ForeThought-SP 1.0.x Release Notes

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Revision A
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1.0 General Description of Software Release

These release notes highlight features of the *ForeThought*-SP 1.0.x release.

2.0 System Requirements

FT-SP 1.0.x operates on the TNX-210 and TNX-1100 ATM switches, as well as the MSC-900. FT-SP 1.0 also supports ASX switch platforms that require FT-SP functionality.

CAUTION

The operation of *ForeThought*-SP software and conventional *ForeThought* software (ASX platform) in the same switch or MSC-900 is not supported and results in a panic.

To ensure proper operation in networks containing switches running FT-SP 1.0.x, any *ForeRunner* UNIX adapters currently running *ForeThought* 2.x or earlier should be upgraded to *ForeThought* 4.0.2 or later.

If you are running the Macintosh *ForeThought* 1.1 driver with a switch running FT-SP 1.0.x, you may encounter an error which causes the Macintosh 1.1 driver to do one of the following, depending on whether you have the MacsBug application installed:

- If you have MacsBug installed, MacsBug will start and produce an error message. To proceed, type **`G`**, and press **`<ENTER>`**.
- If you do not have MacsBug installed, a fatal 'bomb' error occurs and displays the `Unimplemented Trap` message. In this case, you must reboot to proceed.

This error only occurs when using the *ForeThought* 1.1 adapter driver with a FT-SP 1.0.x switch. It does not occur on a Macintosh running the *ForeThought* 4.0.2 or 4.1.x driver.

3.0 Key Features

Designed for the TNX-210, TNX-1100, and the MSC-900, FT-SP 1.0.x software is a superset of *ForeThought* 4.1 and 4.0, building on the advanced features of each of these prior *ForeThought* releases. The following sections assume familiarity with the FT 4.0.x code stream, since it primarily describes enhancements to the FT 4.0.x and 4.1.x streams. For a more general overview of the FT-SP 1.0.x features and functionality, refer to the *ForeThought-SP AMI Reference Manual*.

3.1 TNX-1100, TNX-210, and MSC-900 Support

FT-SP 1.0.x is a new code stream that operates on the TNX-1100 and TNX-210 ATM switches, as well as the MSC-900. Due to the unique switch fabrics and multiplexer modules that are used in the TNX and MSC platforms, conventional *ForeThought* switch software will not operate on these products.

CAUTION

Attempting to run conventional *ForeThought* software on the TNX-1100, TNX-210, or MSC-900 will result in a panic or some other form of non-recoverable error.

3.2 PS-1000/DC-B

FT-SP 1.0.x supports a new DC power supply (PS-1000/DC-B) designed for the TNX-1100 and MSC-900. Unlike the current ASX-1000 DC power supply, PS-1000/DC-B is a more robust, 30A model. It provides a choice between a terminal strip or 3-pin D-subminiature power connector, as well as support for #6 AWG cabling.

3.3 CEC-Plus Support (TNX-1100 and MSC-900)

The CEC-Plus Common Equipment Card provides redundant Stratum 4 or Stratum 3 distributed timing with hitless failover between primary and secondary inputs. The CEC-Plus is standard in the TNX-1100 and an option for the MSC-900.

CEC-Plus hardware is expected to enter Beta trials in mid-July, 1997, with an expected customer release near the end of August, 1997. In the interim, TNX-1100s will ship with the current ASX-1000 CEC (CEC-1000-B). Switches shipped with this CEC will receive a free upgrade to the CEC-Plus when available.

3.4 UNI 3.0 and UNI 3.1 Support

Both UNI 3.0 and UNI 3.1 signalling support are provided in the FT-SP 1.0.x release. The switch can be configured to detect automatically between UNI 3.0 and UNI 3.1 connections. The switch also translates between connections of different types. If the host adapters are downgraded from UNI 3.1 to UNI 3.0 signalling, the switch changes the connections to UNI 3.0 automatically if the **`auto`** feature under **`conf uni new`** is used.

3.5 Public UNI

Individual UNIs can now be configured as either the network side or the user side of a public network. Public UNI operates over either UNI 3.0 or UNI 3.1 ports. When configured to be the user side of a public UNI, it acts like the user side of the Q.2931 and ILMI protocols. Similarly, when a UNI is configured as the network side of a public UNI, it acts like the network side of the Q.2931 and ILMI protocols. The signalling code in FT-SP 1.0.x accepts and translates public E.164 addresses into private NSAP E.164 addresses, and does the inverse translation of private NSAP E.164 addresses into the corresponding public E.164 address format. Public E.164 addresses are accepted and translated into private E.164 addresses for incoming messages (and vice-versa for outgoing messages). This is configurable on a per-UNI basis and involves a straightforward format conversion.

3.6 Address Validation

UNI signalling messages may now be filtered based on the Calling Party Number. This capability allows the network side of the public UNI to accept connection setup requests from authorized parties only and to refuse connection setup requests from unknown or unauthorized parties.

3.7 Standby SCP Option

TNX-210 and TNX-1100 switch fabrics are configured with a second switch control processor (SCP) to provide redundancy, allowing the switch or fabric to recover quickly from a failure on the controlling SCP.

Redundant SCPs are optional for the MSC-900.

Switch configuration information (i.e., CDB configuration, FLASH configuration, etc.) can be synchronized between the two SCPs so that this information is maintained if SCP failover occurs. Use the AMI commands under the **`conf system dualscp`** menu to configure this feature. See the *ForeThought-SP AMI Reference Manual* for more information.

If a failure is detected on the controlling SCP, the standby SCP takes control of the fabric. At this point, PVC connections are dropped, and any SVCs that had been established are torn down at the switch. Once the standby SCP takes control of the switch fabric, PVCs will be re-established (according to the "last-synchronized" CDB), and end-stations will signal the switch to create new SVCs. The larger the CDB (e.g., number of PVCs), the longer the standby SCP will take to fully restore the switch.

The failed SCP can then be removed and replaced with another HA-based SCP.

A standby SCP (SCP-ASXHA or later) can be hot-inserted into the slot from which a failed SCP has been removed.

Repeated and successive hot-insertion or removal of a standby SCP can potentially cause a reset on the primary SCP. This occurrence is intermittent, but will result in cell loss if it does occur.

For proper synchronization of information between SCPs, ensure that the amount of free space on both SCPs is roughly equal before performing these commands.

3.8 PNNI SPVCs

PNNI SPVCs are inherently bidirectional, which means that a single call setup establishes the circuit in both directions. Although PNNI SPVCs are bidirectional, the endpoint that initiates the call setup is known as the "source" and the other endpoint is known as the "destination." However, only the source endpoint is responsible for maintaining the SPVC connection. Therefore, you do not need to open a session to the destination switch to create a PNNI SPVC.

3.8.1 SPVC Fallback or Rerouting

Sometimes SPVCs are forced to use a less than optimal route because of temporary link failures or because of inconsistency in the routing database. This feature lets you configure the SPVC controller to check for SPVCs that are using less than optimal routes and reroute them if a better route becomes available. A path is considered "better" than another path if its administrative weight is lower by a user-specified percentage.

3.8.2 Directed SPVCs

In conjunction with the SPVC rerouting feature, you can optionally specify a path to be the "best" path by creating a Designated Transit List (DTL). If you configure an SPVC to use a specific DTL that you have created, the SVC portion of the SPVC always uses that path so long as it is available, even if another path exists that has a lesser administrative weight. See the section on the AMI **`conf nsap dtl`** commands and the **`conf spvc`** commands in the *TNX ATM Switch Network Configuration Manual* for more information.

3.8.3 SPVC Pacing

SPVC pacing allows you to control the rate at which SPVCs are re-established upon a reboot. Pacing ensures that network connections are restored in a controlled manner and that each SPVC is serviced properly. The SPVC controller can now be set to open only a certain number of SPVCs and to schedule itself for callback after the specified time interval if there are more SPVCs to be opened, both at start up and at the retry callback. This feature is particularly advantageous if the switch has a large number of SPVCs configured in the CDB.

3.9 Call Recording/Performance Monitoring

FT-SP 1.0.x supports call recording and performance monitoring.

Call records are created at connection establishment time and transmitted to a data collection server at the end of a collection interval. Performance monitoring collects data for equipment and transmission facility resources. Currently, the only utilities that are available to aid in post-processing for call records and performance monitoring data are through *ForeView*. These utilities convert the call record and performance record file data from binary to ASCII format so that the information can be imported into databases or spreadsheet programs. For more information about these utilities, please refer to the appropriate *ForeView* User's Manual.

3.10 Signalling Scope Enhancements

FT-SP 1.0.x allows a signalling channel to control VCs within other VPs on the same link.

A UNI can be configured to control either VCs within its own VP (VP-scope, the default) or to control VCs in its own VP, in addition to controlling VCs in other VPs on the link (link-scope). The following criteria must be satisfied in order to use link-scope UNIs:

- There can be only one link-scope UNI on a given link.
- A link-scope UNI must be created within VP 0 on the given link.
- The switch must be in extended mode.
- The path containing the link-scope UNI must be an elastic path.
- A backplane UNI cannot be a link-scope UNI.

3.11 VP-Associated Signalling

FT-SP 1.0.x supports VP-associated signalling. Using this feature, connectivity can be provided in the presence of VP cross-connects. The ATM Forum Interim Inter Switch Signalling Protocol (IISP) does not specify operation in the presence of VP cross-connects. The ITU standards and PNNI 1.0 specify VP-associated signalling as the way to signal over VP cross-connects. This is the mechanism that FORE recommends in FT-SP 1.0.x for signalling over VP cross-connects.

By default, all UNI signalling interfaces are configured to VP-scope and non VP-associated. This will work in the presence of VP cross-connects (and is backward compatible with earlier releases). However, it is recommended that VP-associated signalling be used for signalling over VP cross-connects.

3.12 OAM Cell Support

Operations, Administration and Maintenance (OAM) cells provide fault and performance management at the ATM layer. The OAM capability on FORE ATM switches provides a means to propagate information regarding fault conditions in the ATM network. You can enable and monitor OAM cell generation on a FORE ATM switch to receive Alarm Indication Signals (AISs) and Remote Defect Indications (RDIs) to determine where the fault conditions are located.

FT-SP 1.0.x also supports OAM cell loopback response. Due to the location and type of equipment, TNX and MSC devices only respond to F4 segment loopbacks at all originating / terminating VP endpoints; F5 flows are passed through these devices, unaffected, to their respective endpoints.

3.13 Enhanced Software Upgrade Procedure

To provide flexibility in allocating space for software downloads, the upgrade algorithm in FT-SP 1.0.x writes the new software image to DRAM before storing it in FLASH.

3.14 Changing the Well-Known Address for LANE LECS

FT-SP 1.0.x allows you to disable the ATM Forum's well-known address so the LECS can only be contacted by using the switch's actual address. Additionally, an address can be created and designated as the well-known address, instead of the well-known address defined by the ATM Forum.

3.15 DS1 and E1 Circuit Emulation Support

FT-SP 1.0.x supports the new DS1 and E1 Circuit Emulation Services (CES) network modules. The CES modules provide adaptation from time-division multiplexed traffic (i.e., from PBXs, WAN multiplexers, channel banks, video codecs, etc.) to ATM. The DS1 and E1 CES network modules provide both structured and unstructured services, with a maximum of 127 connections supported per module.

Port timing on a CES network module can be derived from any one of multiple sources. The following sources can be used in structured or unstructured mode, and the resulting clock mode is synchronous:

- the crystal on the network module (structured or unstructured)
- any one port on the network module (structured or unstructured)
- any other network module in the same switch fabric (structured or unstructured)
- any other switch fabric (TNX-1100 or MSC-900 only) (structured or unstructured)

Timing configuration for the above sources is established using the AMI and EMI **`timing`** commands.

Normally, when utilizing one of the above timing sources, the CES network module has only one master source. The only choices for this source are:

- a port on the CES network module
- the crystal on the CES network module
- the import clock from another network module or switch fabric

The Synchronous Residual Time Stamp (SRTS) clock recovery mechanism can also be used as a source for CES port timing. SRTS can be used only when in unstructured mode and results in an asynchronous clock mode. SRTS is configured when an unstructured service is created, using the **`-srts on`** option under the **`conf ces new`** command in AMI. A secondary clock source may also be specified.

SRTS is independent of the master clock, and two SRTS circuits are available for use. Ports are clustered 1,2 and 3,4 and 5,6 and only one port in the cluster may use an SRTS circuit at a time. Using SRTS is the only way to override the master clock. SRTS uses the clock configured as the import clock to be the network derived clock used in the SRTS circuit.

3.16 VP 0 Bandwidth Not Allocated

When a switch boots with FT-SP 1.0.x, the available bandwidth on any given port is not automatically assigned to VP 0. Instead, it is available for use by all elastic VPs on that port.

3.17 Fabric Level Statistics

Fabric level statistics are supported in FT-SP 1.0.x. These counters can help to simplify debugging problems in your network. These counters record the number of CAC (Call Admission Control) failures, VPI allocation failures, VCI allocation failures, and connection setup errors for each port and path. Each port counter maintains all errors of that type that occurred on that port or on any path on that port. The path counters only record errors that occurred on that path. The counters are direction specific, meaning that errors that occurred on the input side are differentiated from errors that occurred on the output side. In AMI, the commands **`stat port fabric`** and **`stat vpt fabric`** display these counters.

3.18 Configurable Call Proceeding

Currently, by default, the switch sends a UNI Call Proceeding signalling response message whenever it receives a Setup signalling request message from another switch or a proxy device. A T303 timer (4 seconds) is started by the sending device at the instant that the Call Setup request is made. If this timer expires before it receives a response, the sending device resets the T303 timer and retransmits the Setup request message. If the timer expires for a second time, the call is deemed to have failed and the originating switch clears the call. During conditions of heavy signalling load, or when the signalling message has to traverse many switch hops to reach its destination, the T303 can expire, and the subsequent retransmission of Setup messages can cause extra network load.

The Call Proceeding message may optionally be sent, which causes the switch that originated a Setup message to stop its T303 timer (4 seconds) and to start a new longer timer T310 (10 seconds). While imposing a small burden on the switch sending the Call Proceeding message, the reduction in traffic from retransmissions of the Setup messages is beneficial.

AMI provides the capability of configuring these Call Proceeding messages on a per-UNI basis at the time the UNI is created. Using the **`[-send_cproc (on|off)]`** argument in **`configuration uni new`** allows you to specify whether the UNI created should send Call Proceeding messages for Setup messages that it receives and successfully forwards. The value **`on`** means that the UNI sends Call Proceeding messages and the value **`off`** means that it does not send them. The default value is **`on`**.

3.19 Configurable Output Signalling Service for UNI

AMI provides the capability of configuring the UNI signalling channel to be put into either the UBR or VBR queue on the output side at the time the UNI is created. This value can be specified using the **`[-outsigservice (vbr|ubr)]`** argument in the **`configuration uni new`** command. VBR is the default value. If the UNI signalling channel is put in the VBR queue, UNI signalling messages are given higher priority on the output side, which prevents UBR traffic from congesting the signalling traffic.

3.20 Configurable Input Signalling Contract

AMI allows you to restrict the amount of traffic on the signalling VC that can be sent to the switch control port by specifying a UPC contract for a given UNI. By default, the UPC contract index of 0 is assigned to the UNI, which means that there is no policing on the input signalling VC. The UPC contract index can be specified when the UNI is created using the **`[-insigupc`** *`<upc_contract>`*`]` argument under **`configuration uni new`**. This prevents large amounts of data from being sent on the signalling VC, thereby affecting signalling traffic on all other signalling VCs.

3.21 Configurable SSCOP No Response Timer

AMI permits the value of the SSCOP No Response timer to be configured on a per-UNI basis at the time the UNI is created. This value can be specified using the [**-ssnoresp_timer** *<sec>*] argument in the **configuration uni new** command. The default value is 10 seconds. If the value zero is specified, the default value is used for the timer. This parameter can be set to a value higher than the default when the remote host is experiencing a heavy load and cannot process a signalling request on time.

3.22 LANE Token Ring Services Support

LANE Token Ring services are now available on the switch. A Token Ring BUS can be configured using the AMI command **conf lane bus new** and specifying **-type token-ring**. A Token Ring LES can be configured using the AMI command **conf lane les new** and specifying **-type token-ring**.

3.23 Large MTU Support for LANE

A larger packet size than is allowed with Ethernet can be used to achieve higher performance in ATM-only ELANs. The supported MTU sizes are 1516, 4544, 9234, and 18190. However, the MTU size must match the MTU size of the other hosts on the ELAN. The MTU can be configured using the AMI command **conf lane bus new** or **conf lane les new** and specifying a value for **-mtu**.

3.24 SNMP ILMI Proxy Support

You can configure the ILMI SNMP Proxy (ISP) table through which you can discover the topology of the network to which your switch is connected. If ILMI is running on each switch in your network, your switch registers its address via ILMI with its neighboring switches. You can add, delete, or display ISP table entries and you can send SNMP requests through the ISP table.

3.25 Traffic Management Features

The following traffic management features are provided in FT-SP 1.0.x:

- Generic Cell Rate Algorithm (GCRA) policing can be configured on a per-port / per-class basis for all CBR and / or VBR PVCs and / or SVCs.
- AAL5 packet discard can be configured on a per-port / per-class basis for all CBR, VBR, and / or UBR SVCs and / or PVCs.
- AAL5 partial packet policing can be configured on a per-port / per-class basis for all CBR and / or VBR PVCs and / or SVCs. However, the HDCOMP ASIC on the switch board must be version 1 or greater to support this feature. Use the **conf board show advanced** command to display the ASIC version.
- UBR tagging can be configured on a per-port and per-connection basis for all UBR connections.

3.26 Virtual Paths Split into VPCs and VPTs

In FT-SP 1.0.x, the commands for configuring VPs are split into two separate AMI menus. Through paths are configured with the **conf vpc** commands. Further, under **conf vpc new**, paths can be labelled to help in identifying them for billing purposes.

To configure originating or terminating paths, the **conf vpt** commands must be used.

The **conf vcc modify** and **conf vpc modify** commands (provided in previous versions of *ForeThought*) do not appear in FT-SP 1.0.x.

3.27 Resetting Network Modules via AMI

The AMI command **conf module reset** is the software equivalent of removing and immediately re-inserting a network module while the switch is under power. This allows you to reset the connections on a given network module without having physical access to the switch.

3.28 Network Module Statistics Moved

Network module statistics are displayed with the **stat port** command (**statistics port** [**ds1 | ds3 | e1 | e3 | j2 | sonet | tp25 | fabric| traffic**] [*<port>*]; e.g., **stat port sonet**, **stat port ds3**).

3.29 Displaying the ARP Server Address

The AMI command **conf atmarp arpserver show** displays the ARP server address for all Classical IP interfaces at the same time. To display the ARP server address of an individual Classical IP interface, include the interface in the command. For example, **conf atmarp arpserver show qaa0**.

3.30 Displaying CPU Information

The AMI command **oper environment cpu** displays the amount of DRAM, the revision level, and the amount of FLASH on the SCP(s) installed in a switch fabric or MSC-900 multiplexer module.

3.31 SONET LED Models

The FT-SP 1.0.x release provides LED models for SONET/SDH network modules. These LED models define the behavior of the LEDs associated with each port on a SONET/SDH network module. Each LED model maps the SONET/SDH error defects to a color pattern on the port receive and transmit LEDs. The LED model may be set on a per-port basis using the AMI **configuration port led** menu. There are currently four SONET/SDH LED models available: lan1, wan1, lan2, and wan2 (with lan1 being the default).

The lan LED models may be used when it is desirable to have a visual indication of traffic, whereas the wan LED models may be used when it is desirable to avoid the distraction of blinking LEDs. Table 1 provides details about the LED models and how they indicate different conditions.

Table 1 - Guide to SONET LED Indicators

Network Module Type	Indicator	State	Meaning
LAN1	Transmit	Green or Extinguished	In normal operation this LED is flashing green indicating traffic flow, either input or output. AMI displays this as AUTO.
		Red	N / A
		Yellow	N / A
	Receive	Green or Extinguished	In normal operation this LED is flashing green indicating traffic flow, either input or output. AMI displays this as AUTO.
		Red	Either LOS or LOF or AIS_L **or** (LOP_P or UNEQ_P or PLM_P or LCD) AND (not AIS_P)
		Yellow	RDI_L
WAN1	Transmit	Green	Normal operation
		Red	N / A
		Yellow	N / A
	Receive	Green	Normal operation
		Red	Either LOS or LOF or AIS_L **or** (LOP_P or UNEQ_P or PLM_P or LCD) AND (not AIS_P)
		Yellow	RDI_L
LAN2, WAN2	Transmit	Green or Extinguished	In normal operation this LED is flashing green indicating traffic flow, either input or output. AMI displays this as AUTO.
		Red	RDI_L
		Yellow	RDI_P
	Receive	Green or Extinguished	In normal operation this LED is flashing green indicating traffic flow, either input or output. AMI displays this as AUTO.
		Red	Either LOS or LOF or AIS_L
		Yellow	AIS_P or LOP_P or UNEQ_P or PLM_P or LCD

4.0 Known Issues or Concerns

4.1 Limitations

- FT-SP 1.0.x supports a maximum of 14,000 PVC / PVP entries on an HA32 SCP, depending on the types of network modules that are used in the same switch. However, these numbers can also be bounded by the memory model that is used in AMI under **`conf module traffic c models`** or **`conf module traffic lc models`**.
- FT-SP 1.0.x supports a maximum of 2,800 SPVCs on an HA32 SCP, depending on the types of network modules that are used in the same switch. However, these numbers can also be bounded by the memory model that is used (see previous bullet). MIB additions have been made which allow ramping of SPVC setups.
- The maximum number of UNIs supported by this release is 192.
- Memory model 4 for Series C network modules does not appear in FT-SP 1.0.x.

- FT-SP 1.0.x supports some OAM cell capabilities as described in Section 3.12. OAM cell 'storms,' however, can cause degraded switch performance. OAM cells are sent when a failure occurs or when an administrator is performing diagnostics. These cells are sent at a rate of approximately 1 cell / sec per connection, per failure or diagnostic test.

  If OAM cells are flooded at rates of 1,000 or more cells / sec, and this flood is directed at an SCP, switch performance will degrade noticeably. Rates of roughly 3,000 cells / sec can prevent users from connecting to the switch.

  OAM cell storms will not occur under normal network conditions, regardless of data traffic levels, but they can be artificially created with network diagnostic equipment.

  OAM cell processing (transmission as well as reception) can be disabled on an entire switch board with the AMI command **`conf board oam`** *<board_number>* **`disable`**. Disabling OAM processing relieves the load on the SCP until the source of the OAM storm can be corrected.
- Series LC network modules cannot operate in the same switch fabric as Series A or Series B network modules. However, Series C and Series LC network modules can operate in the same switch fabric.
- If a *CellPath* 90 is to interoperate with a DS1 or E1 CES network module, the *CellPath* 90 must be running software version 4.1.1 or later.
- OAM cell support is not available on DS1 or E1 CES network modules.
- It is possible for ASX platforms requiring FT-SP functionality to upgrade to FT-SP 1.0.x. The following requirements, however, should be noted:
  - SCPs must have at least 16 MB of DRAM.
  - HA32 SCPs are required for redundant, hot-swappable SCP functionality (revision D or later HA32 SCPs are recommended).
  - When upgrading from FT 4.0 or earlier, it is necessary to initialize the CDB before downloading the new software image.
  - If upgrading multiple SCPs in the same device (i.e., dual SCPs, a TNX-1100, or an MSC-900), **all** SCPs must be upgraded before rebooting. Running *ForeThought*-SP and conventional *ForeThought* software on the same switch causes a panic.

4.2 Known Bugs

- The values under the `Up Time` field displayed using the AMI command **`stat cr`** do not update periodically when the switch is under heavy load.
- FT-PNNI path computation failures may occur after UNI signalling channels are reset.
- The same IP address can be entered on the same port using two different subnet masks. To avoid problems, you should not enter this.
- Creating a UNI with the **`uni30`** or **`uni31`** option and specifying **`-ilmi down`** can degrade AMI responsiveness. To avoid this, either use the **`auto`** option when creating a UNI or ensure the **`uni30`** or **`uni31`** option is used correctly and you have specified **`-ilmi up`**.
- During an upgrade, if a failure occurs due to insufficient free space on the FLASH, you are prompted to delete CURRENT and try again. If this occurs, you should abort the upgrade and free additional space on the FLASH before you attempt the upgrade again.
- The switch may panic if the system log is configured to send messages to an unreachable IP address and the log traffic is very heavy and sustained.

- When a connection between two CES network modules is broken after hot-swapping one of the network modules, it is possible that the connection may not be re-established on the receiving side. This does not occur during normal call setup and teardown.

  To determine if your network module is in this state, run the AMI commands **`stat ces`** and **`stat vcc`**. Under this condition, **`stat ces`** shows a `NoCells` condition for some or all connections on the hotswapped CES network module and **`stat vcc`** shows that cells are being received and forwarded by the fabric.

  To clear this problem, simply hotswap the CES network module again, either physically or logically by using the AMI command **`conf module reset`**.

- When using IRIX to run secure tftp (for software upgrades), do not enter the slash character (/) in front of the path to the file (following the colon). Instead, specify the path as follows:

  `oper upgrade 169.144.3.23:var/boot/s_ft_sp_1.0.0_1.20`

- When configuring CEM connections, the recommendations below should be considered:
  - Minimum recommended value for `-partialfill` is `9` when `-cas` is set to `basic`
  - Minimum recommended value for `-partialfill` is `12` when `-cas` is set to `cas`
  - Minimum recommended value for `-reassCDVT` is `2000` (µs)

  Lower values than those recommended will reduce the call capacity of the network module but will not affect voice quality.

- If a low `reassCDVT` is used when configuring CES connections, bit errors may result in configurations using less than five timeslots or a `partialfill` setting of less than 20.

- If upgrading to FT-SP 1.0.x from a FT-SP BETA release or from *ForeThought* 4.1.x, GCRA policing should be set to **`allOff`** for all CES ports to avoid inadvertent policing following a network module hot-swap or switch reboot. Turning off policing for VCCs coming directly from a CES network module has little effect, because the TDM traffic that these VCCs carry is rate-limited already.

  This minor limitation will be removed in a future release.

LANE BUGS

- When a smaller MTU value is specified in LECS configuration file, LEC on the host fails and LEC on the switch joins the ELAN successfully.
- When the LECS is created after the LES/BUS are created, the LEC can get the MTU value specified in the LECS configuration file, rather than the value specified by the LES.
- When a switch's NSAP prefix is changed using the AMI command **`conf topology forepnni prefix`**, the switch must be rebooted before the LEC uses the new prefix.

5.0 Contacting Technical Support

In the U.S.A., you can contact FORE Systems' Technical Support by any one of four methods:

1. If you have access to the Internet, you may contact FORE Systems' Technical Support via e-mail at:

   support@fore.com

2. You may telephone your questions to "support" at:

   800-671-FORE or **412-635-3700**

3. You may FAX your questions to "support" at:

   412-742-7900

4. You may send questions, via U.S. Mail, to:

   FORE Systems, Inc.
   1000 FORE Drive
   Warrendale, PA 15086-7502

Technical support for non-U.S.A. customers should be handled through your local distributor.

No matter which method is used for technical support, please be prepared to provide the serial number(s) of the product(s) and as much information as possible describing your problem or question.