

WHITE PAPER

3Com[®]
Solutions:
PRESCRIPTION
FOR A VITAL
NETWORK
HEALTH CHECK



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IT managers build, maintain, and in many cases stake their reputations on the networks they support. No one knows their network better than they do, or has a bigger stake in the network's performance. However, a network health check, performed by a third party with specialized equipment, can augment the IT manager's position by providing new data to back assumptions, a fresh perspective on the network architecture and insight into the impact of emerging technologies. A health check can capture and analyze information that the in-house staff does not have the test equipment or bandwidth to collect. From short-term goals like improving performance to creating a long-term network development plan, every IT manager should periodically consider outsourcing their network health check.

IDENTIFY THE GOAL

A professional network health check begins with an interview to determine the company's objectives for the network. Is the primary goal of the network to share applications or simply a method to gain access to the internet? What type of traffic is being passed? What is the strategy behind the current architecture? What percentage of the company's employees travel or work remotely? Are there chronic problems or concerns that need to be addressed? What changes are anticipated? The answers to these questions set the context for what tests to perform, on which segments, under what conditions and for how long. It also guides the engineer when applying his expertise to the interpretation of the data and the recommendations.

Network health checks typically focus on the Local Area Network (LAN) but IT managers who are looking at a converged voice and data network will want to select a health check provider that can extend the tests to include the Wide Area Network (WAN). Testing the routers from point to point provides important information about pipe utilization so it can be accurately adjusted to meet the requirements of the converged environment. Testing WAN traffic is also an opportunity to verify that the carrier is meeting its service level agreements.

OBTAIN PHYSICAL AND LOGICAL VIEWS

Mapping the physical layout of a network can be difficult and time consuming. However, the physical location of cabling, workstations, servers and switches can impact performance, equipment longevity, maintenance, troubleshooting and security. 3Com's Network Health Check uses specialized software with the ability to view the physical network in its active form as well as view the intricacies of the logical network connections from each central point out to the extended edge station.

The term "logical network" refers to the connections that run over the physical network infrastructure. These include assigned IP addresses, routing tables, and transport levels. A physical view and a logical view of the same network can be very different.

A good example of the importance of mapping both views was a mid-size insurance company where all of the application servers were physically protected by placing them in the company's main facility. The application servers were considered the core of the network and all of the outlying buildings were attached to the servers in order to share applications. The logical network diagram, created as part of 3Com's Network Health Check, revealed that those core servers were actually on the edge of the network and extremely vulnerable. The logical diagram also illustrated that this network had a single point of failure that could have brought data transfer to a sudden halt, see Figure 1.

This customer had commissioned the network health check to determine a reason for data traffic congestion. The findings were instrumental in insuring that not only was network performance increased, but the customer's data flow was protected in the event of an equipment failure, see Figure 2.

MEASURE PERFORMANCE LEVELS

IT managers have many reasons for employing a network health check. These can include reliability, utilization measurements, or even protocol distribution concerns. Whatever the reason, a network health check replaces concerns with quantified, actionable data about the network's performance.

A network health check should use industry standard metrics to measure network utilization levels, broadcast rates, and error rates of specified segments during actual business usage on key segments. It should also provide information about the distribution of protocols and applications as well as decode them when there are indications that they may be the source of the problem.

Frames should also be decoded to extract performance information. A common problem in a high usage environment is a delay in response or "window" error. Network users often report this type of occurrence as an application issue. Reports run during a network health check should break down the data flow to a level of granularity that enables the engineer to find the specific server that is causing the problem, see Figure 3 on the following page.

APPLY THE DATA

Interpreting data from network analyzers is a demanding science where the obvious conclusion may not be the real answer and first-hand experience is crucial. The software tools used to capture the data are very powerful, but the engineer must know what filters to set and where to place them. Identifying the root cause of performance issues requires a full understanding of how applications, protocols, network topologies and products interact and influence performance. It is important to select a network health check provider that is experienced using the latest analytical tools and accustomed to working in this complex and varied environment. The report should make recommendations for improving performance and extending network capacity. Suggestions for effective upgrades and network growth should also be included.

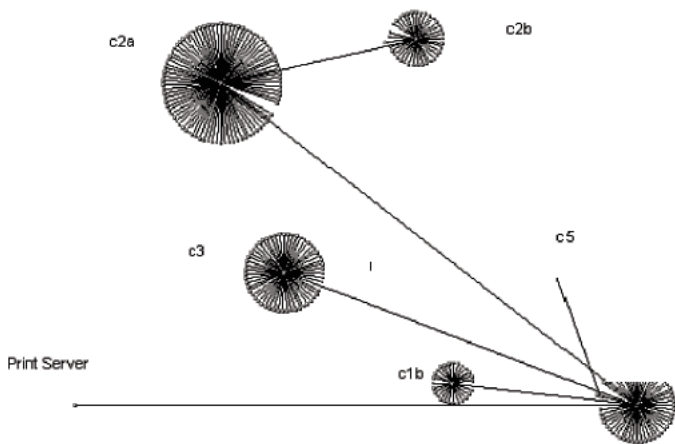


FIGURE 1. The main hub, at the bottom right of this diagram, connects to the outlying center points. The design lacked alternate paths in the event of failure.

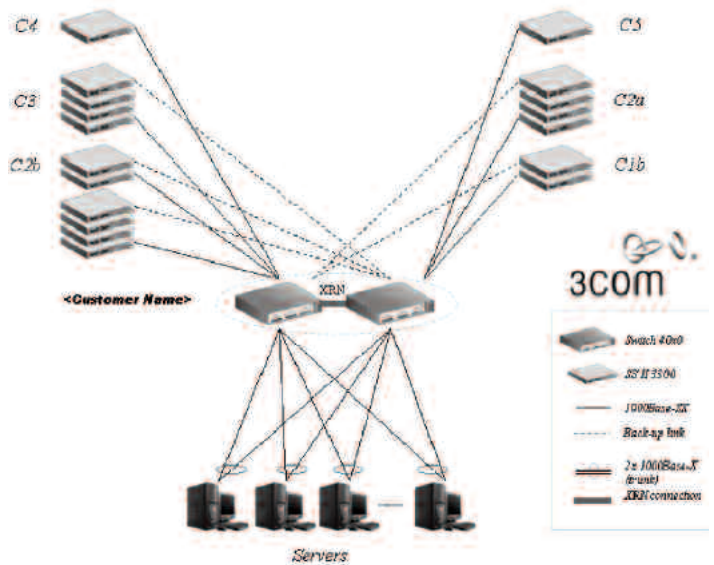


Figure 2. Upon completion of the network health check 3Com recommended network modifications that allowed increased functionality as well as redundancy to prevent network downtime. This was detailed in the final report and illustrated as shown in the drawing above.

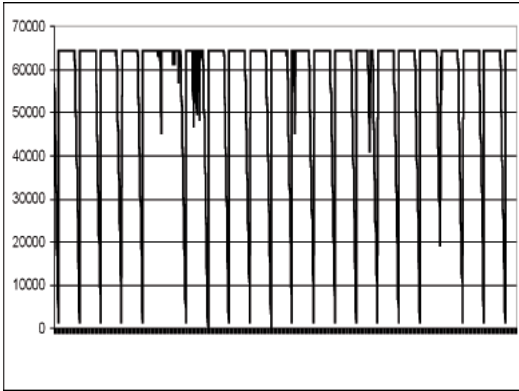


Figure 3. This chart shows a detailed analysis of a receive window that has gone below its original maximum value but repeatedly recovers without reaching zero. The fluctuation causes the window size to drop, resulting in poor data flow. Once identified, the problem is typically resolved by allocating additional memory to the responsible server.

Following in-depth analysis of the data, your network health check provider should give you a written report that includes the network topology, an inventory of critical devices, and an explanation of the methods used. It should include charts and graphs wherever possible. It should also include the raw data along with suggested ways that the data can be further utilized.

In addition to a final report, the network health check should conclude with a discussion of the findings. This is the IT manager's opportunity to ask questions about the recommendations, play out the implications, and explore ways to implement changes in stages. A vital network health check, delivered by an experienced professional, empowers the IT manager with new information, provides a reference point for future comparison and suggests network enhancements that support that company's strategic objectives.

SUMMARY

3Com Global Services puts an emphasis on pragmatic, business-oriented results. 3Com Corporation offers a portfolio of wireless LAN, IP telephony, and data network assessment services to help businesses achieve their objectives and maximize the value of their network. 3Com is a leading provider of secure, converged voice, WAN and LAN data networking solutions for enterprises of all sizes. Learn more about 3Com's innovative products and services at www.3com.com.

ABOUT THE AUTHOR

Ed Sturm, a product developer for 3Com Global Services, brings extensive experience to his discussion of network health checks. During more than a dozen years in the telecommunications and networking industries, he has focused on professional services offerings. Ed began his 3Com career as an engineer tasked with enhancing support process for 3Com's products. He earned a Bachelors Degree in Business with a minor in Electronic Engineering following ten years as an electronics technician with the U.S. Navy.

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