Release Note

MTSRD
for
UNIXWARE 2.X

Installation and Configuration Instructions

1. Contents

2. Introduction

This document describes how to install and configure the MTSRD software for your JETSTREAM or LANSTREAM. It applies from this release of MTSRD software onwards. This additional software supports the UNXIWARE operating system at version 2.X. We refer to this version of MTSRD as release 1.0.

MTSRD allows you to use the serial ports on a JETSTREAM or LANSTREAM as if the same ports were standard serial ports connected directly to the UNIXWARE machine. The effect is that a daemon process on the host simulates a tty interface; the remote port resembles a standard tty device with stty and ioctl functionality supported. The JETSTREAM or LANSTREAM and UNIXWARE machine must be connected to a LAN with routing possible between the two.

In this release note:

> the UnixWare server is also called 'UnixWare machine' or, simply, the 'host'.

> the JETSTREAM or LANSTREAM is called 'JETSTREAM' or 'LANSTREAM' (with or without model numbers) or, simply, the 'unit'.

This release note should be used with the manuals and other release notes provided on paper or on the Perle CD-ROM with your JETSTREAM or LANSTREAM product.

3. Installation

The MTSRD software is supplied separately to the JETSTREAM or LANSTREAM product. Installation may be performed either from the CDROM supplied with the product, from floppy disk or from an image downloaded from another host. It may also be obtained from our World Wide Web site or via your local distributor.

3.1 Pre-requisites

What you are about to do is add some software to your UNIXWARE 2.X kernel to allow programs to access the JETSTREAM or LANSTREAM ports as if they were directly attached to the UNIXWARE machine.

Before starting check/note the following:

1. The kernel software needs to be available on a readable media.

2. You will need root permission on your system.

3. The JETSTREAM or LANSTREAM(s) you wish to use is/are attached to the network and has an IP address, broadcast address, subnet mask and domain set up (See Chapter 3 of the JETSTREAM 6x series User's Guide or Chapter 2 of the JETSTREAM 4000, 8500 LANSTREAM 2000 Installation Guide).

4. When running on the JETSTREAM 6x series the software version should be 4.03 or greater.

3.2 Installing the Software from Floppy Disk

If supplied on a Floppy disk or a floppy disk has been created from the CDROM you will have to install the MTSRD software on a machine that has a floppy drive fitted. The floppy disk contains a pkgadd format distribution.

3.2.1 Installing the Package

Once you have inserted the floppy disk into the drive:

login as root and type:

```
pkgadd -d diskette1
```

NOTE: *If more than one drive is installed into the machine then 'diskette1'*
               should be replaced with the name of the appropriate drive.

The package will be installed onto your machine. In order for the installed software to function the kernel must be rebuilt, to perform this issue the command:

```
shutdown -i6 -g0 -y
```

This will rebuild the kernel and reboot the server. The MTSRD software is now completely installed.

3.3 Installation from CDROM

The CDROM supplied with the product contains the software ready for installation. It is not necessary to copy the package from the CD media prior to installation.

3.3.1 Installing the Package

Login as root

Install the CDROM in the drive. It may be necessary to unmount the CDROM drive to extract any currently installed CD ROM. For example if the CDROM is mount as /cdrom to unmount the device type:

```
umount /cdrom
```

Where /cdrom is the directory name given for the mounted CDROM. This may be replaced by the mount point of the device.

NOTE: An error message may be displayed if the device was not already mounted.

Eject the drive and remove any CDROM currently installed. Insert the CDROM containing the MTSRD software and close the drive bay.

The CDROM must then be mounted either type:

```
mount -a
```

if the drive is normally mounted at boot time or type:

```
mount -r -f cdfs /dev/cdrom/c1b0t0l0 /cdrom
```

to mount the CDROM device /dev/cdrom/c1b0t0l0 as /cdrom. The /dev/cdrom/c1b0t0l0 should be replaced by the device that the CDROM drive is installed as and the /cdrom replaced with the required mount point for the device.

The CD is now ready to be installed from, to install (from the example device) type:

```
pkgadd -d/cdrom/drivers/jetstrm/mtsrd/unixware/flopdisk.dd
```

The package will be installed onto your machine. The kernel should now be rebuilt, to do so issue the command:

```
shutdown -i6 -g0 -y
```

This will rebuild the kernel and reboot the server. The MTSRD software will then be completely installed.

3.4 Installing the Software from a Package Image

If the software was supplied on a media type not readable by the machine on which the software is to be installed or the software is obtained from the Perle World Wide Web site then an image should be copied onto the host before installation. The file available from the World Wide Web site is a correctly formatted image. The file /<CD_DRIVE>/drivers/jetstrm/mtsrd/unixware/flopdisk.dd is also an image with the correct format. To create an image from a floppy disk on another unix system use the command:

```
dd if=<floppy device> of=flopdisk.dd
```

The image may then be copied to the host for installation.

3.4.1 Installing the Package

Login as root. I install from an image file created in /tmp with the name flopdisk.dd, type:

```
pkgadd -d /tmp/flopdisk.dd
```

The /tmp/flopdisk.dd may be replaced by any directory path/file name for a valid MTSRD pkgadd image.

The package will be installed onto your machine. The kernel should now be rebuilt, to do so issue the command:

```
shutdown -i6 -g0 -y
```

This will rebuild the kernel and reboot the server. The MTSRD software is now completely installed.

4. Configuration

There are two parts to the configuration of the MTSRD/JETSTREAM or LANSTREAM package. The MTSRD host software may need to be configured for optimum performance with your network and to recognise the attaching JETSTREAM or LANSTREAM device. The JETSTREAM or LANSTREAM should also be configured to attach ports to the host and allow the tty operation provided by MTSRD to be performed.

4.1 MTSRD Configuration

A small amount of configuration of MTSRD may be required. This will depend on the type and version of software installed on the JETSTREAM or LANSTREAM connecting to the host and the number of connections to be supported.

4.1.1 Configurable Parameters

The parameters are contained in the file `/etc/default/mts`

The list of parameters and their default values is:

```
Parameter            Value      Function

MTS_VERSION          JetStream 6000 6.04 i.2  #JETSTREAM version
AMTS_VERSION         JetStream 6000 6.04 i.2  #AJETSTREAM version
PULLUP_TIMEOUT       5000       #Timeout: Delay before tx (uS)
SENDBUF              2048       #TCP/IP Transmit buffer size (bytes)
RECVBUF              2048       #TCP/IP Receive buffer size (bytes)
DRAINPOLL_PERIOD     500000     #Time between Drain polls (uS)
WINSIZE_PERIOD       50000      #Time between Window Size msgs (us)
KEEPALIVE_PERIOD     30000000   #Timeout: check JETSTREAM alive (uS)
KEEPALIVE_TIMEOUT    30000000   #Timeout: JETSTREAM is dead (uS)
PORTNUM_TIMEOUT      30000000   #Timeout: JETSTREAM port number (uS)
UDP_ACK_TIMEOUT      250000     #Timeout: UDP acknowledgement (uS)
PACKETMODE_TIMEOUT   30000000   #Timeout: JETSTREAM mode switch (uS)
```

NOTES: *1. The default values may vary with different releases.*

                 2. the word 'JETSTREAM' can also apply to 'LANSTREAM'; for example, 'JETSTREAM port number' read 'LANSTREAM port number'.

The first three need to be altered depending on the requirements of particular users. Most of the above should only be changed after consulting your technical support contact.

4.1.2 PULLUP_TIMEOUT

The PULLUP_TIMEOUT line allows for an adjustment of the read/write delay injected by MTSRD. A value of 100000 will cause the MTSRD daemons to pause for 0.1 second each time they send characters to the JETSTREAM or LANSTREAM, to allow more efficient use of the network. If this pause results in a jerky response from terminals attached to the JETSTREAM or LANSTREAM reduce this value. A value below 1000 is effectively a no wait state.

4.1.3 MTS_VERSION and/or AMTS_VERSION

Add/Change a line to reflect the version of the JETSTREAM or LANSTREAM software that you are running, such as:

```
MTS_VERSION   JetStream 6000 6.05 i.1    # JETSTREAM version
```

If you run the SNMP version of the JetStream 6000 software the line will be:

```
MTS_VERSION   JetStream 6001 6.05 i.1    # JETSTREAM version
```

The version string may be derived from the JETSTREAM or LANSTREAM unit. It consists of a product name and a software version number. The product name is that shown in the banner presented at boot time and with the Login prompt (when the banner is enabled) e.g. 'JETSTREAM 8500' followed by the version string e.g. '1.0'. The version string is obtained from the JETSTREAM or LANSTREAM using the `version` command in the cli, for example:

```
JS_8500# version
1.0
JS_8500#
```

NOTE: *The string is case sensitive and should match exactly that generated by the JETSTREAM or LANSTREAM.*

e.g. If you have a JETSTREAM 8500 running version 1.0 of firmware you should enter the syntax:

```
MTS_VERSION   JETSTREAM 8500 1.0         # JETSTREAM version
```

This tells the MTSRD software what version to look for when establishing a connection from the JETSTREAM (or LANSTREAM). If the MTSRD software gets the wrong version back from the JETSTREAM (or LANSTREAM) it will warn that the versions do not match. To check what version the MTSRD is expecting and what it is getting use the syslog daemon, this would have the format:

Sep 29 10:31:46 unixware MTSRD[2460]: MTSRD: Connected 10001.
Sep 29 10:31:46 unixware MTSRD[2460]: Wanted version [JETSTREAM 8500 1.0]
Sep 29 10:31:46 unixware MTSRD[2460]: found version [JetStream 6000 6.04 i.2]

It is only necessary for the JETSTREAM or LANSTREAM software version to match one of the parameters. This allows two devices with differing Versions/Product identifiers to be used without warnings e.g. having the configuration definition of:

```
  MTS_VERSION   JetStream 6000 6.04 i.2     # JETSTREAM version
  AMTS_VERSION  JETSTREAM 8500 1.0          # JETSTREAM version
```

This would allow a JETSTREAM 6000 running version 6.04 of code and a JETSTREAM 8500 running version 1.0 to connect to MTSRD ports.

The same argument applies to the LANSTREAM.

Warning! If the version number of the JETSTREAM or LANSTREAM does not match one of the version numbers configured in the `/etc/default/mts` file then JETSTREAM or LANSTREAM will continually be rebooted.

4.2 Device Configuration

The MTSRD software provides TTY support through the provision of a Master/Slave driver pair and a Daemon process for each TTY provided.

4.2.1 Device Node Configuration

By default, 16 MTSRD master and slave device nodes are set up at install time. If you require more or less devices then the node files should be edited. It is not necessary to remove unused devices but you may wish to do so to avoid cluttering your system with redundant nodes. You can add more than 16 master and slave device nodes if you wish, in order to support more tty ports on you JETSTREAM or LANSTREAM(s); however the number of master/slave device pairs defined should not exceed 1024.

Edit the file `/etc/conf/node.d/mtsm` to change the number of master devices.

Edit the file `/etc/conf/node.d/mtss` to change the number of slave devices, or alternatively use the utility `mtsnode`

4.2.1.1 Master Devices

The file, `/etc/conf/node.d/mtsm` contains one entry per port. They will have the format

```
mtss term/mtsm000 c 0 0 0 644
mtss term/mtsm001 c 1 0 0 644
mtss term/mtsm002 c 2 0 0 644
mtss term/mtsm003 c 3 0 0 644
......
```

These are entries for the devices `/dev/term/mtsm000` to `/dev/term/mtsm003`.

The incrementing number in column four is the minor device num. This provides the relationship between the master and slave devices using by the JETSTREAM or LANSTREAM to TTY connection.

4.2.1.2 Slave Devices

The file, `/etc/conf/node.d/mtss` contains one entry per port. They will have the format

```
mtss term/tty000 c 2048 0 0 644
mtss term/tty001 c 2049 0 0 644
mtss term/tty002 c 2050 0 0 644
mtss term/tty003 c 2051 0 0 644
......
```

These are entries for the devices `/dev/term/tty000` to `/dev/term/tty003`.

The corresponding modem and psuedo modem device entries would have two formats

```
mtss term/ttym000 c 4096 0 0 644
mtss term/ttym001 c 4097 0 0 644
mtss term/ttym002 c 4098 0 0 644
mtss term/ttym003 c 4099 0 0 644
......
```

and

```
mtss term/ttypm000 c 0 0 0 644
mtss term/ttypm001 c 1 0 0 644
mtss term/ttypm002 c 2 0 0 644
mtss term/ttypm003 c 3 0 0 644
......
```

The utility `mtsnode` will automatically create the updates for the ports specified for example issuing the command:

```
mtsnode 16 31
```

creates the entries for devices `/dev/term/tty016` to `/dev/term/tty031` inclusive, together with the corresponding modem and pseudo modem devices. Only new devices will be created, existing devices will not be changed.

4.2.1.3 Device Creation

Once added to the files you must build the devices. This will be done automatically the next time you reboot your machine or you may build them immediately using the command

```
/etc/conf/bin/idmknod
```

The master and slave devices are now installed.

4.2.2 /etc/inittab configuration

The file `/etc/inittab` needs to be set up with the MTSRD daemon processes and any required getty processes to support the MTSRD ports. The mtsrd daemon should be started from the /etc/inittab file and accepts the syntax:

```
mtsrd <master device> <TCP/IP port>
```

One entry for each port should be entered into the `/etc/inittab` file in order to support the connection from the terminal device to the JETSTREAM or LANSTREAM port. These entries should take the format:

```
m042:23:respawn:/etc/mts/mtsrd /dev/term/mtsm042 10042
```

This would be the definition to support a device `/dev/term/tty???`, it starts the daemon connection to the master device for this port and uses TCP/IP port number 10086 to communicate with the JETSTREAM or LANSTREAM. It will ensure that the daemon should be restarted, should it terminate for any reason. These entries should

also be added to the file `/etc/conf/init.d/kernel` so that they remain after subsequent kernel rebuilds.

NOTE: *The exact /dev/term/tty??? device supported by each /dev/term/mtsm??? device/daemon connection is determined by matching the minor device numbers of the mtsm??? and tty??? devices.*

The utility `mtsinit` is provided to automate this process. This command has the syntax:

```
mtsinit <start port> <end port> [getty] [<ttydef label>]
```

where <start port> <end port> is the range of ports to add the inittab entries for. If getty is included then a getty process is added for the port. The optional <ttydef label> allow the terminal definition for the getty to be defined. If unspecified the default 9600_8bit is selected. If you require some other process to run on the direct tty or require to use the modem or pseudo modem devices you will have to edit the files manually.

4.3 JETSTREAM or LANSTREAM Configuration

There are two parts to the configuration of the JETSTREAM or LANSTREAM. These are to upgrade the software on the JETSTREAM or LANSTREAM and to configure a port for use with MTSRD.

4.3.1 The JETSTREAM 6x Series

4.3.1.1 JETSTREAM 6x series Software

If you are running a version of JETSTREAM below 4.03 on your 6x series product you will have to download the PROM software from the server. The server will have to support TFTP for the transfer to occur.

Install the AJETSTREAM / JETSTREAM prom image files in /etc/mts; create an /etc/mts/config directory and using the `touch` command create the JETSTREAM config files, one for each JETSTREAM, with the configured name of the JETSTREAM as the filename. Then change the mode of these files so that they are rw-rw-rw- using the `chmod` command e.g.

```
mkdir /etc/mts/config
cd /etc/mts/config
touch testjs0
chmod 666 testjs0
touch testjs1
chmod 666 testjs1
```

See Chapter 8 of the JETSTREAM 6x series manual for further information.

4.3.1.2 JETSTREAM Ports (6x series only)

The lines you will use to connect to the UNIXWARE server must be set up as follows:

```
Host:          The name of the UNIXWARE host
Type:          SILENT RAW or DIRECT RAW
Host Port:     10000 for MTSRD port 1;
               10001 for MTSRD port 2 etc.
```

The host must be added to the JETSTREAM. This is performed using the 'add host' command e.g.

```
add host unixware 192.152.247.61
```

This host is then configurable for a port.

Configure the JETSTREAM ports into `silent raw` mode, connecting to the ports specified in the `/etc/inittab` file. It is recommended that the ports be configured sequentially, starting at TCP/IP port 10000, with sixteen ports configured per JETSTREAM, and that the JETSTREAM units have sequential names, and that the ports be configured so that it is easy to tell which port is on which JETSTREAM. Remember to use the `save` cli command to save the configuration. For example:

```
$ telnet testjs0
Trying...
Connected to testjs0.perle.com
Escape character is '^]'.
Local flow control off

Telnet connect to JetStream testjs0


Perle JetStream 6000
version 6.04 i.2

Login: admin
Password:
# set line 1 type silent raw unixware 10000
# set line 2 type silent raw unixware 10001
# set line 3 type silent raw unixware 10002
...
# set line 16 type silent raw unixware 10015
# save
Confirm Save Configuration y/n y
INIT: About to transfer data to
unixware:/etc/mts/config/testjs0
TFTP: Transfer succeeded
# logout
Connection closed by foreign host.
$ telnet testjs1
Trying...
Connected to testjs1.perle.com.
Escape character is '^]'.
Local flow control off

Telnet connect to JetStream testjs1


Perle JetStream 6000
version 6.04 i.2

Login: admin
```

```
Password:
# set line 1 type silent raw unixware 10016
# set line 2 type silent raw unixware 10017
# set line 3 type silent raw unixware 10018
    ...
# set line 16 type silent raw unixware 10031
# save
Confirm Save Configuration y/n y
INIT: About to transfer data to
unixware:/etc/mts/config/testjs1
TFTP: Transfer succeeded
# logout
Connection closed by foreign host.
$
```

This will set the ports 1 to 32 to connect to the host unixware without user intervention. The connection will be made to tcp ports in the range 10000-10031, which should correspond to the tcp port number on the mtsrd command line for these processes.

If you require the user to start the connection then you should use the cli command:

```
set line 1 type direct raw unixware 10000
```

which will cause the user to be prompted to press return before the connection is attempted.

4.3.2 The JETSTREAM 4000, 8500 and LANSTREAM 2000

4.3.2.1 JETSTREAM and LANSTREAM Software

All versions of the JETSTREAM 4000, 8500 and LANSTREAM *('the unit')* software support MTSRD operation, however you may choose this time to perform a software upgrade, if so you will have to download the PROM software from the server.

The JETSTREAM or LANSTREAM can upgrade its software from any location on the server. The location of the file is specified on the unit. It may also be configured by BOOTP or manually loaded.

See Chapter 5 of the JETSTREAM 4000, 8500 LANSTREAM 2000 Configuration Guide for further information.

4.3.2.2 JETSTREAM and LANSTREAM ports

The lines you will use to connect to the UNIXWARE server must be set up as follows:

```
Host:        The name of the UNIXWARE host
Service: SILENT RAW or DIRECT RAW
Host Port:   10000 for MTSRD port 1;
             10001 for MTSRD port 2 etc.
```

The host must be added to the JETSTREAM or LANSTREAM. This is performed using the `add host` command e.g.

```
add host unixware 192.152.247.61
```

This host is then configurable for a port.

Configure the JETSTREAM or LANSTREAM ports into `silent raw` mode, connecting to the ports specified in the `/etc/inittab` file. It is recommended that the ports be configured sequentially, starting at TCP/IP port 10000, and that the JETSTREAM or LANSTREAM units have sequential names, and that the ports be configured so that it is easy to tell which port is on which JETSTREAM or LANSTREAM. Remember to use the `netsave` command to save the configuration. For example, using a JETSTREAM 8500:

```
$ telnet testjs5
Trying...
Connected to testjs5.Perle.com.
Escape character is '^]'.
Local flow control off

Telnet connect to JETSTREAM testjs5


Perle JETSTREAM 8500
version 1.0

Login: admin
Password:
# set line 1 service silent raw unixware 10000
# set line 2 service silent raw unixware 10001
# set line 3 service silent raw unixware 10002
...
# set line 24 service silent raw unixware 10023
# netsave configuration unixware /etc/mts/config/testjs5
TFTP: Transfer succeeded
# logout
Connection closed by foreign host.
```

```
$ telnet testjs6
Trying...
Connected to testjs6.perle.com.
Escape character is '^]'.
Local flow control off

Telnet connect to JETSTREAM testjs6


Perle JETSTREAM 8500
version 1.0

Login: admin
Password:
# set line 1 service silent raw unixware 10024
# set line 2 service silent raw unixware 10025
# set line 3 service silent raw unixware 10026
    ...
# set line 24 service silent raw unixware 10047
# netsave configuration unixware /etc/mts/config/testjs6
TFTP: Transfer succeeded
# logout
Connection closed by foreign host.
$
```

This will set the ports 1 to 48 to connect to the host unixware without user intervention. The connection will be made to tcp ports in the range 10000-10047, which should correspond to the tcp port number on the mtsrd command line for these processes.

If you require the user to start the connection then you should use the cli command:

```
set line 1 service direct raw unixware 10000
```

which will cause the user to be prompted to press return before the connection is attempted.

5. Example

5.1 A Quick Configuration for a JETSTREAM 8500

(you can do a similar quick configuration on the JETSTREAM 4000 or LANSTREAM 2000)

This was performed using the following equipment.

1. JETSTREAM 8500 running version 1.0

2. WYSE 60 configured at 9600, 8 bit, 1 Stop, No Parity, Xon/Xoff flow control

3. UNIXWARE version 2.1

5.1.1 Attach the JETSTREAM 8500 to the network

Attach the JETSTREAM 8500 to the network and verify that it has an IP address, broadcast address and subnet mask.

If not, using our values we added these using the following CLI commands while logged in as `admin`:

```
set server internet 195.49.144.4

set server broadcast 195.49.144.255

set server subnet 255.255.255.0

save
```

and then rebooted the JETSTREAM. The internet, broadcast and subnet addresses should be replaced with those used on your network.

5.1.2 Install the MTSRD Software

The software was received on disk, (it may also be downloaded from the WWW site and created a disk using dd). It was installed by typing the following commands while logged in as root:

```
pkgadd -d diskette1

shutdown -i6 -g0 -y
```

The machine will be rebooted and the kernel rebuilt to include the MTSRD software.

5.1.3 Configure the JETSTREAM 8500 Ports

Log in to the JETSTREAM 8500 as admin, and type `screen<cr>.`

Use 'network configuration', 'host table', 'add host' and enter the UNIXWARE host name and the TCP/IP address of this host to define the UNIXWARE host on the JETSTREAM.

Use 'line configuration', 'line settings' and select line 1

Set the service to silent raw, enter the HOSTNAME of the UNIXWARE machine in the hostname field and set host port to 10000

Set up further ports using host port 10001 for line 2, host port 10002 for line 3 and so on.

5.1.4 Update the /etc/default/mts file

Edit the file and change the MTS VERSION line to be:

```
MTS_VERSION   JETSTREAM 8500 1.0          # JETSTREAM version
```

1.0 was our version of software; check the version you are using.

5.1.5 Set up MTSRD ports on the UNXIWARE machine

Each JETSTREAM port must be configured on a different TCP port:

```
mtsinit 0 15 getty
```

This will create 16 TTY devices each with a getty running.

Attach a terminal to one of the JETSTREAM's ports and you should see a login.

6. Troubleshooting

6.1 Debug and Diagnostics

All diagnostic information generated by the mtsrd program is routed to the syslog daemon. By default only messages at level greater than LOG_DEBUG will be sent to the log. However, if an additional argument "debug" is added to the command line for mtsrd verbose messages about the program will be routed to the syslogd at level LOG_DEBUG e.g.

```
m042:23:respawn:/etc/mts/mtsrd /dev/term/mtsm042 10086 debug
```

Warning!   If this option is used your log files may become very large, quite rapidly - it is probably not a good idea to have this option permanently enabled. They should only be enabled after consulting your technical support representative.

The syslog output will be direct to the file specified in the /etc/syslog.conf file.

Should syslogd not be started then it may be started from the command line. While logged in as root use the command:

```
syslogd -p /tmp/mtsrd.log &
```

or if you prefer the messages be displayed to the console use the command:

```
syslogd &
```

NOTE: *If started manually as described above, stop the syslogd daemon when debugging is complete.*

6.2 Problems & Solutions

Symptoms: The JETSTREAM or LANSTREAM continually reboots when the daemon process starts.

Problem: It is possible that the version strings in the /etc/default/mts file does not match that generated by the JETSTREAM or LANSTREAM.

Solution: Logon to the JETSTREAM or LANSTREAM and take the product name and version string as described in 4.1.3 MTS_VERSION and/or AMTS_VERSION above to create a version string. Change the /etc/default/mts file to contain this string.