



# TruePort for Solaris User Guide

This document provides the procedure for installing and using TruePort on Solaris Sparc and Intel.

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## What is TruePort?

You use Trueport when you want to connect extra terminals to a server using a Device Server rather than a multi-port serial card; it is a tty device redirector. TruePort is especially useful when you want to improve data security, as you can create an SSL/TLS connection between the TruePort host port and the Device Server, which will encrypt the data between the two points.

## TruePort Full Mode vs Lite Mode

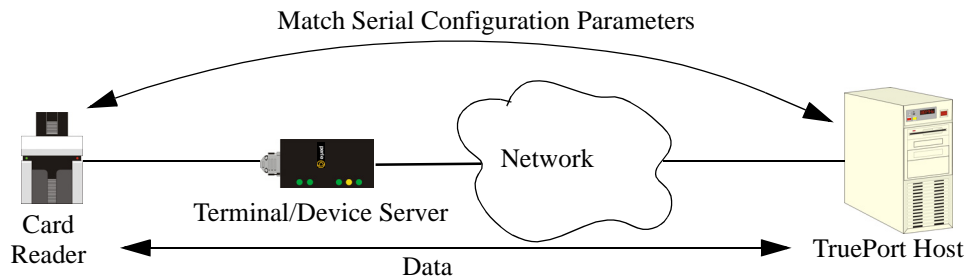
You can configure TruePort on Solaris in either Full Mode or Lite Mode. When you start TruePort in Full Mode, the serial configuration parameters are set on the TruePort host. When you start TruePort in Lite Mode, the serial configuration parameters are set on the device/terminal server. On Solaris, serial configuration parameters consist of bits per second (baud rate speed), data bits, parity, stop bits, flow control, and any other standard stty I/O parameters. In either mode, the data is passed in raw format, although you can enable the SSL/TLS connection option to encrypt the data going through a port.

### Full Mode

This mode allows complete device control and operates exactly like a directly connected serial port. It provides a complete tty device interface between the attached serial device and the network, providing hardware and software flow control.

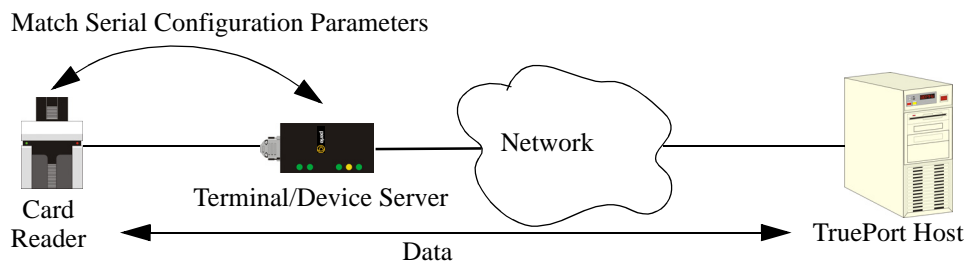
TruePort uses the TCP protocol on the configured port for both data and control functions. This is the default mode and works with the IOLAN Device Server running firmware 3.5 or higher. When TruePort connects with IOLAN Device Servers running older firmware, JetStream or LanStream servers, it will use the UDP protocol for the control functions. Note that some firewalls block UDP packets by default and might need to be reconfigured.

The port serial configuration parameters set on the TruePort host must match the serial configuration parameters set on the device (in this example, to the Card Reader), as shown below:



### Lite Mode

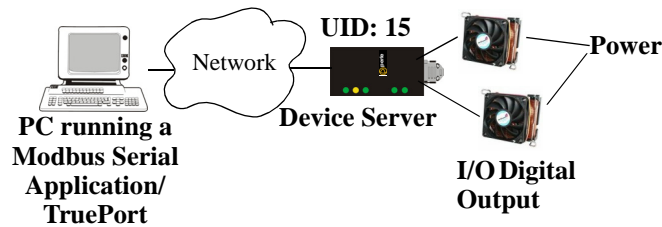
This mode provides a simple raw data interface between the device and the network. Although the port will still operate as a tty device, control signals are ignored. Lite Mode uses the TCP protocol on the configured port. In this mode, the serial communications parameters are configured on the terminal/device server and must match those configured on the device (in this example, a Card Reader), as shown below:



## TruePort I/O Access Options

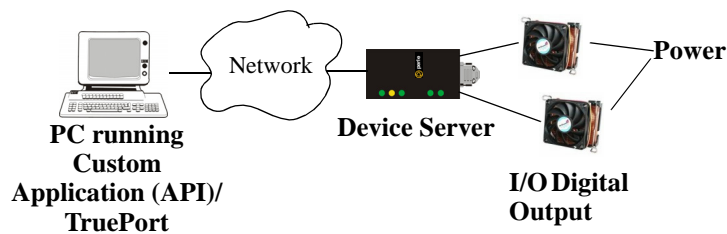
### Modbus ASCII/RTU Mode

If you have a Modbus serial application running on a PC that is connected to a network, you can use TruePort as a virtual serial connection to communicate with the Device Server over the network to access I/O data. You also have the option of enabling SSL as a security option to encrypt the data that is communicated between the Device Server and the host machine (SSL/TLS must be configured on both the Device Server and in TruePort).



### I/O Signal Mode

If you have a custom application that talks to a serial port, you can use TruePort as a virtual serial port to communicate with the Device Server over the network to access I/O data. You also have the option of enabling SSL as a security option to encrypt the data that is communicated between the Device Server and the host machine (SSL/TLS must be configured on both the Device Server and in TruePort).



## Uninstalling TruePort

If you have an existing version of TruePort on your Solaris system, you should uninstall it by doing the following:

1. Log in to the UNIX server as `root` user. The UNIX prompt for login is now displayed.
2. At the UNIX prompt, type `pkgrm trueport`.

You can now install the new version of TruePort.

## Installing TruePort

To install TruePort (this installs both Full and Lite mode) under Solaris, do the following:

1. Log in to the UNIX server as root user and change the directory to the `/tmp` directory.
2. At the UNIX prompt, copy the supplied TruePort package file `tpsol-<version>.<arch>.pkg.z` (where `<arch>` is `sparc` or `i386`, depending on your platform) onto your system into the `/tmp` directory.
3. At the prompt, type `uncompress tpsol-<version>.<arch>.pkg.z`. This will uncompress the file and rename it to `tpsol-<version>.<arch>.pkg`.
4. At the UNIX prompt, type `pkgadd -d /tmp/tpsol-<version>.<arch>.pkg` (where `<arch>` is `sparc` or `i386`, depending on your platform).
5. You will be asked to enter the maximum number of ports you want to install. The default is 64. The maximum number of ports supported for server-initiated mode is 55,534.

**Note:** For OS versions of Solaris 9 and earlier, the default should be chosen. The increased number of ports are supported on Solaris 10 and later versions.

The installation now creates the TruePort home directory and installs TruePort and the TruePort Administration Tools (for easy editing of the `config.tp` file) in the `/etc/trueport` directory.

## Configuring TruePort on a Terminal/Device Server

When you add a port, you need to configure the port(s) on the host running TruePort and you also need to configure the port(s) on the terminal/device server.

### Server-Initiated Mode

When you configure TruePort for server-initiated mode, the terminal/device server will initiate communication to the TruePort host.

To configure a terminal/device server for server-initiated mode (which is the default mode), you need to set the **Line Service** to **TruePort** (firmware version 3.0 or higher) or **Silent Raw** and assign the port number to be the same port number configured on the TruePort host (by default, this number starts at 10000).

**Note:** All versions of the JetStream 4000 and 8500, LanStream 2000, and IOLAN DS Family software support TruePort Full Mode operation. However, the JetStream 6x series software version must be 4.03 or greater.

### On the IOLAN Device Server

The following instructions provide an example of how to set up two ports the IOLAN Device Server using the CLI to TruePort. You will set the **Line Service** to **TruePort** or **Silent Raw** and on 1-port model you don't specify a line number.

1. Connect to the Device Server (for example, via Telnet).
2. Log in to the Device Server as the `admin` user.
3. Add the host running TruePort to the host table using the add host command as shown in the following example:

```
add host solaris50 192.152.247.61
```

You are now ready to configure the ports that will connect to the TruePort host.

4. To configure the ports, enter each of the following commands:

```
set line 1 service silent raw solaris50 10000
set line 2 service silent raw solaris50 10001
kill line 1-2
```

5. At the command prompt, type **save** and press **Enter**.
6. At the command prompt, type **logout** and press **Enter**.

The configuration of Device Server's ports is now complete.

### On a JetStream\LanStream

Configuring a JestStream\LanStream using the CLI is almost same as the Device Server CLI. You will set the **Line Service** to **Silent Raw**.

## Client-Initiated Mode

**Note:** Client-Initiated mode is available on IOLAN Device Server models with firmware 3.0 or higher.

When you configure TruePort for Client-Initiated mode, the TruePort host will initiate communication with the Device Server.

To configure a Device Server for Client-Initiated mode, you need to set the **Line Service** to **TruePort**, enable the **Client Initiated** option, and assign the port number to be the same port number configured on the client initiated configured TruePort host (by default, this number starts at 10001).

The following instructions provide an example of how to set up 4 ports on a IOLAN Device Server for TruePort client initiated mode.

1. Connect to the Device Server (for example, via Telnet).
2. Log in to the Device Server as the **admin** user.
3. To configure the ports, enter each of the following commands:

```
set line service trueport client-initiated on 10001
set line service trueport client-initiated on 10002
set line service trueport client-initiated on 10003
set line service trueport client-initiated on 10004
kill line 1-4
```

4. At the command prompt, type **save** and press **Enter**.
5. At the command prompt, type **logout** and press **Enter**.

The configuration of the Device Server is now complete.

## Client I/O Access Mode (I/O Models Only)

Client I/O access mode allows:

- A Modbus RTU/ASCII serial application running on a TruePort host to access Device Server I/O using Modbus commands.
- A serial application running on a TruePort host to access Device Server I/O using the Perle API (see the *Utilities* chapter of your *IOLAN User's Guide* for TruePort API documentation).

**Note:** Client I/O Access is only available in conjunction with IOLAN Device Servers running version 3.1 or higher.

### Modbus I/O Access

To configure a Device Server for Client I/O Access mode for a Modbus RTU/ASCII serial application you need to preform the following steps:

- enable **I/O TruePort Services** and assign a port number to match the port number on the client I/O Access configured TruePort host (by default, this number is 33816).
- enable **I/O Modbus Slave** and assign a Modbus slave UID to match the UID configured on the Modbus RTU serial application.

The following instructions provide an example of how to set up an IOLAN Device Server for TruePort I/O Access.

1. Connect to the Device Server (for example, via Telnet).
2. Log in to the Device Server as the **admin** user.
3. To enable the I/O TruePort service, enter following command:  

```
set io trueport mode on listen 33816
```
4. To enable I/O Modbus slave, enter following command:  

```
set io modbus mode on uid 1
```
5. Reboot the Device Server by entering the following command:  

```
reboot
```

The configuration of the Device Server is now complete.

To configure the TruePort host running a Modbus ASCII serial application to access Device Server I/O, type the following command:

```
addports -client mydeviceserver:33816 -initconnect -io mb_ascii 0 0
```

The command creates a single port configured for Client I/O Access mode which will connect to host **mydeviceserver** on TCP port 33816 and will support a serial Modbus ASCII application.



## Perle API I/O Access

To configure a Device Server for Client I/O Access mode for a serial application, you need to enable **I/O TruePort Services**.

The following instructions provide an example of how to set up an IOLAN Device Server for TruePort I/O Access.

1. Connect to the Device Server (for example, via Telnet).
2. Log in to the Device Server as the **admin** user.
3. To enable the I/O TruePort service, enter following command:  

```
set io trueport mode on listen 33816
```
4. Reboot the Device Server by entering the following command:  

```
reboot
```

The configuration of the Device Server is now complete.

To configure the TruePort host running a custom serial application to access Device Server I/O, type the following command:

```
addports -client mydeviceserver:33816 -initconnect -io io_api 0 0
```

The command creates a single port configured for Client I/O Access mode which will connect to host **mydeviceserver** on TCP port 33816 and will support a custom serial application using the Perle API.

# Configuring Ports on the TruePort Host

After you have configured the ports on the terminal/device server, you need to configure corresponding ports on the TruePort host. TruePort administrative files and utilities are installed in the `/etc/trueport` directory.

## TruePort Device Names

The TruePort installation creates a set of device nodes (ports), however you must configure these devices (ports) before they can be used. When run in Client-Initiated or Full Mode, the device nodes created are:

```
/dev/term/nnnn
/dev/cua/nnnn
```

where *nnnn* is a number from 0 to the maximum installed ports less 1, if there are no other multiport serial devices already installed. If there are existing devices then the first TruePort device number will start after the existing devices numbers.

When ports are configured for Server-Initiated Lite Mode, TruePort uses the built in pseudo-terminal drivers in Solaris. These ports are named `/dev/term/Xnnnn`.

When run as an auxiliary printer, TruePort ports are named `/dev/term/Xnnnnp`.

## Configuration Methods

After you have configured the ports on the terminal/device server, you have to configure the same port numbers on the TruePort host. The TruePort Host can be configured in the following ways:

1. Use the **addports** script, which will automatically start each port as it is configured. See [TruePort addports Script Options on page 11](#) for more information.
2. Use the **addports** script to create the total range of TTY ports you required and then use **tpadm** administration tool. See [Using the Admintool Utility on page 34](#) to remove/add ports to the **config.tp** file using **tpadm**.
3. Use the **addports** script to create the total range of TTY ports and then edit the **/etc/trueport/config.tp** file (see [config.tp File Syntax on page 18](#)), the **/etc/trueport/sslcfg.tp** file (see [sslcfg.tp File Format on page 27](#)), and the **/etc/trueport/pktfwdcfg.tp** file (see [pktfwdcfg.tp File Format on page 24](#)).

Once the software is installed and configured you can add login sessions using the Solaris Admintool utility ([Using the Admintool Utility on page 34](#)), Solaris Management Console, or the **tplogin** utility ([tplogin on page 31](#)).

If you are running Solaris 11, then serial port logins are configured using the SMF service "svc:/system/console-login". Please see the Solaris documentation for details on SMF services and console-login.

# TruePort addports Script Options

The `addports` script allows you to add a range of ports to the `config.tp` file and automatically start them, without having to use the `tpadm` utility. You can run `addports` after the TruePort host software is installed. The `addports` options are as follows:

## For Server-Initiated Mode:

```
addports [-l] [-hup] [-ssl] [-k <seconds>] [-server <host>]
[-pf] [-opmode optimize_lan|low_latency|packet_idle_timeout|custom]
[-pktidletime <timeout>] [-openwaittime <seconds>]
[-trace <level>] <first port> <last port>
```

## For Client-Initiated Mode:

```
addports [-l] [-hup] [-ssl] [-k <seconds>]
[-pf] [-opmode optimize_lan|low_latency|packet_idle_timeout|custom]
[-pktidletime <timeout>] [-openwaittime <seconds>]
-client <host>[:<TCP-#>]
[-nodisc] [-retrytime <time>] [-retrynum <number>]
[-initconnect] [-closedelaytime <seconds>] [-norestorenet]
[-io mb_ascii | mb_rtu | io_api]
[-trace <level>] <firstport> <lastport>
```

Parameter	Description
<b>-l</b>	(lower case L) Specifies that the TruePort port will be started in Lite mode. <code>addports</code> will configure TruePort for Full mode by default.
<b>-hup</b>	Causes the tty device to automatically be closed when the TCP connection is closed.
<b>-ssl</b>	Enables SSL/TLS on the port. You will automatically be prompted by the SSL/TLS configuration script. For more information see <a href="#">Configuring SSL/TLS on page 25</a> .
<b>-k &lt;seconds&gt;</b>	The time, in seconds, to wait on an idle connection before sending a keep-alive message.
<b>-pf</b>	Enables packet forwarding on the port. You will automatically be prompted by the packet forwarding configuration script. For more information see <a href="#">Configuring Packet Forwarding on page 22</a> .
<b>-opmode</b> <b>optimize_lan </b> <b>low_latency </b> <b>packet_idle_timeout </b> <b>custom</b>	Specify one of the following optimization modes: <ul style="list-style-type: none"> <li>● <b>optimize_lan</b>—This option provides optimal network usage while ensuring that the application performance is not compromised. Select this option when you want to minimize overall packet count, such as when the connection is over a WAN.</li> <li>● <b>low_latency</b>—This option ensures that all application data is immediately forwarded to the serial device. Select this option for timing-sensitive applications.</li> <li>● <b>packet_idle_timeout</b>—This option detects the message, packet, or data blocking characteristics of the serial data and preserves it throughout the communication. Select this option for message-based applications or serial devices that are sensitive to inter-character delays within these messages.</li> <li>● <b>custom</b>—This option allows you to define the packet forwarding rules based on the packet definition or the frame definition. This is the same as the <code>-pf</code> option and will launch the Packet Forwarding configuration script (see <a href="#">Configuring Packet Forwarding on page 22</a>).</li> </ul> Specify either <code>-pf</code> or <code>-opmode &lt;mode&gt;</code> , as these options are mutually exclusive.

Parameter	Description
<b>-packetidletime</b> <timeout>	The minimum time, in milliseconds, between messages that must pass before the data is forwarded to the Device Server. The range is 0-65535. The default is 10 ms.
<b>-openwaittime</b> <seconds>	<p>Specifies the maximum amount of time to wait, in seconds, for a TruePort connection to be established before returning to an application opening the serial port (not supported in Server-Initiated Lite Mode). You can specify the following values:</p> <ul style="list-style-type: none"> <li>• <b>-2</b>, wait forever for the TruePort connection to come up.</li> <li>• <b>-1</b>, open the serial port without waiting, even if there is no network connection, and don't give an error. Any written data is discarded if the TruePort connection is not up.</li> <li>• <b>0</b>, open the serial port without waiting, and return an error (EIO) if the TruePort connection is not up. If a network connection exists, then no error is returned.</li> <li>• <b>1-65535</b>, wait up to the specified seconds for a TruePort connection to be fully established. If a timeout occurs before a network connection is established, an error is returned (EIO).</li> </ul> <p>The TruePort connection is fully established when:</p> <ul style="list-style-type: none"> <li>• The TCP connection between the terminal/device server and the TruePort host is up.</li> <li>• The SSL/TLS negotiation succeeds (if used).</li> <li>• The TruePort Full mode protocol negotiation succeeds (if used).</li> </ul> <p>The range is -2 to 65535. The default is -2 (wait forever).</p>
<b>-server</b> <host>	You can optionally supply the remote host name or IP address that a connection request will be accepted from. The default is to accept connections from any host. The host can be an IPv4 or IPv6 address or a resolvable host name. If specifying an IPv6 address, the address must be enclosed in square brackets ( [ ] ), for example [2001:0db8:85a3:08d3:1319:8a2e:0370:7348].
<b>-client</b> <host>[:<TCP#>]	Specifies a client-initiated connection (meaning that the TruePort host will initiate the connection). You can optionally supply the starting destination TCP port for the connection (the default is 10001, see <firstport> option below). The host can be an IPv4 or IPv6 address or a resolvable host name. If specifying an IPv6 address, the address must be enclosed in square brackets ( [ ] ), for example [2001:0db8:85a3:08d3:1319:8a2e:0370:7348].
<b>-nodisc</b>	Does not drop the TCP connection for a client-initiated connection when the application closes the slave TTY port.
<b>-retrytime</b> <time>	Specifies the number of seconds between TCP connection retries after a client-initiated connection failure. Valid values are 1-255. The default is 30 seconds.
<b>-retrynum</b> <number>	Specifies the number of additional retry attempts for a client-initiated connection, beyond the first attempt. Valid values are -1 to 255. If this option is -1, TruePort will attempt to reconnect forever. If this option is set to 0 (zero) and <b>-norestorenet</b> is not specified, TruePort will try to recover a TCP connection once. The default is -1, retry forever.
<b>-initconnect</b>	Specifies that the TruePort host will try to connect to the Device Server when the TruePort daemon starts, as opposed to waiting for the application to open the serial port before initiating the connection to the Device Server.

Parameter	Description
<b>-closedelaytime</b> < <i>seconds</i> >	Specifies the amount of time, in seconds, to wait after an application closes the serial port, before the TCP connection is closed to avoid bringing the TCP connection down and up if the application is closing and opening the COM port often. The range is 0-65535. The default is 3 seconds.
<b>-norestorenet</b>	By default, when the network connection fails for client-initiated mode, TruePort will attempt to restore it. If this option is specified, and the network connection fails, there is no attempt to restore it.
<b>-io mb_ascii</b> <b>-io mb_rtu</b> <b>-io io_api</b>	Enables client I/O access for this client-initiated session for one of the following: <ul style="list-style-type: none"> <li>• A serial Modbus application configured for either the ASCII or RTU protocol will be using this port.</li> <li>• A custom serial application using the Perle I/O Access API will be using this port.</li> </ul> <p>If you did not specify the <b>:TCP-port</b> option with <b>-client</b>, the <b>-io</b> option will make the destination TCP port default to 33816 (the default value of the TruePort client in the Device Server).</p>
<b>-trace &lt;level&gt;</b>	The trace level for debugging purposes. The default is 1. The trace file for each port can be found under <b>/etc/trueport/trace.&lt;tty-name&gt;</b> , where <b>&lt;tty-name&gt;</b> is either <b>ptpmn</b> or <b>Xn</b> , where <b>n</b> the TTY port number.
<b>&lt;firstport&gt;</b>	The first TTY to add starting at 0 (added as port 10001 for a client-initiated (TruePort) connection or port 10000 for a server (terminal/device server) initiated connection).
<b>&lt;lastport&gt;</b>	The last TTY to add.

## Examples

### Adding Server-Initiated Ports

The following **addports** command will create 4 ports configured for Server-Initiated mode which will listen for connections from host **myjetstream** on TCP ports 10000 to 10003, while running in TruePort Full mode.

```
addports -server myjetstream 0 3
```

### Adding Client-Initiated Ports

The following **addports** command will create 4 ports configured for Client-Initiated mode which will connect to host **myiolands4** on TCP ports 10001 to 10004, while running in TruePort Lite mode.

```
addports -l -client myiolands4 0 3
```

### Adding Client I/O Access Ports

The following **addports** command will create a single port configured for Client I/O Access mode which will connect to host **myiolaniods1** on TCP port 33816 and will support a serial Modbus RTU application.

```
addports -client myiolaniods1 -io mb_rtu 0 0
```

# TruePort Administration Tool (tpadm) Commands

This section describes the commands and syntax for the TruePort Administration tool.

## Syntax

**Description** You can use the `tpadm` utility to add, list, start, and delete ports.

**Syntax** `tpadm -l <TCP#>|<host>:|<host>:<TCP#>|ALL`

```
tpadm -a <TCP#> [-m|-n]
  [--opmode optimize_lan|low_latency|packet_idle_timeout|custom]
  [--pktidletime <milliseconds>] [--openwaittime <seconds>]
  [-e|-F|-e -F [-c [<host>:]<TCP#>]] [-h]
  [-C <host> [-r <seconds>] [-R <retries>] [-o]
    [--initconnect] [--closedelaytime <seconds>] [--norestorenet]
  [-I mb_ascii | mb_rtu | io_api]]
  (-p <devicename> [-t <termtype>]) |
  (--index <start port> --range <number of ports>)
  [-S <host>] [-k <seconds>] [-T <level>]
```

```
tpadm -d <TCP#>|<host>:|<host>:<TCP#>
```

```
tpadm -s <TCP#>|<host>:|<host>:<TCP#>|ALL
```

**Options** `-l <TCP#>|<host>:|<host>:<TCP#>|ALL`

Displays the specified port entry or entries from the `config.tp` file. The host can be an IPv4 or IPv6 address or a resolvable host name. If specifying an IPv6 address, the address must be enclosed in square brackets ([ ]), for example [2001:0db8:85a3:08d3:1319:8a2e:0370:7348]

**-a <TCP#>**

Add a new port with the TCP/IP port number configured for the port on the remote device or terminal server. We recommend that you use the range 10000+.

**-m**

Configures the terminal in TruePort Full Mode (not Lite Mode) for full device control. This is the default.

**-n**

Configures the terminal in TruePort Lite Mode (not Full Mode) for terminal/device server device control.

**--opmode optimize\_lan|low\_latency|packet\_idle\_timeout|custom**

Specify one of the following optimization modes:

- **optimize\_lan**—This option provides optimal network usage while ensuring that the application performance is not compromised. Select this option when you want to minimize overall packet count, such as when the connection is over a WAN.
- **low\_latency**—This option ensures that all application data is immediately forwarded to the serial device. Select this option for timing-sensitive applications.
- **packet\_idle\_timeout**—This option detects the message, packet, or data blocking characteristics of the serial data and preserves it throughout the communication. Select this option for message-based applications or serial devices that are sensitive to inter-character delays within these messages.
- **custom**—This option allows you to define the packet forwarding rules based on the packet definition or the frame definition. This is the same as the `-F` option and will launch the Packet Forwarding configuration script (see [Configuring Packet Forwarding](#) on page 22).

Specify either `-F` or `--opmode <mode>`, as these options are mutually exclusive.

**--pktidletime** <milliseconds>

The minimum time, in milliseconds, between messages that must pass before the data is forwarded to the Device Server. The range is 0-65535. The default is 10 ms.

**--openwaittime** <seconds>

Specifies the maximum amount of time to wait, in seconds, for a TruePort connection to be established before returning to an application opening the serial port (not supported in Server-Initiated Lite Mode). You can specify the following values:

- **-2**, wait forever for the TruePort connection to come up.
- **-1**, open the serial port without waiting, even if there is no network connection, and don't give an error. Any written data is discarded if the TruePort connection is not up.
- **0**, open the serial port without waiting, and return an error (EIO) if the TruePort connection is not up. If a network connection exists, then no error is returned.
- **1-65535**, wait up to the specified seconds for a TruePort connection to be fully established. If a timeout occurs before a network connection is established, an error is returned (EIO).

The TruePort connection is fully established when:

- The TCP connection between the terminal/device server and the TruePort host is up.
- The SSL/TLS negotiation succeeds (if used).
- The TruePort Full mode protocol negotiation succeeds (if used).

The range is -2 to 65535. The default is -2 (wait forever).

**-e**

Enables SSL/TLS for the port. You will automatically be prompted for the SSL/TLS configuration information when you use this command line option. See [Configuring SSL/TLS on page 25](#) for more information.

**-F**

Enables packet forwarding for this port. You will automatically be prompted for the Packet Forwarding configuration information when you use this command line option. See [Configuring Packet Forwarding on page 22](#) for more information. Specify either **-F** or **--opmode** <mode>, as these options are mutually exclusive.

**-c** [<host>:]<TCP#>

Copies the SSL/TLS and/or packet forwarding configuration data from the specified entry to the new port entry being created.

**-h**

Causes the tty device to automatically be closed when the TCP connection is closed.

**-C** <host>

Enables a client-initiated connection (by the TruePort host) for this session and will connect to the specified host and port number. The host can be an IPv4 or IPv6 address or a resolvable host name. If specifying an IPv6 address, the address must be enclosed in square brackets ([ ]), for example [2001:0db8:85a3:08d3:1319:8a2e:0370:7348].

**-r** <seconds>

Specifies the number of seconds between TCP connection retries after a client-initiated connection failure. Valid values are 1-255. The default is 30 seconds.

**-R** <retry#>

Specifies the number of additional retry attempts for a client-initiated connection, beyond the first attempt. Valid values are -1 to 255. If this option is -1, TruePort will attempt to reconnect forever. If this option is set to 0 (zero) and **--norestorenet** is not specified, TruePort will try to recover a TCP connection once. The default is -1, retry forever.

**-o**

Keeps the client-initiated TCP connection open even when the application closes the slave TTY port.

**--initconnect**

Specifies that the TruePort host will try to connect to the Device Server when the TruePort daemon starts, as opposed to waiting for the application to open the serial port before initiating the connection to the Device Server.

**--closedelaytime** <seconds>

Specifies the amount of time, in seconds, to wait after an application closes the serial port, before the TCP connection is closed to avoid bringing the TCP connection down and up if the application is closing and opening the COM port often. The range is 0-65535. The default is 3 seconds.

**--norestorenet**

By default, when the network connection fails for client-initiated mode, TruePort will attempt to restore it. If this option is specified, and the network connection fails, there is no attempt to restore it.

**-I mb\_ascii | mb\_rtu | io\_api**

Enables client I/O access for this client-initiated session.

**-p** <devicename>

The tty name for the port. Use *Xn* for Server-Initiated Lite Mode ports and use *mn* for Client-Initiated or Full Mode ports, where *n* is the port number. Do not use **--index** or **--range** options if using **-p**.

**-t** <termtype>

A terminal type listed in the file `printcap.tp`. This option turns on auxiliary printing; you must specify the type of terminal that is connected to the printer. This option cannot be used in conjunction with the I/O Access option (-I).

**--index** <port number>

Specifies the value of the first port number in **range**. It is used to create the tty port number. Value can be 0 to maximum number of installed ports less 1.

**--range** <number of ports>

Specifies the number of ports to add starting with the **index** port number. Value can be 1 to maximum number of installed ports.

**-S** <host>

Specifies the remote host name or IP address that a connection request will be accepted from in Server mode. The host can be an IPv4 or IPv6 address or a resolvable host name. If specifying an IPv6 address, the address must be enclosed in square brackets ([ ]), for example [2001:0db8:85a3:08d3:1319:8a2e:0370:7348].

**-k** <seconds>

The time, in seconds, to wait on an idle connection before sending a keep-alive message.

**-T** <level>

Sets the trace level for debugging from 1 to 5. The default is 1.

**-d** <TCP#>|<host>:|<host>:<TCP#>

Deletes the specified port entry from the `config.tp` file. The host can be an IPv4 or IPv6 address or a resolvable host name. If specifying an IPv6 address, the address must be enclosed in square brackets ([ ]), for example [2001:0db8:85a3:08d3:1319:8a2e:0370:7348].

**-s** <TCP#>|<host>:|<host>:<TCP#>|ALL

Starts a specific TruePort port or all the TruePort ports. The host can be an IPv4 or IPv6 address or a resolvable host name. If specifying an IPv6 address, the address must be enclosed in square brackets ([ ]), for example [2001:0db8:85a3:08d3:1319:8a2e:0370:7348].



## Examples

### Adding a Port

To add a Server-Initiated port in Lite Mode with SSL/TLS enabled, use the following command:

```
tpadm -a 10000 -n -e -p X0
```

To add a Client Initiated port to connect to host **myiolansds4** on remote port 10001 with packet forwarding enabled, use the following command:

```
tpadm -a 10001 -F -p m2 -C myiolansds4
```

To add a I/O Access port to connect to host **myiolaniods1** on port 33816 to us a serial Modbus RTU application with a keep alive time of 3 minutes, use the following command:

```
tpadm -a 33816 -p m3 -C myiolaniods1 -I mb_rtu - k 180
```

### Deleting a Port

To delete port 10000, use the following command:

```
tpadm -d 10000
```

To delete port 10001 on host **myiolands** use the following command:

```
tpadm -d myiolands:10000
```

**Note:** The `<host>:<TCP#>` combination you use must exist in the **config.tp** configuration file. When you remove a terminal using this command, it does not stop the software running, it just deletes the entry for this terminal in the **config.tp** configuration file. You must then kill the TruePort daemon process.

### Displaying Port Entries

To displays the ports configured in the config.tp file, use the following command:

```
tpadm -l all
```

To display all the ports for a specific host in the config.tp file, use the following command:

```
tpadm -l myiolands:
```

To display a specific port for a specific host in the configuration file, use the following command:

```
tpadm -l myiolands:10002
```

### Starting the TruePort Daemon

To start port number 10000, use the following command:

```
tpadm -s 10000
```

To start all configured ports, use the following command:

```
tpadm -s ALL
```

To start port number 10001 on host 172.16.45.8, use the following command:

```
tpadm -s 172.16.45.8:10001
```

To start all configured port on host **myjetstream**, use the following command:

```
tpadm -s myjetstream:
```

## config.tp File Syntax

**Note:** If you use `addports` to enable TruePort, you do not need to use the `tpadm` utility.

An entry in the `config.tp` configuration file used to control a terminal in server Full Mode via Server-Initiated mode with some of the options enabled looks like this:

```
tpd -trueport -ssl -opmode low_latency -hup -tty /dev/ptpm0 -port 10000
    -server myjetstream -ka 30 -trace 5 -aux /dev/term/X0p -term vt100
```

An entry in the `config.tp` configuration file used to control a terminal/device server in Full Mode via Client-Initiated mode with some of the options enabled looks like this:

```
tpd -trueport -ssl -opmode low_latency -hup -tty /dev/ptpm0 -port 10001
    -client myiolansds4 -ka 30 -trace 5 -aux /dev/term/X0p -term wy60
```

The `config.tp` port parameter options are:

<b>-trueport</b>	Enables TruePort Full Mode (not TruePort Lite) for full device control.
<b>-ssl</b>	Enables SSL/TLS on the port reading the SSL/TLS configuration from the <code>sslcfg.tp</code> file. See <a href="#">Configuring SSL/TLS on page 25</a> for more information.
<b>-hup</b>	Causes the tty device to automatically close or hang up when the TCP connection is closed. This option is not supported in Server-Initiated Lite Mode.
<b>-tty &lt;ttyname&gt;</b>	<ttyname> is the tty name for the port. This must be the complete path name. Use <code>/dev/term/Xn</code> for Server-Initiated Lite Mode ports or use <code>/dev/ptpmn</code> for Client-Initiated or Full Mode ports, where <code>n</code> is the port number.
<b>-port &lt;TCP#&gt;</b>	For a server-initiated connection (terminal/device server), the TCP port number the TruePort daemon will listen on for connection requests. For a client-initiated connection (TruePort host), the Device Server TCP port number ( <b>DS Port</b> ) the TruePort daemon will attempt to connect to. We recommend that you use the range 10000+.
<b>-ka &lt;seconds&gt;</b>	<seconds> is the number of seconds to wait on an idle connection before sending a keep-alive message.
<b>-trace &lt;1-5&gt;</b>	<1-5> is the trace level for debugging purposes, the default is 1.
<b>-aux &lt;auxdevname&gt;</b>	Sets the auxiliary printer device name.
<b>-term &lt;type&gt;</b>	Sets the terminal type of terminal that the auxiliary printer is attached to.
<b>-client &lt;host&gt;</b>	Indicates a client-initiated connection. The <host> can be IPv4, IPv6, or a resolvable host name. If specifying an IPv6 address, the address must be enclosed in square brackets ([ ]), for example [2001:0db8:85a3:08d3:1319:8a2e:0370:7348].
<b>-retrytime &lt;seconds&gt;</b>	Specifies the number of seconds between TCP connection retries after a client-initiated connection failure. Valid values are 1-255. The default is 30 seconds.
<b>-retrynum &lt;number&gt;</b>	Specifies the number of additional retry attempts for a client-initiated connection, beyond the first attempt. Valid values are -1 to 255. If this option is -1, TruePort will attempt to reconnect forever. If this option is set to 0 (zero) and <code>-norestorenet</code> is not specified, TruePort will try to recover a TCP connection once. The default is -1, retry forever.
<b>-nodisc</b>	For client-initiated connections, does not close the TCP connection when the application closes the slave TTY port.

<b>-pf</b>	<p>Enables packet forwarding on the port, reading the packet forwarding configuration from the <code>pktfwdcfg.tp</code> file. For more information see <a href="#">Configuring Packet Forwarding on page 22</a>.</p> <p>Specify either <code>-pf</code> or <code>-opmode &lt;mode&gt;</code>, as these options are mutually exclusive.</p>
<b>-io mb_ascii  mb_rtu  io_api</b>	<p>For client-initiated connections, enables I/O access for the session.</p> <ul style="list-style-type: none"> <li>● A serial Modbus application configured for either the ASCII or RTU protocol will be using this port.</li> <li>● A custom serial application using the Perle I/O Access API will be using this port.</li> </ul> <p>If you did not specify the <code>:TCP-port</code> option with <code>-client</code>, the <code>-io</code> option will make the destination TCP port default to 33816 (the default listen TCP port number of the I/O TruePort services in the IOLAN Device Server).</p>
<b>-server &lt;host&gt;</b>	<p>Specifies the remote host name or IP address that a connection request will be accepted from in Server mode. The default is to accept connections from any host. The <code>&lt;host&gt;</code> can be IPv4, IPv6, or a resolvable host name. If specifying an IPv6 address, the address must be enclosed in square brackets ([ ]), for example [2001:0db8:85a3:08d3:1319:8a2e:0370:7348].</p>
<b>-nagleoff</b>	<p>For client-initiated connections, turn off the TCP Nagle Algorithm, which inserts a short delay so that each character is not sent individually, but sent in small packets instead. The default is On.</p>
<b>-initconnect</b>	<p>Specifies that the TruePort host will try to connect to the Device Server when the TruePort daemon starts, as opposed to waiting for the application to open the serial port before initiating the connection to the Device Server.</p>
<b>-openwaittime &lt;seconds&gt;</b>	<p>Specifies the maximum amount of time to wait, in seconds, for a TruePort connection to be established before returning to an application opening the serial port (not supported in Server-Initiated Lite Mode). You can specify the following values:</p> <ul style="list-style-type: none"> <li>● <b>-2</b>, wait forever for the TruePort connection to come up.</li> <li>● <b>-1</b>, open the serial port without waiting, even if there is no network connection, and don't give an error. Any written data is discarded if the TruePort connection is not up.</li> <li>● <b>0</b>, open the serial port without waiting, and return an error (EIO) if the TruePort connection is not up. If a network connection exists, then no error is returned.</li> <li>● <b>1-65535</b>, wait up to the specified seconds for a TruePort connection to be fully established. If a timeout occurs before a network connection is established, an error is returned (EIO).</li> </ul> <p>The TruePort connection is fully established when:</p> <ul style="list-style-type: none"> <li>● The TCP connection between the terminal/device server and the TruePort host is up.</li> <li>● The SSL/TLS negotiation succeeds (if used).</li> <li>● The TruePort Full mode protocol negotiation succeeds (if used).</li> </ul> <p>The range is -2 to 65535. The default is -2 (wait forever).</p>
<b>-closedelaytime &lt;seconds&gt;</b>	<p>Specifies the amount of time, in seconds, to wait after an application closes the serial port, before the TCP connection is closed to avoid bringing the TCP connection down and up if the application is closing and opening the COM port often. The range is 0-65535. The default is 3 seconds.</p>
<b>-norestorenet</b>	<p>By default, when the network connection fails for client-initiated mode, TruePort will attempt to restore it. If this option is specified, and the network connection fails, there is no attempt to restore it.</p>

- opmode optimize\_lan|low\_latency|packet\_idle\_timeout|custom** Specify one of the following optimization modes:
- **optimize\_lan**—This option provides optimal network usage while ensuring that the application performance is not compromised. Select this option when you want to minimize overall packet count, such as when the connection is over a WAN.
  - **low\_latency**—This option ensures that all application data is immediately forwarded to the serial device. Select this option for timing-sensitive applications.
  - **packet\_idle\_timeout**—This option detects the message, packet, or data blocking characteristics of the serial data and preserves it throughout the communication. Select this option for message-based applications or serial devices that are sensitive to inter-character delays within these messages.
  - **custom**—Enables packet forwarding on the port, reading the packet forwarding configuration from the `pkt.fwdcfg.tp` file. For more information see [Configuring Packet Forwarding on page 22](#).
- Specify either `-pf` or `-opmode <mode>`, as these options are mutually exclusive.
- pktidletime** The minimum time, in milliseconds, between messages that must pass before the data is forwarded to the Device Server. The range is 0-65535. The default is 10 ms.

## Managing Ports on the TruePort Host

### Starting TruePort

A TruePort daemon needs to be run for each port configured. There are three ways to start TruePort daemons:

- Use the `addports` script, which will automatically starts each port as it is configured.
- Run a the startup script called `s79tpadm`, which can be found in the `/etc/rc2.d` directory. The `s79tpadm` script will automatically start all configured TruePort daemons every time the host boots up.
- Enter the `tpadm -s` command to start specific individual ports or all the ports at one time; see [Using the Admintool Utility on page 34](#) for the command syntax.

### As a Transparent Printer

The `addports` script does not support adding a transparent print port so, so you must manually edit the `config.tp` file.

#### In Full Mode

1. An example of a Server-Initiated Full Mode port entry is:

```
tpd -trueport -tty /dev/ptpm0 -port 10000 -ka 30
```

2. To configure that entry as a transparent print port (aux port), you need to add:

```
tpd -trueport -tty /dev/ptpm0 -port 10000 -ka 30 -aux /dev/term/X0p
-term vt100
```

where the transparent printer port is called `/dev/term/X0p` and the term type is `vt100` (this is required).

## In Lite Mode

1. An example of a Server-Initiated Lite Mode port entry is:

```
tpd -tty /dev/term/X0 -port 10000 -ka 30
```

2. To configure that entry as a transparent print port (aux port), you need to add:

```
tpd -tty /dev/term/X0 -port 10000 -ka 30 -aux /dev/term/X0p -term vt100
```

where the transparent printer port is called `/dev/term/X0p` and the term type is `vt100` (this is required).

## Deleting a Single Port

To delete serial ports, do the following:

1. In the `/etc/trueport` directory, use an editor to delete the port entry in the `config.tp` file or type the following command:

```
tpadm -d <TCP#>|<host>:|<host>:<TCP#>
```

2. You must then kill the TruePort daemon process.
3. If you had configured a login for this port, you should remove it using the Solaris command `pmadm -r` (see system man pages for more information) or use the supplied `tplogin -r` command (see [tplogin on page 31](#) for more information).

If you are running on a Solaris 11 system then use the SMF services to disable login. See the Solaris documentation for more information.

## Deleting All Ports

There is a script you can run called `cleanports` that will kill all the TruePort daemon processes and delete all entries in the `config.tp`, `sslcfg.tp`, and `pktfwdfg.tp` files, with the exception of any lines that have been commented out.

# Configuring Packet Forwarding

The Packet Forwarding feature allows you to control how the data written by a Solaris application to the slave TTY port is packetized before forwarding the packet onto the LAN network.

## Configuration Script

When you specify the packet forwarding option, a configuration script is automatically launched as follows:

```
Enable Packet Definition (y/n): y
Packet Size [0] ( 1 - 1024):
Idle Time ([0] - 65535):
Force Transmit Time ([0] - 65535):
Enable End Trigger1 (y/n): y
End Trigger1 Character ([0] - ff):
Enable End Trigger2 (y/n):
End Trigger2 Character ([0] - ff):
Enter the Forwarding Rule ([trigger], trigger+1, trigger+2, strip-trigger):
```

```
Enable Packet Definition (y/n): n
Enable Frame Definition (y/n): y
SOF1 Character ([0] - ff):
Enable SOF2 (y/n):
SOF2 Character ([0] - ff):
Transmit SOF Character(s) ([on]/off):
EOF1 Character ([0] - ff):
Enable EOF2 (y/n):
EOF2 Character ([0] - ff):
Enter the Forwarding Rule ([trigger], trigger+1, trigger+2, strip-trigger):
```

The following table describes the options:

<b>Packet Definition</b>	This section allows you to set a variety of packet definition options. The first criteria that is met causes the packet to be transmitted. For example, if you set a <b>Force Transmit Timer</b> of <b>1000</b> ms and a <b>Packet Size</b> of <b>100</b> bytes, whichever criteria is met first is what will cause the packet to be transmitted.
<b>Packet Size</b>	The number of bytes that must be written by the application before the packet is transmitted to the network. A value of zero (0) ignores this parameter. Valid values are 0-1024 bytes. The default is 0.
<b>Idle Time</b>	The amount of time, in milliseconds, that must elapse between characters before the packet is transmitted to the network. A value of zero (0) ignores this parameter. Valid values are 0-65535 ms. The default is 0.
<b>Force Transmit Timer</b>	When the specified amount of time, in milliseconds, elapses after the first character is written by the application, the packet is transmitted. A value of zero (0) ignores this parameter. Valid values are 0-65535 ms. The default is 0.
<b>End Trigger1 Character</b>	When enabled, specifies the character that when written by the application will define when the packet is ready for transmission. The content of the packet is based on the Trigger Forwarding Rule. Valid values are in hex 0-FF. The default is 0.

<b>End Trigger2 Character</b>	When enabled, creates a sequence of characters that must be written by the application to specify when the packet is ready for transmission (if the End Trigger1 character is not immediately followed by the End Trigger2 character, TruePort waits for another End Trigger1 character to start the End Trigger1/End Trigger2 character sequence). The content of the packet is based on the Trigger Forwarding Rule. Valid values are in hex 0-FF. The default is 0.
<b>Frame Definition</b>	This section allows you to control the frame that is transmitted by defining the start and end of frame character(s). If the internal buffer (1024 bytes) is full before the EOF character(s) are received, the packet will be transmitted and the EOF character(s) search will continue. The default frame definition is SOF=00 and EOF=00.
<b>SOF1 Character</b>	When enabled, the Start of Frame character defines the first character of the frame, any character(s) received before the Start of Frame character is ignored. Valid values are in hex 0-FF. The default is 0.
<b>SOF2 Character</b>	When enabled, creates a sequence of characters that must be received to create the start of the frame (if the SOF1 character is not immediately followed by the SOF2 character, TruePort waits for another SOF1 character to start the SOF1/SOF2 character sequence). Valid values are in hex 0-FF. The default is 0.
<b>Transmit SOF Character(s)</b>	When enabled, the SOF1 or SOF1/SOF2 characters will be transmitted with the frame. If not enabled, the SOF1 or SOF1/SOF2 characters will be stripped from the transmission.
<b>EOF1 Character</b>	Specifies the End of Frame character, which defines when the frame is ready to be transmitted. The content of the frame is based on the Trigger Forwarding Rule. Valid values are in hex 0-FF. The default is 0.
<b>EOF2 Character</b>	When enabled, creates a sequence of characters that must be received to define the end of the frame (if the EOF1 character is not immediately followed by the EOF2 character, TruePort waits for another EOF1 character to start the EOF1/EOF2 character sequence), which defines when the frame is ready to be transmitted. The content of the frame is based on the Trigger Forwarding Rule. Valid values are in hex 0-FF. The default is 0.
<b>Trigger Forwarding Rule</b>	Determines what is included in the Frame (based on the EOF1 or EOF1/EOF2) or Packet (based on Trigger1 or Trigger1/Trigger2). Choose one of the following options: <ul style="list-style-type: none"> <li>● <b>Strip-Trigger</b>—Strips out the EOF1, EOF1/EOF2, Trigger1, or Trigger1/Trigger2, depending on your settings.</li> <li>● <b>Trigger</b>—Includes the EOF1, EOF1/EOF2, Trigger1, or Trigger1/Trigger2, depending on your settings.</li> <li>● <b>Trigger+1</b>—Includes the EOF1, EOF1/EOF2, Trigger1, or Trigger1/Trigger2, depending on your settings, plus the first byte that follows the trigger.</li> <li>● <b>Trigger+2</b>—Includes the EOF1, EOF1/EOF2, Trigger1, or Trigger1/Trigger2, depending on your settings, plus the next two bytes received after the trigger.</li> </ul>

## pktfwcfg.tp File Format

The packet forwarding configuration file is called `pktfwcfg.tp` and is broken up into ports and their defined values as shown in the example below:

```
[10001]
packet_size = 1
idle_time = 2
force_transmit_time = 3
[mysds:10002]
SOF1_char = aa
SOF2_char = bb
transmit_SOF_chars = off
EOF1_char = cc
EOF2_char = dd
trigger_forwarding_rule = trigger
[yoursds:10003]
packet_size = 1000
idle_time = 99
force_transmit_time = 10000
end_trigger1_char = aa
end_trigger2_char = bb
trigger_forwarding_rule = trigger
[172.16.44.21:10004]
packet_size = 1000
idle_time = 99
force_transmit_time = 10000
end_trigger1_char = aa
end_trigger2_char = bb
trigger_forwarding_rule = trigger
```



# Configuring SSL/TLS

The SSL/TLS feature is designed to work with the SDS, SCS, and STS Device Server models. When TruePort is used with the Device Server, the cipher specified by the Device Server will be used for the TruePort connection. Also, if the Device Server is set for **SSL/TLS Type Server**, then you need to set the **TruePort SSL type** to **client**, and vice versa.

## SSL/TLS Configuration Information

SSL/TLS is configured using the `addports` or `tpadm` utilities. If SSL/TLS is enabled, the following prompts will ask for the SSL/TLS configuration information:

```
Certificate file name (full path and file name): /etc/trueport/sslcert.pem
SSL type (client or server): client
SSL/TLS version (any, TLSv1, or SSLv3]: any
Perform peer verification (y/n): y
```

The next section is asked only if peer verification is performed. If you press **Enter** instead of entering a value, the parameter will not appear in the `sslcfg.tp` file for peer validation.

**Note:** The values that you enter here are case sensitive, so the peer certificate must match exactly or the connection will fail.

```
CA file name (full path and file name): /etc/trueport/ca.pem
Country (2 letter code): CA
State or Province: Ontario
Locality (e.g. city): Markham
Organisation (e.g. company): Acme Software
Organisation Unit (e.g. section): Engineering
Common Name (e.g. your name or your server's hostname): solaris50
Email Address: engineering@acme.com
```

The following section provides more information about the SSL/TLS configuration parameters:

**Certificate file name** The full path and file name of the certificate file. If you press **Enter**, the default path, `/etc/trueport/sslcert.pem`, will be used.

**SSL type** Specify whether the TruePort daemon will act as an SSL/TLS client or server.

**SSL/TLS version** Specify whether you want to use:

- **Any**—The TruePort daemon will try a TLSv1 connection first. If that fails, it will try an SSLv3 connection. If that fails, it will try an SSLv2 connection.
- **TLSv1**—The connection will use only TLSv1.
- **SSLv3**—The connection will use only SSLv3.

**Perform peer validation** The certificate received from the peer will be verified against the CA list, along with any values entered in the validation criteria, for an SSL connection; any fields left blank will not be validated against the peer certificate.

**CA file name** The full path and file name of the CA (certificate authority) file. If you press **Enter**, the default path, `/etc/trueport/ca.pem`, will be used.

**Country** A two character country code; for example, US.

<b>State or Province</b>	Up to a 128 character entry for the state/province; for example, IL.
<b>Locality</b>	Up to a 128 character entry for the location; for example, a city.
<b>Organisation</b>	Up to a 64 character entry for the organisation; for example, Acme Software.
<b>Organisation Unit</b>	Up to a 64 character entry for the unit in the organisation; for example, Payroll.
<b>Common Name</b>	Up to a 64 character entry for common name; for example, the host name or fully qualified domain name.
<b>Email Address</b>	Up to a 64 character entry for an email address; for example, acct@anycompany.com.

## SSL/TLS Support Files

When you enable the SSL/TLS option for a port, you need to make sure the TruePort host and Device Server have the appropriate support files: certificates/private keys and/or the CA list file. The IOLAN CD-ROM contains a self-signed RSA certificate named `samplecert.pem`. The `samplecert.pem` file can be used for both the certificate file on the SSL/TLS server and the CA list file on the SSL/TLS client.

### TruePort Port Configured as SSL/TLS Server

When the TruePort port is configured as an SSL/TLS server, the SSL/TLS private key and certificate is required for all key exchange methods except ADH (Anonymous Diffie-Hellman). The private key cannot be encrypted since TruePort on Solaris does not support the configuration of an SSL/TLS passphrase. The private key needs to be appended to the certificate file, to create one certificate/private key file. This can be done using the Solaris command `cat myprivatekey.pem >> mycert.pem`. This certificate/private key file then becomes the TruePort certificate. Copy the TruePort certificate file to the directory you specified in the SSL/TLS configuration.

If the TruePort SSL/TLS server is configured to verify an SSL client, a CA list file is also required. The CA list file is a certificate, or list of certificates, of the Certificate Authorities (CA) who created and signed the peer certificates (the peer certificate(s) must be downloaded to the Device Server).

### TruePort Port Configured as SSL/TLS Client

When the TruePort port is configured as an SSL/TLS client and peer verification is configured, a CA list file is required. The CA list file is a certificate, or list of certificates, of the Certificate Authorities (CA) who created and signed the peer certificates (the peer certificate(s) must be downloaded to the Device Server). This CA list file should be copied to the TruePort host directory specified in the SSL/TLS configuration.

## Pseudo Random Number Generator

If you want to use the SSL/TLS encryption on a TruePort connection you must install Random Number Generator software on the host system. This is available from Sun for each of the following Solaris versions:

- Solaris 2.6, Sparc and Intel platforms: Install **SUNWski** package, available on the Solaris Easy Access CDs in the Sun Webserver product.
- Solaris 7, Sparc and Intel platforms: Install **SUNWski** package, available on the Solaris Easy Access CDs in the Sun Webserver product.
- Solaris 8, Sparc platform: Install Patch **112438** available from Sun: <http://sunsolve.sun.com/pub-cgi/show.pl?target=patchpage>.
- Solaris 8, Intel platform: Install Patch **112439** available from Sun: <http://sunsolve.sun.com/pub-cgi/show.pl?target=patchpage>.
- Solaris 9, Sparc and Intel platforms: Support built-in.
- Solaris 10, Sparc and Intel platforms: Support built-in.

## sslcfg.tp File Format

The `sslcfg.tp` file is created in the following format:

```
[10001]
certificate-file = /etc/trueport/sslcert.pem
ssl-type = server
ssl-version = any
verify-peer = yes
CA-file = /etc/trueport/ca.pem
country = CA
state-province = Ontario
locality = Markham
organisation = Acme Software
organisation-unit = Engineering
common-name = solaris50
email = engineering@acme.com
[yoursds:10002]
certificate-file = /etc/trueport/sslcert.pem
ssl-type = client
ssl-version = TLSv1
verify-peer = yes
CA-file = /etc/trueport/ca.pem
country = UK
locality = London
common-name = solarisuk
```

The [10001] specifies the port for which the SSL/TLS configuration parameters are configured.

## SSL/TLS Trouble Shooting

If you are experiencing problems obtaining a successful SSL/TLS connection, you can add the `-trace 5` option at the end of the appropriate port entry in the `config.tp` file. After editing the `config.tp` file, you will have to kill the TruePort daemon process for the port and restart it again. Adding the `-trace` option will create a trace file called `/etc/trueport/trace.xxxxx`, where `xxxxx` is the TCP/IP port number; for example, `/etc/trueport/trace.10000`.

### Could not obtain peer's certificate

---

**Reason 1** User has selected a cipher key exchange of ADH (anonymous Diffie-Hellman) and enabled Peer verification. ADH does not use certificates so they will not be sent in an SSL/TLS handshake.

**Solution 1** Disable Peer Verification or change to a cipher suite that uses certificates.

---

**Reason 2** User has selected Peer Verification on the configured SSL/TLS server and has not configured a certificate for the client.

**Solution 2** Either disable peer verification on the SSL/TLS server or configure a certificate for the SSL/TLS client.

---

**SSL\_accept failed** on the SSL/TLS server device.

---

**Reason** The device has failed to accept an SSL/TLS connection on top of a TCP connection that has just been established. This could indicate that the peer from which TruePort is trying to accept a connection from is not configured for SSL/TLS.

**Solution** Verify that the peer has been configured for an SSL/TLS client connection.

---

### Certificate did not match configuration

---

**Reason** The message is displayed when **Verify Peer Certificate** has been enabled, but the configured **Validation Criteria** does not match the corresponding data in the certificate received from the peer.

**Solution** The data configured must match exactly to the data in the certificate. The data is also case sensitive.

---

### Encrypted private keys are not supported in TruePort

---

**Reason** This message is displayed by the TruePort daemon when the user has created a certificate with an encrypted private key for TruePort. This applies to either **Client** mode or **Server** mode with configured peer validation criteria.

**Solution** Create a certificate with a private key that is not encrypted.

---

**unknown protocol** message when trying to make an SSL/TLS connection

---

**Reason 1** This will be displayed when both sides of the TCP connection are configured as SSL/TLS clients.

**Solution 1** Change one of the end points to act as an SSL/TLS server.

---

**Reason 2** One of the endpoints is not configured for SSL/TLS.

**Solution 2** Make sure both endpoints are configured for SSL/TLS, verify that one is a client and the other is a server.

---

**tlsv1 alert handshake failure or sslv3 alert handshake failure**

<b>Reason</b>	The remote site has an SSL/TLS error and is sending this message with an alert message.
---------------	---

<b>Solution</b>	Look at the error messages on the remote end and fix the problem indicated.
-----------------	---

**Certificate verify failed.**

<b>Reason 1</b>	TruePort has been configured to verify the peer certificate and there is a mismatch between the peer's certificate and the TruePort CA list.
-----------------	--

<b>Solution 1</b>	Make sure the CA lists contains the certificate of the CA which signed the peer's certificate.
-------------------	--

<b>Reason 2</b>	The peer's certificate or the CA certificate might have expired. Each certificate is created with a valid date interval.
-----------------	--

<b>Solution 2</b>	Make sure the certificate of the peer and CA are up to date. Also verify that the host has the correct date/time. If the date configured on the host is not correct, it can make it look like the certificate is invalid.
-------------------	---

## Using Perle Login Scripts

Several configuration scripts are included in your TruePort installation, which can be used in lieu of the Solaris Admintool (see [Using the Admintool Utility on page 34](#)).

**Note:** For Solaris 11, the following scripts are not supported. Solaris 11 configures serial ports for login using the SMF service "svc:/system/console-login". Please see the Solaris documentation for details on SMF services and console-login.

## addmons

The addmons script allows you to create one or more port monitors. Port logins can then be created to use these monitors with the tlogin or addlogins scripts.

### Syntax

**Description** Invokes the system's `sacadm`, `ttymon`, and `ttyadm` commands to add port monitors. If no parameters are provided, a single monitor will be created with the tag `trumon`. If only the first parameter is given, a single monitor will be created; the tag will be `trumon $x$`  where  $x$  is the number provided. If both parameters are given, a range of monitors from first to last (inclusive) will be created; the tags will be `trumon $x$`  with  $x$  being the range of numbers provided by the parameters.

**Syntax** `addmons [first [last]]`

**Options** *first*  
The number of the first monitor to add.

*last*  
The number of the last monitor to add.

### Examples

**addmons**

Adds a single monitor named `trumon`.

**addmons 0 3**

Adds four monitors named **trumon0**, **trumon1**, **trumon2**, and **trumon3**.

**addmons 4**

Adds a single monitor named **trumon4**.

## rmmons

The **rmmons** script removes one or more port monitors of the type created with the **addmons** script.

### Syntax

**Description** Invokes the system's **sacadm** command to remove **ttymon** type port monitors. If no parameters are provided, a single monitor with the tag **trumon** will be removed. If only the first parameter is given, a single monitor will be removed; the tag will be **trumonx** where **x** is the number provided. If both parameters are given, a range of monitors from first to last (inclusive) will be removed; the tags will be **trumonx** with **x** being the range of numbers provided by the parameters.

**Syntax** `rmmons [first [last]]`

**Options** *first*

The number of the first monitor to remove.

*last*

The number of the last monitor to remove.

### Examples

**rmmons**

Removes a single monitor named **trumon**.

**rmmons 0 3**

Removes four monitors named **trumon0**, **trumon1**, **trumon2**, and **trumon3**.

**rmmons 4**

Removes a single monitor named **trumon4**.

## tplogin

The `tplogin` script adds, enables, disables, removes, or lists a login for a TruePort port.

**Note:** To add or remove logins for more than one port, you may wish to use the `addlogins` and `rmlogins` scripts.

### Syntax

**Description** Uses the system's `pmadm` and `ttyadm` commands to add, enable, disable, remove, or list a login for a TruePort port.

When added, login entries will be set up to push modules `ldterm` and `ttcompat` for Full mode ports. Server Initiated Lite mode entries will be set up to push `ptem` in addition to `ldterm` and `ttcompat`.

**Syntax** `tplogin -a <port_name> [<monitor_tag>] [<tty_label>] [<id>] [<login>]`

`tplogin -e <port_name> [<monitor_tag>]`

`tplogin -d <port_name> [<monitor_tag>]`

`tplogin -r <port_name> [<monitor_tag>]`

`tplogin -l [<monitor_tag>]`

### Options

**-a**

Adds the port.

**-e**

Enables a port.

**-d**

Disables a port.

**-r**

Removes a port.

**-l**

Lists the login entries.

**<port\_name>**

The port name, not including the path. Use `xn` for Server-Initiated Lite mode ports and use `n` for Client-Initiated or Full mode ports, where `n` is the port number. The service tag for the `pmadm -s` switch will be `tty<port_name>` with the device node appended (for example, `ttyX1`, `tty0`).

**<monitor\_tag>**

The tag of the associated port monitor for the `pmadm -p` switch. If not provided or null, the default will be `trumon`.

**<tty\_label>**

The `ttydefs` label for the `ttyadm -l` switch. If not provided or null, the default will be `9600`.

**<id>**

The identity for the `pmadm -i` switch. If not provided or null, the `-i` switch will not be used.

**<login>**

The login string presented to the user, as given to the `ttyadm -p` switch. If not provided or null, the default will be `login:`.

## Examples

### **tplogin -a 10 trumon1 19200E**

This example adds a login for device `/dev/term/10` at 19200 baud with 7 data bits and even parity, using port monitor `trumon1`.

### **tplogin -a X21**

This example adds a login for device `/dev/term/X21` (a Lite mode port). The default port monitor named `trumon` will be used.

### **tplogin -r 10 trumon1**

This example removes the login for `/dev/term/10` created in the first example.

### **tplogin -d X21**

This example disables the login for `/dev/term/X21`, but does not remove it.

## addlogins

The `addlogins` script adds logins for a range of ports, using the `tplogin` script.

## Syntax

**Description** Adds logins for a range of ports by calling the `tplogin` script.

**Syntax** `addlogins [-l] [-t tty_label] first last [ports_per_mon]`

### **Options**

**-l**

Indicates Lite mode.

**-t *tty\_label***

Indicates that the following parameter is the `ttydefs` label to use. If not given, the `tplogin` script's default will be used (9600).

***first***

The number that specifies the start of the range of ports to add logins for. In Server Initiated Lite mode, capital **X** will be prepended to the Server-Initiated port numbers to create port names. A login for a single port can be added by setting both ***first*** and ***last*** to that port's number.

***last***

The number that specifies the end of the range of ports to add logins for. In Server Initiated Lite mode, capital **X** will be prepended to the Server Initiated port numbers to create port names. A login for a single port can be added by setting both ***first*** and ***last*** to that port's number.

***ports\_per\_mon***

The number that is used to assign groups of ports to different port monitor tags. If not given, all ports will use the `tplogin` script default monitor tag (`trumon`). Otherwise, each port number will be divided by the value given (with the remainder discarded). The resulting number will be appended to `trumon` to form the monitor tag.

## Examples

### **addlogins -t 4800 0 95 24**

This example adds logins for devices `/dev/term/0` to `/dev/term/95`. The ports will be set to 4800 baud with 8 data bits and no parity. Ports 0 to 23 will use monitor `trumon0` and ports 24 to 47 will use `trumon1`, etc.

### **addlogins -l 5 12**

This example adds logins for Lite mode devices `/dev/term/X5` to `/dev/term/X12`. They will all use port monitor `trumon`.



## rmlogins

The **rmlogins** removes logins for a range of ports, using the **tplogin** script. Its usage is similar to the **addlogins** script used to create logins.

### Syntax

**Description** Removes logins for a range of ports by calling the **tplogin** script.

**Syntax** `rmlogins [-l] first last [ports_per_mon]`

**Options** **-l**

Indicates Lite mode.

#### *first*

The number that specifies the start of the range of ports to remove logins for. In Server Initiated Lite mode, capital **x** will be prepended to the port numbers to create port names. A login for a single port can be removed by setting both *first* and *last* to that port's number.

#### *last*

The number that specifies the end of the range of ports to remove logins for. In Server Initiated Lite mode, capital **x** will be prepended to the port numbers to create port names. A login for a single port can be removed by setting both *first* and *last* to that port's number.

#### *ports\_per\_mon*

The number that is used to assign groups of ports to different port monitor tags. If not given, all ports will use the **tplogin** script default monitor tag (**trumon**). Otherwise, each port number will be divided by the value given (with the remainder discarded). The resulting number will be appended to **trumon** to form the monitor tag.

### Examples

**rmlogins 0 95 24**

Removes logins for devices `/dev/term/0` to `/dev/term/95`. Ports 0 to 23 are using monitor **trumon0** and ports 24 to 47 use **trumon1**, etc.

**rmlogins -l 5 12**

Removes logins for Server Initiated Lite mode devices `/dev/term/x5` to `/dev/term/x12`. They are all on port monitor **trumon**.

## Using the Admintool Utility

This sections describes how to add logins and remove logins using the Solaris Management Console for Solaris version 10.

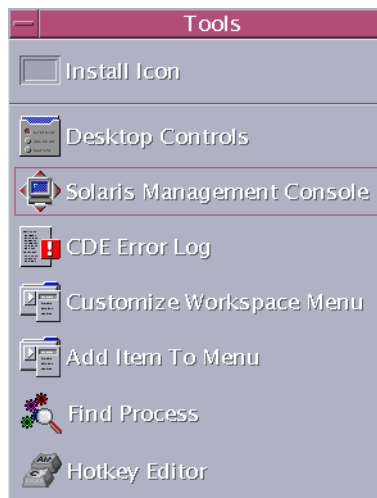
**Note:** Solaris 11 does not support the Solaris Management Console. Solaris 11 configures serial ports for login using the SMF service "svc:/system/console-login". Please see the Solaris documentation for details on SMF services and console-login.

**Note:** Solaris Management Console does not support an option for changing the list of streams modules. Therefore, for Server-Initiated Lite Mode device nodes YOU MUST use the tlogin utility (see [tlogin](#) on page 31).

### Adding Logins to Serial Ports

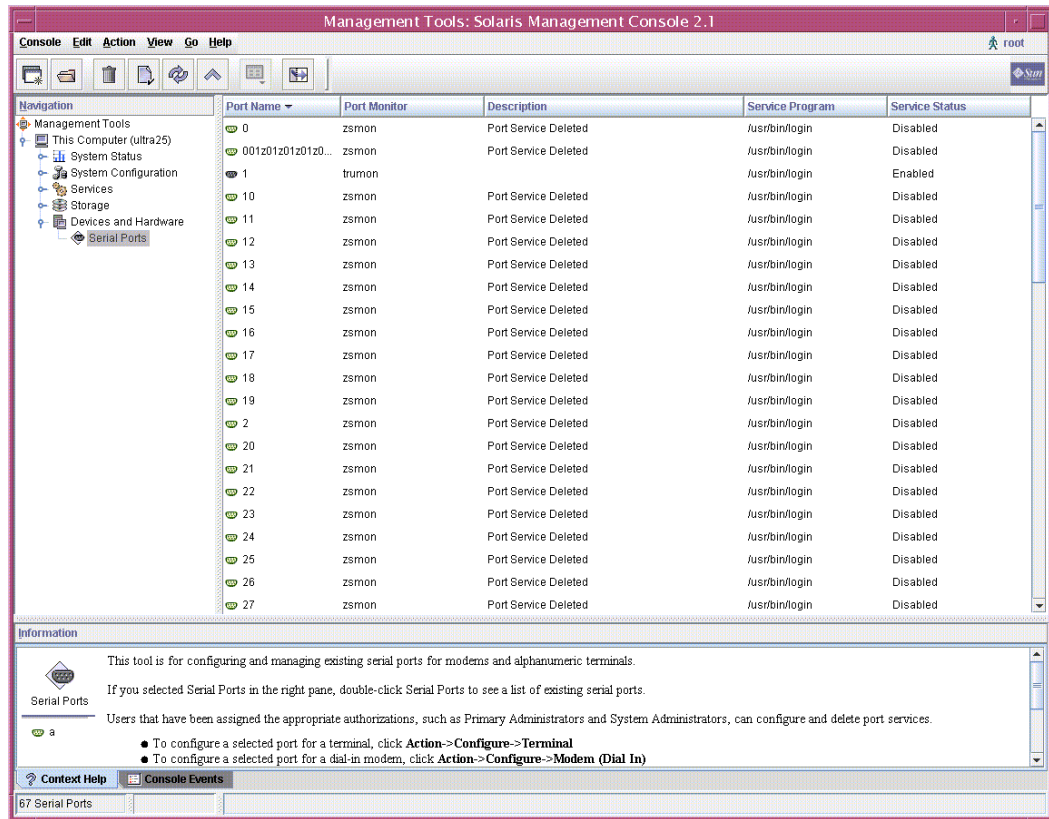
You can add a login on a serial port using the Solaris Management Console as follows:

1. In the Solaris desktop, click on the **Tools** toolbar arrow to get the Tools menu as shown below.

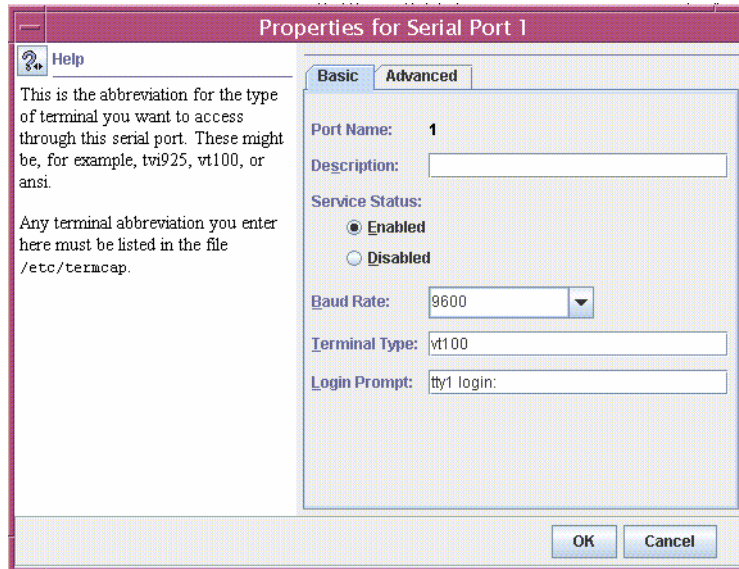


Select **Solaris Management Console** to start the application.

- In the Solaris Management Console window, select **Management Tools, Devices and Hardware, Serial Ports** in the left-hand navigation tree. You will be prompted to login as root. After you have successfully logged in, the Solaris Management Console displays.

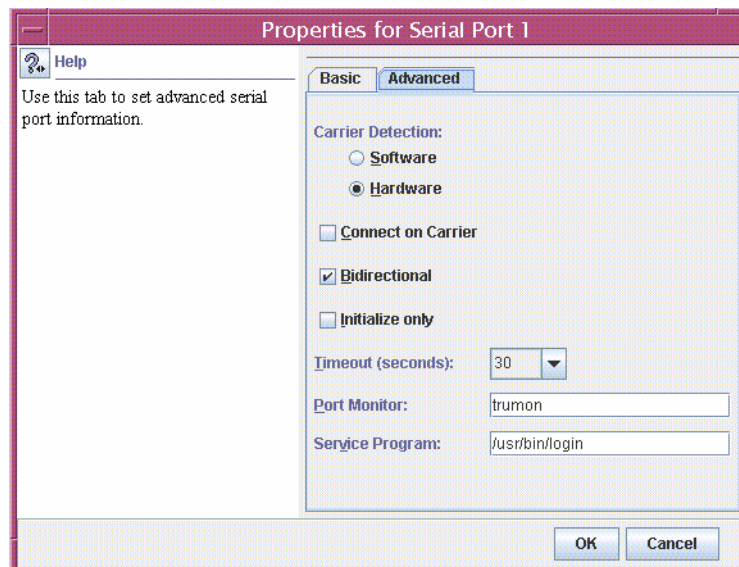


3. Double-click the port that you want to configure as a login port. On the **Basic** tab, **Enable** the **Service Status**. Optionally type in a new **Terminal Type**, **Login Prompt**, and/or **Baud Rate**. Note that the **Baud Rate** field is actually a `/etc/ttydefs` label; for example, 115200E would be valid.



4. On the **Advanced** tab, select **Hardware** and change the Port Monitor to `trumon` (the TruePort monitor).

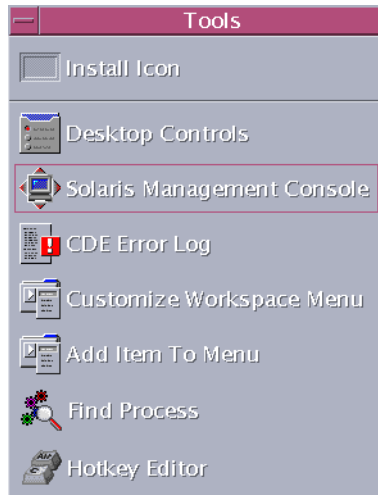
**Note:** You must have already run the command `./addmons` to create the TruePort `trumon` port monitor.



## Removing Terminals

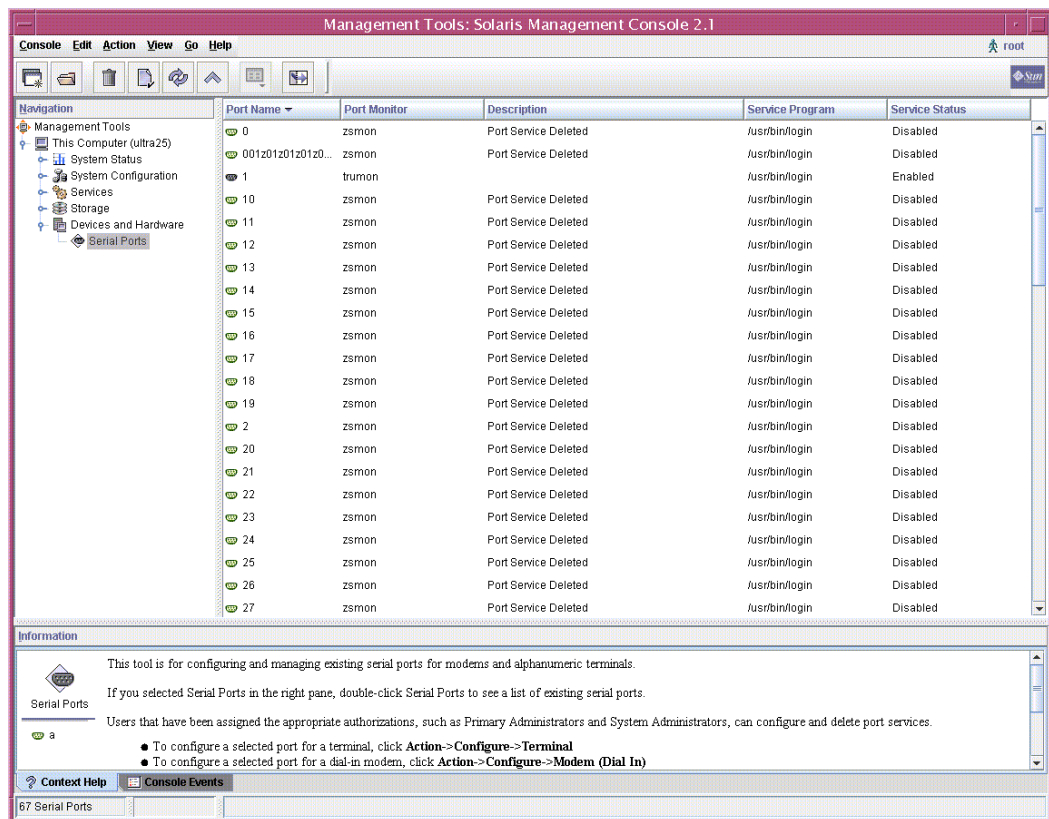
To remove a terminal on a serial port, using the Solaris Management Console as follows:

1. In the Solaris desktop, click on the **Tools** toolbar arrow to get the Tools menu as shown below.



Select Solaris Management Console to start the application.

2. In the Solaris Management Console window, select **Management Tools, Devices and Hardware, Serial Ports** in the left-hand navigation tree. You will be prompted to login as root. After you have successfully logged in, the Solaris Management Console displays.



3. Right-click on the terminal you want to remove and select **Delete Port Service** and then click **OK**.

