ComOS 4.0 Release Notes for the PortMaster 4

Lucent Technologies
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Introduction

The new Lucent Remote Access (formerly Livingston Enterprises) ComOS® 4.0 software release is now available for the PortMaster® 4 Integrated Access Concentrator. This release note applies only to the PortMaster 4. This release is provided at no charge to all Lucent customers. This release note documents commands and features added after the *PortMaster 4 Installation Guide* was printed.

ComOS 4.0 is available for the PortMaster 4 only at this time and is not yet available for the other PortMaster products.

You must use PMconsole™ 3.5.3 or PMVision™ 1.3b5 or later or pmupgrade from PMTools 4.0 or later when upgrading to ComOS 4.0. If you are running Microsoft Windows 95 or Windows NT 4.0, you must use PMVision 1.3b5 or later. You can also use the **tftp get comos** command and TFTP to upgrade. Read "Upgrade Instructions" thoroughly before upgrading. Use PMVision 1.3b5 or later when configuring ComOS 4.0.

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New Features

The following commands and features have been added in ComOS 4.0:

- High port and modem density within a single chassis (36 T1 lines or 27 E1 lines)
- Modem for every port with hot spares available.
- Increased bandwidth.

- Single managed unit by means of one system manager module, which includes a manager board and Ethernet daughterboard.

- Full redundancy for critical components such as power supplies, fans and manager modules. The redundant manager module is not supported in this release.

- All power supplies, fans, and boards are hot swappable, except that the management board is not hot swappable in this release.

- Distributed power supply architecture.

- -48VDC or three n+1 redundant AC power supplies.

- Only 15.7 inches, 9u (40cm) high.

- Five PortMaster 4s fit neatly into a standard 7 foot 19-inch rack.

- Allows 23 administrative telnet sessions instead of 4.

- The **ping** command includes a round-trip time:

  Command> **ping 192.168.1.1**
  192.168.1.1 is alive - round trip=3 ms

- The PortMaster 4 can be booted from the network the same way as any PortMaster product, using the GENERIC.PM4 netboot image.

PortMaster 4 Management

Most commands are the same as for the PortMaster 3, with the following new commands. See also **Changes to Other ComOS Commands**.

- **set view**
- **set** *Slot0* **on|off**
- **reset** *Slot0*
- **show boards**
- **show slots**
- **show files**
- **show files verbose**

To view and configure specific board information within the PortMaster 4, you set your view to the board and then use the standard PortMaster **set**, **show**, and **debug** commands. The default view is of the system manager, board 4. If your view is set to anything other than the default view, your current view is displayed in the command line prompt.

If you set the view to a board that is not present, the command line interface reports that no board is present.

set view

Setting a view on the PortMaster 4 allows you to set and show configurations for a given board. The command takes a slot number that corresponds to the number of the slot where the board is installed in the PortMaster 4 chassis. Setting the console after setting the view displays any console messages about that board to the administrative session.

set view <*Slot_number*>

   Slot_number   Value from 0 to 16 representing a slot in the PortMaster 4.

If the view is set to slot 4, where the manager board is installed, all the boards are shown. A **set console** here displays all console messages from all the boards. Likewise, the show commands show information for all boards.

When a view is set, the view number is displayed in the prompt—except for the manager. When the view is set to the manager no view number is shown.

The **save all** command saves all configuration settings for the entire chassis, regardless of what view is set.

```
Command> set view 2
View changed from 4 to
Command 2>
```

set slot Command

The **set slot** command turns the power on or off for the board in the specified slot. Your view must be set to slot4 (the manager board) in order to use the **set slot** command.

set slot<*Slot_number*> **on | off**

Slot_number	Value from 0 to 9 representing a slot in the PortMaster 4. There is no space between the keyword slot and the Slot_number.
on	Turns on power to the board in the specified slot.
off	Turns off power to the board in the specified slot.

In addition to turning the board on or off this command sets the autostart configuration. If a slot is set to off, the PortMaster 4 will not turn that board on. If the slot is set to on, the PortMaster 4 turns the board on if enough power is available. The **save all** command saves the autostart configuration.

Note – Wait 3 seconds before turning on a board after turning it off.

In the following example, a Quad T1 board is installed in slot 3. You can turn off the board with the **set slot3 off** command. Note that no space appears between "**slot**" and "**3**". If you enter **save all** with the slot configured to off, the slot 3 board does not turn on when the PortMaster 4 is booted.

```
Command> set slot3 off
slot3 disabled
```

reset slot Command

This command restarts the board in the specified slot.

reset slot<*Slot_number*>

  Slot_number   Value from 0 to 9 representing a slot in the PortMaster 4. There is no space between the keyword slot and the Slot_number.

Note – Do not insert a space between the keyword "slot" and Slot_number.

Resetting a board is the equivalent of soft-booting the board. No output is generated from this command.

show boards Command

The **show boards** command shows information about boards installed in the PortMaster 4.

Think of the PortMaster 4 architecture as multiple distributed processors sharing resources across a 5 gigabit ATM cell backplane. Each board loads the portion of the ComOS operating system required to perform its specific function.

All configuration information is stored in the flash file system on the system manager module. When a board is inserted into a slot, it loads the ComOS components it requires and any configuration data needed for its specific interfaces from the manager. If any board (except the manager board) in any slot is replaced with a new board of the same type, the new board uses the existing configuration for that slot from the manager. The "show boards" command shows the following information:

```
Command> show boards
```

```
--------------------------- Board status ------------------------
ID   Type        Directory   Uptime   Boot   Hello   State    OS
04   Manager     manager     14:58    1      0       Active   4.0
05   Quad T1     slot5       14:58    1      26      Active   4.0
10   Ethernet    slot10      14:58    1      8       Active   4.0
```

ID

The board ID number. It corresponds to the slot number where the board is physically located.

Type

The type of board.

- "Quad T1" board contains four T1 line ports and 98 modems.
- "Triple E1" board contains three E1 line ports and 98 modems.
- "Manager" board contains a 10Mbps Ethernet connection and two asynchronous console ports.
- "Ethernet" board contains a 10/100Mbps Ethernet connection.

Directory

The name of the subdirectory in the file system set aside for this board.

Uptime

The amount of time that has passed since this board was last booted.

Boot

The number of startup messages received from the board since the manager board was booted.

Hello

The number of seconds since the last hello packet was received from the board. Hello packets are sent every

30 seconds, so any number greater than 30 indicates a problem.

State

The status of the board.

- "Active" means the board is present and running normally.
- "Board Present" means a board is detected but is turned off or not activated.

OS

The version of ComOS running on the board. Each board runs its own copy of ComOS. The ComOS for every board is stored in the nonvolatile file system on the manager board and can be seen with the **show files** command.

show slots

The "**show slots**" command provides an overall view of the PortMaster 4 power sources, power budget, and fans. It also displays information about each slot.

As each board turns on, it reports information to the manager board. This information includes board type, serial number, power requirements, and the hardware revision of the board. The PortMaster 4 detects its power source as AC or DC. For AC power it

determines if a power supply in installed and if it is generating power. For each power supply that is active, 400 watts of power are added to the power budget. Similarly, if a power supply is removed, then 400 watts are removed from the power budget.

If a power supply fails or is unplugged an SNMP alarm is generated. Before a board is turned on the PortMaster 4 determines how much power the board requires. If enough power is available in the budget the board is turned on. If not enough power is available the board is left turned off and an SNMP alarm is generated. If in the course of operation the PortMaster 4 has a drop in its power budget and cannot run all the boards it begins turning off boards until the power budget is balanced. Boards are turned off first by type, and then by slot number. Line boards (Quad T1 or Tri E1) are turned off first. The manager board and Ethernet board are never turned off due to power. High slot numbers are turned off before low slot numbers.

The PortMaster 4 also monitors the status of its four fans. If a fan fails an SNMP alarm is generated. Fan loss does not directly cause a board to be turned off.

The **show slots** command displays the following information:

- AC power status for each power supply bay: working or removed.
- Maximum power available, allocated, and left, in watts.
- DC power: primary and secondary status: on or off.
- Fans status: on or off

For each slot, **show slots** displays:

- Slot number
- Board state
- Board type
- Configuration on or off
- Board serial number
- Power use in watts
- Temperature in degrees centigrade
- Board revision level

```
Command> show slots
AC Power: Top: Working Middle: Working Bottom: Working
Max Power: 1200W, Allocated: 160W, Left: 1040W
DC Power: Primary DC: Off Secondary DC: Off
Fans Status: 1:On 2:On 3:On 4:On
------------------------ Chassis slot entries -----------------------
Slot     State      Board     Config    Serial No        Power     Temp      Rev
---      -----      ------     ------    -----------      -----     ----      ---
```

00	Empty		On		0W	n/a	
01	Empty		On		0W	n/a	
02	Active	Quad T1	On	3C00006	80W	31c	A
03	Empty		On		0W	n/a	
04	Active	Manager	On	Manager	80W		n/a
05	Empty		On		0W	n/a	
06	Empty		On		0W	n/a	
07	Empty		On		0W	n/a	
08	Empty		On		0W	n/a	
09	Empty		On		0W	n/a	

Slot

The number, 0 through 9, of the physical slot where the board is installed. For daughterboards such as the Ethernet board (attached to the manager board), slot numbers are assigned starting at 10.

State

The status of each board:

- ACTIVE means the board is present and running normally.
- CONFIG means the board is not active.
- PRESENT means a board has been detected. It has not been identified and no code has been loaded.
- EMPTY means the slot contains no board.

While the board is loading its ComOS image, **show slots** shows the board as active, but **show slots** does not display the board.

Board

The type of board in the slot:

- "Quad T1" board contains four T1 line ports and 98 modems.
- "Triple E1" board contains three E1 line ports and 98 modems.
- "Manager" board contains a 10Mbps Ethernet connection and two asynchronous console ports.
- "Ethernet" board contains a 10/100Mbps Ethernet connection.

Config

Indicates if the board is configured or not.

Serial Number

The serial number of the board present in the slot. The manager cannot read its own serial number, so theword "Manager" is displayed instead.

The serial EPROM (SEP) is found on each board and contains the type of board, the serial number of the board, the amount of power to be budgeted for the board, and the temperature for the board. If the SEP driver is unable to interpret the programmed information, it shows the board type as "UNKNOWN." The temperature works independently of the programmed portion of the EPROM and works whether the EPROM has been programmed or not.

Power

The number of watts budgeted for the board. When the board is originally detected, the manager reads this information from the board itself. If for any reason this information is unavailable, the manager budgets 80 watts for the board.

Temp

The temperature of the board in degrees centigrade.

The manager board turns off boards that are too warm due to lack of air flow or too warm an operating environment. If a board exceeds 45C, a warning message is generated in the form of an SNMP alarm. If heat exceeds 50C an SNMP alarm is generated and the board is turned off. The board then has to be turned on with the **set Slot0 on** command. Temperature is sampled from the boards every 10 seconds. The manager board never shuts down due to excessive heat.

See the **show alarms** command in "SNMP Traps and Alarm Management" in the "ComOS 3.8 Release Note" for more information on alarms.

```
Command> show alarms

  Alarm Id     Age       Severity      Alarm Message

  --------     ------    ---------      --------------

  3897124       14        0            slot 5 getting too hot (45 C)

  3897232       10        0            shutting down slot 5 .. too hot (50 C)
```

Rev

The board revision level.

show files Command

The **show files** command displays the name and size in bytes of each file stored in nonvolatile memory on the manager board:

```
Command> show files

 File Name            Length
 ----------
 ComOS-pm4            534523
 /manager
 confdata             2812
 ospfarea             176
 snmp                 21
 /shared
 filters              136
 global               257
 ipxfilt              52
 lan                  489148
 m2c_1.2a             73214
 m2d_1.2a             131072
 passwd               10908
 quadt1               325487
 sapfilt              52
 script               42000
 /slot10
 confdata             172
 /slot2
 confdata             19064
 -------
 Total                1629094
```

show files verbose Command

The **show files verbose** command performs a consistency check on the ComOS nonvolatile file system and lists the results as seen in the following example. The check is also done when the PortMaster 4 boots.

```
Command> show files verbose
Flash type Am29F016 with 8192K of memory in 128 cells and 8064 nodes
2 directory nodes in 2 cells
6710 empty nodes in 107 cells
5 released nodes in 2 cells
1347 data nodes, 0 unreferenced nodes, 0 missing nodes
0 cells being erased, 0 bad cells
```

File Name	Length
ComOS-pm4	525602
/manager	
confdata	2812
snmp	65
/shared	
global	324
lan	293908
m2c_1.2a	73214
m2d_1.2a	131072
quadt1	327452
/slot10	
confdata	124
/slot3	
confdata	18864

Total	1373437

Changes to Other ComOS Commands

The **show all** command on the PortMaster 4 no longer displays the following information. Use the **show global** command for this information:

- Local address
- Default host
- Gateway
- Netmask
- DNS server
- Domain

The **show all** command now includes console port C1 information as well as information for C0 and all slots.

The **show Ether0** and **show Ether1** commands now display local IP address, netmask, broadcast filter, and routing information.

The following commands are no longer global, but are configured on each Quad T1 or Tri E1 board. To use the following commands you must first set your view to the slot you want to configure.

- set assigned_address
- set pool
- set isdn-switch

To display these settings, use the **show global** command.

Frame Relay DLCI Configuration.

The **set** *S0* **dlci** command has been removed for the PortMaster 4. To configure Frame Relay DLCIs use the **add dlci** command instead, as shown in the following example:

```
Command 0> add dlci w70 16 192.168.1.2
New dlci successfully added
```

```
Command> show w70
--------------------- Current Status - Port W70 ---------------------
          Status:   ESTABLISHED
           Input:   0                      Abort Errors:   0
          Output:   672                      CRC Errors:   0
         Pending:   0                    Overrun Errors:   0
       TX Errors:   0                      Frame Errors:   0
    Modem Status:   DCD- CTS-


                    Active Configuration  Default Configuration
               ----------------------------  ----------------------------
       Port Type:   Netwrk                Netwrk (Hardwired)
      Line Speed:   Ext 1536K
   Modem Control:   off
       Interface:   Unassigned (FRM,Listen) (FRM,Routing)
             Mtu:   0                     0
      Dial Group:   0
      IP DLCI's:   DLCI                  Address
                    ------                -----------
                    16                    192.168.1.2
```

L2TP LAC Support

The Layer 2 Tunneling Protocol (L2TP) allows PPP frames to be tunneled across an IP network from one PortMaster that answers the call -- the L2TP access concentrator (LAC) -- to another PortMaster that processes the PPP frames -- the L2TP network server (LNS):

> end user--->incoming call--->LAC--->LNS--->network access

A PortMaster running ComOS 4.0 can be a LAC. ComOS 4.1 will support both LAC and LNS on the PortMaster 4, and ComOS 3.9 will support LAC and LNS on the PortMaster 3. The following sequence of events takes place when you establish a typical L2TP session:

1. The end user places a call as normal.

2. The LAC detects the incoming call.

3. The LAC sends an authentication request to a RADIUS server. If call-check is being used, the RADIUS request is sent before the call is answered.

4. If the RADIUS server accepts the user, it returns an accept message to the LAC. The accept message includes information on how to create the L2TP tunnel, such as type of tunnel and IP address of the endpoint of the tunnel.

5. The LAC then creates a tunnel to the LNS by encapsulating the PPP frames into IP packets and forwarding those packets to the LNS.

6. The LNS negotiates PPP normally with the enduser.

The following command enables or disables LAC features on a PortMaster:

set l2tp-lac disable | enable

enable   Enables use of L2TP LAC features on the PortMaster 4.

disable   Disables the user of L2TP LAC features on the PortMaster 4.
       This is the default.

Note – You must issue the "save all" and "reboot" commands after issuing the "set l2tp-lac enable" command, before any L2TP sessions can be established.

RADIUS Configuration for L2TP LAC Support

Both LAC and LNS can use the same RADIUS server, or they can use separate servers. The LAC authenticates using call-check and responds with L2TP tunnel information. The LNS does RADIUS authentication using PAP or CHAP.

To configure RADIUS for L2TP LAC support:

1. Prepare RADIUS as normal. Refer to the *RADIUS Administrator's Guide.* To set up call-check, refer to "How to Use RADIUS Call-Check" in the "ComOS 3.8 Release Notes".

2. Add the following entries to the dictionary file of the RADIUS server. Then kill and restart the RADIUS server.

ATTRIBUTE	Tunnel-Type	64	integer
ATTRIBUTE	Tunnel-Medium-Type	65	integer
ATTRIBUTE	Tunnel-Server-Endpoint	67	string
ATTRIBUTE	Tunnel-Password	69	string
#			
VALUE	Tunnel-Type	L2TP	3
VALUE	Tunnel-Medium-Type	IP	1
#			
VALUE	Service-Type	Call-Check	10

3. Add users to the users file. LNS user entries are the same as typical PPP users. LAC user entries are similar to the following:

```
DEFAULT Service-Type = Call-Check, Called-Station-Id = "5551234"
                      Service-Type = Framed-User,
                      Framed-Protocol = PPP,
                      Tunnel-Type = L2TP,
                      Tunnel-Medium-Type = IP,
                      Tunnel-Server-Endpoint = "192.168.110.17"
```

The first line contains the check items. This is a typical use of the call-check feature. Called-Station-Id checks the number that the user dialed. Tunnel-Type defines the type of tunnel being used, in this case L2TP. Tunnel-Medium-Type specifies the type of network medium L2TP uses, in this case IP. Tunnel-Server-Endpoint designates the IP address of the LNS that terminates the L2TP tunnel. Because this value is sent as a string, it must be surrounded by double quotation marks. Do not use a hostname.

A user profile can be configured to contain redundant tunnel server endpoints. The LAC uses the first endpoint specified if the endpoint is running L2TP. Otherwise, the LAC tries the second endpoint, and then the third. Up to three redundant tunnel server endpoints can be specified. Any more than three are ignored by the LAC.

The LAC's acceptance of a tunnel server endpoint is determined by whether the endpoint is running L2TP. An endpoint running L2TP but configured as a LAC will make the session fail because the L2TP tunnel cannot be terminated.

The following example shows a RADIUS user profile using multiple redundant tunnel server endpoints. Each tunnel server endpoint is preceded by the tunnel medium type for that tunnel.

```
DEFAULT Service-Type = Call-Check, Called-Station-Id = "5551234"
                      Service-Type = Framed-User,
                      Framed-Protocol = PPP,
                      Tunnel-Type=L2TP,
                      Tunnel-Medium-Type = IP,
                      Tunnel-Server-Endpoint = "192.168.11.2",
                      Tunnel-Medium-Type = IP,
                      Tunnel-Server-Endpoint = "192.168.11.17",
                      Tunnel-Medium-Type = IP,
                      Tunnel-Server-Endpoint = "192.168.230.97"
```

Hardware Diagnostics

An SNMP alarm is generated for the following conditions. The alarms can be viewed with the **show alarms** command.

- When a board generates a warning due to excessive heat (45C). A warning is generated only when the temperature crosses the threshold. If the temperature continues to be greater than the threshold, additional alarms are not sent. If the temperature falls below the threshold and then exceeds it again, another alarm is generated. The temperature is sampled very 10 seconds. The manager board never shuts down due to heat.

- When a board shuts down due to excessive heat (50C).

- When any fan stops. Fans stopping do not trigger boards to be shut down. Only excessive heat or lack of power causes boards to be shut down.

- When a power supply is unplugged. The PortMaster 4 can distinguish whether a power supply is unplugged or if it is pulled out. A power supply being pulled out is considered intentional and does not generate an alarm.

- When a power supply fuse is blown.

- When a power supply fails.

- When a board is shut down due to lack of power. Each power supply generates 400 watts. If insufficient power is available, boards are turned off first by type, then by slot number. High slot numbers are turned off before low slot numbers. The manager board is never turned off due to lack of power. (But note that if there is no power, the manager board stops running, of course.) The trap OID is iso.org.dod.internet.private.enterprises.307.2.1.1 The following traps are used (but are subject to change) n, x, and y represent numbers.

  - slot n T1 line(x) down

  - slot n E1 line(x) down

  - Modem Failure: card(n) modem(x)

  - shutting down slot n due to lack of power

  - shutting down slot n ..too hot

  - slot n getting too hot

  - No power for slot n ..needs xW, available yW

  - Bottom Power Supply is Removed

  - Middle Power Supply is Removed

  - Top Power Supply is Removed

  - Fan n is turned On

  - Fan n is turned Off

  - Primary DC Power is On

  - Primary DC Power is Off

  - Secondary DC Power is On

  - Secondary DC Power is Off

Tips on Ether0 and Ether1

The PortMaster 4 comes with two Ethernet ports: Ether0 and Ether1.

Lucent recommends that Ether0 and Ether1 be connected to separate Ethernet segments.

- Both Ether0 and Ether1 are fully routable ports.
- Ether0 and Ether1 have their own MAC (machine) addresses.
- Ether0 does 10Mbps.
- Ether0 is physically on the manager board.
- Ether0 is used for netboots.
- The Ethernet board (Ether1) is in logical slot 10 and gets its power directly from the manager board.
- Ether1 can do 10Mbps or 100Mbps full duplex data transfers.
- Ether1 is physically on the Ethernet board. It communicates with the manager board over the passive ATM
- backplane.
- Ether1 is supported by two CPUs. One is for inbound data, the other is for outbound data.
- Ether1 is not shut down in a low power situation.
- Ether1 is not shut down due to overheating.
- Ether1 maintains its own forwarding table learned from the manager board.
- Ethernet subinterfaces cannot be configured on Ether1.
- To reset the Ether1 port you use the "reset slot10" command which reboots the Ethernet board connected to the manager board in slot4. You must use this command to activate any change in Ether1 configuration.
- During PPP/IPCP negotiation the PortMaster identifies itself using an IP address chosen according to the following priority:

1. Using a local IP address configured for the user profile.
2. Using the reported IP address.
3. Using the interface address of Ether1.
4. Using the interface address of Ether0.

For the time being:

- At this time Lucent recommends using Ether1 if you use only one Ethernet port.
- RADIUS packets leaving the PortMaster have a source IP address of Ether1, even if the packet exits through Ether0.

Frequently Asked Questions

Here are some answers to frequently asked questions concerning the PortMaster 4. manager board refers to the System Management Module (manager board).

Q. Is the PortMaster 4 rack mountable?
A. Yes, the PortMaster 4 fits neatly in a standard 19" rack. Five will fit into a seven foot rack.

Q. What is the PortMaster 4's physical dimensions?
A. 17" wide, 19" rack mount 18" deep 15.7" high (9U), (16 SU in metric practice, IEEE 1301, IEC 917)

Q. What is the best way to rack mount the PortMaster 4 chassis?
A. The easiest way to rack mount a PortMaster 4 is with all slots empty and with the aid of an assistant.

Once the chassis is mounted, you can put in the power supplies (or connect the -48VDC power) and boards.

Q. How many boards can the PortMaster 4 hold?
A. Ten chassis slots are provided. The slot cage is divided into two identical sections.

Q. Are there any slot dependencies?
A. Yes, the system management board must be inserted into slot 4. ComOS 4.0 does not support a redundant manager module. Do not install an additional (redundant) manager board into a PortMaster 4 running ComOS 4.0. When supported in a future release, a redundant manager module can be placed into slot 5.

Q. What powers the PortMaster 4?
A. The PortMaster 4 is native -48VDC. There is a dual input -48VDC connector on the rear panel. Each board has its own DC to DC converter. To use AC power instead, insert up to three 400 watt AC power supplies in the provided bays, to provide N+1 redundant power.

Q. Can the PortMaster 4 power supplies, boards and fans be hot swapped?
A. Yes, except for the manager board. Note: If only one manager board is installed there will be no ComOS redundancy resulting in a down system if the main manager board is pulled from the chassis for any reason.

Q. How is the PortMaster 4 cooled?
A. The PortMaster 4 is cooled by 4 PAPST multifans pulling air from front to back, bottom to top:
- Two -48VDC fans rated at 100CFM at 0 inches of water static pressure
- Two -48VDC fans rated at 50CFM at 0 inches of water static pressure

Q. How many watts of power are supplied to each slot?
A. Approximately 80 watts per slot.

Q. Are the modems and Quad T1 circuits physically on the same board.?
A. Yes, The main Quad T1 board has 34 modems on board plus 64 modems arranged on a daughtercard that plugs directly to the main Quad T1 board. There are 96 active modems per board, plus 2 modems acting as hot spares. The Tri E1 board also has 98 modems per board, with 90 active modems and 8 hot spares.

Q. Can I hot swap the Quad T1 and management boards?
A. Yes, all boards can be hot swapped. Note: If only one management board is installed there will be no ComOS redundancy resulting in a down system if the main manager board is pulled from the chassis for any reason.

Q. How many Quad T1 boards can I insert into the PortMaster 4 chassis?
A. Nine Quad T1 boards for a total of 882 modems: 864 active modems plus 18 hot standby modems.

Q. Does the PortMaster 4 support T1, E1 or Fractional T1 connections?
A. Yes, you can install up to 9 Quad T1 boards for a total of 36 full T1's, or up to 9 Tri E1 boards for a total of 27 full E1's. The Quad T1 board uses 4 shielded RJ-45 connectors with category type 5 cabling. Each connector is equipped with two embedded LED's for circuit status. The Tri E1 board has 3 RJ-45 connectors.

Q. Will T3 be supported and how?
A. Currently, seven Quad T1 boards can be multiplexed together with an external multiplexer. At a later date, one T3 board that can multiplex and demultiplex T3 framing and provide clocking will become available. This board will enable the PortMaster 4 to split the T3 line into separate T1 streams to go to the Quad T1 boards. An E3 board will also be available.

Q. How many T1 lines equal 1 T3 line?
A. 28 T1 lines equal one T3

Q. How many E1 lines equal 1 E3 line?
A. 16 E1 lines equal one E3.

Q. Will the Quad T1 and Tri E1 boards support Van Jacobson header compression and Stac LZA hardware compression?
A. Yes. The Stac LZS hardware compression board is designed into the hardware architecture.

Q. How many amps does a fully loaded PortMaster 4 draw?
A. A fully loaded PortMaster 4 draws roughly 16 Amps at -48VDC, or seven Amps at 120VAC.

Q. How much heat does a fully loaded PortMaster 4 generate?
A. The PortMaster 4 draws approximately 800 watts, so at 3.41443 BTU/hr per watt, it generates approximately 2730 BTU/hr.

Q. What is the physical connection to my local network?
A. The PortMaster 4 has one 100/10Mbps RJ-45 Ethernet connection, which runs at 100Mbps or 10Mbps and autodetects the rate. The Ethernet board is full duplex and has two RISC-based CPUs. One media-independent interface (MII) is provided for the 100Mbps Ethernet connection. An additional 10Mbps Ethernet interface is provided for optional use in network management.

Q. When available, can the second manager board be used to load balance routing traffic out the 100Mbps port, allowing for dual 100Mbps feeds into the network?
A. No.

Q. Is an IP address required on each Quad T1 (or Tri E1) board or just the manager board?
A. The PortMaster 4 needs only one IP address for itself.

Q. How do I manage my PortMaster 4?
A. The PortMaster 4 is managed by one system manager board. The manager board uses SNMP, RADIUS and PMVision, and has a command line interface similar to the one on the PortMaster 3. Two console ports are provided on the manager board for local and remote monitoring. There is a 10Base-T port for private system management.

Q. Does the PortMaster 4 have a dedicated bus architecture?
A. No, the PortMaster 4 has a virtual backplane architecture, using a passive backplane.

Q. What kind of processors are used on the manager module?
A. The manager board uses a 486DX5 CPU. The 100Mbps Ethernet board uses dual R4640 processors.

Q. What kind of processor is used on the Quad T1 and Tri E1 boards?
A. A 486DX5 is used on each Quad T1 and Tri E1 board.

Q. How much memory is standard on the manager board? What is the maximum amount of memory the manager board can handle? What kind of memory is used?
A. Currently 16MB is standard on the manager board, upgradable to 32MB using a standard 1Mx32, 72 pin, 60ns SIMM. For instructions on adding memory refer to the *PortMaster 4 Installation Guide*, available online at **http://www.livingston.com/**.

Q. Do I need more memory to run the Border Gateway Protocol (BGP)?
A. BGP can be run with the base configuration of 16MB of memory.

Q. How much memory is on the Quad T1 and Tri E1 board?
A. Each Quad T1 or Tri E1 board contains at least 8MB of memory.

Limitations

- No support is provided for IPX.

- No support is provided for Multichassis PPP (MCPPP).

- No support for a redundant system manager board. Do not insert a second manager board into a PortMaster 4 running ComOS 4.0.

- The **erase configuration**, **erase comos**, and **erase partition** commands must not be used. The configuration is now stored in files in subdirectories of the nonvolatile file system, not in partitions.

- Dial-in and dial-out OSPF are not supported.

- The **set** *M0* **on**|**off** command is not supported.

- The **reset** *D0* command is not supported.

- The **show isdn** command is not supported.

  When using a line board (Quad T1 or Tri E1) you must plug in any lines from the telephone company that use telephone company clocking into the lower line ports starting with line0. Lines that do not have telephone company clocking must be plugged into the higher line ports starting with line3 and counting down.

  The line board uses the clock signal of the first line port that comes up, starting with line0, for its transmit clock signal which is shared among all the line ports. If the frequency of the clock signal is shifted, as it is in the case of clock generated by non-telephone company sources, then analog modems encounter problems and might not answer calls.

  ISDN and hardwired connections are mostly immune to shifts in clock frequency.

- Ethernet subinterfaces cannot be configured on Ether1.

- To reset the Ether1 port you must use the **reset slot10** command, which reboots the Ethernet board connected to the manager board in slot4. You must use this command to activate any change in Ether1 configuration.

- The RADIUS client on the PortMaster 4 always uses the Ether1 IP address as the source IP address in the IP header sent to the RADIUS server, even if the packet exits through Ether0.

- RADIUS, traceroute, syslog, DNS, and other management packets leaving Ether0 have a source IP address of Ether1 if both Ether0 and Ether1 are configured.

- The PortMaster 4 manager board reboots if an snmpwalk is done at the same time that BGP is loaded.

- A ptrace dump works only on outbound traffic.

- OSPF neighbor information is propagated as all zeroes when Ether0 has no IP address configured. To avoid this behavior, use the command **set ospf router-id >IP address of Ether1**>.

- If you change the assigned pool size on a line board (Quad T1 or Tri E1) the manager board must be rebooted to flush out the routing table. Dynamic pool routing information is put into the routing table maintained on the manager, that is then sent to each board (including the manager) in the form of forwarding tables. Resetting the line board is not sufficient because routes to the old dynamic pool still exist in the routing table.

- The **show session** command sometimes displays an idle timer of 99 days from the manager board view. This problem usually clears after you issue the command a few times.

- In some cases when the client terminal adapter (TA) is configured to dial an 11-digit telephone number, ISDN data-over-voice calls might fail to connect. To fix the problem, configure the client TA to dial a 7-digit telephone number when possible. Call Lucent Remote Access Technical Support if this does not resolve the issue.

Upgrade Instructions

Warning – YOU MUST USE PMINSTALL VERSION 3.5.3 OR LATER TO PERFORM THIS UPGRADE!

You can also perform this upgrade using PMVision 1.3b5 or later, or the pmupgrade from PMTools 4.0. You can also use the **tftp get comos** command and TFTP to upgrade.

Caution – If the upgrade fails, do NOT reboot! Contact Lucent Remote Access Technical Support without rebooting. Never interrupt the upgrade process, or loss of configuration information can result.

The installation software can be retrieved by FTP from **ftp://ftp.livingston.com/pub/le/software/System/Tarfile.tar.Z**. Replace System and Tarfile.tar.Z with the names of the files. You can retrieve the upgrade image at the same time. The following example shows an administrator retrieving pmupgrade and the PortMaster 4 upgrade image:

```
umask 22
mkdir /usr/portmaster
cd /usr/portmaster
ftp ftp.livingston.com
(Enter anonymous)
(Enter your email address; it will not echo.)
binary
cd /pub/le/software/java
get pmtools40.txt
get pmtools40_unix.tar
cd /pub/le/upgrades
get pm4_4.0
quit
```

Follow the instructions in pmtools40.txt to install and run pmupgrade.

PMconsole for the following operating systems can be found under **ftp://ftp.livingston.com/pub/le/software/**:

bsdi/pm_3.5.3_BSDOS_2.0.tar.Z	BSD/OS 2.0 and 2.1
sgi/pm_3.5.3_IRIX_5.2.tar.Z	SGI IRIX 5.2
linux/pm_3.5.3_Linux.tar.Z	Linux 1.2.13 ELF
rs6000/pm_3.5.3_RS6000_4.1.tar.Z	RS6000 AIX 4.1
alpha/pm_3.5.3_alpha_T3.0.tar.Z	Digital Alpha OSF/1 T3.0
hp/pm_3.5.3_hp9000_10.01.tar.Z	HP 9000 HP/UX 10.01

sun4/pm_3.5.3_sun4.tar.Z	SunOS 4.1.4, 5.5.1 on Sparc
sun86/pm_3.5.3_sun86_5.5.tar.Z	Solaris x86 2.5.1
pc/pmw3514.exe	Windows 95 and Windows NT 4.0
java/pmvision13b5.tar	Java on UNIX
java/pmvision13b5.zip	Java on Windows 95 and NT

See **ftp://ftp.livingston.com/pub/le/software/java/pmvision13b5.txt** for installation instructions for PMVision 1.3b5.

The following upgrade image is available at **ftp://ftp.livingston.com/pub/le/upgrades/**:

ComOS	Upgrade Image	Product
_____	_____	_____
4.0	pm4_4.0	PortMaster 4

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Contacting Lucent Remote Access Business Unit Technical Support

Lucent Technologies Remote Access Business Unit (previously Livingston Enterprises) provides technical support via voice, fax, electronic mail, or through the World Wide Web at **http://www.livingston.com/**. Specify that you are running ComOS 4.0 when reporting problems with this release.

Internet service providers (ISPs) and other end users in Europe, the Middle East, Africa, India, and Pakistan should contact their authorized Lucent Remote Access sales channel partner for technical support; see **http://www.livingston.com/International/EMEA/distributors.html**.

For North and South America and Asia Pacific customers, technical support is available Monday through Friday from 7 a.m. to 5 p.m. U.S. Pacific Time (GMT -8). Dial 1-800-458-9966 within the United States (including Alaska and Hawaii), Canada, and the Caribbean, or 1-925-737-2100 from elsewhere, for voice support. Otherwise, fax to 1-925-737-2110, or send email to support@livingston.com (asia-support@livingston.com for Asia Pacific customers).