White Paper

Network Problems on the Frontline: Turning techs into fast problem solvers

Network technicians today face many problems on the frontline. What may seem to be a simple network problem with a simple solution can quickly turn into an all-day effort involving several levels of IT personnel to identify, isolate, and resolve. Today technicians are presented with more network tools than ever – open source, vendor supported, laptop software, handheld, etc. These tools often give data that is difficult even for network experts to interpret. In many cases, several tools are needed to get to the bottom line, which simply takes too much time.

This whitepaper will describe the problems facing technicians today, and will illustrate how self-interpreting tools will turn network techs into fast problem solvers, not just problem finders.

Table of contents

A day in the life of a network tech 2

Health Audit to the rescue 3

Speed troubleshooting scenarios: 5

Network Connectivity Problem

Network Slowness – Virus Problem

Network Slowness – Duplex Problem

Conclusion 8

FLUKE networks

A day in the life of a network technician

Typical network tech troubleshooting scenario – network is reported to be slow

A frustrated user was just kicked out of his critical application and calls the IT Help Desk to find out what is going on. The monitoring tools in the data center show everything is fine, so a network technician is dispatched to the wing of the building where the user is located. The tech is armed with a laptop loaded with a ping tool, an SNMP tool, a DNS Service tool, an application connectivity tool, a client simulator, a throughput software utility, an open-source packet analyzer, a traffic analysis utility, a DHCP tool, and an SSH client to be able to log into the switch to check speed, duplex, and VLAN assignment of the switch port. Just to cover his bases, he also carries a bag with a toner, cable tester, and a termination kit in case all else fails and he needs to check the cabling. Once at the desk of the problem user, he starts several different tools and begins testing the network from that location, hoping to put together the right recipe of details from all these tools to isolate and resolve the problem.

The clock is ticking.

More tools than ever before are available to network technicians today. These tools, many of which are software utilities or programs designed for use on portable laptops, provide the user with only a piece of the information necessary to isolate the root cause of a problem. Combining outputs from several different tools is required to define, prove, resolve, and document a problem. The fact that multiple tools are needed can add extra time and training to the troubleshooting process, which adds to the overall cost of network maintenance. Often, complex test results may require escalation to a senior network engineer for analysis and next-step decision making. This too can add a huge amount of time to problem resolution on even simple network problems, revealing a very simple truth: a tool is only as good as the technician interpreting it.

There is a clear need in the frontline technician arena for a tool which runs several different tests to cover all vital signs of network connectivity and core service testing. This tool should also be self-interpreting with automated problem identification, eliminating complex screens which can only be read by an expert.

Health Audit test to the rescue!

The EtherScope™ Network Assistant is exclusively equipped with a test which delivers on this need. The Health Audit test is a system of network troubleshooting tests geared to the frontline – providing simple, readable, actionable test results to the network technician. The Heath Audit test runs with just one touch of a button, and after a few minutes, the user has the test results and details necessary to know what steps to take next to resolve common network problems. The ease of use and automatic test interpretation make this a practical, money-saving tool for all network environments.

What is a Health Audit?

Almost every time we go to the doctor, we get our vital signs checked. Our pulse, blood pressure, weight, temperature, and breathing are checked regardless of what physical symptoms we may have. Why? These are critical indicators that assess the basic functions of the body. If there are problems with these indicators, the doctor can immediately steer his analysis to focus on the problem.

Figure 1: Troubleshoot the network by clicking the Health Audit icon

On a network, a Health Audit works in a very similar way, only instead of needing doctor-level experience to interpret the results, the test takes care of the interpretation automatically. The user is provided with simple, good-fair-poor health status indicators for individual test results, and a good-fair-poor indication for the overall LAN health. This allows the technician to quickly see what aspect of the network requires attention. If more detail about a certain test is needed, one click displays in-depth test results for further analysis.

The Health Audit not only helps to resolve active problems, but it can also help to prevent them. By running this test during network upgrades or expansions, performance killers can be found and resolved before they are experienced by the users.

Health Audit Test Details

The Health Audit test assesses test results from nine critical network areas, including key services, protocols, and network resources. The nine tests are:

1. **Cable Test –** Measures twisted pair cabling characteristics
2. **Link Test –** Auto-negotiation signaling test
3. **Connection Test –** Connectivity and DHCP test
4. **IP Problems Test –** Displays duplicate or bad IP address, lost DHCP lease, as well as an address already in use
5. **Traffic Test –** Measures traffic against defined thresholds for collision, broadcast and unicast levels
6. **Nearest Switch Test –** Shows switch port connectivity, VLAN information, as well as utilization and errors on the nearest switch
7. **Protocol Test –** Displays network protocols by protocol percentage and packet count
8. **Key Device Test –** Availability of key servers and network devices
9. **Networks Test –** EtherScope looks for network problems such as bad subnet mask, unresponsive router, incorrect domain, and networks with only one isolated device

The Health Audit test will check all these vital signs, analyze the output of each test, and provide an overall health status indicator based on the results.

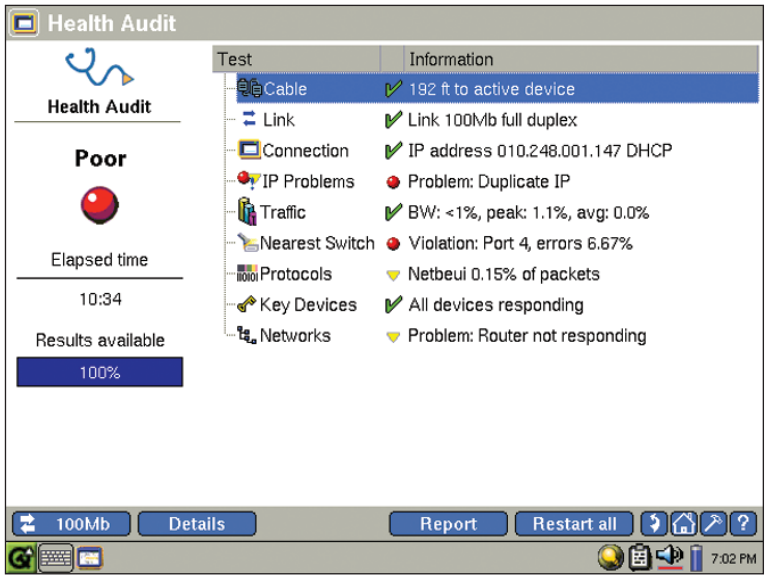

Figure 2: Health status indicators provide a clear picture of LAN health

With the Health Audit, anyone can be a problem solver. The overall health will equal the lowest test output result. For example, if eight tests receive a "good" health score, but one test receives a "poor" score, the overall LAN health indicator will be "poor". From these test results, the technician immediately can take action on the problem area of the network, rather than sifting through the results from several tools to try to piece together a complete picture.

All networks are different, and "normal" traffic levels change based on environment. To address this, Health Audit thresholds for problem-level reporting can be user-configured, allowing for flexibility in defining when a test result is interpreted as a problem.

After the Health Audit tests have been run, reports can be generated for fast and easy problem documentation. These reports can also be used as a baseline to demonstrate network health.

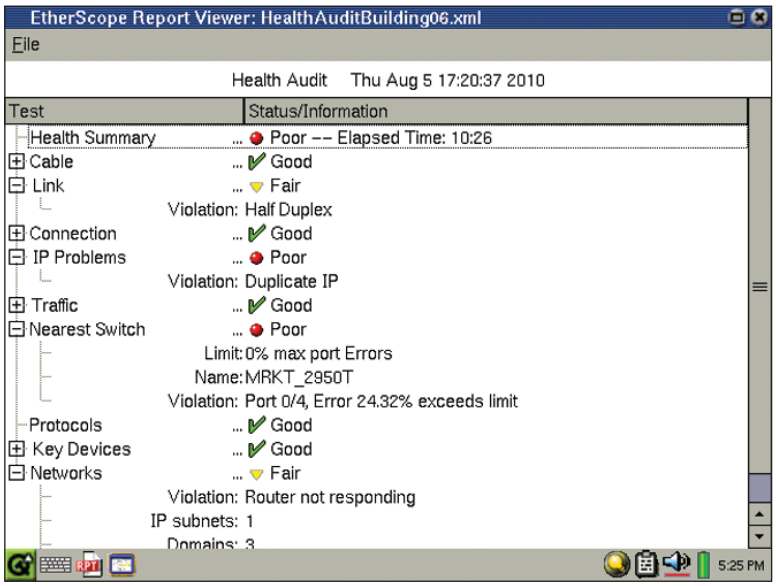

Figure 3: Save Health Audit reports

Scenarios:

Network Connectivity Problem

A large manufacturing company was having problems with users logging onto the network. Some people were able to connect and access applications with no problems, but others were having difficulty using any network services.

Using the EtherScope Network Assistant, a technician was dispatched to an area of the network where problems were being reported, while at the same time, a network engineer began to capture packets on the system where he assumed the problem was. After a few minutes, the Health Audit was complete, and the technician saw a "poor" health indicator next to the Connection test on the EtherScope. Using the Connection Log in the test details, he was able to quickly see that the DHCP server was no longer handing out IP leases and he was able to report this to the server team within a few minutes. The server team quickly identified and resolved the problem in one of the DHCP scopes.

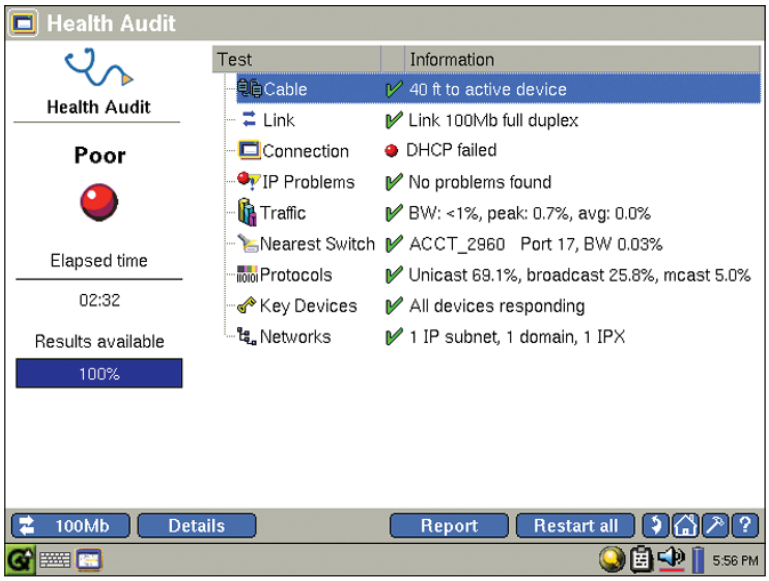

Figure 4: Health indicators identify the source of the problem

Meanwhile, the engineer who used the protocol analyzer was busy applying display filters to the traffic stream he was analyzing, trying to find the needle in the packet haystack which would show why users are not able to access the network.

In this case, the EtherScope located and flagged the problem with actionable data, much quicker than other tools.

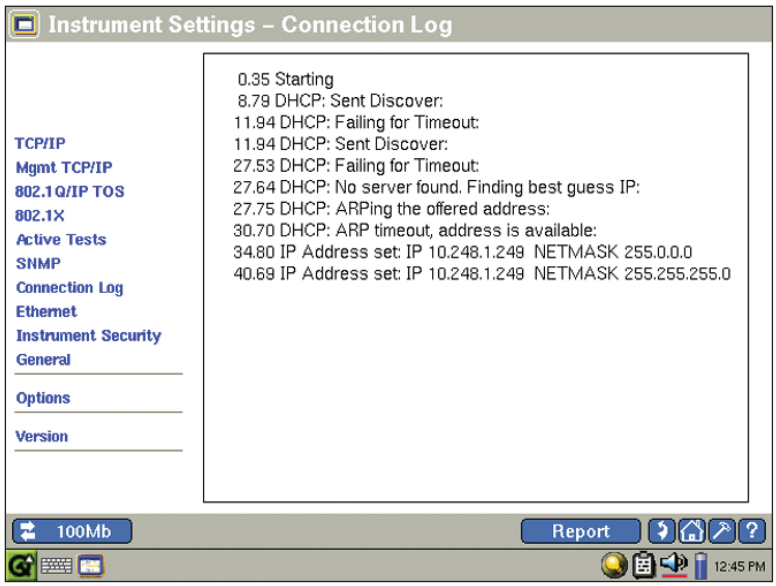

Figure 5: Guided troubleshooting helps technicians resolve problems fast

Network Slowness – Virus Problem

In another environment, users were calling into the help desk complaining of network slowness. There weren't reports of network outages or downtime, only reports that critical applications seemed slower than usual. The application monitors in the data center showed that all servers were responding quickly to user requests and that no backups were occurring at present. There didn't seem to be problems on the server side.

A network technician was dispatched to check the network from the client perspective. After running the Health Audit test, the problem was quite obvious to the tech. There was a huge amount of broadcast traffic on the network.

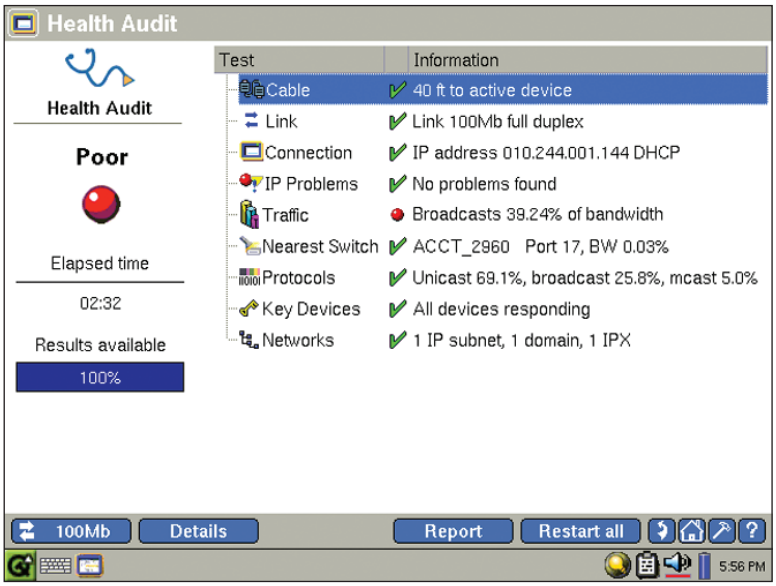

Figure 6: Excessive broadcast traffic causing poor network health

After a few more minutes, the technician was able to drill into the traffic area of the EtherScope and determine exactly which host on the network was generating these broadcasts. This report was sent to the Engineering team for resolution. They were able to isolate the device and find that it was infected with a virus designed to blast broadcast traffic on the network.

Once this device was identified and removed, network performance returned to normal.

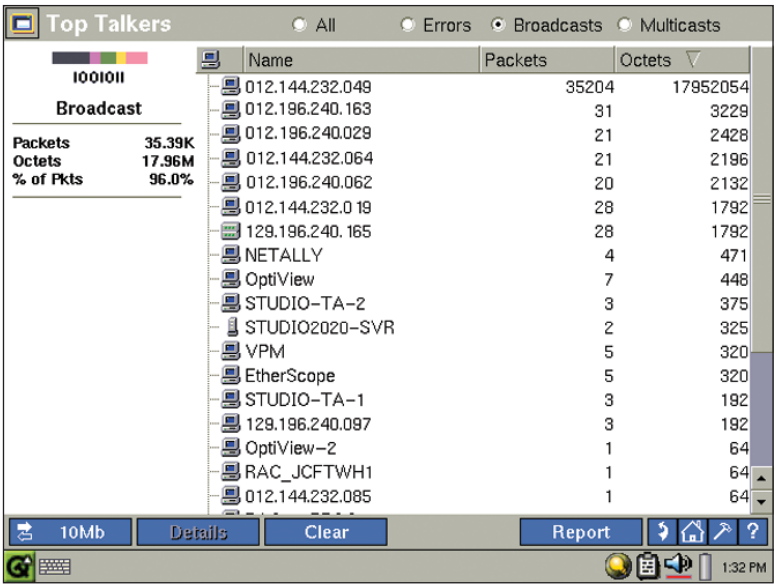

Figure 7: Intelligent drill-downs identify the problem devices

Network Slowness – Duplex Problem

After performing a network expansion, one wing of a building was reporting slow network connectivity. The problem didn't seem to be affecting other areas of the network, only the area where a new switch was installed to provide access to more users. Application monitors revealed that the servers were performing normally, so a network technician was sent to the problem area. Using the EtherScope Health Audit test, he ran a comprehensive scan of the network vital signs.

The test showed that the new switch had Ethernet errors on the port and the link test result showed that the EtherScope connected at 100Mbps half duplex. Using the details from the link test, the tech was able to see that the switch was not sending auto-negotiation signaling.

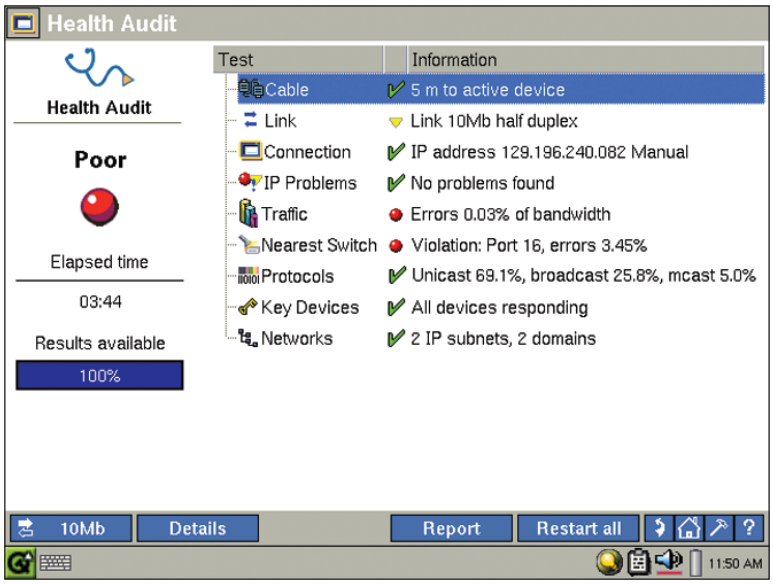

Figure 8: Poor health due to errors

After reporting this to the Engineering team, they found that every port on the new switch had been set to 100Mbps Full duplex, forcing every device to auto-negotiate to 100Mbps half duplex. This resulted in every port experiencing CRC and FCS errors and poor throughput.

Within a few minutes the network technician was able to spot the problem, drill into the details, and give fact-based test results to the IT team.

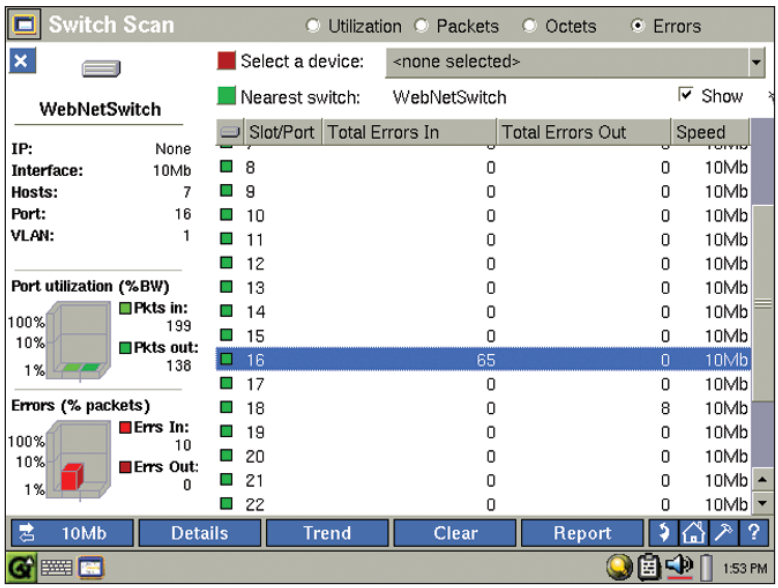

Figure 9: View switch interface statistics to troubleshoot problems and close trouble tickets

Fluke Networks' EtherScope Series II Network Assistant is your fast assistant for LAN and Wi-Fi installation and troubleshooting. The EtherScope is a handheld portable network troubleshooting tool for 10, 100 and Gigabit copper, fiber and wireless LANs. It combines essential tools that help frontline network professionals quickly solve the wide range of problems they encounter.

The handheld EtherScope Gigabit LAN and 802.11 Wi-Fi analyzer assists network professionals with installation, validation and troubleshooting. Install and integrate infrastructure easily by testing, verifying and fixing configuration issues during deployment. Validate network performance and service delivery by measuring key performance attributes and the availability and responsiveness of essential resources. Diagnosis LAN health with one click. Close trouble tickets fast with guided drill-downs to the root cause. Audit network performance on a regular, periodic basis to identify and correct emerging issues. The EtherScope Network Assistant makes testing is so simple, practically anyone can troubleshoot problems instantly.

Take EtherScope and the new Health Audit for a virtual test drive – **www.flukenetworks.com/healthaudit**

Conclusion

These scenarios clearly show the benefit of having a tool that quickly determines the health of several areas of the network, including IP issues, DHCP problems, and switch problems. In each of these cases, it would have taken several tools and an experienced engineer to find the causes of the network problems. It almost certainly would have taken much longer than an EtherScope with Health Audit. The Health Audit test makes finding front-line network problems fast, easy, and actionable. It turns technicians with minimal training and experience into fast problem solvers, not just a problem finders.

The EtherScope Health Audit test provides visual diagnostics of LAN health with one click, visual health indicators on one screen, guided troubleshooting, and LAN health reports. Health Audit makes network testing so simple, practically any technician can use it to instantly troubleshoot network problems.