Clear Systems Limited

48 Queens Road, Coventry, CV1 3EH, UK.
Tel: (024) 76 231 440. Fax 231 451.

TIME+ Technical Bulletin.

TimeClock Network Serial Servers.

When TimeClocks are connected to a TIME+ UNIX/NT system via network serial servers there are some special processes called *daemons/tasks/ervices* used. These are usually started automatically by specially configured commands in the system's startup scripts and then run continually.

On UNIX systems each daemon creates a pair of special devices, called master and slave pseudo devices, which the TIME+ - TimeClock comms program can connect to as if there was a physical serial device. Depending on the particular UNIX / network / database implementation the details may differ.

One serial server port is needed per TimeClock Line Driver. This may be a dedicated port on an existing terminal server Annexe, Chase lolan, Spider etc) or the port on a dedicated serial server supplied for the TimeClocks Axel AX4010, Lantronix MSS1/2 serial server). In either case the IP address of the serial server should be in the /etc/hosts file and the IP port (i.e. service) of the comms port known or specially configured (e.g. 3001 is the IP port for the serial port of a Lantronics MSS1).

A typical daemon command is "/usr/csl/iolan/iolandn -xl –t10 -o -d rc mss3 3001 mss3". where:

- iolandn is the name of the daemon executable
- -xl -tl0 -o are operational parameters
- -d **rc** defines the device name to be used e.g. /dev/tty**rc**
- mss3 is the /etc/hosts name of the serial server which defines the IP address
- 3001 is the IP port of the serial port to use
- mss3 is a logical name for the daemon's device used in error logging etc

This may generate output:

```
$ /usr/csl/iolan/iolandn -xl -t10 -o -d rc mss3 3001 mssl
     +-----------------------------------------+
     I        IPS software version 1.2         |
     |                                         |
     |        This software is licensed        |
     I        solely for ose with Chase        |
     |        Research products. All other             |
     |        uses are strictly prohihited.            |
     I        Copyright 1991                  |
     |        Chase Research plc                |
     +-----------------------------------------+
```

Other such daemon services are *hpnptyd*, *rtelnet* etc.

The daemon may update an error/event log - the command to check it may vary:

```
$ tail /etc/iolog

mssl3 3001: receiving data from host
msc3 3001 : waiting for data from iolan
mss3 3001: daemon using master pseudo-tty /dev/ptyrc
mss3 3001: Debug level set to 1
mss3 3001: Sleep time before close set to 1800
mss3 3001: host to iolan process ronning
mss3 3001: waiting for input from host
mss3 3001: receiving data from host connect
mss3 3001: Connection timed out
mss3 3001: FATAL: Failed to connect : errno=238
$
```

This may show a failure to connect to a failed serial server, a TCL verb may be set-up to check the log. in this case it was *IOLG*.

If there is a network or device fault a daemon may terminate, thus losing the serial device used by TIME+ this is typically seen as *timeout* and *fail* messages in the TIME+ comms log, similar to a physical cable fault. If this happens the daemon may usually be restarted by entering the daemon command when logged in as the super-user *(root)* and must only be done by or with the knowledge and consent of your system administrator- otherwise events may occur which could have a serious effect on your whole system. However before just restarting the daemon it is wise to look for the cause of the problem!

To check for a failed daemon at a UNIX shell prompt do something like:

```
Ps -ef | grep iolan
root  1106     1        0 12:07:08       ?        0:04     /usr/csl/iolan/iolandn -x1 -t10 -0 -d rd mss4 3001 mss4
root  1107     1106     0 12:07:08       ?        0:04     /usr/csl/iolan/iolandn -x1 -t10 -0 -d rd mss4 3001 mss4
csl   5943     5941     2 11:32:44       tty0p7   0:00     grep iolan
```

Depending on the type of daemon (in this case iolan) you should see one or two entries per serial server port being used. In this example the pairs of daemons for mss1,2 & 3 are missing. This command may be set-up on you system as a TCL verb *IOLD.*

To check for a failed serial server (not just the individual port) or a network fault do something like:

```
$ /etc/ping mss3 -n 1

PING mss3: 64 byte packets

----mss3 PING Statistics----

190 packets transmitted, 0 packets received, 1001 packet loss

$ /etc/ping/mss4 -n 1

PING mss4: 64 byte packets

64 bytes from 192.9.203.94: icmp_seg=0. Time=11. ms

----mss4 PING Statistics---1 packets transmitted, 1 packets received, 0% packet loss
round-trip (ms) mm/avg/max 11/11/11
```

Where the first test failed (and indicates a serial server and/or network fault), and the second one succeeded. There may be a TCL verb *IOLP* which is set-up to do this for all the serial servers on your system.

The diagnostic commands, apart from the daemon start-up, may be put into a bespoke user menu.

```
TIMECLOCK NETWORK CGMMS        12:00:07 TUESDAY, JANuARY 28, 1997. (19 TADATA SYSTEM ADMIN)

1 IOLP Check serial server connections

2 IOLG Display iolan log file

3 IOLD Look for iolan daemons

T to enter Tcl, or 0 to Log off



Please cboose an option, or <cr> for previous menu ____
```

Other Daemons

hpnptyd

On HP-UX systems, there is a daemon called *hpnptyd*, which is part of the Jet Admin package. This is preferable to other third party products as it is supported by HP.
A typical daemon command is: /usr/lib/hpnp/ OR /usr/opts/hpnp/ OR similar:
…/hpnptyd/ -m /dev/ptyDEV -x IP_ADDRESS -p IP_PORT -k
where: **DEV** is the pseudo-device e.g. pty**tr0** - note the device used by UniVerse/UniData is the equivalent **tty**DEV

rtelnet

This is usually associated with xylogics annexe hardware

Axel tty server

This is the preferred daemon for Axel AX4010 office servers on Unix systems - it is an active service for ports configured as clients.
This runs as a single service. It makes the pseudo-devices defined in the */etc/axttyfile* configuration (e.g. /dev/ttyp11 etc) and listens for reqests from the AX4010 on IP port 2048.

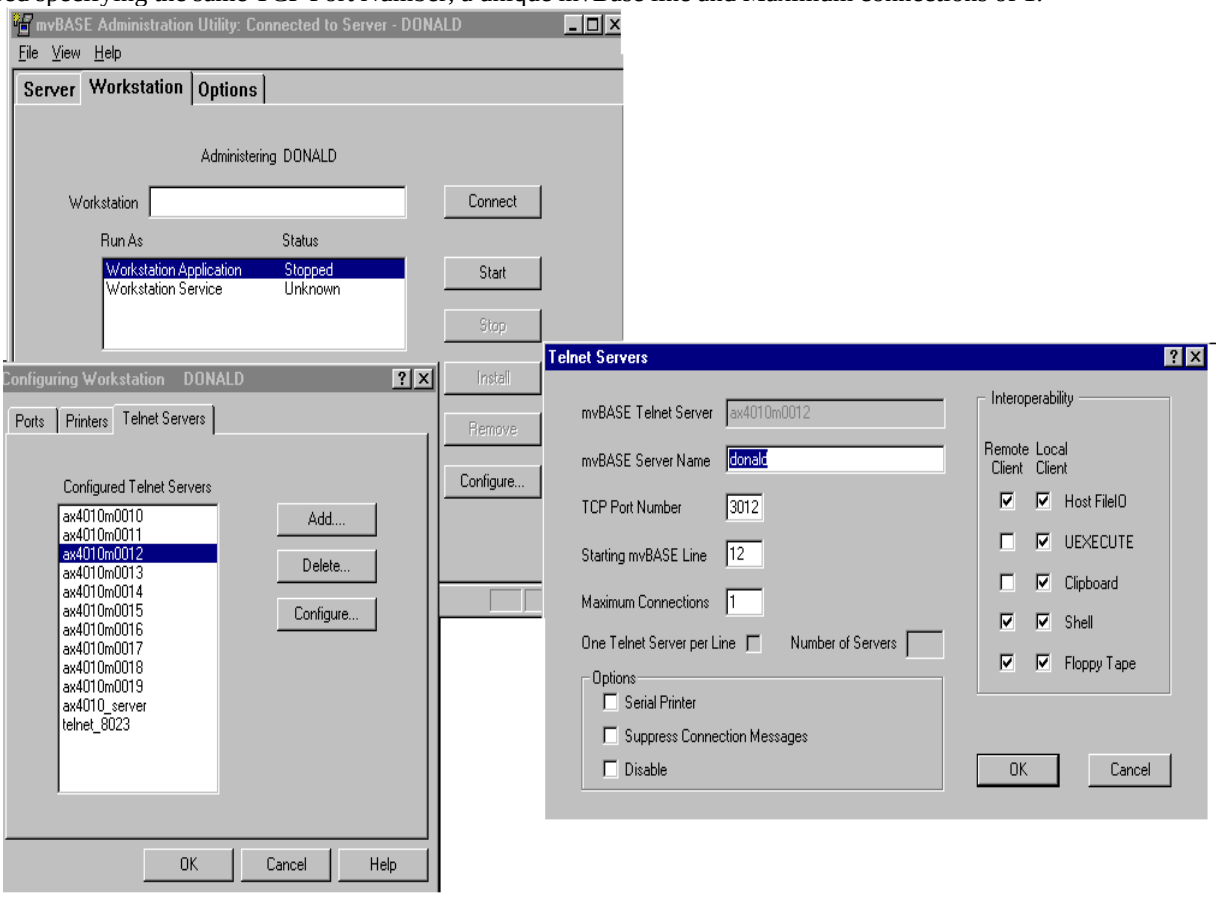
NT Systems

DialOut/IP

This is used to create one or more com-port devices that are virtual connections to the IP address and IP port number(s) on network terminal/serial servers. The DialOut/IP manager is a toolbar process running on the UniVerse/UniData Server, it creates an alternative COM-port per network connection. E.g. COM3 may be a virtual connection to the first serial port on an Axel AX4010 - with an IP address of, say, 195.1.2.3 and with the serial connection configured as IP port 3001. The protocol is usually set to *Telnet* with *Unimodem* compatibility. The COM ports can be accessed by serial terminal emulations such as HyperStar, Host Access, wIntegrate etc. When used with DialOut/IP the Axel serial network service is configured as a server. DialOut/IP versions prior to version 2 are licensed per COM port per system; version 2 is licensed per system.

MvBase and Serial Server Clients

This Pick-like database from GA for NT has a configurable WorkStation Service that allows Telnet Servers to be configured for particular Ports. This is suited to serial servers such as the Axel AX4010 where a serial port's network service can be configured as a tty client looking for a service on a configurable host and IP port number. For each port an mvBase Telnet Server is configured specifying the same TCP Port Number, a unique mvBase line and Maximum connections of 1.



Axel AX4010

```
SERIAL LINE2 SERVICE PARAMETERS
  -------------------------------
SERVICE MODE              :client
SERVICE TYPE              :tty
HOST NAME/IP ADDR.        :donald
TTY TCP PORT              :3012
ID STRING                 :y
AUTO CONN.                :y
INACTIVITY TIMEOUT        :0
TCP KEEPALIVE TIMEOUT     :0
BACKUP HOST USED          :n

Type: [qQ] to come back; [CR] to proceed
```

GENERAL RULES FOR TROUBLE_SHOOTING

Think of the daemons/processes as uniquely disposable bits of "wire" - similar to a telephone exchange connection. If a network connection is broken (e.g. the terminal server is powered off etc) then that bit of wire is lost forever and the TimeClock comms will be connected to a non-existent black-hole (except for active processes such as the Axel tty server).
The whole "wire" must therefore be replaced and the connections re-made from scratch. You may have to:

- Stop the TimeClocks Port(s)
- Kill any existing daemons/processes/task-bar managers
- Fix the network fault
- Start-up a new set of daemons/processes/task-bar manager
- Start the TimeClock Ports.

Independent comms check

The serial/terminal server must be accessible with the ping command at the Unix shell or NT command prompt - otherwise there is a network/routing fault:
Type: *ping 195.1.2.3* for a server with an IP address of 195.1.2.3. If you get *Host Unreachable* or *Request timed out* then there is a network fault. If you get *Reply from 195.1.2.3: bytes=32 time=NNms TTL=SS* repeatedly then there is a good connection.
With NO daemons/process running you should be able to check the TimeClocks by using Telnet at the Unix shell or NT command prompt . You will need to know the TCP/IP address and IP Port number for the terminal/serial server port(s) and which TimeClocks are connected to them.
e.g. for an AX4010 (adresss 195.1.2.3 ***NOT using the axttyd server***) with TimeClocks 1,20 & 21 connect to ports 1, 2 & 2 respectively try:
telnet 195.1.2.3 3001 this attempts to connect to IP port 3001 - which is usually the address configured for port 1.
type: *<control>P01<enter>* - you should get a response of *0101++* OR *0101--*. This is a valid resoponse from TimeClock 01.
telnet 195.1.2.3 3002 this attempts to connect to IP port 3002 - which is usually the address configured for port 2.
type: *<control>P20<enter>* - you should get a response of *2001++* OR *2001--*. This is a valid resoponse from TimeClock 20
type: *<control>P21<enter>* - you should get a response of *2101++* OR *2101--*. This is a valid resoponse from TimeClock 21

If you have a network *hosts* table set-up then you may use address names instead of IP address numbers.
e.g *ping mss1* or *telnet mss1 3001*
If the AX4010 is configured to use the axttyd service then you cannot check out the ports with telnet as they are clients and do not provide a telnet service. However the axttyd daemon logs significant events in /tmp/axttylog.
N.B. the IP port numbers are usually set in the serial/terminal server configuration. Some servers have a specific IP port number and/or login sequence for configuration. E.G.

- the Axel AX4010 is accessed by *telnet ADDRESS 4096*.
- The Lantronix MSS1 or MSS2 is accessed by telnet on the standard port of 23, logging as any user, typing *SET PRIVILEGED* and entering the system password - default is *system*, and then using the *CHANGE* comnand(s). To see the setting type *SHOW SERVER*, *SHOW PORTS*, etc at a normal login.

TIME+ TimeClock Ports Configuration.

TIME+ talks to TimeClocks connected to connections via PORTS. A port is defined in the item CSL.TYYS in the file DICT ACC. The port for each Unix or NT device is the attribute/line number within this item, e.g.:

```
> ED DICT ACC CSL.TTYS
. . .
0020: /dev/ttyp0
0021: /dev/ttyp1
0022: /dev/ttyp2
0023: /dev/ttyp3
```

Unix systems

The device(s) must not have any associated user logon service, getty etc, and must have world read/write permissions (666). These are usually set in the rc script in /etc/rc or rcN.d directories.

UniVerse - Unix

The UniVerse LOGON command is used to start TimeClock Ports. This is policed via the UniVerse devices file, &DEVICE&. The logon is visible as a unix process.

```
LIST &DEVICE& "TTY20" 05:10:17pm  21 Jul 1999  PAGE    1

DEVICE.......... TTY20
Description..... TIMECLOCKS ON MSS1-1
UNIX pathname... /dev/ttyp0
Blockýsize......     0
Deviceýtype..... O
```

Where the TIME+ port number is appended to TTY to make an id of, say, TTY20 for port 20.

UniVerse - NT

The PHANTOM command is used to start TimeClock PortsThe ports device charateristics are set in NT.COMnn items in SYSPAR. The phantom is visible as an NT process.

UniData - Unix

A Clear Systems LOGON utility is used to start-up a phantom with I/O redirected to the PORT's device, which is policed using LINE-ATT, LINE-DET and is defined by SETLINE. The phantom is visible as a unix process.

```
:setline
LINE#   DEVICE-NAME
17      /dev/tty2a
```

UniData - NT

A Clear Systems LOGON utility is used to start-up a phantom with I/O redirected to the PORT's device, which is policed using LINE-ATT, LINE-DET and is defined by SETLINE. The PHANTOM command is used to start TimeClock Ports. The phantom is visible as an NT process.

```
:setline
LINE#   DEVICE-NAME
5       COM5
```

MvBase NT

As mention on a previous page thw Workstation Service is used to configure what device or network connection as associated with an mvBase Line, which is the equivalent of a Port in TIME+.