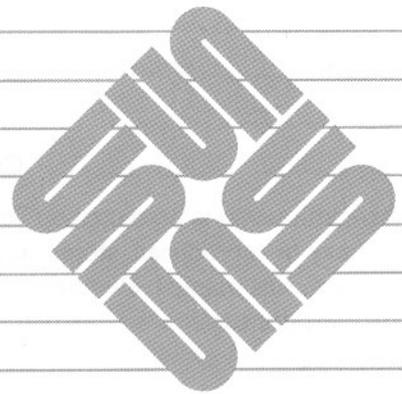


Using *the* Network: Beginner's Guide



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Login Access to Other Machines

You can log in from your machine to another machine using one of three programs:

<code>rlogin</code>	from one UNIX† machine to another UNIX machine on a local network
<code>telnet</code>	from one machine to another machine (may have a different operating system) on a local network using Internet Protocol
<code>tip</code>	machine-assisted dialup from one machine to another

Some systems *trust* certain users and certain machines to log in without requiring a password and other security mechanisms.

2.1. Trust Amongst Machines on a Network

You can allow or restrict login access by other users to your machine. You, or your system administrator, can set up your machine so that users must supply a password to log in to your machine, or so that certain users from certain machines simply can't log in to your machine.

When another UNIX machine on your local network *trusts* your username on your machine, that machine doesn't require that you type your password or undergo other security checks to log in. The system files called `/etc/hosts` and `/etc/hosts.equiv`, and a personal file called `.rhosts` in your home directory, control the users and the machines that may log in to your machine and to your account.

`/etc/hosts` File

Note: A machine only needs an up-to-date `/etc/hosts` file when it is on a network that doesn't support the *yellow pages*.

If your local Ethernet supports the *yellow pages*, a network directory, you have no need for the `/etc/hosts` file. However, when your network doesn't support the *yellow pages*, you or your system administrator may have to maintain an `/etc/hosts` file. `/etc/hosts` contains the internet address, official machine name, and machine "nicknames" for each machine that you want your machine to be able to communicate with, one line of information per machine.

Here is an example `/etc/hosts` file that permits the listed machines to connect to your machine:

† UNIX is a trademark of AT&T Bell Laboratories.

Figure 2-1 A /etc/hosts File

```

venus% cat /etc/hosts
#
# If the yellow pages is running, this file is only consulted when booting
#
# These lines added by the Sun Setup Program from server gaia
#
192.7.2.23      gaia loghost
192.7.2.96      venus
192.7.2.76      pluto
192.7.2.45      mercury
192.7.2.189    aphrodite
192.7.2.123    verlaine

136.0.0.1      localhost
#
# End of lines added by the Sun Setup Program
#
venus%

```

/etc/hosts.equiv File

The `/etc/hosts.equiv` file contains a list of machine names that your machine trusts. When a user on one of the machines in the list tries to log in or execute a command on your machine, your machine checks in your `/etc/passwd` file to see whether it should permit access.⁵

Here is an example `/etc/hosts.equiv` file that permits any users on machines `gaia`, `pluto`, and `verlaine`, who also appear in your `/etc/passwd` file, to log in or execute commands on your machine from their machine.

Figure 2-2 /etc/hosts.equiv File

```

venus% cat /etc/hosts.equiv
gaia
pluto
verlaine
venus%

```

⁵ For more information about the `/etc/passwd` file, see the chapter on processes and other users in *Doing More With UNIX: Beginner's Guide*.

~/ .rhosts File

Note: Network programs ignore your ~/ .rhosts file when you're superuser (username root) because the programs look for a .rhosts file in the superuser home directory, the root directory of the file system (/), not in your home directory.

You can specify usernames and machine names of those users you wish to allow access to your home directory without typing a password by adding them to a .rhosts in your home directory. Each line in the ~/ .rhosts file contains a *machine name* and a *username*, separated by a space character, or just *machine names* as in /etc/hosts.equiv.

This example .rhosts file allows users sappho and cosimo to log in to your home directory on venus from the machine called aphrodite, and permits user rimbaud to log in to venus from verlaine, without typing a password:

Figure 2-3 A .rhosts File

```
venus% cat ~/ .rhosts
aphrodite sappho
aphrodite cosimo
verlaine rimbaud
venus%
```

2.2. Remote Login With rlogin

You can use rlogin when both machines are UNIX machines on the same local network.

Logging In to Another Machine With rlogin

Type rlogin and the *machine name* of the other machine. Should a password prompt appear, type your password for that machine followed by **RETURN**.⁶

Figure 2-4 rlogin: Logging In to Another Machine

```
venus% rlogin jupiter
Password:
Last login: Mon Oct 20 00:30:52 from venus
Sun UNIX 4.2 Release 3.0 (SUN) #9: Sat Nov 16 12:51:59 PST 1985
jupiter% pwd
/usr/medici
jupiter% logout
Connection closed.
venus%
```

⁶ If the other machine trusts your username and machine name, it won't require you to type your password.

rlogin to a Machine Where You Don't Have a Home Directory

When you log in to a machine where you don't have a home directory, `rlogin` displays a notification that you have no home directory on that machine, and logs you in to the root directory (`/`) of that machine.

Figure 2-5 `rlogin`: Logging In to a Machine Without a Home Directory

```
venus% rlogin neptune
Password:
No directory! Logging in with home=/
Last login: Mon Nov 25 16:58:57 from venus
Sun UNIX 4.2 Release 3.0 (SUN) #9: Sat Nov 16 12:51:59 PST 1985
neptune% pwd
/
neptune% logout
Connection closed.
venus%
```

rlogin to a Machine With a Different Username

When you want to log in to a machine where you use an account with a different username than the username associated with your account on the original machine, type `rlogin` and the *machine name*, followed by the `-l` option and the *username* for the other machine.

For example, when user `medici` on machine `venus` wants to log in to his account on machine `aphrodite` where he has username `cosimo`:

Figure 2-6 `rlogin`: Logging In to Another Machine With a Different Username

```
venus% rlogin aphrodite -l cosimo
Password:
Last login: Tue Nov 26 00:02:00 from venus
Sun UNIX 4.2 Release 3.0 (SUN) #9: Sat Nov 16 12:51:59 PST 1985
aphrodite% pwd
/usr/cosimo
aphrodite% logout
Connection closed.
venus%
```

rlogin to a Non-Existent Machine

If you attempt to log in to a machine whose address isn't known to your machine, say the machine `andromeda`, `rlogin` searches unsuccessfully through the hosts database for that machine, then displays the following notification:

Figure 2-7 `rlogin`: Logging In to a Non-Existent Machine

```
venus% rlogin andromeda
andromeda: unknown host
venus%
```

If you see any notifications that you don't understand, try looking at Section 3.6 on solutions associated with networking error notifications.

Aborting an rlogin Connection

Note: Usually you abort an rlogin connection only when you can't terminate the connection using `logout` at the end of the work session.

To abort an rlogin connection, type a tilde character followed by a period character (`~.`) at the beginning of a line. The login connection to the other machine aborts, and you find yourself back at your original machine.⁷

Figure 2-8 rlogin: *Aborting a Connection*

```
venus% rlogin comet
Last login: Thu Nov 21 05:04:03 from venus
Sun UNIX 4.2 Release 3.0 (SUN) #9: Sat Nov 16 12:51:59 PST 1985
comet% ~.
Closed connection.
venus%
```

Suspending an rlogin Connection

When you want to *suspend* an rlogin connection, so that you can return to it later, type the tilde character (`~`) followed by `CTRL-Z`. The rlogin connection becomes a *stopped process*. To reactivate the connection, type `fg`, or `%` followed by the *job number* of the stopped process (default job number for `%` is the job you most recently stopped or put in the background).⁸

Figure 2-9 rlogin: *Suspending a Connection*

```
venus% rlogin animation
Last login: Thu Nov 21 07:07:07 from venus
Sun UNIX 4.2 Release 3.0 (SUN) #9: Sat Nov 16 13:21:24 PST 1985
animation% ~ (Sometimes ^Z doesn't echo on the screen.)

Stopped
venus% pwd
/usr/medici
venus% %
rlogin titan (Type RETURN here to get the command prompt.)

animation% logout
Connection closed.
venus%
```

⁷ When you log in to a series of machines, accessing each machine through another machine, and you abort the connection to any of the machines in the series, you return to the machine where you started.

⁸ For more information on running jobs in the background, see the chapter on timesaving features in *Getting Started With UNIX: Beginner's Guide* and the section on job control in the chapter about the C-shell in *Doing More With UNIX: Beginner's Guide*.

Further Information About rlogin

For further information about `rlogin`, see its Man Page, online or in the *Commands Reference Manual*.

2.3. Remote Login With telnet

Because you can log in from one UNIX machine to another UNIX machine with `rlogin`, you need to use `telnet` only when you want to log in to a machine running another operating system.⁹

Therefore, `telnet` is most useful when your machine is on a local network with machines that run other operating systems.

Logging In to a Machine Running Another Operating System With telnet

For example, to log in to machine `tops20`, running the TOPS20¹⁰ operating system, type `telnet`, followed by its *machine name*. After `telnet` notifies you of the connection with the other machine and identifies your *escape character*, try logging in to the machine as you ordinarily would.

Figure 2-10 `telnet: Logging In to a Machine Running Another Operating System`

```
venus% telnet tops20
Trying...
Connected to tops20.
Escape character is '^]'.

Yoyodyne Corp., TOPS-20 Monitor 6.1 (6762)-4
@LOG MEDICI

...

@LOGOUT
Connection closed by foreign host.
venus%
```

telnet to a Non-Existent Machine

If you attempt to log in to a machine that isn't a part of your local network, say the machine `andromeda`, `telnet` searches unsuccessfully through the hosts database for that machine, then displays a notification and a prompt. Exit from `telnet` by typing `quit`, or the abbreviation `q`.

⁹ You may have to use `telnet` to log in to machines running varieties of UNIX that aren't compatible with the current version of the Berkeley UNIX operating system (4.2 BSD).

¹⁰ TOPS20 is a trademark of Digital Equipment Corporation.

Figure 2-11 telnet: *Logging In to a Non-Existent Machine*

```
venus% telnet andromeda
andromeda: unknown host
telnet> q
venus%
```

If you see any notifications that you don't understand, look at the `telnet` Man Page, online or in the *Commands Reference Manual*.

Aborting a telnet Connection

Note: Just as with `rlogin`, one aborts a `telnet` connection only when one can't terminate the connection using `logout` at the end of the work session.

When you want to abort a `telnet` connection, type the standard *escape character* (usually `CTRL-]`), press the `CTRL` key and the close-bracket key simultaneously), followed by `quit` to the `telnet>` prompt. The login connection to the other machine aborts, and you find yourself back at your original machine.¹¹

Figure 2-12 telnet: *Aborting a Connection*

```
venus% telnet tops20
Trying...
Connected to tops20.
Escape character is '^]'.

Yoyodyne Corp., TOPS-20 Monitor 6.1 (6762)-4
@LOG MEDICI

...
@ (Type CTRL-] to get telnet> prompt.)
telnet> quit
venus%
```

Suspending a telnet Connection

When you want to *suspend* a `telnet` connection, so that you can return to it later, type the standard escape character (usually `CTRL-]`) followed by `z` to the `telnet>` prompt. The `telnet` program becomes a *background process*. To reactivate the connection, type `fg`, or `%` followed by the `job` number of the background process (default job number for `%` is the job you most recently put in the background).¹²

¹¹ When you log in to a series of machines, accessing each machine through another machine, and you abort the connection to any of the machines in the series, you return to the machine where you started.

¹² The `z` command only works with the C-shell (`csh`). For more information on running jobs in the background, see the chapter on timesaving features in *Getting Started With UNIX: Beginner's Guide* and the section on job control in the chapter about the C-shell in *Doing More With UNIX: Beginner's Guide*.

Figure 2-13 telnet: *Suspending a Connection*

```

venus% telnet tops20
Trying...
Connected to tops20.
Escape character is '^]'.

Yoyodyne Corp., TOPS-20 Monitor 6.1 (6762)-4
@LOG MEDICI

...
@ (Type CTRL-I to get telnet> prompt.)
telnet> z

Stopped
venus% % (Type RETURN twice to get command prompt of other system.)
telnet tops20

@logout
Connection closed by foreign host.
venus%

```

Further Information About telnet

For further information about telnet, see its Man Page, online or in the *Commands Reference Manual*.

2.4. Remote Login With tip

Note: cu, an interface to tip based on what was originally a UNIX Version 7 command, is available. See its Man Page if you want to know more about it.

Establishing a Connection With tip

You can use tip to log in to machines that aren't on your local network, but are accessible by dialing up. tip, the terminal interface processor, lets you dial up other machines and establish a modem connection.

To establish a tip connection, type tip followed by the phone number of the machine to which you want to connect.

Figure 2-14 `tip`: *Establishing a Connection*

```

venus% tip 555-0000
dialing...connected (Type RETURN twice.)

Yoyodyne Corp., TOPS-20 Monitor 6.1 (6762)-4
@LOG MEDICI

...

@LOGOUT
Connection closed by foreign host.
venus%

```

Problems Establishing a Connection With `tip`

`tip` may fail to make a connection for one of several reasons. When the phone line is busy or doesn't answer, `tip` displays the notifier `call failed`. Check the phone number and try again. If the problem persists, try looking at the `tip` Man Page, online or in the *Commands Reference Manual*.

Figure 2-15 `tip`: *Call Fails*

```

venus% tip 555-9999
dialing...call failed
[EOT]
venus%

```

Sometimes the system at the other end of the phone line may not respond properly. Perhaps it is down temporarily or has some kind of maintenance problem. Contact a user on the other system, or its system administrator, to correct the problem.

When the local machine is loaded with many processes, `tip` may not be able to synchronize with a Ventel modem to connect with the other machine. Try again, and if that doesn't work, wait until the system is less loaded.

Figure 2-16 `tip`: *Synchronization Problem*

```

venus% tip 555-0101
can't synchronize with ventel
call failed
[EOT]
venus%

```

2.5. Summary

You've learned how to log in to other machines from your machine. Next, this manual explains how to execute commands on other machines without logging in to them.

B

Command Summary

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Command Summary

This is a summary of all commands mentioned in this manual. Each command appears in alphabetical order by name, and includes a syntax diagram, and a brief paragraph describing its function.

- ftp** **ftp**
File transfer program that includes commands:
- get** **get *filename local-filename***
Transfer file *filename* from the machine to which a connection is open to this machine and call it *local-filename*.
- open** **open *machine-name***
Establish a connection to *machine-name*.
- quit** **quit**
Quit ftp.
- send** **send *local-filename filename***
Transfer file *local-filename* from this machine to become file *filename* on the machine to which a connection is open.
- perfmeter**
perfmeter [*machine-name*]
Provide status information window for this machine or the machine specified by *machine-name*.
- rcp** **rcp *local-filename other-machine-name : destination-filename***
Copy file from *local-filename* on your machine to the *destination-filename* on machine *other-machine-name* (use absolute pathnames for files).
- rcp *other-machine-name : filename local-filename***
Copy file *filename* from machine *other-machine-name* to *local-filename* (use absolute pathnames for files).
- rcp -r *local-directory-name other-machine-name : destination-directory-name***
With **-r** option, copy from *local-directory-name* on your machine to the *destination-directory-name* on machine *other-machine-name*.

- `rcp -r other-machine-name : directory-name local-directory-name`
 With `-r` option, copy directory *directory-name* from machine *other-machine-name* to *local-directory-name*.
- `rlogin rlogin machine-name [-l username]`
 Log in from your machine to the machine called *machine-name* using the current username; when you specify `-l username` option, `rlogin` attempts to log in with the *username* you specify. "~ ." aborts an `rlogin` connection. ~ followed by **CTRL-Z** suspends an `rlogin` connection.
- `rsh rsh machine-name command`
 Execute command *command* on *machine-name*.
- `rup rup [machine-name]`
 Display system uptime and load average information for all machines on local Ethernet, or for machine specified.
- `rusers rusers [machine-name]`
 Display usernames of users logged in on all machines of the local Ethernet, or for *machine-name* if specified.
- `rwall rwall machine-name`
 Broadcast message text on lines following command line (ending with **CTRL-D** on a line by itself) to all users on *machine-name*.
- `telnet telnet [machine-name]`
 File transfer program that includes commands:
- `z z`
 Suspend telnet program.
- `quit quit`
 Quit telnet.
CTRL-I obtains telnet prompt.
- `tftp tftp`
 File transfer program that includes commands:
- `connect connect machine-name`
 Establish a connection to *machine-name*
- `get get filename local-filename`
 Transfer file *filename* from machine to which you are connected to local machine calling it *local-filename*.
- `put put local-filename filename`
 Transfer file *local-filename* to replace contents of existing file *filename* on other machine.
- `quit quit`
 Quit tftp.
- `tip tip phone-number`
 Dial up *phone-number* and attempt to start a login connection.