

Passport

User's Guide



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Passport User's Guide

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About this Manual

This reference guide describes Passport™ licensing and provides information on installation, configuration, Passport device cables, testing and debugging.

The terms and conventions used in this manual provide a consistent format.

Conventions

Commands are shown in **bold** type.

Filenames and directories are shown in *italic* type.

Mono-spaced type is used to display screen output and keyboard input commands and program examples.

```
Installation for "Passport" Security
```

This manual is grouped into topical sections. Whenever a topic or a function of another section is referenced, that topic is followed by a **See also:** reference for the section where it may be found.

For example:

Disable the port that was selected.

See also: Disabling getty

In this example, a reference to disabling a port informs the reader to find the complete text for disabling getty by using the table of contents.

When the information may be found in documentation other than this manual, the sentence includes a descriptor identifying the command and other documentation to reference. In the following example, the user is referred to the Unix documentation.

...use the Unix **cp** command to make a copy of this file.

Introduction to Passport

Passport security (licensing) is available in either hardware or software form. Both forms are controlled by the supplied Passport daemon, */etc/passport*, automatically launched by Dynamic Concepts, Inc. (DCI) products. Whereas software licensing is based upon information derived during installation, hardware licensing is based upon the external DCI Passport device.

In either case, each installation is identified by a unique 32-bit license number. A license number is expressed as an 8-character hexadecimal value, such as 99D04832. The first two characters represent a specific operating system and/or hardware environment. In this example, 99 represents SCO Unix. Licenses are not transferable to other platforms.

The license number, along with a DCI supplied Software Selection Number (SSN) activates the installation of DCI products and configurations. The SSN assignment is based, among other things, on the following criteria: the hardware or software license number, the DCI products authorized and the number of concurrent users.

The daemon is a program that performs product security verification by manipulation of the license number. This process is automatically launched by */etc/DCI/passport.cmd* each time that a DCI product is in use (unless a daemon is already running). The daemon runs continually in the background and during all user logins, verifying the DCI license number.

A special directory, */etc/DCI*, is created during installation to maintain security-specific information and files for use by all DCI software products. Typically, the following text files are stored in the directory:

- *ssn* DCI activation key for the installation
- *osn* OEM activation keys enabling encrypted application software
- *passport.cmd* Command text used to initiate the daemon
- *passport.log* Log file appended by the daemon with security information, licensing methods and errors
- *ppstresstest* A program used to verify the operational status of the Passport device.

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When installing with software security, one additional binary file may be created:

- *license* License number information for systems installed with software licensing

Warning: Modification, deletion, renaming or moving the license file will invalidate it.

Installation & Configuration

Unix kernel message queues must be properly configured and licensing configuration values must be entered into the `/etc/DCI/passport.cmd` file to provide an execution environment for the daemon. For hardware licensing, a terminal port must be physically configured and logins disabled. Configuration of licensing is initially performed during installation, or by later usage of the supplied **ppconfig** utility.

Hardware Licensing

Hardware licensing is based upon the connection of a Passport device to an unused serial RS232 communication channel on the computer. Each Passport device is pre-programmed with its own unique 32-bit license number. The assigned SSN for that license number is perpetual. Therefore, the license number remains constant when the Passport device and associated SSN are moved to another identical platform.

Disabling getty

In order to attach the Passport device to a serial line, that serial line must first be disabled. Typically, this means that the `getty` process must be disabled for that port, so that it will not be automatically launched at startup. If `getty` is not disabled, the Passport device may not initialize properly. Although the disabling method will vary on different platforms, an SCO-Unix example is provided below:

See also: The manufacturer's manual for the operating system.

To disable a port (terminal), follow these steps:

1. Turn off the power to the terminal.
2. Log in on another terminal as the superuser.

3. Use the **disable** command to disable the terminal. The command has the form:

```
# disable ttyname
```

ttyname is the name of the serial line to which the terminal is attached. For example:

```
# disable /dev/ttyla
```

This command disables user logins using the serial line `/dev/ttyla`.

4. Disconnect the terminal from the system.

The serial line previously connected to the terminal should now be free to accept another device. To verify that the port was disabled, type the following command:

```
# ps -ef|grep getty
```

A list of all active getty processes will be displayed. The port just disabled should not be listed.

Installing Hardware Licensing

When installing hardware licensing for security verification with DCI products, a DCI Passport device must be physically attached to a mux or com port on the system. Instructions for installing the Passport device are outlined below:

1. Select an available port and determine the port device name (ttyname).

See also: The system manufacturer's manual for the assignment of port device names.

2. Disable the port that was selected.

See also: Disabling getty

3. DCI supplies configured connectors for only the most common port types. If the Passport device was supplied with a configured connector, verify that it is configured correctly for the selected port. The Passport Connector Documentation included with the device describes the configuration of the connector. When necessary, configure a custom connector for the selected port.

See also: Attaching a Passport Device

4. Using the cable and configured connector, attach the Passport device to the port. The cable should be attached to the "Host" modular jack on the Passport device.
-

Software Licensing

Each of the software licensing methods described below produce the same net result, a 32-bit "soft" license number which uniquely identifies the computer system. All methods attempt to associate the soft license number with some hardware component in the system, so that it will remain constant unless that component fails or is replaced.

The method employed on a given platform can be determined by examining the daemon log file, */etc/DCI/passport.log*. For example, the line may read:

```
11/18 09:09:15 Licensing: Software (#1) - Your license is 99149C5E
```

This indicates that method #1 is used for this platform. As with a Passport device, the first two characters of the license number represent a specific operating system and/or hardware environment. In this example, 99 represents SCO Unix.

Methods of Producing a Software License Number

- #1 This method derives a license number by creating the file */etc/DCI/license*. This file becomes invalid and unusable if it is moved, copied, restored from a back-up, or otherwise modified. Usually, the license number remains constant unless the root disk drive is replaced or the O/S is reinstalled.

If the license file becomes invalid, the only alternative is to remove the file and let the daemon build a new one, thereby producing a new license number. A new SSN from DCI must then be obtained.

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If an existing license must be replaced, be sure to write down the old license number. DCI needs to link that license with the new one in order to track replacements accurately.

Note: When method #1 is utilized, the initial creation of a license number may take a few minutes to complete. The following message may output to the screen:

```
License #: Currently being determined.
```

Monitor the */etc/DCI/passport.log* file or reissue the command until a valid license number is displayed.

#2 This method also derives a license number by creating the file */etc/DCI/license*, but employs an alternative algorithm to compensate where insufficient O/S support exists to implement method #1.

#3, #5, #6, #7, #8

All of these methods incorporate the system serial number into the license number. The serial number is typically obtained from the system motherboard or CPU board. Therefore, the license number remains constant unless that hardware component is replaced.

#4 This method incorporates the system's Ethernet interface address into the license number. The license number remains constant unless the Ethernet card is replaced.

Note: When using software licensing, the license number is keyed to the specific system. Prior to updating the operating system (Unix), or replacing or reformatting the disk drive, contact your distributor or Dynamic Concepts concerning the deactivation and replacement policy for the license.

Software Installation & Configuration

Configuring Kernel [IPC] Message Queues

Before beginning software installation and security licensing procedures, it is important to verify that Unix kernel message queues have been properly configured, since these queues provide channels of communication between DCI products and the daemon. If these queues are full, a security failure may result, since free message space must be available to start a new port. Please refer to the system's manuals for message queue configuration procedures.

See also: Message Queues in the UniBasic Reference Guide.

Loading the Distribution Diskettes & Tapes

The Passport installation tape or diskette should be copied into the */tmp* directory using the instructions printed on the media. The name of the device used by DCI to make the tape or diskette is listed on the label, e.g. */dev/fd096*. In many cases, similar computer systems sold by various manufacturers have differing device names. If difficulties arise when loading the distribution media, contact your supplier to ascertain the exact device name for the format supplied.

The following list of filenames should appear on the distribution:

```
passport/README
passport/burnin
passport/passport
passport/ppstresstest
passport/ssnmaint
passport/ppconfig
ppinstall
```

Licensing a New Installation

From the superuser account, invoke the DCI utility **ppinstall** to install the Passport software:

```
# ./ppinstall
```

After some initial checks, the following prompt will display on the screen:

```
Installation for "Passport" Security
All Rights Reserved. Copyright (C) 1995 by:

Dynamic Concepts Inc. Aliso Viejo, California USA
Do you wish to continue? (Yes or No, default = Yes)

To continue with the installation, press RETURN to accept the
default (Yes).
```

Press [RETURN] as prompted to continue with the installation.

```
Enter Software Selection Number (SSN):
```

The user will then be prompted to enter the SSN. The SSN may be entered now as prompted or later using the **ssnmaint** utility. If the SSN is not available, press [RETURN] to invoke a single-user grace period. A special warning about the grace period is printed periodically until an authorized SSN is entered.

To obtain an authorized SSN for this installation, contact your supplier with the following information:

- License Number displayed
- Number of ports desired
- Type of system
- End-User name
- Options, such as UniBasic IQ Runtime, IQ Development, IMT, etc.

If available, enter the DCI issued SSN for the license as shown on the SSN printout. SSN entry is space and case insensitive. After entering all characters, press [RETURN]. At the next prompt, enter the User Name. Enter the name exactly as printed on the SSN License Agreement. Entry of the name is case and space sensitive. Backspace may be used to correct input errors.

If this is a new installation, the */etc/DCI* directory is created to store security related files and the following message is displayed:

```
Creating directory "/etc/DCI" . . . Done
```

At this point, the **ppconfig** utility is invoked.

Configuration Using the ppconfig Utility

The **ppconfig** utility allows the user to enter values into the passport startup file which establishes the environment for the execution of the daemon. Passport security can be configured at any time after installation by manually executing **ppconfig**, or editing the */etc/DCI/passport.cmd* file.

Note: **ppconfig** may be run directly from a superuser shell, at any time.

The prompts from ppconfig will be as follows:

```
Configuration for PASSPORT Security daemon.
```

```
All Rights Reserved. Copyright (C) 1992 - 1995 by:  
Dynamic Concepts Inc. Aliso Viejo, California USA
```

```
Part 1) PASSPORT Security
```

```
PASSPORT Security uses the background daemon "/etc/passport".  
The following prompts will guide you through set-up of the  
daemon. These parameters can later be changed by running  
"ppconfig" or editing the file "etc/DCI/passport.cmd".
```

```
(H)ardware or (S)oftware licensing? (default = "Software")
```

The user is required to select either hardware or software licensing configuration. When configuring for software licensing, the short version of **ppconfig** is invoked. The next two sections guide the user through both software and hardware configuration.

ppconfig with Software Licensing

DCI recommends accepting the default choices, unless otherwise directed by DCI support staff. When configuring for software licensing, the following prompts are displayed:

```
Option: -t batch_delay
Enter the delay time in seconds for batching security
inquiries (0-15 or auto): (default = "auto")
```

Enter the number of seconds to delay when batching incoming security requests into a queue.

```
Option: -v
Verbose mode (for troubleshooting only). Do you want full
verbose log output? (Yes or No, default = No)
```

Specify if debugging messages should be written to the */etc/DCI/passport.log* file.

```
Do you wish to continue? (Yes or No, default = Yes)
```

Enter "Y" to accept the values as entered. To continue without accepting the values just entered, enter "N" and press [RETURN].

```
FOR CHANGES TO TAKE EFFECT, KILL ANY EXISTING PASSPORT DAEMON
WHICH MAY BE RUNNING.
```

To verify that no existing daemon is running, enter the following command:

```
$ ps | fgrep passport
```

To kill an existing daemon, enter the **kill** command:

```
$ kill (pid#)
```


ppconfig with Hardware Licensing

DCI recommends accepting the default choices, with the exception of TTY device and baud rate options, unless otherwise directed by DCI support staff. When configuring for hardware licensing, the following prompts are displayed:

```
Enter the TTY device name to which the PASSPORT is connected:
(Example: /dev/ttyla)
(default = "/dev/null")
```

The user is required to enter the device name of the serial line connected to the Passport device. (**Note:** The line must be disabled and currently not in use by any other process.)

See also: Disabling getty

```
Option: -b baud_rate
Enter the baud rate as selected on the PASSPORT device. 9600,
19200, or 38400: (default="19200")
```

The user is required to enter the baud rate that determines the data transmission speed. The baud rate is set on the Passport device by manipulating the “dip switch” located in the middle of the box. The baud rate settings for the switch are indicated on the Passport device label.

```
Option: -m max_count
Enter maximum transfer count in bytes (1-32 or auto):
(default = "auto")
```

Enter the maximum number of bytes per second to be transmitted from the daemon to the Passport device.

```
Option: -a hang_alarm
Enter the hang-alarm time (if you can't write to TTY line) in
minutes (1-15 or auto): (default = "auto")
```

Enter the number of seconds to complete communications from the Passport device to the daemon. If communications cannot be completed within this amount of time, an error message will be displayed.

```
Option: -r read_time_out
Enter the read_time_out value (in 1/10 sec.)(1-18000 or auto):
(default = "auto")
```

Enter the number of 1/10 seconds the daemon should wait until it receives a message from the Passport device. If communications cannot be completed within this amount of time, an error message will be displayed.

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Option: -0 `retry_count`
Enter the number of retries on read time-out (0-200 or auto):
(default = "auto")

Enter the number of retries before a communications process will be disrupted and an error message will be displayed.

Option: -t `batch_delay`
Enter the delay time in seconds for batching security inquiries (0-15 or auto): (default = "auto")

Enter the number of seconds to delay when batching incoming security requests into a queue.

Option: -v
Verbose mode (for troubleshooting only). Do you want full verbose log output? (Yes or No, default = No)

Specify if detailed error messages should be written to the `/etc/DCI/passport.log` file. If the verbose mode is not selected, then only serial I/O-related errors will be produced in the `/etc/DCI/passport.log` file.

Do you wish to continue? (Yes or No, default = Yes)

Enter "Y" to accept the values as entered. To continue without changing the values, enter "N" and press [RETURN].

FOR CHANGES TO TAKE EFFECT, KILL ANY EXISTING PASSPORT DAEMON WHICH MAY BE RUNNING.

To verify that no existing daemon is running, enter the following command:

```
$ ps | fgrep passport
```

To kill an existing daemon, enter the **kill** command:

```
$ kill (pid#)
```

Changing the SSN Activation Key

The Passport software includes the utility **ssnmaint**, which allows the user to display a status report of the current SSN information. The same program will also allow the user to edit or enter a new SSN for the purpose of adding users, enabling additional products, or converting a demonstration license to a full license. While any user may use **ssnmaint** to view a ssn, only the superuser may change a SSN.

Prior to changing a system's SSN, save a copy of the existing SSN number, as contained within the file */etc/DCI/ssn*.

To view or change an existing SSN issue the following command at the Unix prompt:

```
# ssnmaint
or
$ ssnmaint
```

If there is an existing SSN, the following information will be displayed to the screen:

```
SSN:          (DCI issued SSN for this license)
License #:    (current license number)
Licensed to:  (enduser name)
Platform:     (license platform)
User limit:   (maximum number of users)
Authorized products:
              (DCI products authorized with this license)
```

Enter Software Selection Number (SSN), RETURN to remain the same:

To exit **ssnmaint** with no changes to the information, press [RETURN]. Otherwise, enter the new SSN as prompted and press [RETURN]. SSN entry is space and case insensitive. At the next prompt, enter the User Name. Enter the name exactly as printed on the SSN License Agreement. Entry of the name is case and space sensitive. Backspace may be used to correct input errors.

Attaching a Passport Device

In order to attach the Passport device to a system hardware port, a connector for the mux or com port must be properly configured. DCI supplies configured connectors for only the most common port types. Therefore, the Passport device kit may or may not include the configured connector(s) required for the specific serial port. Because of the wide variety of serial ports, it may be necessary for the installer to configure a custom connector. In that case, connector kits are available from DCI for configuring custom connectors. Use the information provided in the following section to configure the required connector.

Located on the front panel of the Passport device are two RS232 modular jacks and a power fault light (“LED”). The two modular jacks are identified as Host and Terminal. The Host jack is generally connected directly to an available RS232 connection on the main computer. The Terminal jack is reserved for future use.

In most configurations the Passport device draws its power directly from the RS232 Host connection. The power fault LED, if lit, indicates that insufficient power is available from the RS232 connection. Frequently, the LED will go off when the tty port is opened by the Passport software or during diagnostic testing. However, if the power from the RS232 is insufficient the LED will remain on and a power adapter may be required. The necessity of a power adapter is rare, but in such an event, power adapters are available from DCI.

Configuring a Connector

The signal locations for the Passport device’s Host modular jack and the corresponding wire colors on the RJ-to-DB connector are as follows:

Host Jack:	RJ-to-DB Connector:
1- Chassis Ground (CHSGND)	1- Blue
2- Transmit Data (TD)	2- Orange
3- Receive Data (RD)	3- Black
4- Request to Send (RTS)	4- Red
5- Clear to Send (CTS)	5- Green
6- Data Set Ready (DSR)	6- Yellow
7- Signal Ground (GND)	7- Brown
8- Data Terminal Ready (DTR)	8- White

As illustrated above, the Chassis Ground signal from the Passport device is the blue wire on the connector. The Transmit Data signal from the Passport device is the orange wire and etc.

When configuring a connector using the Host modular jack and a RJ-to-DB connector, the signals can be configured using the preceding information. For example, the "Receive Data" signal is the number 3 signal at the Passport device Host jack, and would therefore be the black wire on the RJ-to-DB connector. The black wire can then be inserted in the proper pin location to correspond with the selected port.

In other words, if the selected port's Transmit Data signal is located at the number 2 pin location, then the Receive Data signal (black wire) from the Passport device Host jack would need to be inserted into the number 2 pin location on the connector.

See also: The system's manufacturer manual for the configuration of the port.

Although the Terminal modular jack is currently not used for hardware licensing, the signal locations for that jack are listed below for possible future use.

Terminal Jack:

- | | |
|----------------------------|------------------------------|
| 1- Chassis Ground (CHSGND) | 5- Clear to Send (CTS) |
| 2- Receive Data (RD) | 6- Data Set Ready (DSR) |
| 3- Transmit Data (TD) | 7- Signal Ground (GND) |
| 4- Request to Send (RTS) | 8- Data Terminal Ready (DTR) |

Available Configured Connectors

As mentioned above, DCI supplies configured connectors for only the most common serial port types. The following is a partial list of currently available connectors:

SCO-UNIX, SCO-XENIX, etc. (PC USING COM PORT)
MOTOROLA 88000 (25M)
MOTOROLA 88000 (9F)
MOTOROLA 900
IBM RS/6000 AIX
MOTOROLA POWER PC 603 AIX

Connector Documentation

When a configured connector(s) is supplied with the Passport device, DCI includes documentation describing the configuration of the connector. The supplied connector's configuration is based on the standard specification for a specific serial port. Prior to installation, confirm that the selected port signal requirements correspond with the supplied connector.

The documentation lists the platform or port type, for which the supplied connector is configured. Also listed is the connector type, typical device name, terminator requirement, and any special notes.

The table section of the documentation indicates the configuration of the connector. The Color column refers to the colors of the wires within the connector. The Signal column lists the abbreviation of the signal type. The Connector column indicates the pin location ("pinouts") of the signals on the connector. Verify that these signal locations correspond with the selected port. (Note: "-" indicates the signal on that row is not required and, therefore, was not connected.) The Passport Host column indicates the signal location on the Host modular jack of the Passport device.

Connector documentation for some of the most common port types are described below.

SCO-UNIX, SCO-XENIX, etc. (PC USING COM PORT)

Connector Type: DB-9 F / RJ45

Typical Device Name: /dev/tty1a

Terminator: Not Required

Color	Signal	Connector	Passport Host
Blue	CHSGND	---	1
Orange	RD	2	2
Black	TD	3	3
Red	RTS	7	4
Green	CTS	8	5
Yellow	DSR	6	6
Brown	GND	5	7
White	DTR	4	8

MOTOROLA 88000 (25M)**Connector Type:** DB-25 M / RJ45**Typical Device Name:** /dev/tty01**Terminator:** Not Required**Note:** CD signal is looped back to computer.

Color	Signal	Connector	Passport Host
Blue	CHSGND	1	1
Orange	TD	3	2
Black	RD	2	3
Red	RTS	4	4
Green	CTS	5	5
Yellow	DSR	6	6
Brown	GND	7	7
White	DTR	20,8	8

MOTOROLA 88000 (9F)**Connector Type:** DB-9 F / RJ45**Typical Device Name:** /dev/tty01**Terminator:** Not Required**Note:** Same as PC COM port, except it loops CD back to the computer.

Color	Signal	Connector	Passport Host
Blue	CHSGND	---	1
Orange	TD	2	2
Black	RD	3	3
Red	CTS	7	4
Green	RTS	8	5
Yellow	DSR	6	6
Brown	GND	5	7
White	DTR	4,1	8

MOTOROLA 900

Connector Type: RJ45 / DB-9 M - DB-9 F / RJ45

Typical Device Name: /dev/contly02

Terminator: Not Required

Note: CD signal is looped back to computer. Connect cables as follows: Passport Host - RJ45, Cable to DB9M Connector to DB9F Connector to RJ45, Cable - Computer port.

Color	Signal	Connector	Passport Host
Blue	CHSGND	---	1
Orange	TD	5	2
Black	RD	4	3
Red	RTS	7	4
Green	CTS	2	5
Yellow	DSR	---	6
Brown	GND	6,3	7
White	DTR	1,8	8

IBM RS/6000 AIX

Connector Type: DB-25 F / RJ45

Typical Device Name: /dev/tty3

Terminator: Not Required

Note: CD signal is looped back to computer.

Color	Signal	Connector	Passport Host
Blue	CHSGND	1	1
Orange	TD	3	2
Black	RD	2	3
Red	RTS	4	4
Green	CTS	5	5
Yellow	DSR	6	6
Brown	GND	7	7
White	DTR	20,8	8

Testing & Debugging

Testing using ppstresstest

ppstresstest is a program used to verify the operational status of the Passport device. This program verifies that the system is able to transmit and receive data from the Passport device.

To run the **ppstresstest** program, disable any getty or other processes that may be running on the port (**See also:** Disabling getty). Make sure that the daemon is not running on the port. If it is, log off all DCI products and kill the daemon. Attach the proper cabling and connectors from the serial port to the Host input on the Passport device. Set the 3-position slide switch on the device for the desired baud rate.

Enter the command:

```
# /etc/DCI/ppstresstest -bbaud rate license number  
</dev/ttyname >/dev/ttyname
```

Command line options are:

<i>-b baud rate</i>	Valid <i>baud rates</i> are 9600, 19200, 38400.
<i>license number</i>	Any valid <i>license number</i> from a Passport device (case insensitive).
<i>ttyname</i>	<i>ttyname</i> of the serial line to which the Passport device is attached.

The following is an example command line:

```
# /etc/DCI/ppstresstest -b19200 991d0043 </dev/ttyla  
>/dev/ttyla
```

If the Passport device is connected properly, no failure messages will appear. The screen will display the number of successful operations and data transmitted and received until the interrupt key is pressed to stop its execution.

If any errors occur or there is no response, try the following:

1. Check to make sure the baud rate set on the Passport device is the same as the command line. The baud rate settings for the switch are indicated on the Passport device label.
2. Issue the command: `</dev/ttyname` and press [RETURN]. The terminal should immediately return. If the command hangs, press the interrupt key to abort the command and check the wiring of the Passport host connector.

Some multiplexors and serial controllers require certain signals present in order to open a tty line. To accomplish this, either loop those signals at the serial port while still transmitting them through to the Passport device, or loop those signals by using a terminator attached to the TERMINAL connector of the Passport device.

Debugging the Passport Device

This section explains error messages that the user may encounter while running the daemon. If the user is still unable to resolve hardware problems after following these suggestions, please contact your supplier or DCI support for assistance.

Daemon Failure

When DCI products run the Passport security program daemon, authorization failure may occur for several reasons. If failure does occur, then the following message will display:

```
License #: ????????  
Platform: (e.g. SCO-Unix)  
  
Invalid SSN  
For proper operation you must correct this problem and rerun  
(DCI product name).
```

Note that the license number is not displayed, therefore the Passport device and the daemon communications failed. When failure occurs, the first step necessary in the debugging process is to analyze error messages listed in the `/etc/DCI/passport.log` file.

If the daemon failed because of a hardware problem related to the Passport device, then the following error message will be displayed in the */etc/DCI/passport.log* file:

```
2/16 16:13:32 Self-test: FAIL
```

If this message is displayed, try the following steps to debug the Passport device failure:

1. Not Attached to the Port:

Verify that Passport device has been physically installed on the port.

2. Attached to Wrong Port:

The port specified in the */etc/DCI/passport.cmd* file is incorrect.

Enter the **tty** command at the Unix prompt to determine the device name specification for the port

Consult the system manufacturer's manual to determine if the correct device name has been specified for the port.

3. Incorrect Baud Rate:

Check the baud rate setting on the Passport device.

4. Maximum Transfer Count Too High:

Lower the max count parameter in the */etc/DCI/passport.cmd* file to "1". This value sets the transmission speed for data bits from the Passport device to the daemon.

5. Bad Cable Line for Port:

Verify that the connector pinouts have been configured correctly for the port.

See also: Passport Device Cables

6. No Read or Write Permission for Port:

Enter the following command to list the port file permissions:

```
$ ls -l /dev/tty17
```

If read or write permission must be added, enter the following change mode command:

```
$ su
# chmod 666 /dev/tty17
```

Verify that read permission exists for the cable connection by entering the following command:

```
$ </dev/ttyname
```

Verify that write permission exists for the cable connection by entering the following command:

```
$ >/dev/ttyname
```

A message will be returned if permission is not valid. The prompt will not return if the cable is not attached.

7. Bad Port:

Disconnect the Passport device from its port and attach a terminal to that port. Test the working condition of the port by enabling and using it. Also try to send output to the disabled port using the Unix **date** command:

```
$ date >/dev/tty17
```

If the terminal will not accept input or display output, then the port is bad and the Passport device must be attached to a different port.

8. Attached to Wrong Platform:

Verify that the Passport device is the right platform for the operating system. The device is not transferable between different platforms.

9. Port not Disabled:

Verify that the Unix disable command (or system equivalent) has been used to disable the port:

```
# disable ttyname
```

See also: Disabling getty

10. Faulty Passport Device:

If all other diagnostic procedures fail and the problem can't be corrected, try cabling another hardware device to the port.

11. Terminator Cable Line Required:

Verify if a terminator cable line hook-up is required from the Passport device to the port. (Check with your system operations administrator.)

Appendix A - Messages

Error Messages

The `/etc/DCI/passport.log` file contains error messages explaining the reason for daemon security authorization failure. Enter the following Unix command to display the latest error messages:

```
# tail /etc/DCI/passport.log
```

Daemon error messages will display on screen. The possible error messages are listed and described in the following sections.

MESSAGE: "Attempting forced restart"
"Forced restart failed"

DESCRIPTION: Five successive hang alarms have occurred (**See also:** `-a` option). The daemon now attempts to "kick" the serial I/O using `ioctl(0, TCXONC, 1)`, in case a stray CTRL-S was received.

MESSAGE: "##-byte inquiry too large, truncated to ##"

DESCRIPTION: A client process has requested an inquiry string to the daemon which is larger than the maximum allowed inquiry string, of 32 bytes. This indicates a bug in the client software.

MESSAGE: "Cannot allocate memory"

DESCRIPTION: An attempt to allocate or reallocate memory failed. The system's maximum process size may need to be increased.

MESSAGE: "Cannot build message queue"

DESCRIPTION: The daemon was unable to build its incoming message queue. The system parameters for IPC message queues should be checked.

MESSAGE: "Cannot drain output"
DESCRIPTION: A request to the system to drain the serial output queue has failed.

MESSAGE: "Cannot find block device 0xhhhhhhhh"
DESCRIPTION: The block device file for the root file system device could not be found in the /dev directory.

MESSAGE: "Cannot find network address"
"Cannot get network configuration"
"Cannot get socket"
"Cannot read network address"
DESCRIPTION: The system network address required for software licensing method #4 could not be obtained. Ensure that the network hardware and software are configured properly.

MESSAGE: "Cannot find streams module: xyz"
"Cannot pop off streams modules"
"Cannot push streams module: xyz"
DESCRIPTION: On some platforms employing STREAMS technology, certain modules must be activated by the daemon in order for serial I/O to work properly. Platforms in this category currently are 21 (ICL DRS-3000) and E7 (ICL DRS-6000).

MESSAGE: "Cannot flush I/O"
DESCRIPTION: A request to the system to flush all serial I/O queues has failed.

MESSAGE: "Cannot get status of modem lines"
"Cannot set status of modem lines"
DESCRIPTION: A request to the system to read or change the status of the modem control lines has failed. This only applies to HP-UX systems, 61 (HP 9000 Series 300) and E9 (HP 9000 Series 800).

On HP-UX, the system often doesn't activate any modem control signals on a serial port unless the port is specifically configured to use modem protocol. Without at least one raised line (positive voltage) the Passport device won't work, at least not

without external power. In this situation, the daemon attempts manually to raise the required lines.

MESSAGE: "Cannot open block device"
"Cannot read disk device"
"Cannot reopen disk device"
"Incorrect seek on disk device"
"License generation failed, contact DCI"

DESCRIPTION: An operation on the block device for the root file system has failed.

MESSAGE: "Cannot read device"
"Cannot write device"

DESCRIPTION: An attempt to read data from or write data to the Passport device has failed.

MESSAGE: "Cannot read serial number"
"illegal machine serial number"

DESCRIPTION: An attempt to read the system serial number has failed. This message applies to software licensing methods #3, #5, #6, #7, and #8.

MESSAGE: "Cannot read TTY parameters" "Cannot set TTY parameters"

DESCRIPTION: An attempt to read or change the TTY parameters on the Passport serial line has failed.

MESSAGE: "Cannot remove temporary file"
"Cannot write temporary file"

DESCRIPTION: An attempt to write to or remove a temporary file used in the creation of the software license has failed.

MESSAGE: "Cannot read license file"
"Cannot reopen license file"
"Cannot stat license file"
"Cannot write license file"
"Incorrect seek on license file"

DESCRIPTION: The indicated operation on the file */etc/DCI/license* has failed. Make sure the file exists and can be accessed. If not, a replacement license is needed.

MESSAGE: "Cannot set 2 stop bits, transfer count reduced to 1 byte"

DESCRIPTION: The normal mode of operation for the serial line when talking to the Passport device uses 2 stop bits. If this mode is not available, the daemon must reduce I/O with the Passport to single-byte transfers. This message is informative only.

MESSAGE: "Caught signal ##"

DESCRIPTION: The daemon process has received a Unix **SIGHUP** or **SIGTERM** signal. These signals are interpreted as requests to shutdown the daemon.

MESSAGE: "Daemon already runjning"

DESCRIPTION: A Passport daemon process is already running on this system. Only one Passport daemon at a time can run on a given system.

MESSAGE: "Daemon not running as 'root'"

DESCRIPTION: The Passport daemon process must run with root privilege. This is normally accomplished by ensuring that the */etc/passport* file has owner=root, group=bin, and mode=4555. i.e.:

```
# chown root /etc/passport
# chgrp bin /etc/passport
# chmod 4555 /etc/passport
```

MESSAGE: "Error in recv()"
"Error in send()"
"Illegal size passed to recv()"
"Illegal size passed to send()"

DESCRIPTION: A call to the daemon's send or receive communication routine has failed. Check the configuration of message queues.

MESSAGE: "Invalid batch delay time"

DESCRIPTION: The value given for the -t option is invalid. The valid range is 0-15 seconds.

MESSAGE: "Invalid baud rate"

DESCRIPTION: The value given for the -b option is invalid. The valid baud rates are 9600, 19200, and 38400.

MESSAGE: "Invalid hang alarm time"

DESCRIPTION: The value given for the -a option is invalid. The valid range is 1-15 seconds.

MESSAGE: "Invalid maximum transfer count"

DESCRIPTION: The value given for the -m option is invalid. The valid range is 1-32 bytes.

MESSAGE: "Invalid read time-out value"

DESCRIPTION: The value given for the -r option is invalid. The valid range is 1-18000 tenth-seconds.

MESSAGE: "Invalid time-out retry count"

DESCRIPTION: The value given for the -o option is invalid. The valid range is 0-200 retries.

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MESSAGE: "License file is invalid! Remove /etc/DCI/license and rerun /etc/passport"

DESCRIPTION: The license file has been moved, copied, or otherwise corrupted. This message only applies to software licensing methods #1 and #2.

MESSAGE: "Read failed after ## retries"

DESCRIPTION: Serial communication with the Passport device has failed after the indicated number of retries. The current batched inquiry is skipped and the next inquiry, if any, is started.

MESSAGE: "setdtablesize failed"

DESCRIPTION: A call to the setdtablesize () function to increase the maximum number of file descriptors has failed. This message only applies to platform 9A (Sequent DYNIX/ptx).

MESSAGE: "Standard input not a TTY"
"Standard output not a TTY"

DESCRIPTION: The daemon was started in hardware licensing mode but the standard input (output) of the daemon process is not a TTY (i.e. serial line).

MESSAGE: "System message buffers full"

DESCRIPTION: The daemon was unable to send a response to a client's message queue because of insufficient IPC message resources. The system parameters for IPC message queues should be checked.

MESSAGE: "TTY modes have changed; check interference from other processes, e.g. getty"

DESCRIPTION: A failure in reading data from the Passport device was caused by an unexpected change in the TTY modes; a change performed by a process other than the daemon itself. This kind of inter-process interference is usually caused by getty, indicating that the Passport's TTY line has not been disabled.

MESSAGE: "Unable to open log file"
 DESCRIPTION: The daemon message log file */etc/DCI/passport.log* could not be opened.

MESSAGE: "WARNING: PASSPORT line hung for ## minutes, check peripheral"
 DESCRIPTION: The time required to perform and respond to a batch of security inquiries has exceeded the "hang alarm" time specified by the -a option (default = two minutes). This message is only a warning. The hang alarm is reset and the cycle will repeat if I/O continues to hang.

Informative Messages

MESSAGE: "Licensing: Hardware PASSPORT, ## baud"
 "Licensing: Software (##) - Your license is #####"
 DESCRIPTION: Output at daemon startup to indicate licensing mode.

MESSAGE: "Self-test: Pass"
 "Self-test: FAIL"
 DESCRIPTION: Output at daemon startup to indicate the results of the Passport device self-test diagnostic.

Messages produced in verbose mode (-v)

The following messages are used for debugging purposes by DCI.

MESSAGE: "Batch delay - ## seconds (-t)"
 "Hang alarm = ## minutes (-a)"
 "Max transfer = ## bytes (-m)"
 "Read time-out = ## tenth-seconds (-r)"
 "Time-out retry = ## retries (-o)"
 DESCRIPTION: The active program settings.

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MESSAGE: "Inquiry, prod ## port ##"

DESCRIPTION: Output as each security inquiry is received from a client.

MESSAGE: "Response, prod ## port ##"

DESCRIPTION: Output as each response to a security inquiry is sent back to a client.

MESSAGE: "## inquiries done"

DESCRIPTION: Output after each batch of security inquiries is completed.