

Network Related Utilities

ping

- The ping command sends an echo request to a network host. It is useful for:
 - Determining the status of the network and various foreign hosts.
 - Tracking and isolating hardware and software problems.
 - Testing, measuring, and managing networks.
- The ping command sends one datagram per second and prints one line of output for every response received. Round-trip times and packet loss statistics are calculated and displayed.
Example:

```
% ping kanaha or 164.122.27.33
PING kanaha.mhpcc.edu: (164.122.27.33): 56 data bytes
64 bytes from 164.122.27.33: icmp_seq=0 ttl=254 time=3 ms
64 bytes from 164.122.27.33: icmp_seq=1 ttl=254 time=2 ms
64 bytes from 164.122.27.33: icmp_seq=2 ttl=254 time=2 ms
64 bytes from 164.122.27.33: icmp_seq=3 ttl=254 time=2 ms
^C
----kanaha.mhpcc.edu PING Statistics----
6 packets transmitted, 6 packets received, 0% packet loss
round-trip min/avg/max = 2/2/3 ms
```

traceroute

- The traceroute command prints the route that IP packets take to a network host. It is intended for use in network testing, measurement, and management.
Example:

```
% traceroute archie.rutgers.edu
traceroute to dorm.Rutgers.EDU (128.6.18.15), 30 hops max, 40 byte
packets
 1 B2_IGSL_01 (129.24.96.1)  2 ms  2 ms  2 ms
 2 FZ00_rtr_01 (129.24.56.1)  3 ms  2 ms  7 ms
 3 msh (129.24.8.193)  5 ms  7 ms  4 ms
 4 198.83.5.5 (198.83.5.5)  7 ms  4 ms  7 ms
 5 hssi3-0.cnss116.Albuquerque.t3.ans.net (192.103.74.41)  5 ms  4 ms  6
ms
 6 mf-0.cnss112.Albuquerque.t3.ans.net (140.222.112.222)  4 ms  4 ms  4
ms
 7 t3-0.cnss64.Houston.t3.ans.net (140.222.64.1)  30 ms  30 ms  30 ms
 8 t3-0.cnss80.St-Louis.t3.ans.net (140.222.80.1)  47 ms  47 ms  46 ms
 9 t3-1.cnss25.Chicago.t3.ans.net (140.222.25.2)  54 ms  52 ms  53 ms
10 t3-0.cnss40.Cleveland.t3.ans.net (140.222.40.1)  60 ms  59 ms  59
ms
11 t3-1.cnss48.Hartford.t3.ans.net (140.222.48.2)  73 ms  78 ms  74 ms
12 t3-2.cnss32.New-York.t3.ans.net (140.222.32.3)  78 ms  76 ms  76 ms
13 t3-0.cnss137.t3.ans.net (140.222.137.1)  79 ms  80 ms  86 ms
14 fenchurch-gateway.jvnc.net (192.12.211.65)  83 ms  80 ms  84 ms
15 airport2-gateway.jvnc.net (130.94.9.250)  84 ms  86 ms  88 ms
16 airport1-gateway.jvnc.net (130.94.7.1)  85 ms  92 ms  84 ms
17 rutgers-gateway.jvnc.net (130.94.7.10)  89 ms  86 ms  90 ms
18 rucs-gw.rutgers.edu (128.6.21.7)  94 ms  104 ms  95 ms
```

19 dorm.rutgers.edu (128.6.18.15) 92 ms 93 ms 91 ms

- **Warning:** Because of the load traceroute imposes on the network, the traceroute command should not be used during normal operations or from automated scripts.
- The traceroute utility may not be available on all systems.

ftp

- ftp stands for File Transfer Protocol. File transfer provides a means for you to obtain computer files (text, image, sound, etc.) from other computers over the network.
- ftp can also be used to send (upload) files from your computer to another computer, providing you have write permission or a real account on the machine you are uploading.
- The ftp utility has its own set of UNIX like commands which allow you to perform tasks such as:
 - Connect and login to a remote host
 - Navigate directories
 - List directory contents
 - Put and get files
 - Transfer files as ascii, ebcdic or binary

- A sample ftp session appears below. The commands which are entered by the user are in bold type.

```
kanaha% ftp makena.mhpcc.edu
Connected to makena.mhpcc.edu.
220 makena.mhpcc.edu FTP server (Version 4.9 Thu Sep 2 20:35:07 CDT
1993)
Name (makena.mhpcc.edu:jsmith): jsmith
331 Password required for jsmith.
Password:
230 User jsmith logged in.
ftp> dir
200 PORT command successful.
150 Opening data connection for /bin/ls.
total 1464
drwxr-sr-x   3 jsmith   staff      1024 Mar 11 20:04 Mail
drwxr-sr-x   2 jsmith   staff      1536 Mar  3 18:07 Misc
drwxr-sr-x   5 jsmith   staff        512 Dec  7 10:59 OldStuff
drwxr-sr-x   2 jsmith   staff      1024 Mar 11 15:24 bin
drwxr-sr-x   5 jsmith   staff      3072 Mar 13 16:10 mpl
-rw-r--r--   1 jsmith   staff    209671 Mar 15 10:57 myfile.out
drwxr-sr-x   3 jsmith   staff        512 Jan  5 13:32 public
drwxr-sr-x   3 jsmith   staff        512 Feb 10 10:17 pvm3
226 Transfer complete.
ftp> cd mpl
250 CWD command successful.
ftp> dir
200 PORT command successful.
150 Opening data connection for /bin/ls.
total 7320
-rw-r--r--   1 jsmith   staff      1630 Aug  8 1994  dboard.f
-rw-r-----  1 jsmith   staff      4340 Jul 17 1994  vttest.c
-rwxr-xr-x   1 jsmith   staff    525574 Feb 15 11:52  wave_shift
-rw-r--r--   1 jsmith   staff      1648 Aug  5 1994  wide.list
-rwxr-xr-x   1 jsmith   staff      4019 Feb 14 16:26  fix.c
```

```

226 Transfer complete.
ftp> get wave_shift
200 PORT command successful.
150 Opening data connection for wave_shift (525574 bytes).
226 Transfer complete.
528454 bytes received in 1.296 seconds (398.1 Kbytes/s)
ftp> quit
221 Goodbye.

```

- Many computers on the Internet permit *anonymous ftp* . You can login to these machines without a real account, to obtain files which have been made publicly available. Typically, the user name **anonymous** is used, coupled with your email address as the password.
- Anonymous ftp is usually restricted so that users can only see what the server permits them to see. Anonymous users do not have full privileges as would a user with a real computer account.

telnet

- Telnet is a utility that allows a computer user at one site to make a connection, login and then conduct work on a computer at another site. For example, you can use the telnet command to run a program in your directory on a supercomputer thousands of miles away.
- Telnet is used to access many of the Internet resources, such as databases, libraries and computers

Example telnet session:

```

% telnet makena
Trying...
Connected to makena.mhpcc.edu.
Escape character is '^]'.

AIX Version 3
(C) Copyrights by IBM and by others 1982, 1993.
login: jsmith
jsmith's Password:
*****
***
*
*
*
*
*      WELCOME TO THE Maui High Performance Computing Center      *
*
*
*
*****
***

Last unsuccessful login: Fri Mar  3 12:01:09 HST 1995 on pts/0 from
kanaha.mhpcc.edu
Last login: Wed Mar  8 18:33:27 HST 1995 on pts/10

```

```
{ do some work }
```

```
makena% logout  
Connection closed.
```

rlogin

rsh

rcp

- rlogin (remote login), rsh (remote shell) and rcp (remote copy) are three utilities which allow you to perform tasks on other machines without requiring the usual login authentication.
- All three utilities depend upon a `.rhosts` located in your home directory. The `.rhosts` file contains the names of your "trusted" hosts and your userid on each of those hosts. An example appears below:

```
apache.unm.edu  jsmith  
zeus.mit.edu   jsmith  
athena.com     smith  
fox.eeco.org   smithj
```

- rlogin: Allows you to login to a remote machine. It is nearly identical to telnet in function and appearance, however if your `.rhosts` file is setup accordingly, you will be able to login to your account on another machine without having to enter a userid and password.
- rsh: The remote shell command can be used to execute a command on remote host or log into remote host. With the proper `.rhosts` file, authentication is not required.

Examples:

```
rsh host2 - will connect to host2 for login  
rsh host2 df - check the amount of free disk space on remote host2  
rsh host2 ps aux |grep jsmith - check for processes owned by jsmith on host2  
rsh host2 rm /tmp/myfile.old - remove a file in host2  
rsh host2 cat test1 ">>" test2 - append test1 file on remote host to test2 file on remote host  
rsh host2 cat test1 >> test2 - append test1 file on remote host to test2 file on local host
```

- rcp: Remote copy enables you to copy files between different systems. With the proper `.rhosts` file, authentication is not required.

Example:

```
rcp localfile host2:/home/eng/journal
```