MPLA

3Com's link aggregation technology offers an important capability beyond trunking. It provides MPLA, or multipoint link aggregation. Working with both Fast Ethernet and Gigabit Ethernet, MPLA dramatically increases the capacity and availability at the core of my campus LAN.

Like FDDI, MPLA provides dual-homed link resiliency on high-bandwidth, point-to-multipoint pipelines. In other words, each edge switch has a physical connection to every core switch and they communicate with each other via these aggregated multiple links. This provides system-level resiliency, eliminating single points of failure. Should I lose a device or a link, my traffic flows over the other connections, ensuring that my users and their work are uninterrupted. However, what's unique about MPLA is because all the switch ports are active, it supports automatic load-sharing, giving my network additional resiliency and efficiency.

As a result, MPLA delivers ATM-like benefits, such as load sharing, redundancy and scalability, but without ATM's complexities. The technology enables Ethernet-based campus backbones to be expandable and very robust while delivering wirespeed performance. With MPLA, I'm optimizing my bandwidth and my network's availability.

14. NLA / OSPF

To ensure high availability of my IP network, I deployed the Open Shortest Path First protocol, or OSPF. A standards-based solution, OSPF lets my routers maintain identical databases of my network's topology. Should a router fail, the other routers quickly recalculate the shortest paths in the new topology, ensuring continued services.

OSPF also provides area routing so I can subdivide my network, and it enables different subnetworks to have variable length subnet masks, letting me support discontinuous networks. This robust protocol has proven an ideal strategy for building a reliable, meshed TCP/IP infrastructure.

15. NLA / VRRP

To let hosts on my network, such as servers, know their first-hop routers are en route to their IP destinations, I use statically-configured default routes. Other methods, like dynamic routing or router discovery protocols on every host, presented me with too many issues. The trouble with default routes, however, is they provide single points of failure, which gives me big problems whenever a default router goes down.

For a solution, I turned to VRRP, or Virtual Router Redundancy Protocol. As its name implies, VRRP allows for two or more routers to act as a single virtual router. Should a VRRP-aware router fail, another automatically assumes the traffic. This standards-based

solution gives me very high availability, but without the complexities of alternative strategies.

17. Service and Support

To sustain a high availability network, my staff and I have to proactively manage my infrastructure and quickly resolve any problems that arise. Thankfully, 3Com gave me the support to do both. 3Com outlined all of my options, enabling me to determine which devices and functions worked best for my needs. Relying on a suite of professional services called Strategic Network Solutions, 3Com experts evaluated my network from design and installation, to configuration, integration and deployment. I deployed Transcend Network Management solutions so I can make sure my infrastructure operated reliably and at peak performance.

I also learned that reaching my uptime goals was not simply a matter of building a robust network with bandwidth and high-availability devices. I also needed a support strategy so I could rapidly fix problems before they took their toll on my services. Once again, 3Com showed me the big picture. Its experienced professionals helped me to assess my resources, my staff's training requirements and my recovery procedures. They explained considerations like product warranties, the logistics of parts replacement and the availability of technical information.

3Com's support was superb. It met my every requirement, from flexible support contracts and enhanced warranty terms to highly-responsive 24/7 support availability and advanced hardware replacement services. 3Com even provided us with a complete portfolio of Web-based services, including comprehensive technical support and software downloads. Moreover, 3Com, teaming with its partners, delivered near-global coverage for support, ensuring that all my sites are covered. With 3Com and its partners at my side, I know I have a well-engineered network I can effectively manage, control and maintain.

18. 3Com Approach

As my network and applications grow larger and more sophisticated, I require new strategies to effectively control them. 3Com's approach for meeting this need begins in wiring closets. Its Layer 2 switches combine simplicity with advanced features, supporting both traffic and security controls. Links to desktops are powered by Dynamic Access. In this strategy, the hardware and software perform many management functions, keeping administration to a minimum.

In the data center, smart Layer 2 switches support wirespeed Layer 3 switches. The switches provide traffic and security controls as well as access management. By using Web-based tools and Transcend management applications, administration here is moderate.

For the campus interconnect, the design is similar to the data center. Smart Layer 2 switches support wirespeed Layer 3 switches and both deliver controls for traffic, security and access. Web-based tools and Transcend management applications keep administration at moderate levels.

19. Role of Control

I've long used traditional, software-based routers in my network. They gave me bandwidth, availability and control. With them, I provided security and contained my broadcast and multicast traffic. But they've always been difficult to maintain, needing costly and time-consuming administration. Now, with today's advanced applications and services, they've become bottlenecks, causing latency and congestion. Routers also don't scale well, which means expanding my network could be complex and expensive.

My solution was simple and it works. I'm deploying Layer 2 and Layer 3 switches. I get the control and availability of routers, but at wirespeed performance. My users may not know I installed switches, but they certainly noticed the network was faster. Moreover, my switches are more affordable and simpler to operate, which gives me a lower cost of ownership. I'm also able to migrate gradually to switching, avoiding the headaches of a major network overhaul.

Using my Layer 2 and Layer 3 switches gives me ample bandwidth for my backbone with proven reliability I need. Now I deliver advanced security and contain broadcasts and multicasts, but without degrading my network's performance.

I still use routers. I need them at the LAN/WAN boundary to connect different technologies and provide firewalls. But I've learned to distinguish between "routers" and "routing," which is the difference between form and function. So, I'm using Layer 2 and Layer 3 switches wherever I can. Getting the control of routers as well as the speed, affordability and simplicity of switches is a win-win proposition.

20. Broadcast Multicast Containment / Broadcast Throttling

When I was building my network, I worried about controlling broadcast and multicast traffic. I didn't want these packets creating "storms" within a segment and degrading performance. Fortunately, 3Com switches give me broadcast throttling, which lets me limit broadcast and multicast traffic on a per port basis. This means I can contain the amount of bandwidth these packets consume on any segment. By using management tools like RMON, I configure alarms to notify me with my thresholds are reached. No more disruptive broadcast storms. Thanks to these throttling mechanisms, I've created larger subnetworks, which reduces the number of router ports I have to configure and simplifies overall management.

21. BMC / 802.1Q VLANs

I've wanted to implement virtual LANs, or VLANs, but for the longest time, there's been no standard for their creation. Each vendor seemed to have its own proprietary methods for deploying them. As a result, I backed off VLANs for fear they would cause interoperability issues with the various devices on my network.

This is why I was so excited by 3Com's support of the 802.1Q protocol, which standardizes the creation of VLANs once and for all. With 3Com's Ethernet Campus Solutions, I can implement VLANs on my network without worrying about incompatibility caused by legacy devices from other vendors. More importantly, 3Com's support is end-to-end, extending through its switches down to the Dynamic Access software in its NICs.

I know that there are other solutions that can give me some of the features of VLANs. Layer 3 switches, for example, provide the control of VLANs, but at wirespeed performance. My 3Com-supported VLANs, however, have proven extremely useful. They're simpler to configure than routing interfaces, so I use them to reduce the number of routers I need, making my job easier.

I deploy protocol-based VLANs to connect all my traffic to routers, thereby integrating the various protocols on my LAN. I also rely on port-based VLANs to separate my user communities, thus providing security for departments with sensitive traffic.

Moreover, with 3Com's end-to-end support, I use VLANs to deploy Class of Service control based on the 802.1p standard for prioritization. Now I can reliably deliver mission-critical apps and data throughout my LAN. For these reasons, I'll continue to use VLANs to optimize my network and streamline its management.

23. Class of Service

As I deployed high-bandwidth, time-sensitive apps, my network became congested. During heavy usage, my switches buffered traffic but without any regard to the importance of individual applications. Critical apps suffered latency as they competed for bandwidth with low priority traffic. I needed a way to prioritize traffic. Fortunately, 3Com Ethernet Campus Solutions provide me standards-based 802.1p with Dynamic Access software. Now I can centrally prioritize applications across my network, giving business-critical apps top priority. With this strategy, my packets are labeled according to their assigned priority, enabling my switches, servers and desktops to know which apps require timely end-to-end delivery. I have an efficient class-of-service solution that delivers my critical applications with the highest service levels possible throughout my entire network. And it works. Converged applications such as videoconferencing are now smooth and jitter-free. In fact, during peak congestion, my prioritized traffic gets up to 28 times the throughput of unprioritized traffic.

24. PPN / Intro/ Den/ Traffic Priority

I'm under pressure to deliver increasingly sophisticated apps and services, so I have to leverage my networking resources. This means I no longer can afford to simply manage my network on the device level, doing things like configurations, monitoring and troubleshooting. Instead, I need to broaden my management strategy. I need to make my network operate as I want it to – according to set policies or rules that support my company's business needs.

This is what 3Com calls Policy Powered Networking. It's 3Com's vision of next-generation management where I set policies to control how my network performs. Basically, policies are any planned mechanisms that influence the forwarding of packets through network devices, and they support all kinds of functions – security, traffic prioritization, user access, service levels, configurations – whatever benefits my organization.

3Com's policy elements are supported by a framework called Directory-Enabled Networking, or DEN. A directory is a dedicated database that contains information about all the nodes and devices attached to my enterprise network. 3Com has been at the forefront of establishing industry-wide standards for this powerful technology. DEN has proven to be an effective tool for simplifying and automating the management of a large network like mine. Using 3Com's Policy Powered Networking, I've made my system safer, more efficient and less costly to operate and maintain.

Relying on the intelligence built into 3Com's switches, NICs and other network devices, I've established policies in key areas, such as traffic prioritization. Rather than have all my traffic compete equally for bandwidth, I prioritize my essential apps over routine traffic to ensure their timely delivery. In effect, I've made my bandwidth smart. Using Quality of Service and Class of Service policies, I'm able to converge my voice, video and data, delivering multimedia apps like LAN telephony and jitter-free videoconferencing. In fact, using 802.1p and other technologies, 3Com is helping me implement prioritization end-to-end across my LAN, WAN and beyond to enhance my firm's business processes.

25. PPN/Security

3Com's Policy-Powered Networking has allowed me to provide my network with an additional measure of protection. Since my policies can apply to users and groups, not just devices, I use them to restrict access to sensitive parts of my network, providing a comfort zone of security.

26. PPN/Device Configuration

Thanks to 3Com's Policy-Powered Networking, I use policies to greatly simplify management by automating such time-consuming tasks as configurations, software updates and address management, freeing up my time and resources. What's more,

policies result in more consistent and predictable networking behavior, making my job easier.

28. 3Com Approach

As I upgrade my network to keep pace with evolving business needs, I must invest my resources with an eye on containing costs. I chose 3Com's Ethernet Campus Solutions because they lower my cost of ownership while providing the scalability I require to meet any foreseeable demands.

The switches in my wiring closets and the NICs in my desktops feature 10/100 scalability. The downlinks to my wiring closets are scalable Fast Ethernet or Gigabit Ethernet.

The switches in my data center support multiple legacy protocols, protecting my investments in these technologies. These solutions are highly-scalable and provide the features and policies I'll need for next-generation applications.

At my campus interconnect, I have a backbone that is scalable to multi-gigabit speeds, future-proofing my network and maximizing my investment. Since my 3Com systems support all major standards, they are interoperable with my legacy devices, allowing me to cost-efficiently migrate over time.

29. Interoperability in the LAN

When I needed to improve my network, a primary concern was whether new platforms or systems would support my existing LAN protocols. 3Com eliminated this worry due to its commitment to industry standards and building scaleable network designs. Its Ethernet Campus Solutions work with all major networking technologies – Ethernet, Fast Ethernet, Gigabit Ethernet, FDDI, IP, IPX and AppleTalk.

Even better, they provide superior networking performance. Their advanced ASIC architecture delivers wirespeed switching and routing, even when sophisticated features

like packet filtering and Quality of Service are deployed. That's why 3Com refers to its solutions as the "ultimate migration machines" – they give me unequalled performance while coexisting with my legacy systems and allowing me to migrate to new network applications.

I've used them to create high-speed VLANs to support both routable and non-routable protocol traffic. Of course, by using VLANs with my high-performance switches, I've eliminated the bottlenecks caused by my legacy routers. I've even reduced the amount of routing in my data center by placing individual servers in multiple switched VLAN domains.

30. Interoperability in the WAN

As I took steps to enhance my networking infrastructure, I was worried about the interoperability between my LAN and WAN. After all, my LAN and WAN are fundamentally different and operate at different speeds. That's not about to change. My solution was simple and cost-effective. I deployed my legacy routers as gateways between my LAN and WAN. Serving as gateways is what they do best.

To ensure interoperability between my WAN gateways and my LAN, I turned to 3Com's Layer 3 switches to communicate with the legacy routers. They use industry-standard protocols like RIP, OSPF, DVMRP and RSVP to communicate with my routers. The result is a seamless infrastructure that delivers business-critical connectivity throughout my enterprise.

31. Managed PCs

Studies by Gartner and others show that the total cost of running a PC in a corporate LAN environment is over ten thousand dollars a year. We did our own cost-of-

ownership study and found that we spent 75 percent of our money managing our PCs. The real cost wasn't buying the box, but maintaining it. We needed to manage our PCs more intelligently.

That's where our 3Com NICs helped us. They give me much more than connectivity, with features like Remote Wake Up, DMI 2.0 support, and a Pre-OS Boot Agent. With a motherboard connection or PCI 2.2 support, we can power on PCs remotely using our 3Com NICs. It's a big improvement over how we used to do our maintenance and upgrades. The DMI agents enable us to do automated centralized inventory and asset management, and to track and monitor PC resource utilization. The Managed PC Boot Agent delivers a "Pre OS" boot function so we can remotely and automatically install system software on new PCs. We can also do network-wide OS upgrades, repair damaged desktops, and do faster disaster recovery, even when the PC does not boot remotely. All that, and the 3Com desktop management features are compatible with all the main boot protocols and management applications. 3Com NICs are the best in reliability and performance. Now they help us manage our desktops intelligently and they save us money.

32. Standards

3Com has long been committed to integrating industry standards into its Ethernet Campus Solutions. This ensures customers of full compatibility in multi-vendor networks, lower costs of ownership and unparalleled investment protection. 3Com engineers and system architects actively participate in the design and development of networking standards. 3Com solutions are built around key standards such as:

IEEE 802.3z for Gigabit Ethernet

802.1D

802.1p for traffic prioritization

802.1Q for VLANs

802.3ad for link aggregation

GARP

IGMP

DVMRP

OSPF

VRRP

As well as all emerging standards.

33. Technology Guarantee Program

For my firm to remain competitive, my users need leading edge applications and services. The question is: how can my network keep pace as new technologies and solutions continue to roll out? I can 't afford to trash my old devices and buy new ones every few years.

3Com has devised the perfect solution – the 3Com Technology Guarantee Program. It lets me buy qualified 3Com products now and return them within two years for a pro-rated credit toward next-generation 3Com devices. This means I can buy products today with investment protection for tomorrow's solutions.

What's more, 3Com complements the Technology Guarantee Program with trade-up programs that allow me to trade in equipment from 3Com or even other vendors, such as Bay or Cisco for rebates on new 3Com gear. Thanks to 3Com, I'm stretching my budget, and leveraging my current investments to meet future networking needs. My network stays ahead of the curve and so does my company.

35. Migration Scenarios

I needed to migrate my FDDI-based campus LAN to a Gigabit Ethernet backbone with high capacity, availability and scalability. At the same time, I had to protect my investments in legacy systems.

My original FDDI backbone provided server access and links for two Fast Ethernet subnetworks. However, the volume of traffic passing through the backbone caused congestion and latency.

To boost my network's capacity and resiliency while preserving my legacy gear, I aggregated, or trunked, my backbone, which quickly increased available bandwidth. Furthermore, I deployed Fast Ethernet and Gigabit Ethernet connections to support my workstations. As a result, I greatly improved networking performance without disturbing much of my existing system.

To achieve a truly modern Ethernet Campus Solution, I replaced my trunked FDDI backbone with a Gigabit Ethernet MPLA backbone, which dramatically enhanced my capacity and provided outstanding scalability. I also continued to migrate links between users and the wiring closets to higher speeds. This strategy lets me gradually and cost-effectively transform my network into a powerful, scalable system poised to meet any future needs.