



***ForeThought 5.2 Release Notes
for ForeRunner and TNX Switches***

Software Version 5.2.x

**MANU0151-06
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1.0 General Description of Software Release

These release notes highlight features that have been added or changed in the *ForeThought 5.2.x* release.

2.0 System Requirements

ForeThought 5.2.x supports the *ForeRunner* ASX-200BX, ASX-200WG (16 MB version only), ASX-1000, *ForeRunnerLE* 155, TNX-1100, and TNX-210 ATM switches.

To ensure proper operation in networks containing switches running *ForeThought 5.2.x*, any UNIX adapters currently running *ForeThought 2.x* or earlier should be upgraded to run *ForeThought 4.1.x* or *ForeThought 5.0.x*.

Any Macintosh adapters should be upgraded to run *ForeThought 4.1.x* or *5.0.x* drivers.

3.0 New Features

3.1 Support for the *FramePlus*[™] Network Module

ForeThought 5.2.x supports the new *FramePlus* Frame-to-Cell Interworking network module. The *FramePlus* network module delivers comprehensive, high performance interworking for the seamless migration of Frame Relay or ATM FUNI services to a common multiservice ATM infrastructure. The *FramePlus* module provides standards-based frame-to-cell interworking that is compliant with the Frame Relay Forum's FRF.8 Frame Relay/ATM PVC Service Interworking Implementation Agreement, as well as the ATM Forum's Frame Based User-To-Network Interface (FUNI) Specification, Version 2.0.

The *FramePlus* module aggregates both fractional and full DS1/E1 line rate frame services, while providing high performance interworking between individual frame and cell-based virtual connections (Frame Relay Data Link Connection Identifier (DLCIs) or FUNI VCCs to ATM VCCs and vice versa). *FramePlus* interworking enables seamless end-to-end connectivity between remote frame-based equipment and local frame and/or native ATM-attached end-devices spanning either ATM or Frame backbone networks. The *FramePlus* network module is supported and fully compatible with FORE's existing line of ASX-200BX, ASX-1000, TNX-210, and TNX-1100 backbone ATM switching solutions.

Please see the *Network Configuration Manual* for a discussion about configuring the network module. See the *ATM Management Interface (AMI) Manual* and Parts 1 and 2 of the *AMI Configuration Command Reference Manual* for a description of the individual commands.

3.2 Support for UNI 4.0

ForeThought 5.2.x includes support for the mandatory elements that are listed in Table 1-2 of the UNI 4.0 specification. *ForeThought 5.2.x* also includes support of the following optional elements: ABR Signalling for PP Calls, Generic Identifier Transport, Sub-Addressing, and User-User Signalling. The UNI 4.0 Specification also adopts, as an optional capability, the frame discard mechanism, pioneered by FORE. Of course, this release continues to support it.

The signalling configuration interface under **conf sig new** lets you create a UNI 4.0 interface. The existing rules for UNI auto configuration that deal with specifying the signalling type and interface and specifying the signalling scope and mode apply to the creation of a UNI 4.0 interface. (For more information about these rules and for examples of valid and invalid combinations (and reasons why the invalid ones are not allowed), see Chapter 7 in the *Network Configuration Manual*.)

3.3 Multiple DTLs for FT-PNNI SPVCs

ForeThought 5.2.x now allows you to specify up to four FT-PNNI Designated Transit List (DTL) indices for each directed SPVC. The DTL specifies the preferred call routing for the SVC portion of the SPVC. Each DTL can be weighted to prioritize the order in which the DTLs are tried. If the ATM switch cannot establish a connection on the preferred DTL, it attempts each of the subsequent DTLs in weight order.

If none of the DTLs are usable, the call is dynamically rerouted if the `-reroute` option is enabled under `conf spvc pnni`. If that option is disabled, the call setup fails, and a notification of the failure is sent to syslog, but the DTLs are retried. DTLs with equal weights are ignored on retries once a circuit is established with a given weight. SPVCs in the `up` state are periodically monitored to ensure they are using the optimal route. If a DTL with a higher weight becomes available, the SPVC is rerouted using that DTL.

If a circuit on a DTL fails, the switch will, by default, wait 30 minutes before retrying that particular DTL. This delay mechanism can be disabled on a per-SPVC basis, although one should take careful consideration before doing so, since this delay is needed to avoid a “thrash” condition in some circumstances. This delay applies even if the SPVC is configured with only one DTL; so a single-DTL SPVC with dynamic rerouting disabled would suffer a 30-minute interruption. Using PVCs may be a better choice for such connections.

The multiple DTL feature provides much greater flexibility in configuring and using directed SPVCs. See Part 2 of the *AMI Configuration Command Reference Manual* for more information.

3.4 Support for Explicit Rate ABR Traffic

ForeThought 5.2.x allows you to create ABR PVCs and PVPs through a new service category under `conf upc new`. This ABR support is offered only on Series D network modules. The ABR PVCs and PVPs must be bidirectional and use the same VPI/VCI on the network modules. See Part 2 of the *AMI Configuration Command Reference Manual* for more information about ABR UPC contracts.

3.5 Configurable Switch Fabric ID

ForeThought 5.2.x now lets you change the fabric ID of the switch. The fabric ID is a unique, six-byte MAC address. Switch software uses the fabric ID as the MAC address of the switch Ethernet port, and as the End System Identifier (ESI) portion (bytes 14-19) of the switch NSAP address. Some bytes of the fabric ID are used in forming the SPANS address and PNNI and FT-PNNI domain prefixes.

In the past, if you moved an SCP from one fabric to another, this six-byte fabric ID changed. Therefore, the SCP had a different MAC address, a different NSAP address, and a different domain prefix. If LANE or CLIP services were configured on the switch, some manual reconfiguration was required for all of the clients to learn the new server NSAP addresses. Any static routes also had to be reconfigured.

This feature now lets you configure an SCP with the fabric ID of the original switch fabric, thus overriding the default (factory-configured) fabric ID of the destination switch. This operation saves you from performing lots of manual reconfiguration to reflect the hardware change. See Part 2 of the *AMI Configuration Command Reference Manual* for more information.

3.6 Support for E1 CEC-Plus

The CEC-Plus is an intelligent management subsystem that is hot-swappable and offers redundant environmental monitoring, redundant timing input sources, support for Stratum 3 or 4 timing synchronization, and isolated internal switch management traffic. The installed CEC-Plus configuration consists of a frame (card carrier and passive backplane interface) and redundant Environmental Control Processor (ECP)/External Synchronization Input (ESI) pairs. The ECP/ESI pair comprises the Timing Control Module (TCM). *ForeThought 5.2.x* now supports the E1 version of the CEC-Plus, as well as the DS1 version. See Part 1 of the *AMI Configuration Command Reference Manual* for more information.

3.7 Editable Configuration Database (CDB) File

This new feature allows you to convert your CDB to an ASCII text script of AMI commands which you can edit. This feature is useful if you want to use your existing CDB as a basis for creating a script for the new feature (described in Section 3.9) that allows the batch creation of PVCs and SPVCs. It is not a reliable mechanism for recreating the overall configuration of a switch. Some editing of the output is necessary; e.g., the order of the Frame Relay services commands needs to be changed.

To convert the CDB to ASCII, enter the `-ami` option under `oper cdb backup` and to restore the CDB, use the `-ami` option under `oper cdb restore`. See the *ATM Management Interface (AMI) Manual* for a description of this feature.

3.8 AMI Command Line Editing

This new feature makes it easier to configure your switch. You can scroll through the commands stored in AMI's history and edit the lines by deleting, inserting, and replacing characters. This is particularly useful if you need to enter several long command strings that are similar.

When editing a line, the current cursor position is always in "insert" mode. Cursor movements are controlled using standard ANSI terminal escape sequences. Non-ANSI terminals and terminal emulators are not supported. See the *ATM Management Interface (AMI) Manual* for a description of the individual key sequences that are supported.

3.9 Batch Creation of PVCs and PNNI SPVCs

This new feature lets you easily create or delete a large number of PVCs and/or SPVCs. You create an ASCII text script file on a host that contains the `new` commands or `delete` commands in the order in which you wish to create or delete the connections. Then you load the file on to the switch and use the `conf vcc batch` command (for PVCs) or `conf spvc pnni batch` command (for SPVCs) to execute the script on the switch. This command sequentially executes every PVC and SPVC command in the file. Since batch files are downloaded using a reliable, checksummed protocol, this method of constructing large numbers of PVCs and SPVCs is fast and reliable. See Part 2 of the *AMI Configuration Command Reference Manual* for more information.

3.10 Panic File Can Be Saved to FLASH

This new feature lets you save a panic file to FLASH using the `oper panic save` command. Then you can easily transfer the panic file to an existing host using the `oper flash put` command. From there, you can either attach the file to an e-mail to send to the FORE Technical Assistance Center (TAC) or print the file and fax it to the TAC as specified in Section 6.0 of this document. See the *ATM Management Interface (AMI) Manual* for more information about this feature.

3.11 LANE 2.0 Support

Our earlier *ForeThought 5.0.x* release included support of LANE UNI 2.0 items needed for MPOA operation. This release adds support for the remaining mandatory items in that specification. These items do not provide new capabilities to you today, but make *ForeThought 5.2.x* ready for emerging applications. (The ATM Forum LANE UNI 2.0 Specification was adopted in mid-1997. The other half of LANE 2.0, a service-service protocol specification, will not be completed by the Forum until early 1999.)

4.0 Known Issues or Concerns

4.1 Upgrade Considerations

FLASH Size - *ForeThought* 5.2.x occupies 1.8 MB of non-volatile (FLASH) memory, more than earlier *ForeThought* releases did. On Switch Control Processors (SCPs) with 3MB of FLASH, you must delete the earlier release to make room for *ForeThought* 5.2.x. You will be asked to do so when you perform an **oper upgrade** command. For SCPs with 4MB of FLASH, these procedures are not needed; there is room to keep both the old and new releases in FLASH. To determine the amount of FLASH on your SCP, use the **oper env cpu** command and look at the `FlashSize` field.

If a failure occurs during the upgrade, the switch will temporarily have no *ForeThought* image at all. If your switch is configured to use a bootp server, it will recover automatically by re-loading *ForeThought* into memory. You can then repeat the **oper upgrade** command to load *ForeThought* into FLASH as well.

Instead of using a bootp server, you can copy the Mini Loader into FLASH along with the *ForeThought* release. Then, if the upgrade fails, you can interrupt the switch re-boot sequence, start the Mini Loader, and repeat the **oper upgrade** operation. For more information about Mini Loader, see the Installation and Maintenance manual for your switch.

Upgrade and Downgrade Procedures - *ForeThought* 5.2.x will automatically import configuration information when upgrading an ASX, TNX, or *ForeRunnerLE* switch from *ForeThought* 4.1.x, *ForeThought* 5.0.x, 5.1.x, or SP 1.0.x. To upgrade from one of the earlier *ForeThought* releases listed here, you should back up your CDB (using AMI command **oper cdb backup**), and then upgrade directly to 5.2.x (using **oper upgrade**).

Downgrades, however, do not automatically export configuration information to the earlier version. You will only be able to access the switch through the serial port. The FLASH is reformatted during this process.

If you absolutely need to downgrade a switch running *ForeThought* 5.2.x to *ForeThought* 4.1.x, *ForeThought* 5.0.x, 5.1.x, or SP 1.0.x, you must perform the following steps on a console connected to the serial port:

1. Back up the CDB of the switch running *ForeThought* 5.2.x (using **oper cdb backup**).
2. Downgrade to *ForeThought* 4.1.x, *ForeThought* 5.0.x, *ForeThought* 5.1.x, or SP 1.0.x (using **oper upgrade**) and reboot the switch.
3. Perform a FLASH init (using **oper flash init**).
4. If needed, re-assign the IP address and default route information, and reboot over Ethernet.
5. Perform an **oper upgrade** again of the older version, but DO NOT reboot the switch.
6. Restore the CDB of the version that you downgraded to in step 2 (using **oper cdb restore**) and reboot the switch.

If you have any questions about changing between software versions, contact FORE Technical Support.

Upgrading to an SCP-ASXP5 - To upgrade your switch from an older SCP running *ForeThought* 4.1.x, 5.0.x, 5.1.x, or SP 1.0.x to an SCP-ASXP5 running *ForeThought* 5.2.x, perform the following steps:

1. Back up the CDB of the older SCP using the **oper cdb backup** command.
2. Pull out the older SCP and insert the new SCP. (If you have dual SCPs configured, you must remove both of the older SCPs before inserting a new SCP; i.e., you cannot have an older version SCP in one slot and an SCP-ASXP5 in the other slot at the same time.)
3. Bring up the switch software by booting over Ethernet or FLASH.
4. Set the IP address and default route information.
5. Restore the LECS.CFG file (if one previously existed) using **conf lane lecs get**.
6. Restore the CDB (using AMI command **oper cdb restore**).

E.164 Address Format - In earlier *ForeThought* releases, it was possible to create a signalling interface using the E.164 address format and specifying the `-type` as `auto`. This results in the interface coming up as PNNI or FT-PNNI with the E.164 address format enabled, which is not a valid combination. When you create a signalling interface using the E.164 address format in *ForeThought* 5.2.x, you must specify the `-type` as `publicUNI`. Upon upgrading to *ForeThought* 5.2.x, any signalling interfaces that used the E.164 address format and used a `-type` of `auto` will be automatically changed to use the E.164 address format, a `-type` of `publicUNI`, and `-ilmireg` of `disable`. Also, any signalling interfaces that used the E.164 address format and used a `-type` other than `auto` or `publicUNI` will be automatically changed to use a private address format while retaining the configured `-type`.

User Password Changes - Releases prior to *ForeThought* 5.x supported only one AMI login profile, accessible through the login ids `ami` or `asx`. When you first upgrade to *ForeThought* 5.x, the switch software creates two separate default userids: `ami` and `asx`. Both are configured with `local` authentication, `admin` privileges, and `all` access. If a pre-*ForeThought* 5.x password file already existed, both userids are assigned that same password. If a pre-*ForeThought* 5.x password file did not exist, both userids are assigned a null password.

LES/BUS Platform Location - In *ForeThought* 5.x, the LES and BUS for an ELAN must always be located on the same platform (co-located); e.g., if switch A is providing a LES for an ELAN, it will act as a BUS as well. If you have previously run the LES and the BUS on different platforms, re-configure your switch before upgrading. Otherwise, the BUS will be deleted from the CDB, the LES will not be recreated, and a warning message will be written to the console.

Memory Pools and PVC Capacity - *ForeThought* 5.x lets you configure the amount of memory allocated for call processing. The default memory pools setting is 2.5 MB. On a 16 MB SCP, this leaves room for 6500 PVCs. On a 64 MB SCP, this leaves room for 25,000 PVCs. If you have more PVCs configured in an earlier *ForeThought* release, back up your CDB before performing the upgrade. After the upgrade, change the memory pool setting to 0, and then restore the old CDB.

Overbooking Factors - The maximum overbooking factor for both link and path overbooking has been changed from 99,999 to 32,767. When upgrading, overbooking factors which are between 32,768 and 99,999 are changed to 32,767. The changes are updated in the CDB.

UPC Contract Index - Switches are typically configured with approximately 20 UPC contracts, each of which is given a unique numeric index. In pre-*ForeThought* 5.x releases, this index had a maximum value of roughly 2 billion. *ForeThought* 5.x lowers the maximum UPC index value to 32,767. Your UPC index numbers should typically have low values and will be converted transparently. If you have used values above 32,767 for UPC contract indexes, you must delete these contracts and re-create them with indexes below 32,767, and delete and re-create any PVCs or SPVCs using those UPCs. Otherwise, the UPCs and circuits will not be re-created under *ForeThought* 5.x. (A warning is printed to the console for any such UPC contract. If no warning appears, there were no illegal contracts in your configuration.)

Number of LANE Clients on a Switch - As with earlier *ForeThought* releases, the maximum number of LANE clients resident on an SCP is 16. This limit was not enforced in earlier releases. In *ForeThought* 5.x it is enforced, so you will not be able to configure a 17th client.

Old Panic Records - Panic records are automatically removed upon upgrading your switches to *ForeThought* 5.2.x. If you execute the `oper panic show` command, a message is displayed saying, `There is no panic dump to show you.`

Timing Configuration - If distributed timing had been previously configured on a switch with a pre-*ForeThought* 5.x release, that timing configuration will be lost when it is upgraded to *ForeThought* 5.x. An explanation of the new distributed timing feature and examples of how to configure timing using the new method are provided in the Network Configuration manual for your switch.

Change to Series LC and Series LE Memory Models - The values in the `Mcasts` field and `Cells` field in memory models 5 and 8 have changed in *ForeThought* 5.x for the `conf module traffic lc models` and the `conf module traffic le models` commands. See Part 1 of the *AMI Configuration Commands Reference Manual* for more information.

Configurable Switch Prompt - To make it easier to identify switches, the switch prompt is now configurable via the AMI command `conf system prompt <new-prompt>`. This command allows the user to replace the old `localhost :>` prompt with any ASCII string. Upon upgrading to this release, the default switch prompt has been modified to use the switch name. If no switch name has been configured (using `conf switch name`), the prompt will default to `ATM SWITCH :>`.

After an `oper cdb init`, the prompt will default to `ATM SWITCH :>` and, if the switch name is ever changed, the switch prompt will default to the new name. If the switch name and configured prompt were different, you will have to modify the prompt again.

If you open a remote AMI session using the open command, an asterisk (*) is displayed in front of the remote switch's prompt to distinguish it from the local switch's prompt. The remote switch prompt always uses the remote switch's name for the prompt. To return to the local switch, you must type `localhost`.

4.2 Configuration Considerations

FramePlus Line Framing - The *FramePlus* network module provides the user with the ability to configure DS1 line framing to either Extended Superframe (ESF) or Superframe (SF) formats. It should be noted that while both line framing schemes are supported, Frame Relay or FUNI services being supported over SF line framing may experience data corruption during line alarm conditions, specifically RAI. This corruption is a result of the inherent structure of the SF framing format.

CEC-Plus Interface - The user interface to the Timing Control Module (TCM) is called the Extended Management Interface (EMI). Although EMI on the TCM and AMI on the switch are similar in structure, they are not identical. For example, command line editing is not available in EMI. For information about the commands that are available in EMI, see the *CEC-Plus Installation and User's Manual*.

PNNI SPVC with CDVT Specified in UPC Contract - When creating a PNNI SPVC using a UPC contract, the CDVT value only applies to the local port. To guarantee the CDVT throughout the circuit, you must specify the CDVT on a port-by-port basis.

FramePlus Service License Keys - The *FramePlus* network module may be configured to support either Frame Relay or ATM FUNI services at a module level. Frame Relay services are enabled by default; no application key is required. If you wish to enable FUNI services, you are required to enter a FUNI application key using the `conf module fram application <module> <application_key>` command. To obtain a FUNI service application key, please contact the FORE Technical Assistance Center (TAC) as specified in Section 6.0 of this document. However, if you wish to use Frame Relay services after you have been running FUNI services, you must enter a Frame Relay application key. The Frame Relay service application keys are generally available. For your convenience, a valid Frame Relay key is published in Section 1.12.2.1 in Volume 1 of the *ATM Management Interface (AMI) Configuration Commands Reference Manual*.

ATM FUNI Services - The *FramePlus* network module supports ATM FUNI service that is compliant with the ATM Forum Frame Based User-To-Network Interface (FUNI) Specification, Version 2.0 mode of operation 1a. Mode 1a provides the following FUNI service profile: Full or fractional services up to DS1/E1 line rate, AAL5 PDU adaptation, 2 octet frame header, 2 octet CRC, maximum FUNI frames size of 4,096 octets, up to 512 user VCCs, and at least 16 concurrent frame reassembly instances. The *FramePlus* module supports ATM FUNI PVC connections. The *FramePlus* module does not support signalled connections, or in-band ILMi signalling per the ATM Forum UNI 3.1 or UNI 4.0 Specifications.

Frame Relay Services - The *FramePlus* network module supports Frame Relay services that are compliant with the Frame Relay Forum's FRF.8 Frame Relay/ATM PVC Service Interworking Implementation Agreement, FRF.1.1 Frame Relay User-to-Network Implementation Agreement, and FRF.3 Multiprotocol Encapsulation Over Frame Relaying Networks Implementation Agreement. The *FramePlus* module specifically supports both FRF.8 upper layer user protocol encapsulation modes of operation: Mode 1 - Transparent Mode and Mode 2 - Translation Mode.

FramePlus to VoicePlus™ Connectivity / Interoperability - The ForeThought 5.2.x code release does not permit the establishment of connections between *FramePlus* network module (Frame Relay or FUNI) and *VoicePlus* (ATM Circuit Emulation) network module ports. This limitation is system-wide and is due to inherent interoperability limitations between the FRF.8 (AAL5) and ATMF CES-IS v2.0 (AAL1) specifications.

PVC Capacity on FramePlus Network Modules - The number of services and PVCs that can be supported on a *FramePlus* network module depends upon the amount of memory in the SCP that is installed in the switch fabric. To support the maximum number of services (124) and PVCs (1,012) on a *FramePlus* network module, an SCP with 16MB DRAM and 4MB FLASH, or greater, is required.

POST Support on FramePlus Network Modules - The *FramePlus* network module is an intelligent interface card that has its own processor. Upon a reset, the module runs a power-on self test (POST) to verify the integrity of the hardware. This POST takes about 25 seconds to complete. The network module may take up to an additional 35 seconds to come back on-line, if a large number of PVCs and services need to be recreated. When the POST is complete, the Operational State under `conf mod fram display` shows `applupruning`.

When using a *FramePlus* network module as the primary source or both the primary and secondary sources of timing for a CEC-Plus, there is a slight delay before the TCM can lock onto the source because it cannot lock until the POST is complete.

Resetting the CDB - In an extreme condition, when there is very little memory left in the FLASH, the switch may come back up with the same CDB after performing an `oper cdb reset`. If this happens, use the `oper flash free` command to see how much space is left. (This operation may take a few minutes to complete.) Perform an `oper flash dir` to list the contents of the FLASH. Use `oper flash delete` to remove any unnecessary files. An `oper cdb reset` should now complete successfully.

Capacities - The following are the VC and UNI capacities of the software:

- **PVCs/PVPs** - The maximum number of PVC/PVP entries supported by this release on a CF processor board is 7,000. This number is roughly double (14,000 circuits) for an HA32 series processor board, depending on the types of network modules that are used in the same switch. The number for a P5 processor board is 15,000. However, in some cases, these numbers are also bounded by the memory model that is used in AMI under `conf module traffic c models`, `conf module traffic lc models`, `conf module traffic le models`, or `conf module traffic d models`.
- **SPVCs** - The maximum number of SPVCs supported by this release on a CF processor board is 1,400. This number is roughly double (2,800 circuits) for an HA32 series processor board, depending on the types of network modules that are used in the same switch. The number for a P5 processor board is 15,000. However, in some cases, these numbers are also bounded by the memory model that is used in AMI under `conf module traffic c models`, `conf module traffic lc models`, `conf module traffic le models`, or `conf module traffic d models`. MIB additions have been made which allow ramping of SPVC setups.
- **UNI Signalling Channels** - This release supports 192 UNI signalling channels on a *ForeRunner* ASX-200WG, ASX-200BX, LE 155 or TNX-210. It supports 768 UNI signalling channels on an ASX-1000 or a TNX-1100.

OAM Storms - Abnormally high OAM cell traffic loads (above roughly 1,000 cells per second) can cause performance degradation if the switch is processing the cells. This condition might be caused by faulty equipment in the network, for example. You may want to disable OAM processing using the command `conf board oam <board number> disable`. OAM processing is controlled separately on *FramePlus* network module. Use the `conf module fram oamf5 <module> disabled` command to disable OAM processing on a *FramePlus* network module.

Creating UNI Instances - Creating a new UNI signalling channel and specifying `-ilmi down`, can cause AMI responsiveness to decrease. To avoid this, either use the `auto` option when creating a UNI or ensure that you have specified `-ilmi up`.

Debug Dump Commands Output - The output of the `debug dump` commands is sent to syslog and it is printed out to either your telnet session or to your console (depending on how you logged in). If you logged in through the console and you also have enabled syslog output to the console (using `conf system syslog console enable`), the `debug dump` output appears twice on the console. To display only one copy of the output, turn off syslog to the console (using `conf system syslog console disable`) before issuing the `debug dump` commands.

4.3 Known Problems and Limitations

OAM Cell Translation on FUNI PVCs - Tunnelling OAM cells through FUNI PVCs does not work properly. Although this does not cause problems with FORE equipment, it may cause relatively high OAM cell error rates on third-party FUNI equipment.

Advanced Options in UPC Contracts - When creating a UPC contract that uses the advanced options, the software automatically maps the Frame Relay parameters to ATM parameters. The mapping is performed based on method 2 in Appendix A of the B-ICI Specification, Version 1.1. Although this is a useful tool, occasionally some of these mappings may result in a UPC contract that returns invalid ATM parameters. An invalid contract is noted by a `suspicious traffic contract debug` error message in the syslog, and should not be applied to any PVCs. You should delete the invalid contract and recreate it without using the advanced options.

FT-PNNI and Load Balancing Failover on Adapters - For best performance when configuring load balancing failover (LBFO) on multiple adapters on a host, use a non-default prefix in the adapter address. Otherwise, when LBFO is used in a FT-PNNI network, it may take 5-10 minutes for failover to occur. If a host is connected to switches A and B, the host, by default, registers ATM addresses A.X and B.X on both switches. Since A.X is native to switch A, switch A summarizes the registered address as prefix A, but switch B advertises the entire address A.X. Similarly, switch B summarizes address B.X and switch A advertises the entire address B.X.

If the link from the host to switch B is broken, connections to the ATM address A.X are not re-established because address A.X as advertised by B is not flushed from the FT-PNNI topology database for 5-10 minutes. Connections are not routed to address A.X to A as long as the advertisement for A.X from switch B persists.

To avoid this, configure a non-default prefix C.X on both switches A and B (using the `conf nsap prefix new` command) on the ports to which the host is connected. Then, the host registers C.X as the ATM address on both switch A and switch B. Since C.X is not native to either switch, both switches advertise this address. Therefore, if one of the links fails, the other link is immediately chosen rather than waiting for the invalid link to be deleted from the FT-PNNI topology database.

FramePlus Local Frame Switching - The *FramePlus* network module does not permit the establishment of Frame-to-Frame connections across a single fabric. This restriction prevents connections between FramePlus ports located on the same network module, or *FramePlus* ports located across separate modules, but attached to the same switch fabric.

FramePlus Call and Performance Records - The *FramePlus* network module does not export either call or performance records.

FramePlus PMP Connections - The *FramePlus* network module does not permit the establishment of either frame-to-cell or cell-to-frame point-to-multipoint (PMP) virtual connections.

Anycast Signalling - Basic anycast signalling is fully supported, but the optional “connection scope” call setup attribute is not.

Trap Generated Twice - The Enterprise Specific Trap (29 asxLinkUp) is generated twice for each port when a *FramePlus* network module is administered up from the down state.

Upgrading a *FramePlus* Network Module - On rare occasions, while upgrading the software on the *FramePlus* network module, the operation fails with the following message:

```
{Netmod aborted download.}
Transfer failed {Netmod aborted download.}.
Reset the network module [n] ?
```

You should respond with **n** to the reset question and perform the upgrade again. The upgrade should now complete successfully.

Call Records on Series D Network Modules - Call Records do not report the additional counters that are supported by the Series D network modules.

Call Records Hang - It is possible that the Call Recording feature may cause the switch to appear to be unresponsive or hung. This can occur if the destination directory for the call records is an NFS-mounted drive on the server and the NFS mount is currently unavailable. This scenario causes switch system resources to slowly become unavailable for other switch functions. To avoid this problem, it is recommended that the destination directory for call records use local server resources and not NFS-mounted drives.

5.0 Special Information

5.1 AMI Conversion Table

The following table lists the AMI commands that have been moved, renamed, or replaced between *ForeThought 4.1.x* or *SP 1.0.x* and *ForeThought 5.x*.

<i>ForeThought 4.1.x</i> or <i>SP 1.0.x</i> Command	<i>ForeThought 5.x</i> Equivalent
conf av>	conf security nsapfiltering>
conf board topology	display atmroute spans map
conf board timing	conf timing switchclock
conf module timing	conf timing switchclock
conf nsap av>	conf security nsapfiltering>
conf nsap dtl>	conf atmroute ftpnni dtl>
conf nsap route>	conf atmroute ftpnni staticroute>
conf snmp trap	conf snmp trap destinations
conf topology forepnni>	conf atmroute ftpnni>
conf topology spans>	conf atmroute spans>
conf uni>	conf signalling>
oper password	conf security login password



The **conf av** and **conf nsap av** menus that had been under the old address validation feature filtered calls based only on the calling (source) address. They have been replaced by **conf security nsapfiltering**, which is a new feature that filters calls based on a combination of the calling (source) and called (destination) addresses, as well as the source ports, VPIs, NSAP addresses, and NSAP address masks, and the destination ports, VPIs, NSAP addresses, and NSAP address masks.



The **conf board timing** and **conf module timing** commands have not moved to, but have been replaced by, a simplified method of timing under **conf timing switchclock**.

6.0 Contacting Technical Support

In the U.S.A., customers can reach FORE Systems' Technical Assistance Center (TAC) using any one of the following methods:

1. Select the "Support" link from FORE's World Wide Web page:

<http://www.fore.com/>

2. Send questions, via e-mail, to:

support@fore.com

3. Telephone questions to "support" at:

800-671-FORE (3673) or 724-742-6999

4. FAX questions to "support" at:

724-742-7900

Technical support for customers outside the United States should be handled through the local distributor or via telephone at the following number:

+1 724-742-6999

No matter which method is used to reach FORE Support, customers should be ready to provide the following:

- A support contract ID number
- The serial number of each product in question
- All relevant information describing the problem or question

