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# NETTOOL

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# Network Terminology

- Internet Protocols
- Often referred to as TCP/IP Protocol Suite, but involves many other protocols
- Protocols = Rules that enable exchange of information in an orderly, error-free manner
- Layers = specifically defined areas of network communication
- ISO/OSI 7-Layer Reference Model

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# OSI 7-Layer Model

7. Application
6. Presentation
5. Session
4. Transport
3. Network
2. Data Link
1. Physical

TCP-IP Suite works within layers 2-4

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# Physical Layer (1)

- Physical media
- Cables – UTP, fiber optic, coaxial
- Wireless – Lasers, microwave, radio
- Send and receive bits

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# Data Link Layer (2)

- Provides node-to-node communication on a single local network
- Address mechanism for correct delivery of data to nodes (MAC address – media access control)
- Translates messages from upper layer into bits for physical layer
- Network device drivers
- Interface Cards
- Ethernet, 802.3, 802.5 (Token Ring), SLIP, PPP
- Bridging and Switching

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# Network Layer (3)

- Allows inter-network communication
- ARP and RARP – mapping network address to physical (MAC) address
- IP
- ICMP
- Routing and Layer-3 Switching

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# Transport Layer (4)

- Transport layer divides messages into small fragments (packets) to fit into lower layer protocols
- Packets are reassembled at target based upon message sequence number
- TCP
- UDP

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# Protocols & Applications

- SMTP
- BootP
- SNMP
- FTP
- Telnet
- Ping
- DNS



# Other Terms

- Sockets
- Ports
- Well known port numbers:

FTP	21/TCP	NETBIOS	137-139
Telnet	23/TCP	POP3	110/TCP
SMTP	25/TCP	DNS	53/UDP
TFTP	69/UDP		

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# What is NETTOOL?

- A “complete” set of networking diagnostic programs
- Common User Interface
- Allows real-time look at network statistics and configuration
- Flexible - users can add their own applications to NETTOOL
- Includes online help for commands

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# Tool Types

- Three types of tools:
- Core
- Associated
- User

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# Core Tools

- Integrated into NETTOOL – not available elsewhere
- Consistent user interface
- Online help for all Core commands
- HP supported

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# Core Tools

- Configuration Summary
- Name-Address Manager
- Ping (different from utility ping.net.sys)
- Resource Monitor
- Status

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# Associated Tools

- Developed as stand-alone programs by HP
- Supported by HP
- Inconsistent user interfaces
- Many tools located in 'NET.SYS' group

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# Associated Tools

- IPCINT
- LOOPINIT
- NMDUMP
- NSTEST
- NSLOGON
- QVALNS
- SOCKINFO
- X25CHECK, X25STAT
- XPPERF, XPVAL

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# User Tools

- Developed as stand-alone programs by users
- Not supported by HP
- Inconsistent user interfaces



# Tools Comparison

## Differences in Tool Types

	<b>Core</b>	<b>Associated</b>	<b>User</b>
Consistent user interface	Yes	No	No
Access NETTOOL help within tool	Yes	No	No
Use NETTOOL global commands	Yes	No	No
Control-Y recognized	Yes	Tool dependent	Tool dependent
Run standalone	No	Yes	Yes
HP factory support	Yes	Yes	No

- Source: 'Using Nettool' in NS3000/iX Operations and Maintenance Manual

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# Running NETTOOL

- NETTOOL.NET.SYS

- RUN command can include “INFO=“

:RUN NETTOOL.NET.SYS;INFO=“NAMEADDR;CACHE;NAME;QUIT”

- Multiple commands can be chained together, separated by ‘;’

> NAMEADDR;CACHE;NAME;QUIT

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# Root Menu

- Appears after launching NETTOOL
- Base from which all tools are entered

```
:NETTOOL.NET
```

```
NETTOOL Version:      B0600003
```

```
Enter HELP HELP for an explanation of the help facility.
```

```
Enter HELP OPERATION for guidance on NETTOOL use.
```

```
Commands can be abbreviated, HELP keywords cannot.
```

```
Menu-specific commands for the ROOT:
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```
RESOURCE      CONFIG      NAMEADDR    PING        STATUS      NMDUMP  
X25STAT       X25CHECK   IPCINT      XPVAL       XPPERF     QVALNS  
NSTEST        LOOPINIT   NSLOGON     SOCKINFO    filters  
[1]>>>
```

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# Configuration Summary

- CONFIG at root menu
- SUMMARY – generates a summary of NMCONFIG file
- NETDIR – generates a summary of NSDIR network directory file
- COMPARE – compare two NMCONFIG files
- filters – displays current filter settings
- subtree – specify a subset of records to compare with COMPARE command

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# filters

- Allows setup of global filters that affect what is displayed within Core tools

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# IPCINT

- Provides a command interface to IPC
- Enter a NetIPC intrinsic
- Prompted for any parameters required by Intrinsic

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# LOOPINIT

- Sends series of packets to a specific remote node and monitors round-trip response time

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# Name-Address Manager

- Allows display of local cache of node names and addresses
- Can detect duplicate IP addresses



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# Name-Address Manager

- **MAPPINGS** – correlates link addresses and IP addresses

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# Name-Address Manager

- **ROUTING** – Obtain information about gateways used to access subnets

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# NMDUMP

- A Node Management Services (NMS) utility
- Used to decode & format log records
- Used to decode & format trace messages
- Manual - Using the Node Management Services (NMS) Utilities

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# NSTEST & NSLOGON

- NSTEST allows interactive testing of Network Services
- NSLOGON allows quick verification of the network transport

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# PING

- The PING utility allows testing of remote connections by sending ICMP echo requests
- PING – you can ping by name or number (PING.NET.SYS by number only)
- RANGEPING – ping a range of remote devices
- GATEPING – ping all gateways in routing tables

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# QVALNS

- Provides a quick validation of the Network Services

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# Resource Monitor

- Displays current network resource usage

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# SOCKINFO

- Display socket information
- See which processes have open sockets
- View sockets in use by process PID number



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# STATUS

- Display status of network interfaces and associated links
  
- Display network statistics

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# X25CHECK & X25STAT

- X25CHECK – test X.25 connections and verify response
- X25STAT – monitor X.25 interface status and statistics

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# XPPERF & XPVAL

- XPPERF – test performance between 3000 and remote node
- XPVAL – provides a quick validation of the transport between the 3000 and a remote node

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# MPE Network Commands

- LINKCONTROL - Provides link information, or activates or deactivates link level tracing
- NETCONTROL - Initiates, terminates, and controls the operation of the network transport
- NSCONTROL - Initiates, terminates and controls the operation of the Network Services

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# LINKCONTROL

- **LINKCONTROL STATUS** - Requests status information about the link
- **LINKCONTROL TRACE** - Activates or deactivates link level tracing

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# NETCONTROL

- NETCONTROL START - Initiates the network transport functional entities
- NETCONTROL STATUS - Displays the status of the network transport functional entities
- NETCONTROL STOP - Terminates the network transport functional entities (Immediately terminates the Network Services)
- NETCONTROL UPDATE - Dynamically updates selected network transport configuration parameters for an active network interface
- NETCONTROL TRACE - Enables or disables message tracing for a specified network transport functional entity
- NETCONTROL VERSION - Displays the version of the software modules of the network transport

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# NSCONTROL

- NSCONTROL ABORT - Immediately terminates the Network Services
- NSCONTROL LOG - Enables or disables detailed logging (configured as CLAS0004 of SUB0006) for the Network Services
- NSCONTROL START- Initiates the Network Services
- NSCONTROL STATUS - Displays status information about the Network Services
- NSCONTROL STOP - Allows existing users to continue with current task, but prevents initiation of any new tasks or new users for the Network Services
- NSCONTROL VERSION - Displays the version of the software modules of the Network Services

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# NS Logging

- Files located in PUB.SYS (NMLG####.PUB.SYS)
- SWITCHNMLOG - Closes the current log file and creates and opens a new one
- SHOWNMLOG - Displays the identification number and available space of the log file
- RESUMENMLOG - Resumes logging after a recoverable error



# Usage Example # 1

- Everyone was knocked off of the server – nobody could reconnect
- In NETTOOL/NAMEADDR, the IP number of the HP 3000 had a duplicate with another device
- Cause: The help desk had added a Jet Direct device to the network with the same IP number as the 3000
- Fix: JetDirect disconnected, duplicate IP numbers deleted from cache in NAMEADDR

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# Usage Example # 2

- Production HP 3000 users are moved to a new system on an FDDI network – user Reflection settings are changed to point to new system – two remote sites can no longer connect
- NETTOOL – we can no longer PING remote sites from HP 3000
- NETTOOL/NAMEADDR/ROUTING – there is a default gateway and no static routes to remote sites
- The remote sites have separate routers from rest of network
- NMMGR – Added static routes for all subnets on remote nets
- NETTOOL – we can now PING remote sites
- TELNET – we can telnet to remote routers from 3000 and from remote routers to 3000
- Remote side can still not connect – problem in their remote networks – when remote routers reconfigured, everything works

# Usage Example # 3

- User can't FTP to remote network device
- NETTOOL/PING – can't ping remote device
- NETTOOL/NAMEADDR/ROUTING – all networks defined with static routes
- No static route exists to new remote site
- NMMGR – added static route to network
- NETTOOL – can now PING remote device
- FTP now works

# Usage Example # 4

- User has an application with a Windows front-end client that communicates via DDE to Reflection and an Imaging app
- Remote users complain of poor response time
- Network tech support – “not a network problem”; Imaging/app support – “problem on the HP 3000”
- NETTOOL – continuous PING of remote user - good packets and consistent round trip time
- NETTOOL – continuous PING of imaging server – some dropped packets and wildly inconsistent round trip times
- From user PC – continuous PING 3000 - good packets and consistent round trip time
- From user PC – continuous PING imaging server – some dropped packets and wildly inconsistent round trip times
- Cause – network congestion on Token-Ring of Imaging server

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# Network Tips

- Connect HP 3000 to network managed devices (SNMP)
- Connect the 3000 to a switch or router port to reduce traffic
- Set to fixed speed the 3000 10/100BaseT card (also set same on switch or router) – do not set port to auto-negotiate
- Have *current* network documentation in one repository (binder) – should include NMMGR info, NETTOOL configuration summary, network diagrams
- Always ask for confirming documentation from telco or network engineer

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# Resources

- [//http:docs.hp.com](http://docs.hp.com)
- NS3000/iX Operations & Maintenance manual
- Using NS3000/iX Network Services manual
- 3000-L list server
- HP: Response Center and IT Resource Center

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# Resources

- Douglas Comer's – TCP/IP series of books
- Stevens' TCP/IP Illustrated series of books
- HP Openview & Tootools
- Current network diagrams (Visio)

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