Lucent Technologies
Bell Labs Innovations



APX™ 8000

TAOS 9.1.9 Release Note

For software release 9.1.9
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Upgrade and downgrade procedures

This section shows how to upgrade and downgrade the TAOS software of an APX 8000 unit.

Requirements and recommendations

These recommendations for upgrading APX 8000 units help ensure a smooth upgrade. If you must downgrade from this release to an earlier TAOS release, please see “Downgrade instructions” on page 4.

Obtaining the TAOS 9.1.9 software

The TAOS 9.1.9 software consists of the following files:

Filename	Descriptions
`apxsrb.bin`	The boot loader. Both T1 and E1 loads use the same boot loader software. Install the appropriate boot loader for your release when upgrading or downgrading.
`apxrel.tar` and `apxrel2.tar`	Tar files (T1 load) that contain images for the shelf controller and all T1-compatible slot cards.
`apxrele.tar` and `apxrele2.tar`	Tar files (E1 load) that contain images for the shelf controller and all E1-compatible slot cards.

If you need further assistance on how to obtain the TAOS 9.1.9 software, see “Customer Service” on page iii.

To identify the software that you need based on the slot cards that have been physically installed in your chassis, refer to the following table. This table lists the contents of the tar files that contain the most commonly used slot-card images.

Minimally, you must load the first tar file (`apxrel.tar` or `apxrele.tar`). If your APX 8000 chassis contains additional slot cards (for example, a SWAN slot card), then you must also load the second tar file (`apxrel2.tar` or `apxrele2.tar`)Table 1 list the contents of the APX 8000 TAOS 9.1.9 tar files.

Table 1. Tar file content description

Filename	Contents	
	Description	**Slot-card images**
`apxrel.tar`	Shelf controller	`apxsr`
	Ethernet	`tntenet2 tntenet3 tntenet3nd`
	HDLC	`tnthdlc2 tnthdlc2ec`
	T1-specific images	`tnt8t1 tntt3 tntut1 tntpctfit`
	APX 8000 modem images	`tntcsmx tntcsm3v`
	MultiDSP	`tntmadd`

Filename	Contents	
	Description	**Slot-card images**
apxrel2.tar	STM-0	tntstm0
	UDS3	tntuds3
	DS3-ATM, DS3-ATM-2	tntds3atm tntds3atm2
	OC3-ATM, OC3-ATM-2	tntoc3atm tnt0c3atm2
	SWAN	tntswan tntswan2
apxrele.tar	Shelf controller	apxsre
	Ethernet	tntenet2 tntenet3 tntenet3nd
	HDLC	tnthdlc2 tnthdlc2ec
	E1-specific images	tnt8e1 tntue1 tntpctfie
	APX 8000 modem images	tntcsmx tntcsm3v
	MultiDSP	tntmadd
apxrele2.tar	E3-ATM	tnte3atm
	OC3-ATM, OC3-ATM-2	tntoc3atm tnt0c3atm2
	SWAN	tntswan tntswan2

Local access to the unit recommended

Whenever you install system software, Lucent recommends that you access the unit through the shelf controller serial or LAN port rather than a slot card port.

Saving the system configuration

As a general practice, always save the system configuration before upgrading or downgrading system software. If you use TFTP to save the system configuration, the target file must exist on the TFTP server and you must have permission to write it. For example, the following commands executed on a TFTP server create a target file and set its permissions:

```
$ touch /tftpboot/config/testcfg.1
$ chmod a=rw /tftpboot/config/testcfg.1
```

Before you save the system configuration, you must enable the `allow-password` permission in the `User` profile to save the configured passwords. If you do not have a`llow-password` permission enabled, you are prompted to confirm that you wish to save the configuration without passwords. If you do so and then restore the saved configuration, all passwords in the configuration are wiped out. The following commands executed on the APX 8000 unit save the system's configuration to the target file on the TFTP server and then restore the saved configuration:

```
admin> save network 10.10.10.10 config/testcfg.1
admin> load config network 10.10.10.10 config/testcfg.1
```

For additional information about the `save` command and its options, see the *APX 8000/MAX TNT/DSLTNT Reference* at `http://www.lucent.com/support/documentation.html`.

Upgrade synchronization on systems with dual controllers

If you are logged into the primary controller and use one of the following commands, the effect is system wide:

Command	Description
`load`	Load a new software version.
`nvram`	Clear NVRAM.
`reset`	Reset the system, dropping all calls.

By default, when logged into the primary controller, these commands affect both controllers. However, you can specify command options to restrict the operation to a specific controller.

Note: If you are logged into the secondary controller and use the `nvram` or `reset` command, the operation affects only the secondary controller. The secondary controller cannot reset or clear the memory of the primary controller.

Upgrade instructions

These instructions show how to upgrade to TAOS 9.1.9 from an earlier TAOS version. The instructions apply to both single-controller and dual-controller APX 8000 units.

Note: Under certain conditions, the `load tar` command might recognize no slot cards and load only the shelf controller image during the upgrade procedure. If this occurs, reset the system and load the tar files again. The second load tar command loads the appropriate slot-card images for the system.

Before you begin upgrading

Before upgrading the APX 8000 unit, follow these preliminary steps:

1. Log into the system and save its configuration to a TFTP server. This step is optional but strongly recommended. For details, see “Saving the system configuration” on page 2.
2. Verify that the `Load-Select` profile is configured to either automatically load only required binaries or to load only selected binaries.

Upgrading an APX unit

The following steps are order-sensitive. To help ensure a smooth upgrade first perform the preliminary upgrade steps described in the preceding section, and then perform the steps in the order in which they are shown.

To upgrade an APX unit, proceed as follows.

1. Load the boot loader. For example:

```
admin> load boot-sr network 10.10.10.10 apxsrb.bin
```

Note: If you only need the first required tar file, continue with step 2. If you need both tar files, go to step 4.

2 Load the tar file. For example:

```
admin> load tar network 10.10.10.10 apxrel.tar
```

Note: Use the `ls` command to see if any of the slot cards on your system do not have the equivalent file on the flash card. If a slot-card image is missing, continue with step 3; otherwise continue with step 5.

3 Reset the system. For example:

```
admin> reset
```

The `Reset` command on the primary controller resets both controllers, dropping all calls. The system should come up with the existing configuration intact. If so, go to step 5. Otherwise, if unexpected circumstances result with an incomplete configuration (such as, physically installed cards still not being reconfigured), continue with the next step.

4 Load the tar files as follows:

```
admin> load tar network 10.10.10.10 apxrel.tar apxrel2.tar
```

5 Restore the system configuration (optional). For example:

```
admin> load config network 10.10.10.10 /tftpboot/config/apx-config
```

6 Reset the system as follows:

```
admin> reset
```

Note: If your unit is configured with DNIS and CLID passwords, after upgrading from TAOS 8.0.x to TAOS 0.1.x, the unit no longer recognizees the `dnis-password` and `clid-password` values that were set in prior releases and dial-in users may experience a busy tone. See “Notice of parameter name changes in the External-Auth profile” on page 27 for additional information.

Downgrade instructions

Note: If you must downgrade, you must have serial access to the APX 8000 unit. See the previous APX 8000 *TAOS 9.0 Release Notes* at http://www.lucent.com/ins/doclibrary.

Because releases are not necessarily backward compatible, Lucent recommends that you always restore a backup configuration made under the previous version. To restore the previous software version (TAOS 9.0.x), proceed as follows:

1 Load the previous version of the boot loader. For example:

```
admin> load boot-sr network 10.10.10.10 apxsrb.bin
```

2 Format the flash card:

```
admin> format flash-card-1
```

To restore it to a previous software version prior to version 9.0.x, continue with step 3. Otherwise, continue with step 4.

3 Load the previous version of the tar file. For example, to load via TFTP from a local host:

```
admin> load tar network 10.10.10.10 apxrel.tar
```

Note: Skip step 4.

4. Load the previous version of the files.

   ```
   admin> load tar network 10.10.10.10 apxrel.tar apxrel2.tar
   ```

5. Clear all profiles by entering the `nvram` command, for example:

   ```
   admin> nvram
   ```

6. Log into the primary shelf controller via the serial connection. Open the `IP-Interface` profile for the shelf controller and set the address. For example:

   ```
   admin> read ip-interface { { 1 right-controller 1 } 0}
   IP-INTERFACE/{ { shelf-1 right-controller 1 } 0 } read
   admin> set ip-address = 10.10.10.2/24
   admin> write
   IP-INTERFACE/{ { shelf-1 right-controller 1 } 0 } written
   ```

7. Load a backup configuration made under the restored software version or one of its predecessors. For example:

   ```
   admin> load config network 10.10.10.10 config/backup-config
   ```

8. Reset the system. This step is required. For example:

   ```
   admin> reset
   ```

TAOS 9.1.9 enhancements and corrections

TAOS 9.1.9 introduced new enhancements and corrected certain problems from the previous release.

TAOS 9.1.9 enhancements

TAOS 9.1.9 includes the following enhancements:

Improved POST diagnostics for slot cards

The power-on and self test (POST) logic has been improved. Slot cards that pass POST with previous software releases might now be declared defective.

Firmware versions for digital modem cards

The Mindspeed (formerly known as Conexant) firmware versions for the MAX TNT Digital Modem slot cards include support for V.90, K56flex, K56plus, and all slower, standard modem speeds. This release includes the following Mindspeed firmware:

- Series56 Digital Modem slot cards (also called CSM/1, TNT-SL-48MOD-S56) support V2.0982-K56_DLP_CSM firmware.
- Series56 II Digital Modem slot cards (also called CSM/3, TNT-SL-48MOD-SGL and TNT-SL-48MOD-S-C) support V5.817 firmware.
- Series56 III Digital Modem slot cards (also called CSMV/3, TNT-SL-48MODV3-S-C) support V5.8175 firmware.

Firmware versions for MultiDSP cards

This release includes the following Lucent firmware versions for the MAX TNT MultiDSP slot cards:

- 48-port MultiDSP slot cards (TNTP-SL-ADI-C or TNTV-SL-ADI-C) support Controller V0.1.71, Modem DSP V0.1909.0, and VoIP DSP V3.0.52 Lucent firmware.
- 96-port MultiDSP slot cards (APX8-SL-96DSP) support Controller V0.1.71, Modem DSP V0.1909.0, and VoIP DSP V3.0.52 Lucent firmware.

TAOS 9.1.9 corrections

Table 2 lists the change request (CR) identification numbers and the problems corrected in TAOS 9.1.9.

Table 2. Change request *ID numbers and problems corrected in TAOS 9.1.9*

CR ID	Problem corrected
7006963	FE36 resets were sent to TAOS units on 96-port MultiDSP modem cards upon upgrade to the current software.

Table 2. Change request *ID numbers and problems corrected in TAOS 9.1.9 (continued)*

CR ID	Problem corrected
7007110	On the Ethernet-3ND slot card, the SNMP agent incorrectly populated RFC 2233 MIB objects. The Ethernet-3ND was also inconsistent with Ether-3 and Ethernet-2 slot cards.
7007138	TAOS units forwarded the Hot Standby Routing Protocol (HSRP) multicast packet with the source IP address as the Cisco IP address.
7007153	The `call-log-key` and `shared-secret` are still visible when `allow-password` is set to `no`.
7007216	After a PPP a session was established, Sharp's Picwalk SH712m PHS mobile phones with terminated web browser PPP PIAFs calls sent a DNS query to the DNS server. Approximately half of the time the TAOS unit did not forward the first DNS response packet back to the PIAFS terminal when the remote address was assigned from an IP pool and the call went through Ethernet-3ND slot card.
7007221	Data Filters were not applied when Dialed Number Information Service (DNIS) authentication was used on Remote Authentication Dial-In User Service (RADIUS).
7007267	A `Login-User` with a RADIUS profile failed a Telnet session after 5 seconds.
7007278	The SNMP trap received from the TAOS unit was posted as the wrong data type (`Wrong type: should be Counter32`).
7007315	There was either a mismatch in the management information base (MIB) between the interface index of the soft IP address reported in the `ipAddrTable` and in the `ifTable`, or the interface index of the soft IP address reported in these tables was the same. This impacted the way the TAOS unit was discovered in network management software, and prevented correct supervision of the network access server in HP OpenView.
7007351	TAOS units rejected incoming V.120 calls at the Integrated Digital Services Network (ISDN) when incoming Q.931 setup messages containedlogical link control (LLC) information and V.120 bearer capatibility. The call was not routed to a modem card, and was released on the E1 slot card with an `Incompatible Destination` message.
7007356	Fragmented 1500 byte packets were incorrectly compressed with MS-STACK and Mircrosoft Point-to-Point Compression (MPPC).
7007375	The output to the `userstat` command was limited to 1024 lines.
7007385	FTP sessions over Mircrosoft Point-to-Point Compression (MPPC) froze on both Win98SE and Win2k at approximately 99% during an `ftp get` transfer.
7007391	A terminal server Point-to-Point Protocol (PPP) delay was applied to V.120 and X.75 asynchronous calls when Dial Number Information Service (DNIS) pre-authentication and an immediate service, such as Raw Transport Control Protocol (TCP), was used.
7007407	There was a V.92 connection problem with Zoom serial modem.

Table 2. Change request *ID numbers and problems corrected in TAOS 9.1.9 (continued)*

CR ID	Problem corrected
7007499	When users connected to a BZ5000 switch placed a VoIP call to a TAOS unit, they did not receive a voice announcement. The voice announcement was sent from the TAOS unit to the switch, but the switch was unable to pass it on to the user because the extension bit (bit 8) of the third octet needed to be set to `1` and the TAOS unit was sending a value of `0`.
7007523	The Courier Modem I did not work with V.34 emulation.
7007527	TAOS unit either corrupted or duplicated tones received at the egress gateway. In traces, PIN tones were received in altered form and propagated to the switch.
7007534	Microsoft Challange Handshake Authentication Protocol (MS-CHAP) V1 authenication via RADIUS failed.
7007535	When an `IP TCP SYN` packet was sent to an unreachable TCP port (for example, port 80) on the open virtual router interface or system address, the `TCP RST ACK` reply packet was sent by the TAOS unit originating from the main router interface.
7007555	The T3 slot card crashing with FE18 and shut down the quadrant.
7007586	Data link connection identifier (DLCI) backup did not work when Frame Relay Direct was used.
N/A	A `sysConfigChangeTrap(30)` was not sent when the configuration was modified using the Simple Network Management Protocol (SNMP).

TAOS 9.1.8 enhancements and corrections

TAOS 9.1.8 introduced new enhancements and corrected certain problems from the previous release.

TAOS 9.1.8 enhancements

TAOS 9.1.8 includes the following enhancements:

Improved POST diagnostics for slot cards

The power-on and self test (POST) logic has been improved. Slot cards that pass POST with previous software releases might now be declared defective.

Firmware versions for digital modem cards

The Mindspeed (formerly known as Conexant) firmware versions for the MAX TNT Digital Modem slot cards include support for V.90, K56flex, K56plus, and all slower, standard modem speeds. This release includes the following Mindspeed firmware:

- Series56 Digital Modem slot cards (also called CSM/1, TNT-SL-48MOD-S56) support V2.0982-K56_DLP_CSM firmware.
- Series56 II Digital Modem slot cards (also called CSM/3, TNT-SL-48MOD-SGL and TNT-SL-48MOD-S-C) support V5.817 firmware.
- Series56 III Digital Modem slot cards (also called CSMV/3, TNT-SL-48MODV3-S-C) support V5.8175 firmware.

Firmware versions for MultiDSP cards

This release includes the following Lucent firmware versions for the MAX TNT MultiDSP slot cards:

- 48-port MultiDSP slot cards (TNTP-SL-ADI-C or TNTV-SL-ADI-C) support Controller V0.1.69, Modem DSP V0.1908.0, and VoIP DSP V3.6.2 Lucent firmware.
- 96-port MultiDSP slot cards (APX8-SL-96DSP) support Controller V0.1.69, Modem DSP V0.1908.0, and VoIP DSP V3.6.2 Lucent firmware.

TAOS 9.1.8 corrections

Table 3 lists the change request (CR) identification numbers and the problems corrected in TAOS 9.1.8.

Table 3. Change request *ID numbers and problems corrected in TAOS 9.1.8*

CR ID	Problem corrected
7006665	No RADIUS accounting `Tunnel-Link-Stop` packet was being sent for an incoming call on an L2TP access concentrator (LAC) when the call went down before ICRQ was sent for the call.

Table 3. Change request *ID numbers and problems corrected in TAOS 9.1.8 (continued)*

CR ID	Problem corrected
7006816	The `ipportmap` statistics were not being updated when IP packets were routed via fast-path.
7006964	The APX unit was not successfully copying the TAOS software from one shelf controller to the other.
7007004	Sessions were reported to have filters present when they infact did not. This happened for the sessions that came up after the TAOS unit had reached its stress condition(maximum calls up).
7007025	When the `load -t` command was issued on an APX unit, the controller loaded the file on its flash card but failed to send the file to its peer controller.
7007003	When an `ip-route` profile was created, the route was added to the interface as a permanent static route, even though the interface it was tied to was temporary—therefore the route got added without the TEMP flag. Because only routes with a TEMP flag are deleted when a call goes down, routes without a TEMP flag persisted even after the interface they were tied to no longer existed. When an attempt was made to send updates of such routes to the slots, a Warning 179 occured.
7006818	The `filterdisp` command could not retrieve filter contents for CLID or DNIS authenticated sessions, even though filters were properly applied .
7007086	In the syslog messages of IPDC call setups, many LAN information records of the followoing type were found: `Cause 806 maps to “channel unacceptable”`. Some calls were being dropped because the lines were under yellow alarm.
7007104	Cancellation of voice announcements were not successful when cancellation requests were sent within 50 milliseconds of sending of the actual request for playing the announcement.
6000646	MultiDSP card could not be limited to lower modulation using the `+MS=3` answer string.
7007050	There was a high percentage of no carrier calls on MultiDSP cards compared to CSM cards, in Japan.
7007051	The V.92 quick connect was not efficient.
7007085	On MultiDSP cards, there was a high packet latency every 30 seconds at low speed v.34 modulation.
7007215	The secondary controller was showing the IPDC link as bouncing even when the primary controller was up and running and the IPDC link is up and stable. This was caused by both the primary and the secondary controller trying to bring up the IPDC link with the soft switch simultaneously.

TAOS 9.1.5 enhancements and corrections

TAOS 9.1.5 introduced new enhancements and corrected certain problems from the previous release.

Note: TAOS 9.1.5 includes improved resistance to Denial of Service attempts.

TAOS 9.1.5 enhancements

TAOS 9.1.5 includes the following Lucent firmware versions for MultiDSP cards:

Firmware versions for digital modem cards

The Mindspeed (formerly known as Conexant) firmware versions for the MAX TNT Digital Modem slot cards include support for V.90, K56flex, K56plus, and all slower, standard modem speeds. This release includes the following Mindspeed firmware:

- Series56 Digital Modem slot cards (also called CSM/1, TNT-SL-48MOD-S56) support V2.0982-K56_2M_DLP_CSM firmware.
- Series56 II Digital Modem slot cards (also called CSM/3, TNT-SL-48MOD-SGL and TNT-SL-48MOD-S-C) support V5.8177 firmware.
- Series56 III Digital Modem slot cards (also called CSMV/3, TNT-SL-48MODV3-S-C) support V5.8177 firmware.

Firmware versions for MultiDSP cards

This release includes the following Lucent firmware versions for the MAX TNT MultiDSP slot cards:

- 48-port MultiDSP slot cards (TNTP-SL-ADI-C or TNTV-SL-ADI-C) support Controller V0.1.59, Modem DSP V0.1903.0, and VoIP DSP V3.6.2 Lucent firmware.
- 96-port MultiDSP slot cards (APX8-SL-96DSP) support Controller V0.1.59, Modem DSP V0.1903.0, and VoIP DSP V3.6.2 Lucent firmware.

TAOS 9.1.3 enhancements and corrections

TAOS 9.1.3 introduced new enhancements and corrected certain problems from the previous release.

TAOS 9.1.3 enhancements

TAOS 9.1.3 includes the following Lucent firmware versions for MultiDSP cards:

Firmware versions for digital modem cards

The Mindspeed (formerly known as Conexant) firmware versions for the MAX TNT Digital Modem slot cards include support for V.90, K56flex, K56plus, and all slower, standard modem speeds. This release includes the following Mindspeed firmware:

- Series56 Digital Modem slot cards (also called CSM/1, TNT-SL-48MOD-S56) support V2.0982-K56_2M_DLP_CSM firmware.
- Series56 II Digital Modem slot cards (also called CSM/3, TNT-SL-48MOD-SGL and TNT-SL-48MOD-S-C) support V5.8177 firmware.
- Series56 III Digital Modem slot cards (also called CSMV/3, TNT-SL-48MODV3-S-C) support V5.8177 firmware.

Firmware versions for MultiDSP cards

This release includes the following Lucent firmware versions for the MAX TNT MultiDSP slot cards:

- 48-port MultiDSP slot cards (TNTP-SL-ADI-C or TNTV-SL-ADI-C) support Controller V0.1.59, Modem DSP V0.1903.0, and VoIP DSP V3.6.2 Lucent firmware.
- 96-port MultiDSP slot cards (APX8-SL-96DSP) support Controller V0.1.59, Modem DSP V0.1903.0, and VoIP DSP V3.6.2 Lucent firmware.

TAOS 9.1.3 corrections

Table 4 lists the trouble report (TR) identification numbers and the problems corrected in TAOS 9.1.3.

Table 4. Trouble report ID numbers and problems corrected in TAOS 9.1.3

TR ID	Problem corrected
6002284	The successful connection rate (for dial-in users) was down to 80% in the TNT unit with DS3 interfaces.
6002335	User sessions authenticated through RADIUS using `Ascend-Telnet-Profile = admin` were unable to perform many administration functions, such as save the configuration to flash or network or open a trunk card.

Table 4. Trouble report ID numbers and problems corrected in TAOS 9.1.3 (continued)

TR ID	Problem corrected
6002459	Suspect modems were being accessed before remaining available modems were used, causing suspect modems to be used over and over and increasing call failure rate.
6002537	Treatment of IPX net numbers for IPX dialin clients was inconsistent with other branches.
6002574	The client was using the DNS addresses that the TNT unit sent it in the configure nonacknowledgment (cf-nak) rather than using the DNS addresses that it had been statically assigned and that it indicated it wanted to use in the configure request.
7000045	Stacked data was being sent to the shelf controller when an IP address was configured.
7000084	V.110 calls were not being answered.
7006386	The TNT unit did not re-transmit unacknowledged high-level data link control-normal response mode (HDLC-NRM) packets.
7006485	The TAOS unit was receiving 179 warnings on Madd and Madd2 cards
7006490	The Madd and CSMX cards were generating 179 warnings.

TAOS 9.1.2 enhancements

TAOS 9.1.2 includes the following digital modem enhancements.

Firmware versions for digital modem cards

The Mindspeed (formerly known as Conexant) firmware versions for the APX 8000 Digital Modem slot cards include support for V.90, K56flex, K56plus, and all slower, standard modem speeds. This release includes the following Mindspeed firmware:

- Series56 Digital Modem slot cards (also called CSM/1, TNT-SL-48MOD-S56) support V2.0982-K56_2M_DLP_CSM firmware.
- Series56 II Digital Modem slot cards (also called CSM/3, TNT-SL-48MOD-SGL and TNT-SL-48MOD-S-C) support V5.8177 firmware.
- Series56 III Digital Modem slot cards (also called CSMV/3, TNT-SL-48MODV3-S-C) support V5.8177 firmware.

Firmware versions for MultiDSP cards

This release includes the following Lucent firmware versions for the APX 8000 MultiDSP slot cards:

- 48-port MultiDSP slot cards (TNTP-SL-ADI-C or TNTV-SL-ADI-C) support Controller V0.1.55, Modem DSP V0.1902.0, and VoIP DSP V3.6.2 Lucent firmware.
- 96-port MultiDSP slot cards (APX8-SL-96DSP) support Controller V0.1.55, Modem DSP V0.1902.0, and VoIP DSP V3.6.2 Lucent firmware.

TAOS 9.1.1 enhancements and corrections

TAOS 9.1.1 includes the following new enhancements and corrected certain problems from the previous release.

TAOS 9.1.1 enhancements

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Firmware versions for digital modem cards

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- Series56 II Digital Modem slot cards (also called CSM/3, TNT-SL-48MOD-SGL and TNT-SL-48MOD-S-C) support V5.8177 firmware.
- Series56 III Digital Modem slot cards (also called CSMV/3, TNT-SL-48MODV3-S-C) support V5.8177 firmware.

Firmware versions for MultiDSP cards

This release includes the following Lucent firmware versions for the APX 8000 MultiDSP slot cards:

- 48-port MultiDSP slot cards (TNTP-SL-ADI-C or TNTV-SL-ADI-C) support Controller V0.1.53, Modem DSP V0.1902.0, and VoIP DSP V3.6.2 Lucent firmware.
- 96-port MultiDSP slot cards (APX8-SL-96DSP) support Controller V0.1.53, Modem DSP V0.1902.0, and VoIP DSP V3.6.2 Lucent firmware.

This MultiDSP firmware addresses the following trouble reports:

TAOS 9.1.1 provides the following firmware fixes and their associated trouble reports.

1 Silence timer fixes (TR 6001445)

The two silence timers fixed in this release include:

– Retrain timer, and

– PH2-PH3 silence timer

Prior to this release, modem clients did not respond to retrains initiated by server modems. This issue resulted in abnormal disconnects. The fix of the retrain timer reduced abnormal disconnects and also corrected PH2-PH3 silence timer settings.

2 V90 rate mask fix (TR 6002242)

Prior to this release, some client modems would always attempt to connect at 50667bps. Previous versions of TAOS incorrectly published a lack of support for 50667bps connections. This scenario sometimes resulted in the client modem disconnecting before establishing a data connection. Modems that experienced this problem included

Jaguar2000, Legend, T&W, and the TP568. This TAOS release adds support for 50667bps connections.

3 Spectral shaper fix (TR 6001214/6001235)

In prior TAOS releases, some modems would fail to connect to MultiDSP slot cards over slightly degraded circuits. This release modifies the spectral shaping characteristics and provides better connection success rates with client modems such as the AZT MR2800 and the COM1 light modem 56k.

4 MOH disabled by default fix (TR 6002284)

In prior TAOS releases, the Modem-on-Hold (MOH) feature disabled by default. Enabling the MOH feature would occasionally interfere with a call that was not using MOH. This release fixes that problem and has MOH enabled by default.

5 TRN1D timer fix (TR 6002242)

This release increases the TRN1D timeout. Some client modems perform better with the MultiDSP slot cards when the TRN1D timeout has been increased.

6 V22 power level fix (TR 6002540)

In prior TAOS releases, some client modems would fail to establish a connection when connecting to MultiDSP slot cards using V22/V22bis and would fall back to Bell 103. This release fixes this problem.

7 V8 bit mask fix (TR 6001795/6006001)

In prior TAOS releases, the bits in the V8 masks indicating support of V23 were incorrectly set to 0. This caused some client modems to disconnect when attempting to establish a connection using V23 through V8. This release fixes this problem by setting the appropriate bits to 1, which indicate support for V23.

DSCP and TOS support

TAOS 9.1.0 provided differentiated services code point (DSCP) support by adding configurable parameters to the `Connection`, `Filter`, and `VoIP` profiles and a new RADIUS attribute to support the ability to mark packets for differentiated services that are compatible with RFC 2474 ("Definition of the Differentiated Services Field in the IPv4 and IPv6 Headers", December, 1998).

Note: For 9.1.x releases, queuing strategies, per-hop behaviors, and other QoS schemes defined in RFC 2474 are not supported.

Differentiating class of service

In TAOS 9.1.1, DSCP and type of service (TOS) marking is supported on the OC3-ATM2 slot card. However, if configured, it will incurr a performance overhead. The following example illustrates this behavior.

The location of the `tos-options` subprofile within the connection profile is:

```
CONNECTION > ip-options > tos-options
```

The following is an example of the `tos-options` subprofile, named `test1`.

```
[in CONNECTION/test1:ip-options:tos-options]
active = no
precedence = 000
type-of-service = normal
```

```
apply-to = incoming
marking-type = precedence-tos
dscp = 00
```

In this example of the tos-options subprofile, the active field is set to no. This indicates that TOS marking will not be activated on the IP packets and the performance penalty will not be incurred.

If the `active` field is set to `yes`, the profile will look as follows:

```
[in CONNECTION/test1:ip-options:tos-options]
active = yes
precedence = 000
type-of-service = normal
apply-to = incoming
marking-type = precedence-tosdscp = 00
```

The packets which arrive at the OC3-ATM2 slot card from the ATM interface are marked with the TOS byte, since the apply-to field defines the direction of the packet as incoming. This means that incoming packets will incurr a performance penalty but outgoing packets will not.

Similarly, if the `apply-to` field is changed to `outgoing` the profile looks as follows:

```
[in CONNECTION/test1:ip-options:tos-options (changed)]
active = yes
precedence = 000
type-of-service = normal
apply-to = outgoing
marking-type = precedence-tos
dscp = 00
```

Packets which are destined to egress through the OC3-ATM2 slot card will incurr a performance penalty, whereas packets arriving at the OC3-ATM2 slot card will not incurr this penalty.

Likewise, if the `apply-to` field is set to `both`, the profile looks as follows:

```
[in CONNECTION/test1:ip-options:tos-options]
active = yes
precedence = 000
type-of-service = normal
apply-to = both
marking-type = precedence-tos
dscp = 00
```

Packets destined to arrive at and egress through the OC3-ATM2 slot card will incurr the performance penalty.

Note: This behavior does not affect connection profiles configured for ingress host cards. More specifically, if a users connection profile has TOS enabled, and the card connects to an ingress host card (e.g. 48-port MultiDSP slot card), packets sent from that profile will have the TOS byte marked in the IP header (on the ingress-host card), and if the packets egress through the OC3-ATM2 slot card, they will not incurr the performance penalty; provided that TOS is not enabled on the OC3-ATM2 slot card connection profile.

Command line changes

The following two parameters have been added to the `Connection`, `Filter`, and `VoIP` profiles:

Parameter	Setting
`marking-type`	• `precedence-tos` (default)—specifies RFC 791 as the standard to differentiate class of service
`dscp`	• `dscp`—specifies RFC 2474 as the standard to differentiate class of service. The `DSCP` value if DSCP is specified in the `marking-type` parameter. Values can range from 00 to FF (hexidecimal)

Note: Although all eight bits of the second octet in the IP packet header can be set by entering hexidecimal values from 00 to FF, to stay compliant with RFC 2474 only the first six bits should be set, by entering values from 00 to 3F.

Connection profiles

In a `Connection` profile, the new DSCP parameters are located in the `tos-options` subprofile, as shown in the following example:

```
[in CONNECTION/test-profile:ip-options:tos-options]
active = no
precedence = 000
type-of-service = normal
apply-to = incoming
marking-type = precedence-tos
dscp = 00
```

Filter profiles

In a `Filter` profile, the new DSCP parameters are located in the `tos-filter` subprofile of a specific input or output filter, as shown in the following example:

```
[in FILTER/test-filt:input-filters[1]:tos-filter]
protocol = 0
source-address-mask = 0.0.0.0
source-address = 0.0.0.0
dest-address-mask = 0.0.0.0
dest-address = 0.0.0.0
Src-Port-Cmp = none
source-port = 0
Dst-Port-Cmp = 0
dest-port = 0
precedence = 000
type-of-service = normal
marking-type = precedence-tos
dscp = 00
```

VoIP profiles

In the `VoIP` profile, the new DSCP attributes are located in the `tos-options` subprofile, as shown in the following example:

```
[in VOIP/{ "" "" }:tos-options]
active = no
precedence = 101
type-of-service = latency
apply-to = both
marking-type = precedence-tos
dscp = 00
```

RADIUS support

A new VSA RADIUS attribute has been defined to support DSCP marking from RADIUS profiles. The following attribute has been added to the RADIUS dictionary file:

```
ATTRIBUTE      Ascend-IP-DSCP                    3         integer
```

The following attribute values have been added to the dictionary file:

```
VALUE Ascend-IP-TOS IP-TOS-Dscp                              128
VALUE Ascend-IP-DSCP IP-DSCP-Default                           0
```

To select DSCP marking over the default `Precedence-TOS` marking, the `Ascend-IP-TOS RADIUS` attribute must be set to `IP-TOS-Dscp`. The `new Ascend-IP-DSCP RADIUS` attribute is used to specify the DSCP value to be set in the `Connection` profile. The value specified in the RADIUS profile must be the decimal equivalent of the binary bit setting desired in the second octet of the IP packet header.

Following is an example RADIUS profile, named `test2`. The last two lines show how to specify the use of DSCP marking and set the DSCP value to 252.

```
test    Password                =         “test2”
        Ascend-Route-IP         =         Route-IP-Yes,
        Ascend-Bridge           =         Bridge-No,
        Ascend-Idle-Limit       =         0,
        Ascend-IP-TOS           =         IP-TOS-Dscp,
        Ascend-IP-TOS-DSCP       =         252
```

Corrected problems in TAOS 9.1.1

Table 5 lists the trouble report (TR) identification numbers and the problems that have been corrected in TAOS 9.1.1.

Table 5. Trouble report ID numbers and problems corrected in TAOS 9.1.1

TR ID	Problem corrected
TR 6001986	The `netstat -i` command reported incorrect values for the DS3-ATM, OC3-ATM, and E3-ATM slot cards.
TR 6002076	It was possible for L2TP authentication to fail because the hostname field length was too short.
TR 6002118	A TAOS unit with a CSMX modem slot card could experience Warning 179 messages.
TR 6002133	When configured to use two-stage dialing, the MultiVoice® Gateway did not prompt the user for the end point phone number.

Table 5. Trouble report ID numbers and problems corrected in TAOS 9.1.1 (continued)

TR ID	Problem corrected
TR 6002189	The SNMP queue did not recover correctly after being flooded.
TR 6002261	TAOS units were unable to use BACP to initiate lowering the available bandwidth by dropping a channel during an ISDN MPPP call.
TR 6002395	The MADD2-SNMP agent incorrectly set the `mdmIDProductDetails` string.
TR 6002423	The MultiVoice® Gateway was incorrectly set to use B3 as the busy tone for Brazil instead of the correct B2.
TR 6002442	TAOS units upgraded to TAOS 9.1.0 could not send data across frame relay switched PVCs.
TR 6002468	Tag 0x99 (Estimated average latency) has been added in IPDC messages (RCR/ACR), which is supported by SoftSwitch.
TR 6002504	A wrong LCN was being returned by a MultiVoice® Gateway in a `FastStart` element.
TR 6002505	H.323 calls made by a MultiVoice® Gateway configured with video codecs that included CIFs were resetting.
TR 6002512	IP-IP decapsulation was not supported even when doing IP-IP encapsulation.
TR 6002528	DSCP (differentiated services code point) marking did not work correctly for OC3-ATM2 slot cards. Only the first packet was marked.
TR 6002534	When the d-channel became unavailable, it was reported in the Line/T1-stats and SNMP trap as a d-channel failure.
TR 6002536	When an E1 line was configured in `NT` mode, the MultiVoice® Gateway erroneously requested an optional Q.931 information element (IE).
TR 6002537	The RADIUS IPX network node attribribute would not be correctly transferred for ATMP sessions.
TR 6002539	There were some layer 3 compliance problems in regards to ITU-T Q.931. Some connections were incorrectly established even when sent illegal information.
N/A	All audio was lost after call establishment and when voice announcements were repeated continuously.
N/A	Audibility was lost in DRQ messages (forced drop calls) but was successful in PIN and DNIS requests.

Notices, Known Issues, and Caveats for TAOS 9.1.9

Notice of compatibility with RFC 2833

When using RFC 2833 for dual-tone multifrequency (DTMF) tone-passing, and passing the following tones:

- *
- #
- A
- B
- C
- D

TAOS software versions 9.1.0 through 9.1.7, and TAOS 10.0 will have compatiblity problems with TAOS 9.1.9. TAOS software versions 9.1.9 and onward, and TAOS 10.0.1 and onward, are compliant with RFC 2833.

Notice of TAOS license and upgrade changes

For the release of TAOS 9.1.9, the following changes are now in effect for TAOS base software and TAOS software upgrades, service, and maintenance.

Price change for base TAOS software

With the release of TAOS 9.1.9, the APX 8000, MAX TNT, MAX 6000 and MAX 3000 hardware platforms and TAOS software are priced separately. The TAOS software license is now a mandatory item for any new order. The license grants licensees the right to use the base TAOS 9.1.9 software on the specific platform purchased. *The right to upgrade to a subsequent TAOS minor or major software release that includes new operating system software features is no longer included as part of the base TAOS software license.*

Price change for upgrades and maintenance to TAOS 9.1.9 software

Upgrades to TAOS 9.1.9 software and subsequent releases for the APX 8000, MAX TNT, MAX 6000, and MAX 3000 platforms are available through Lucent Worldwide Services as part of an annual Software Upgrade and Maintenance Service contract. These contracts are priced separately for each platform and include the following software and services:

- TAOS software updates, upgrades, and support
- TAOS software options (hashcodes), updates, upgrades, and support
- Remote technical support
- Hardware maintenance and return

Only customers with an established Software Upgrade and Maintenance Service contract are authorized to upgrade designated TAOS-enabled units to TAOS 9.1.9 and to download the required TAOS 9.1.9 software files.

Distribution change for TAOS 9.1.9 software

TAOS 9.1.9 and subsequent general-availability TAOS software releases are no longer available from `ftp.ascend.com`. Upgrades to TAOS 9.1.9 and all subsequent releases and updates (maintenance releases) will be available instead from the Lucent Worldwide Services software front-end Web site at `http://www.eSight.com`.

TAOS software license agreement change

Lucent Technologies is introducing a new software license agreement that grants you a personal, nontransferable, nonexclusive right to use TAOS 9.1.9 in object code form only, and its accompanying documentation. The agreement prohibits you from loading or using TAOS software on any unit of Lucent equipment other than the unit for which you purchased the software, unless otherwise agreed upon in writing by Lucent.

Use of TAOS software on any equipment other than that for which it was obtained, or any material breach of these conditions, immediately and automatically terminates the license. Lucent reserves the right to pursue all available legal remedies to enforce the terms and conditions of the software license.

Notice of memory requirement in TAOS 9.1.9

To upgrade to TAOS 9.1.9, your TAOS unit must be equipped with the 32MB flash card. Please contact your Lucent sales representative to purchase the 32MB flash card.

Notice of support for Universal Port on the 96-port MultiDSP slot card

The following is a correction to the *APX 8000 TAOS 9.0 Release Note*.

The 96-port MultiDSP slot card currently supports mixing voice and data services on the same card. The following combination of services are supported:

- 96 VoIP and modem sessions, in any combination, with VoIP using either the G.729 or G.711 audio codec
- 96 VoIP sessions using either the G.729 or G.711 audio codec
- 96 modem sessions

A total of 96 ports is supported on this card.

Notice about MultiDSP cards

In TAOS 9.1.9, you can combine 48-port and 96-port MultiDSP cards in an APX 8000 unit for V.90 and ISDN dial-up termination.

Notice about upgrading slot cards

If you replace a Fast (100MB) Ethernet-1 slot card (TNT-SL-E100) with a newer Ethernet card (TNT-SL-E10-100 or TNT-SL-E100-V-C) that supports MultiVoice, you must write new Ethernet profiles for the new card. The old Ethernet profiles do not carry forward.

If you replace an older Hybrid Access slot card (TNT-SL-HA128 or TNT-SL-HA192) with a newer Hybrid Access card (TNT-SL-HDLC2 or TNT-SL-HDLC2-EC-C), you must write new profiles for the new cards.

If you replace a Series56 modem card (TNT-SL-48MOD-S56, TNT-SL-48MOD-SGL, TNT-SL-48MOD-S-C or TNT-SL-48MODV3-S-C) with a MultiDSP card (TNTP-SL-ADI-C, TNTV-SL-ADI-C, or APX8-SL-96DSP), you must write new profiles for the new cards.

When changing the slot card type for any slot, execute the `slot -r` command after downing (`slot -d`) or removing the existing card and before inserting a different slot card type.

Notice of parameter name changes in the External-Auth profile

In TAOS 8.0.x, the `dnis-password` and `clid-password` parameters were added to the `External-Auth` profile. With these parameters, you were able to set RADIUS passwords for DNIS and CLID preauthentication.

In TAOS 9.0, the `dnis-password` and `clid-password` parameters were moved to the `password` subprofile of the `External-Auth` profile. The parameter names were also changed, as shown in the following sample subprofile (shown with default values):

```
[in EXTERNAL-AUTH:password-profile]
clid = Ascend-CLID
dnis = Ascend-DNIS
```

If your unit is configured with DNIS and CLID passwords, after upgrading from TAOS 8.0.x to TAOS 9.1.9, the unit will no longer recognize the `dnis-password` and `clid-password` values that were set in prior releases and dial-in users might experience a busy tone.

To restore the DNIS and CLID preauthorization passwords, you must apply the value of the `dnis-password` and `clid-password` parameters (set in earlier TAOS 8.0.x releases), to the new `dnis` and `clid` parameters as follows:

```
admin> read external-auth
EXTERNAL-AUTH read

admin> set password-profile dnis = secretdnis

admin> set password-profile clid = secretclid

admin> write
EXTERNAL-AUTH written
```

Notice of nonsupport for WORM-ARQ on the 96-port MultiDSP slot card

WORM-ARQ is not currently supported on the 96-port MultiDSP slot card. In TAOS 9.1.9, WORM-ARQ for personal digital cellular (PDC) phones is supported *only* on the 48-port MultiDSP slot card. NTT DoCoMo developed the WORM-ARQ technology to maintain transmission quality for PDC wireless phones in Japan. The Lucent Technologies WORM-ARQ license can be enabled only for the 48-port MultiDSP slot card.

Notice of discontinuance of configurable RADIUS port and ID space

In TAOS 8.0.x, the default settings for User Datagram Protocol (UDP) source ports and ID spaces for communication with a RADIUS server specified the use of a unique source port for each card and a distinct ID space for both authentication and accounting requests. However, the MAX TNT unit could be configured to use a single source port and ID space system wide, to accommodate certain RADIUS server daemons that had a system-unique requirement.

Because no known RADIUS servers continue to maintain this requirement, and because the unit's port density makes the use of a single port and ID space undesirable, with TAOS 9.1.0, and TAOS 9.1.9, the APX 8000 unit always uses port-unique source ports and always sends RADIUS authentication and accounting requests with distinct RADIUS IDs. The following parameters are therefore no longer supported and have been removed from the `External-Auth` profile:

```
[EXTERNAL-AUTH]
rad-id-space = distinct
rad-id-source-unique = port-unique
```

Note: The `rad-ip-space` and `rad-id-source-unique` parameters no longer appear in the External-Auth profile in TAOS 9.1.9. If you downgrade the unit to an earlier release, the parameters revert to their default values for that release.

Notice of a tunneling configuration requirement

If you are configuring Ascend Tunnel Management Protocol (ATMP), Layer 2 Tunneling Protocol (L2TP), or Point-to-Point Tunneling Protocol (PPTP) on a TAOS unit, you must set the `System-IP-Address` parameter of the `IP-Global` profile to specify a system IP address.

Notice concerning call signaling support on T1 and E1 slot cards

When configuring call signaling support on E1 trunks:

- Do not configure R1/R2 multi-frequency (MF) signaling and R2 dual-tone multifrequency (DTMF) signaling for different trunks on the same E1 slot card.

  When configuring call signaling on E1 trunks, the APX 8000 unit loads only one tone look-up table per slot card. The tone look-up tables for R1/R2 MF and R2 DTMF signaling are unique to the call signaling type specified by the `Signaling-Mode` parameter. The MF tone look-up table will not support DTMF signaling, and the DTMF tone look-up table will not support R1/R2 MF signaling.

When configuring call signaling support on T1 trunks:

- Do not configure ISDN or inband, robbed-bit signaling and Feature Group D (FGD) signaling for different trunks on the same T1 slot card. The tone look-up tables for FGD are unique to the call signaling requirements for Access Tandem switching.
- Do not configure inband multifrequency (MF) signaling and inband dual-tone multifrequency (DTMF) signaling for different trunks on the same T1 slot card. The tone look-up tables are unique to the call signaling type specified by the `Signaling-Mode` parameter. The MF tone look-up table will not support DTMF signaling, and the DTMF tone look-up table will not support MF signaling.

Notice of change in egress call routing configuration

Internal changes made to MultiVoice® in TAOS 8.0-118.1 still apply in TAOS 9.1.9, which cause the APX 8000 unit to check both the Call-Route and the `T1 > Line-Interface > Channel-Config > Channel-Config#N` profile when determining which slot and line is used to route the call. When determining call routes, MultiVoice® will use:

1. The `Trunk Group` parameter in the `Call-Route` profile to identify slot cards where the call can be routed
2. The `Trunk Group` parameter at the `T1 > Line-Interface > Channel-Config > Channel-Config#N` profile to identify a line/DS0, if any are available, which can egress the call.

In the following example, T1 slot cards are installed in Slot 12 and Slot 13. For the T1 card in Slot 12 of the APX 8000, all eight T1 trunks are assigned to trunk group 12 using the `Trunk-Group` parameter in both the `Call-Route` profile for the T1 slot card and the `T1 > Line-Interface > Channel-Config > Channel-Config#N` profiles for each DS0 as follows:

```
tnt45>list
[in CALL-ROUTE/{ { { shelf-1 slot-12 0 } 0 } 0 }]
index* = { { { shelf-1 slot-12 0 } 0 } 0 }
trunk-group = 12
phone-number = ""
preferred-source = { { any-shelf any-slot 0 } 0 }
call-route-type = trunk-call-type

tnt45>list 1
[in T1/{ shelf-1 slot-12 1 }:line-interface:channel-con-
```

```
fig[1]]
channel-usage = switched-channel
trunk-group = 12
phone-number = ""
call-route-info = { any-shelf any-slot 0 }
```

When configuring call routing, you must provision the following:

1. At the least, a T1 or an E1 profile must have a trunk group set at the slot or line level which matches the trunk group prefixed to a call's dial string. Setting `trunk-group=0` is equivalent to specifying any trunk group.
2. All channels on the same line must be specified with the same trunk group.
3. If a call is accepted onto a slot card, you must have at least one line and channel on that card with a matching trunk group in `T1 > Line-Interface > Channel-Config`.

It is recommended to always create a `Call-Route` profile for each line of a T1 card. Specify the trunk group at the line level and for each channel at the channel level. In the following example, on the T1 slot card installed in Slot 7, the first T1 trunk is assigned to trunk group 7 using the `Trunk-Group` parameter in the `Call-Route` profile for that T1 trunk and the `T1 > Line-Interface > Channel-Config > Channel-Config[1]` profile as follows:

```
admin>list
[in CALL-ROUTE/{ { { shelf-1 slot-7 1 } 0 } 3 } ]
index* = { { { shelf-1 slot-7 1 } 0 } 3 }
trunk-group = 7
phone-number = ""
preferred-source = { { any-shelf any-slot 0 } 0 }
call-route-type = voip-call-type
```

```
admin>list 1
[in T1/{ shelf-1 slot-7 1 }:line-interface:channel-con-
fig[1]]
channel-usage = switched-channel
trunk-group = 7
phone-number = ""
call-route-info = { any-shelf any-slot 0 }
```

Though other methods might work in limited situations, these are not discussed here because they usually do not scale to multiple T1 card configurations that use trunk groups.

Known issue regarding RFC 2003 compliance

In TAOS 9.1.9, RFC 2003 compliant IP in IP encapsulation is implemented by setting an appropriate RADIUS Tunnel-Type Attribute in a RADIUS users record to pass a value of seven (7) to the TAOS unit. The TAOS dictionary indicates the Tunnel Type Attribute as "IP-in-IP". Other RADIUS dictionaries may specify "IP-IP".

Known issue linking more than one PVC to a single traffic shaper

In TAOS 9.1.9, when two or more private virtual circuits (PVCs) are configured to use the same traffic shaper, one PVC can consume more than its proportional share of the shaper's transmit buffers, preventing other PVCs from transmitting at their maximum allowed bandwidth.

As long as none of the PVCs exceed their respective bandwidth limits, traffic shaping performs as expected. However, if one of the PVCs exceeds its bandwidth limit, it can use all of the traffic shaper's pool resources, potentially preventing all throughput from other PVCs in the pool. In cases where more than one PVC in a pool is requesting more than its allotted benefit, the PVC with the most traffic has the highest probability of obtaining pool resources.

Caveats in TAOS 9.1.9

You should be aware of the following issues in TAOS 9.1.9.

- As new features are added to each TAOS release, the amount of memory used by the operating system increases. TAOS units will report less available memory with each subsequent release.
- Before changing an ATM connection's (VPI-VCI) assignment, you must disable the connection on a APX 8000 unit's OC3 (copper) ATM slot card (TNT-SL-OC3-C) or a APX 8000 unit's OC3 (fiber) ATM slot card (TNT-SL-OC3-F).
- Multilink Protocol (MP) bonding of analog calls is supported, but some client modems and software might have compatibility problems.
- Configurable receive and transmit data rate limits are not supported on the APX 8000 units unchannelized DS3-ATM slot card (TNT-SL-UDS3A). Configurable receive and transmit data rate limits *are* supported on the unchannelized DS3 Frame slot card (TNT-SL-UDS3).