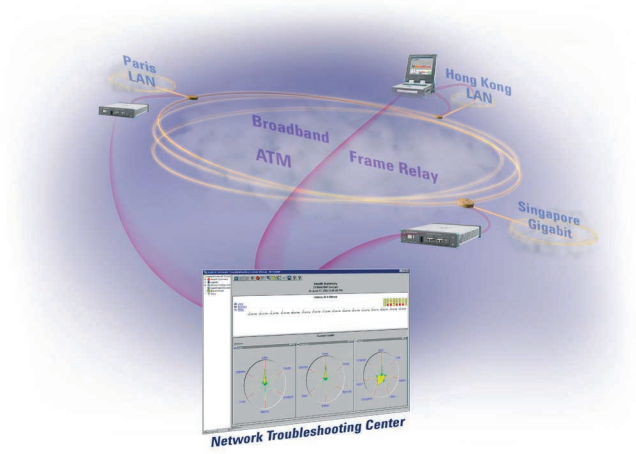
J6781A Network Troubleshooting Center

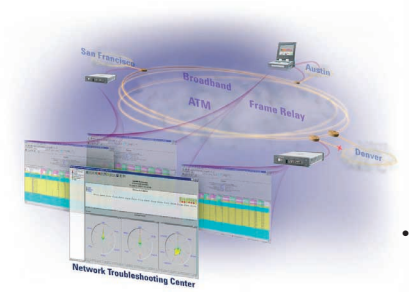
Technical Overview



Centralized Network Troubleshooting Solutions

Agilent Technologies

Network Troubleshooting Center



Agilent's centralized network troubleshooting solutions, featuring the Network Analyzer and the Network Troubleshooting Center, significantly reduce the time, people, and expertise needed to solve the most costly problems in today's multi-site, multi-technology networks.

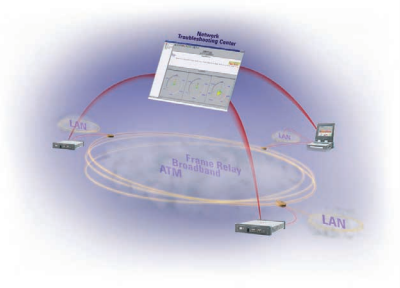
The Network Troubleshooting Center (NTC) places the power of multiple Agilent Network Analyzer platforms and other test agents in the hands of a single, centrally located individual or group. Together with the Network Analyzer product family, NTC provides a centralized troubleshooting solution that:

- Expedites problem resolution by providing aggregated network-wide views of performance across multiple LAN and WAN technologies
- Provides seamless integration between problem isolation and troubleshooting
- Enables rapid progression from problem detection and isolation to resolution with integrated RMON statistics analysis and advanced troubleshooting
- Eliminates the need for expert engineers/technicians at multiple locations, thus enabling a smaller workforce and reducing travel
- Reduces training time and workflow interruptions by providing a common solution and interface for both centralized testing and dispatched testing; and for multiple LAN and WAN technologies

NTC is a software solution that provides single-user and multi-user access to information collected from one or more Agilent Network Analyzer platforms and other data sources on a network. It also provides remote access to one or more Network Analyzer platforms.

NTC processes and correlates data into intelligent information, useful for problem isolation and troubleshooting. It also provides aggregated views of network health and performance, along with the ability to drill down to detailed views of individual LANs, WANs, switches, nodes, connections, protocols, and error types. This enables the user to quickly go from identifying a problem from an overall view of a network to isolating the location and nature of the problem. NTC then allows the user to open remote Network Analyzer applications for advanced troubleshooting at the source of the problem.

Centralized Network Troubleshooting



Fast Ethernet. Gigabit Ethernet. ATM. Frame Relay. Packet over SONET. T3/E3. OC-3/STM-1. Voice. Data. 3G mobile. It is evident today's networks are significantly more complex than ever before, and the demands of installing and maintaining them are growing while companies are reducing workforces.

Troubleshooting today's networks is technically more difficult for several reasons:

- More problems are occurring in layers 3-7
  In 1990, network engineers reported that a majority of network problems occur in layers 1-2. By 2001, they reported that a majority of network problems were now occurring in layers 3-7. Problems in the network layer and above are often distributed, spanning many network links and nodes. This makes problem isolation more difficult.
- Problems are distributed across different network technologies, requiring more network expertise
  Networks comprise different technologies and network problems, and therefore network problems often span across these different technologies, including Fast Ethernet, Gigabit Ethernet, ATM, and Frame Relay. This increases the expertise needed to identify and solve network problems.
- Performance benchmarks focused on end-to-end services and applications, rather than segment-by-segment technologies
  With deployments of multiple services (voice, data, mobile, video) on a single network, performance must be delivered from end-user to end-user. This means testing and troubleshooting performance problems must focus on end-to-end performance, rather than just the performance of a single link or segment.
- Switched networks vs. hubbed/shared
  The deployment of switched networks in the late 1990s means that no longer can one analyze traffic for all LAN nodes simultaneously by connecting an analyzer to a single hub port.

Troubleshooting today's networks is also economically more difficult for several reasons:

- Workforce reductions result in significantly fewer people to fix problems on a network, even though the number of problems hasn't decreased.
- Centralization of experts: As companies slash operating budgets, skilled engineers and technicians can no longer be deployed to all network sites and must maintain the network from a centralized location.
- Reduced travel budgets prohibit companies from dispatching engineers and technicians to various locations whenever there is a problem.

Agilent's centralized troubleshooting solution introduces powerful new capabilities for network engineers and technicians. It empowers them to identify and solve complex problems on a distributed network, even a global network, from a single location. It simplifies and expedites the process for identifying, isolating, and troubleshooting problems that span multiple network links, nodes, and even different technologies. For example, an IP routing problem can disrupt network traffic beginning on a Fast Ethernet node, to a Gigabit Ethernet access network, to an ATM link, and across a WAN to another Gigabit Ethernet access network. With Agilent's NTC and Network Analyzer products, which provide a single solution for analyzing the network at each segment and for each technology, such problems can be quickly identified, isolated, and fixed.

Agilent's centralized troubleshooting solution can:

- Increase the efficiency of a smaller workforce
- Reduce training needs for engineers and technicians by providing a single solution for all network troubleshooting
- Simplify the troubleshooting of complex problems
- Enable troubleshooting on widely distributed LAN and WAN networks from a single location
- Reduce travel requirements

NTC Centralizes the Power of Multiple Network Analyzers

Agilent's Network Troubleshooting Center (NTC) integrates and centralizes troubleshooting capabilities from multiple Network Analyzer platforms and other test agents. NTC places the power of multiple Network Analyzer platforms in the hands of a single user or group. It supports both single-user and multi-user deployments. These deployments can be as simple as providing a single user with remote or direct access to a single Network Analyzer platform, and as powerful as providing multiple users with access to aggregated, correlated data from over one hundred Network Analyzer platforms and other test agents.

NTC provides both remote access to, and aggregated data from, Agilent's Network Analyzer hardware and software platforms:

- Network Analyzer (J6800A)
- Distributed Network Analyzer (J6801A)[1]
- Distributed Network Analyzer MX (J6802A)
- Distributed Network Analyzer ME (J6805A)
- Network Analyzer Software (J6840A)[2]

For more information on these products, please refer to the "Network Analyzer Family Technical Overview" (see Related Literature).

The Agilent Application Analyzer extends the centralized troubleshooting capabilities provided by NTC and the Network Analyzer. The Application Analyzer helps network professionals, from a single location, identify and resolve application- and service-related problems across the entire IP network. It is a fully distributed IP network performance analysis tool that provides visibility into end-to-end network, application and service performance from anywhere on the network. The Application Analyzer addresses the most pressing problems faced by network professionals, which include difficult-to-diagnose problems related to networked applications. With the Application Analyzer, users can easily determine if a particular application is having communication problems, losing packets across the network, experiencing long response times, etc. For more information on the Application Analyzer, please refer to the "Application Analyzer Technical Overview" (see Related Literature).

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1 NTC support for Distributed Network Analyzer (J6801A) requires that a PC with the Windows XP operating system controls the J6801A. The J6800A, J6802A, and J6805A are all qualified to control a J6801A for NTC.

2 NTC support for Network Analyzer Software (J6840A) on a PC requires that the PC runs the Windows XP operating system.

Powerful and Unique RMON Capabilities

NTC collects RMON and RMON2 statistics from agents running on Network Analyzer platforms. Each Network Analyzer hardware platform (J6800A, J6801A, J6802A, J6805A), as well as the Network Analyzer Software (J6840A) running on a Windows XP PC, includes an RMON1/2 compliant agent and MIB that can continuously record vital network statistics. These statistics are delivered to NTC for aggregation and presentation in various formats.

NTC can also collect statistics from RMON, RMON2, and MIB-II compliant agents on other devices in a network. These include switches, routers, hubs, LAN and WAN RMON probes, printers, network servers and hosts, and other types of analyzers. Due to variations in vendors' implementations of RMON1/2 and MIB-II specifications, NTC may not be able to collect data from all devices claiming compliance with these specifications. The following devices have been tested with NTC:

- Agilent Network Analyzer hardware and software platforms
- Agilent NetMetrix LAN/WAN/ATM Probes
- Cisco Catalyst Switches (1900, 2820, 5000, 5500, 5509, 6500)
- Cisco 7200 Routers
- HP Procurve Switches (224M, 1600M, 4000M, 8000M)
- Network Associates Sniffer Distributed RMON Agents (Frame Relay, FastEthernet)
- HP LaserJet Printers (5M, 8100DN)
- Microsoft SNMP service

With its powerful RMON capabilities, NTC can show the overall health of the network, identify problem areas, and enable the user to quickly isolate the problem for further troubleshooting with a Network Analyzer platform. NTC provides unique aggregated views of RMON and MIB-II statistics collected from many different sources. Statistics are presented correlated in time and across the network. Aggregated views include the ability to drill down to individual agent and statistics views so that one can quickly go from identifying a problem from an overall view of a network to isolating the location and nature of the problem.

NTC can also generate SNMP event traps based on user-defined thresholds for RMON and MIB-II statistics. These event traps can be sent to an external system, such as an SNMP-compliant network management system, for event management operations, such as automated notifications.

NTC's RMON capabilities, along with the Network Analyzer's advanced troubleshooting capabilities, provides a seamless integration between problem isolation and troubleshooting. Engineers can rapidly progress from problem identification to resolution.

NTC Simplifies and Expedites Problem Resolution

With the deployment of multi-technology networks, engineers previously had to use multiple tools to detect, isolate, and troubleshoot a problem. This increases training time and adds time to the troubleshooting process by disrupting the workflow when moving from one tool to another.

NTC along with the Network Analyzer products provide a complete solution for both centralized and dispatched troubleshooting in one package, eliminating the need for multiple tools. This solution:

- Works across multiple LAN and WAN technologies, including 10/100 Ethernet, Gigabit Ethernet, ATM, Frame Relay, and Packet over SONET. Provides analysis of all technologies with the same look and feel, so engineers need to learn only one tool. A single graphical user interface provides correlated information from all Network Analyzer LAN and WAN technologies.
- Addresses multi-service networks: data, voice, mobile
- Can be integrated into a Network Management System (NMS) or Operations Support System (OSS) architecture to provide tactical troubleshooting

NTC provides all capabilities needed for troubleshooting the most complex networks:

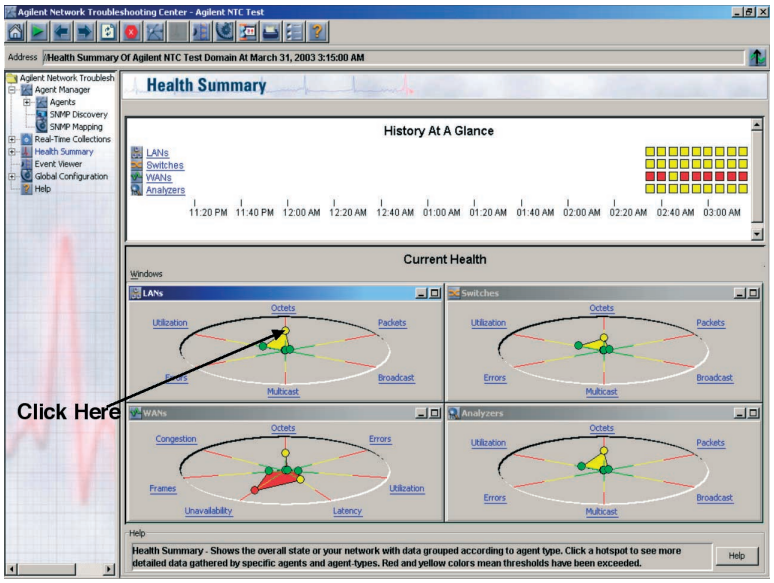
- Aggregated views of RMON and MIB-II statistics from hundreds of data sources to present the overall health and performance of the network
- One-click drill down from aggregated views to detailed views of individual LANs, WANs, switches, nodes, connections, protocols, and error types. Quickly isolate the location and nature of a problem
- Integrated RMON and advanced protocol analysis for seamless integration between problem isolation and troubleshooting
- Network data correlation across time and network

In addition, the Network Analyzer product family offers the most flexible and scalable line of hardware platforms available to meet any deployment or performance requirement. It also offers hot-swappable interfaces so that one hardware solution can be used for any LAN or WAN network interface.

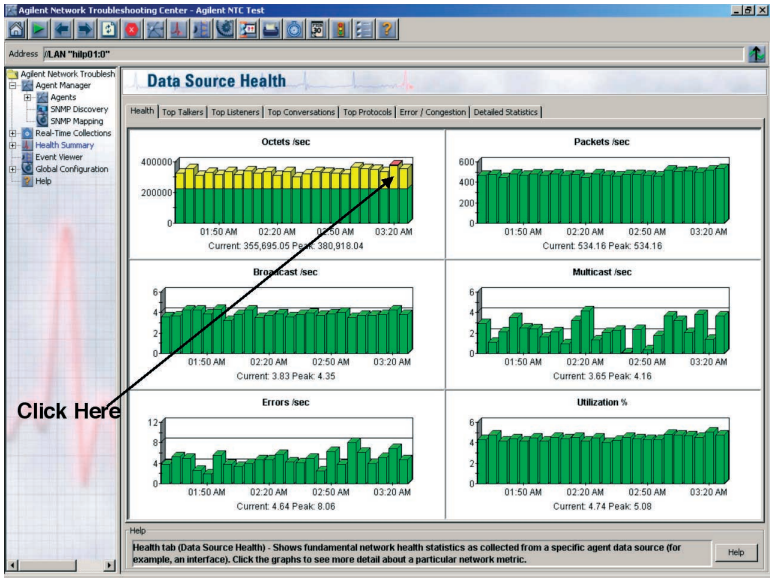
Seamless Integration Between Problem Isolation and Troubleshooting

With traditional network and protocol analysis techniques, problem isolation and troubleshooting were segregated processes requiring different solutions. Engineers and technicians had to first determine where on a network a problem was occurring before dispatching a protocol analyzer to the trouble segment.

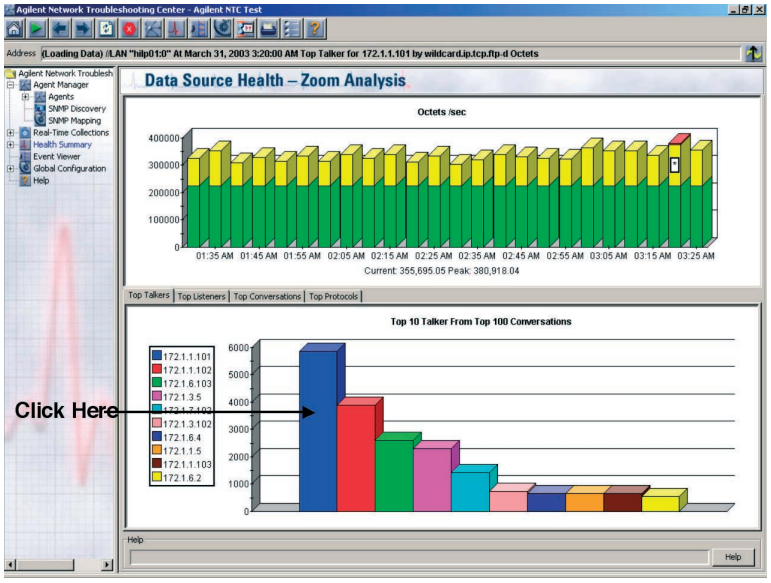
With NTC, this becomes one rapidly progressing process that can be performed from a single computer. The following is one of many examples:



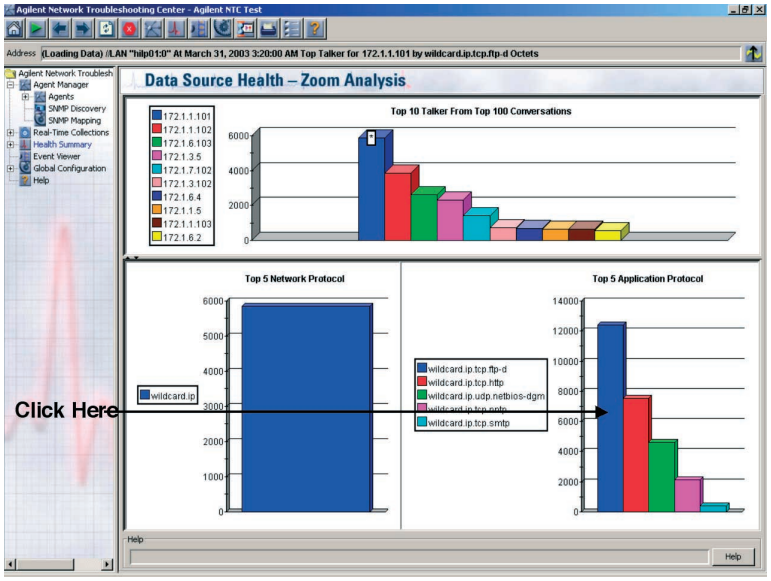
View the overall health of the network. See "red" status LEDs on "History at a Glance" view. Under "Current Health", click on a yellow or red "hot spot" in a radar chart to drill down to the specific data source view that is exhibiting a problem.



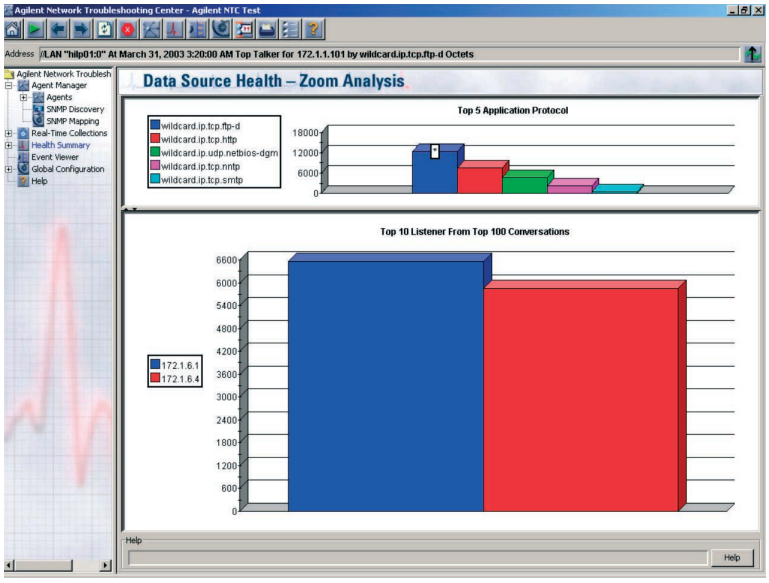
See all vital statistics for the selected data source. Click on a yellow or red "hot spot" to drill down to the specific statistics view to see main contributors behind the statistic.



See the "Top Talkers" or other detail behind the selected statistic. Click on a "Top Talker" to drill down to specific protocols view for that node.

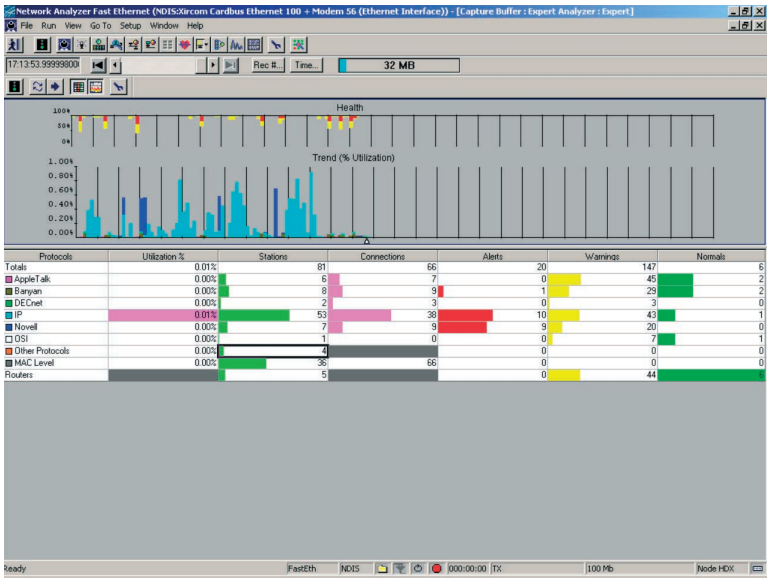


See the most active protocols used by the selected Top Talker. Click on a protocol to drill down to the Top Listeners for that protocol.

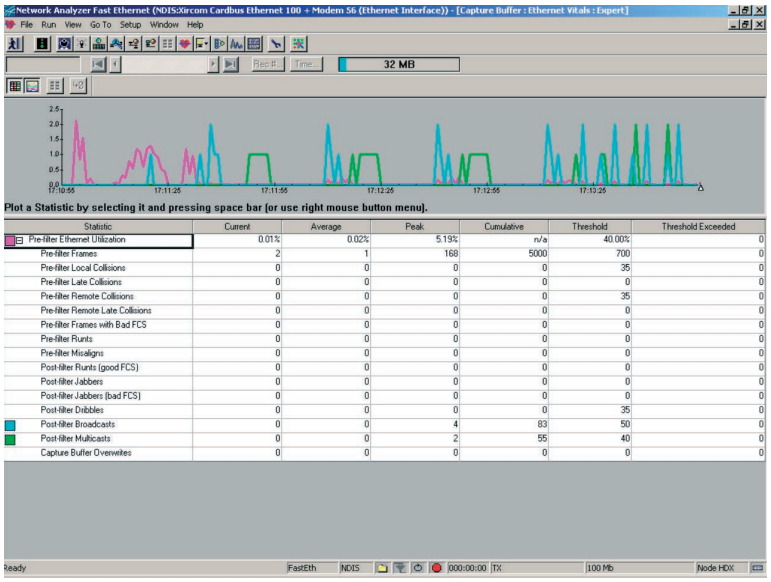


See the "Top Listeners" for the selected Top Talker node and selected protocol. Now you know the specific protocol used by specific nodes that contributed to the threshold violation, or "hot spot", in the Health Summary View.

You can now launch a remote Network Analyzer application and filter on both the protocol and the node IP address found.



Perform protocol and network analysis remotely on any Network Analyzer platform. Troubleshoot the root cause of the problem using the Network Analyzer's Expert Analyzer...



... Protocol Vitals, and many other of the Network Analyzer's powerful analysis capabilities.

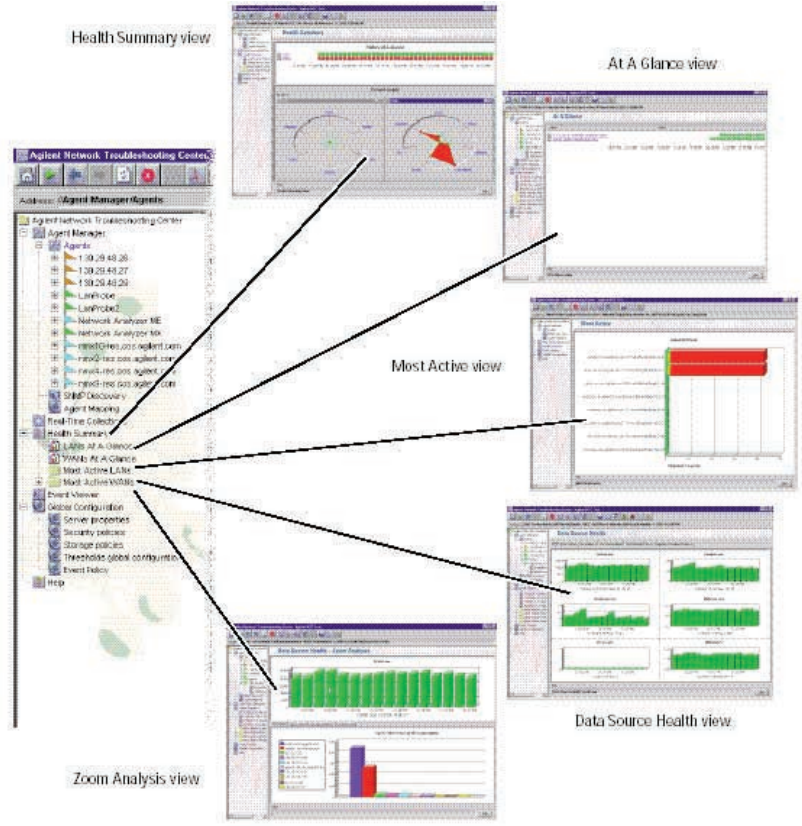
NTC and Network Management Systems

NTC can serve as a tactical troubleshooting tool for a Network Management System (NMS) or an Operations Support System (OSS). NTC can easily integrate into an NMS or OSS architecture by sending SNMP traps based on user-defined thresholds.

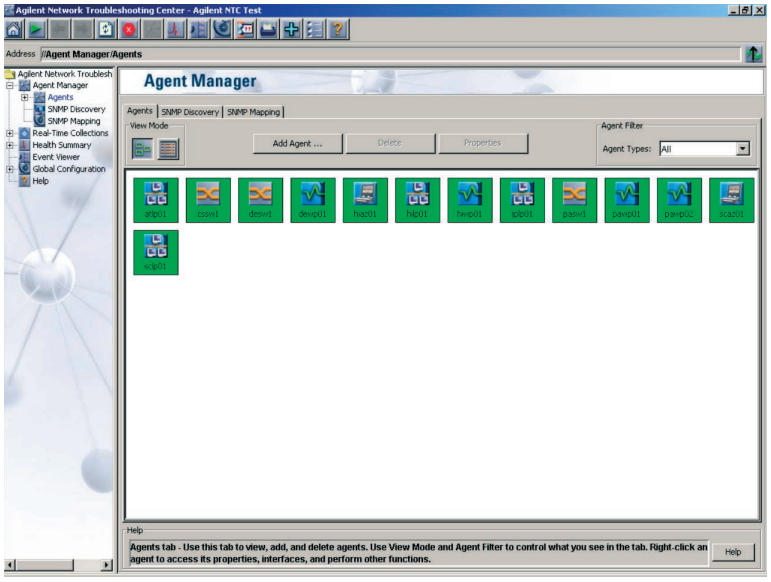
Such an architecture enables a network operator to use their existing NMS or OSS to monitor and manage their network. When an alarm is generated indicating a problem on the network, the operator can bring up the NTC console to isolate the problem on the network and determine its nature (high utilization, unavailability, etc.). The operator can then open a remote session with the Network Analyzer application to troubleshoot the problem.

NTC Features

- Remote access to one or more Network Analyzer platforms
- Centralized management of multiple Network Analyzer platforms
- Single-user and multi-user deployment models
- Supported on Windows and UNIX®
- Aggregated view of RMON, RMON2, and MIB-II statistics to show overall network health and performance and isolate problems quickly
- Integrated RMON statistics with advanced troubleshooting
- Correlation in time of network data from different sources
- SNMP event traps based on user-defined thresholds. Thresholds can be set globally or individually for a data source.
- Automated agent discovery
- Extensive embedded Help utilities
- Centralized and automated Network Analyzer software updates
- Navigation tree provides easy navigation through different features and views:

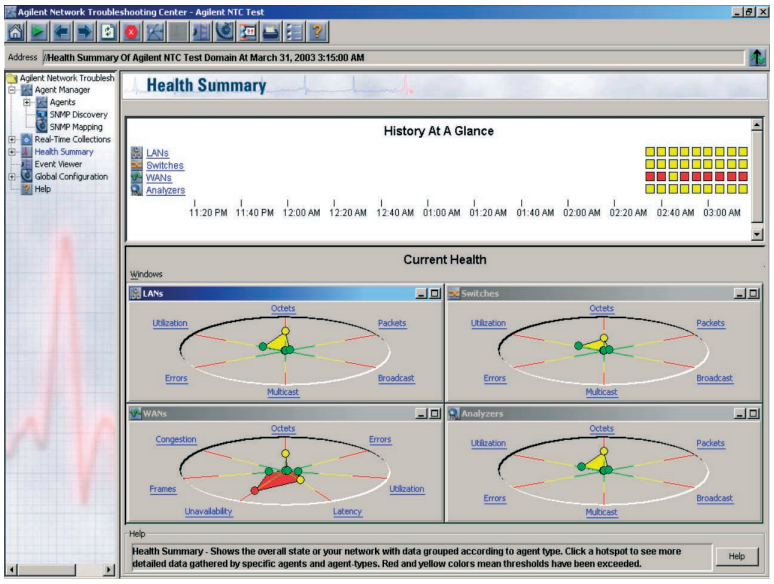


- Agent Manager:



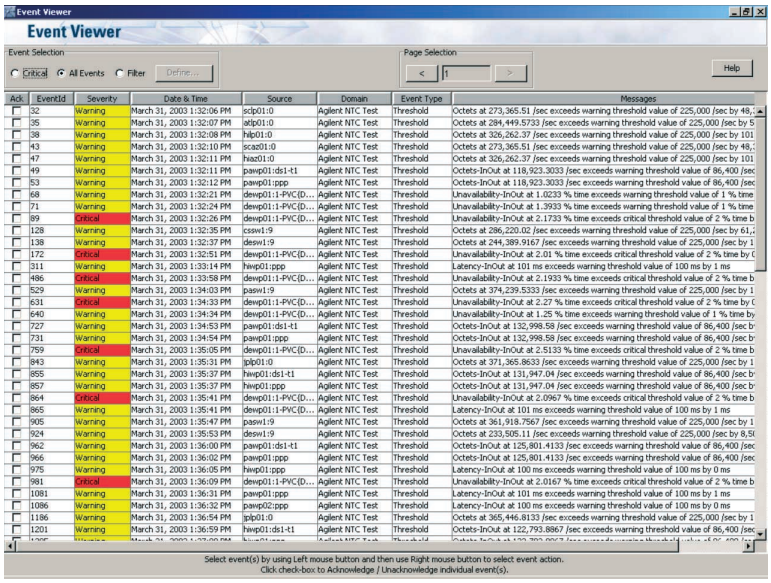
- Add agents (Network Analyzer platforms, RMON and MIB-II agents)
- Auto-discover agents
- Manage agents: start/stop data collection, view properties, update software, open remote application, etc. (as supported by agent)
- Supported agent types:
  - LANs (includes all Network Analyzer LAN data sources)
  - WANs (NetMetrix WAN probes only)
  - Switches
  - SwitchLinks (NetMetrix 10/100 Ethernet and Network Analyzer only)
  - Routers
  - Hubs
  - Printers
  - Hosts
  - Servers
  - Analyzers (e.g., Distributed Sniffer Frame Relay)

- Health Summary:



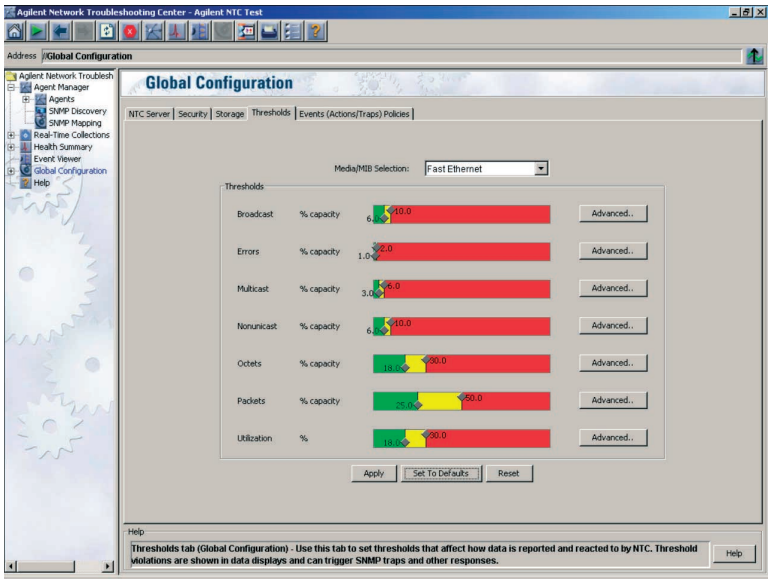
  - View aggregated RMON and MIB-II statistics collected in time intervals
  - Automatic links for drill down to detailed views of individual LANs, WANs, switches, nodes, connections, protocols, and error types

- Real-Time Collections: Collect RMON and MIB-II statistics in real-time in intervals ranging from 10 seconds to 2 minutes (Standard non-realtime historical NTC collection intervals are 5 minutes and greater)
- Event Viewer:



  - View user-defined events, including threshold violations and device alarms
  - Filter events by severity, type, and time frame

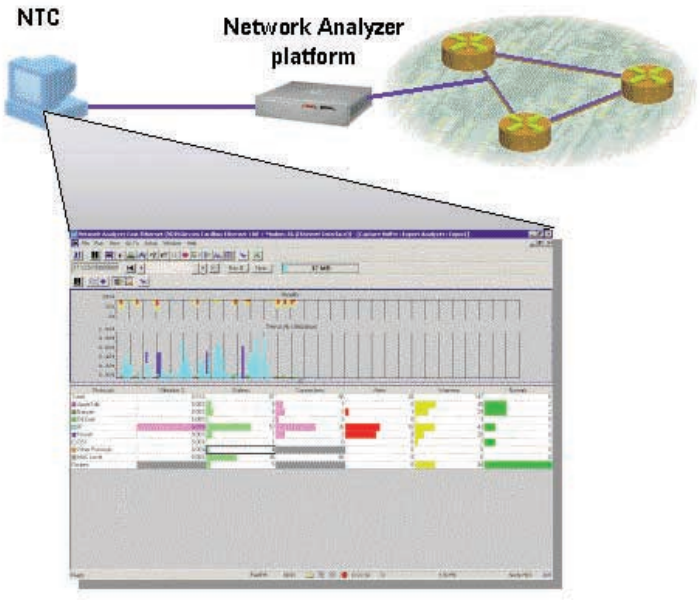
- Global Configuration:



  - Configure thresholds globally or per agent
  - Add and configure events for data sources and the NTC system
  - Configure NTC server, security, and data storage parameters

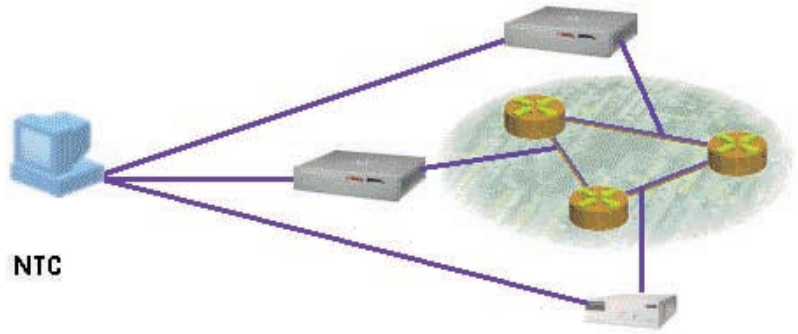
NTC Deployments

NTC can be deployed in many different architectures. Supported on both Windows and UNIX®, NTC can be deployed for single-user and multi-user environments.

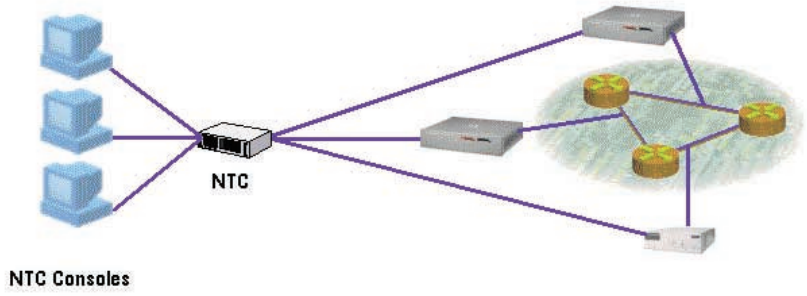


Single-user for remote access to any Network Analyzer platform

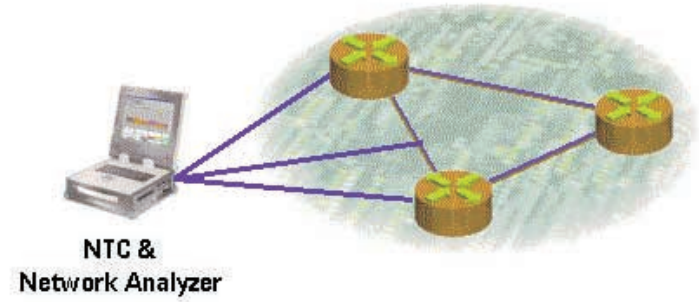
NTC provides remote access for each of the Network Analyzer's hardware and software platforms. A basic version of NTC software is shipped with all Network Analyzer family platforms. This basic version can remotely access Network Analyzer platforms, perform SNMP-based data collection from up to four data sources simultaneously (analyzers from the Network Analyzer family or interface MIBs), and manage many agents.



Single-user for centralized testing using multiple Network Analyzer platforms and other data sources

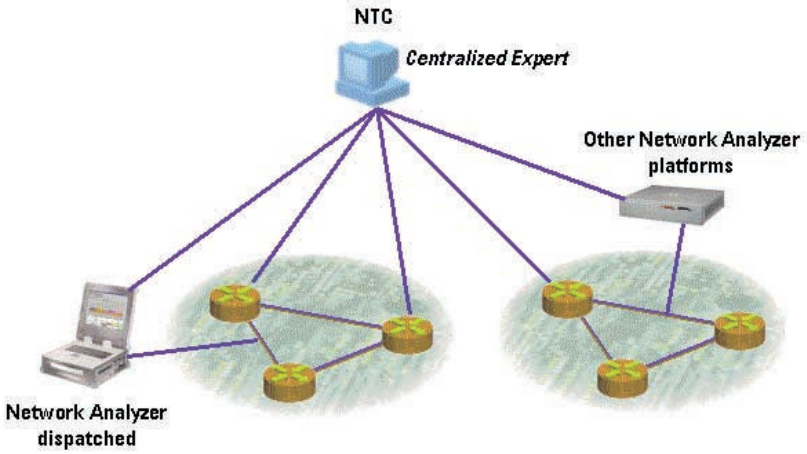


Multi-user for centralized testing using multiple Network Analyzer platforms and other data sources



Field testing using multiple data sources

NTC can run on a J6800A Network Analyzer dispatched in the field. A technician or engineer can analyze the network at a particular segment using the Network Analyzer's Line Interface Module (LIM) while collecting data from other sources on the network to determine the extent and nature of the problem.



Remote Dispatched for centralized experts

A Network Analyzer or Distributed Network Analyzer MX can be dispatched to any site and inserted into the network by local technicians. NTC then provides experts at a centralized location with access to the dispatched Network Analyzer's powerful troubleshooting capabilities. NTC can also provide the centralized experts with access to other Network Analyzer platforms and SNMP data sources distributed throughout the network for complete centralized troubleshooting.

NTC System Requirements

NTC is comprised of two main parts: the NTC Server and NTC Console. Both are supplied with the product and can run on the same PC. Additional NTC Consoles running on different PCs can access the same NTC Server.

The minimum recommended PC requirements for running the Network Troubleshooting Center software:

Number of data sources for historical SNMP data collections at 5-minute intervals	PC Speed	PC Memory	Free Disk Space Required Before Installation	Disk Space Used After Installation[1]
Up to 25	500 MHz	256 MB	600 MB	240 MB
Up to 120	700 MHz	256 MB	600 MB	240 MB
Up to 150	1 GHz	256 MB	600 MB	240 MB
Up to 200	2 GHz	500 MB	600 MB	240 MB

Number of data sources for real-time SNMP data collections at 10-second intervals (with 100 historical collections)	PC Speed	PC Memory	Free Disk Space Required Before Installation	Disk Space Used After Installation[1]
Up to 1	500 MHz	256 MB	600 MB	240 MB
Up to 10	700 MHz	256 MB	600 MB	240 MB
Up to 15	2 GHz	500 MB	600 MB	240 MB
Up to 20	2 GHz	1 GB	600 MB	240 MB
For NTC Console installation only	500 MHz	256 MB	600 MB	110 MB

The NTC Server can also operate on UNIX® (Solaris 8/9). NTC Consoles can operate on UNIX for viewing RMON/MIB data collections. In addition, an open source software package is provided for opening remote sessions to Network Analyzers from an NTC Console running on UNIX. This open source software package is not supported by Agilent. Other third party software is also available for remote session capability from UNIX.
Minimum Installation and Operational Requirements (NTC Console and Server, or Console-only) for UNIX

Operating Systems:	Solaris 8 or 9
Minimum CPU:	Single UltraSparc II, 650MHz
Minimum Memory (RAM)	1024 Megabytes
Display Monitor Resolution:	1024 x 768
Disk Space Server1:	500 MB
Disk Space Console only:	250 MB

Data Collection Performance: The above minimum configuration will support:
– up to 125 historical collections at 5 minute collection intervals (with appropriate software license enabled)
– up to 5 real-time collections (10 second collection interval, co-existing with 100 historical collections on the same NTC Server)

NTC software can run on the following operating systems:
Microsoft Windows 2000®
Microsoft Windows XP®

Microsoft Windows NT® 4.0 Service Pack 5 or higher, with Internet Explorer 5 or higher
Solaris versions 8 and 9

Related Literature

Network Analyzer Family	Technical Overview	5988-4231EN
Network Analyzer Family	Data Sheet	5988-4176EN
Network Analyzer Family	Configuration Guide	5988-4248EN
Application Analyzer	Technical Overview	5988-8142EN

[1] Indicates disk space with a clean database. Database disk space requirements will depend on users' data storage policy.

Notes

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Agilent Ordering Information
J6781A Network Troubleshooting Center

Network Analyzer Family
Each of the following products are shipped with all Network Analyzer family platforms. This basic version can remotely access Network Analyzer platforms, perform SNMP-based data collection from up to four data sources simultaneously (analyzers from the Network Analyzer family or interface MIBs), and manage many agents:
J6800A Agilent Network Analyzer
J6801A Agilent Distributed Network Analyzer
J6802A Agilent Distributed Network Analyzer MX
J6805A Agilent Distributed Network Analyzer ME
J6840A Agilent Network Analyzer Software

Application Analyzer
J6790A Agilent Application Analyzer

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