Lucent Technologies
Bell Labs Innovations



MAX™ 6000/3000

TAOS 9.1.5 Cumulative Release Note

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Introducing TAOS 9.1.5



Note: The MAX™ 3000 unit is no longer supported as a MultiVoice® Gateway. The MAX 6000 unit continues be the platform in the MAX family that can operate as a MultiVoice® Gateway.

The True Access™ Operating System (TAOS) runs on the advanced WAN access products of Lucent Technologies. These products provide modular chassis that integrate a range of technologies to enable service providers and enterprise managers to install customized network infrastructures. As new enhancements are added to TAOS, the amount of memory used by the operating system grows. Therefore, the products running later versions of TAOS report less available memory. When you install TAOS 9.1.5 you see a smaller amount of available memory on the MAX than was available to a unit that ran a previous TAOS release. This is because the software binaries have gotten bigger and the memory used to store those software binaries is greater.

Following are the sections that describe what's in this TAOS 9.1.5 cumulative maintenance release:

- "Problem corrected in this release"
- "Changing operating system software" on page 8
- "Firmware versions" on page 18
- "Notices and known issues" on page 19

This cumulative release note also includes problem corrections and enhancements from previous releases:

- "9.1.3 Corrections" on page 23
- "9.1.2 Correction" on page 23
- "9.1.1 Corrections and enhancements" on page 23

Problem corrected

Following is the problem corrected in this release. There are no enhancements.

TR	Problem corrected
NA	Improved resistance to Denial of Service attempts.

Changing operating system software

Caution: When you upgrade a MAX™ unit's version of the True Access™ Operating System (TAOS), the newer version might use a configuration file format that is incompatible with the version that preceded it. The upgrade process automatically converts the unit's configuration file to the newer format. You need a backup copy of the configuration file created using the older format in case it ever becomes necessary to revert back to a previous version of TAOS (for example, 8.0.3). If you fail to create and save a backup copy of the configuration before you change the unit's version of TAOS, you might lose all configuration information.

Caution: The standard software binaries you use to upgrade to True Access™ Operating System (TAOS) 9.1.5 require additional flash memory available to the MAX™ 6000 unit only by means of an external PCMCIA flash card. The MAX 6000 unit requires a Lucent-approved external PCMCIA card. The MAX 3000 unit does not require an external PCMCIA flash card.

Caution: If possible, change a MAX unit's version of TAOS by using TFTP. Refer to "Using TFTP to upgrade or downgrade" on page 9 for further details.

As you prepare to change the system software on a MAX unit, you must verify that Field Service and Operations are enabled on the unit.

Enabling Field Service and Operations parameters

The `Field Service` parameter in the `Security` profile enables or disables permission to perform Lucent-specific field service operations, such as changing the operating system software on a MAX unit. The Field Service parameter is not applicable if the Operations parameter, also in the Security profile, is set to `No`. Before you begin the process of changing the unit's version of TAOS, ensure that the security profile you use as an administrator is configured to support Field Service and Operations.

For example, the following Full Access security profile of a MAX 6000 unit is correctly configured to support a change of operating system software:

```
00-300 Security
 00-303 Full Access
 >Name=Full Access
  Passwd=*SECURE*
  Operations=Yes
  Edit Security=Yes
  Edit System=Yes
  Field Service=Yes
```

Keeping the same software binary name

If possible, you should always keep the same software binary name when you upgrade or downgrade. For example, the MultiVoice® binary for TAOS 9.0.2 is called `tbiv.bin`. To upgrade to release 9.1.5, continue to use `tbiv.bin` even though the contents have changed, unless you are upgrading with the MultiVoice® binary that supports VDSP cards. If you want to support voice DSP, the binary name before the prefix will end with the numeral 6 (for example, `tbiv6.m60`).

MAX TAOS 9.1.5 no longer supports AppleTalk and the binary file has changed.

If you install a different version, your unit might lose its configuration. If this happens, you might need to manually restore your configuration. There might be no automated way to restore configuration data from a backup when changing builds since, if the file formats between the builds are incompatible, no suitable backup exists.

Use TFTP to transfer a build intended for a different type of network interface. For example, your MAX unit might have a T1 interface and you are attempting to transfer a build that is appropriate for an E1 interface. In such a case, the MAX unit can display the following message:

```
This load appears not to support your network interface.
Download aborted. Use tloadcode -f to force.
```

When the build is intended for a different type of network interface, verify again that you have selected the correct build. If you use TFTP to transfer a build intended for another type of unit, the MAX unit displays the following message:

```
This load appears to be for another platform.
Download aborted. Use tloadcode -f to force.
```

When the build is intended for another type of unit, it is not recommended that you do this.

Using TFTP to upgrade or downgrade

TFTP is a more reliable way to obtain, store, and then change the version of TAOS than the alternative (that is, using the serial port to upgrade). Using TFTP, you must use a MAX 6000 unit's external flash memory to upgrade the unit's version of TAOS.

Creating redundant backup images for a MAX 6000 unit

The PCMCIA flash memory card for a MAX 6000 unit now supports two copies of TAOS code. If the first version of software code becomes corrupt, the MAX can boot up the second version.

To create the redundant backup image, proceed as follows:

The order of these two steps is not important, but the MAX will be unable to recover from a failure in the primary code image until they have both been executed. The migration to the backed up binary is transparent to the user and no action is required by you to effect the migration.

1 Create a backup copy of the currently running binary on the PCMCIA flash card by using the `fBackupImage` debug command, as follows:

```
> fBackupImage
Preparing for image copy...
This load contains an IOP part
Copying 1797281 bytes from PCMCIA flash to PCMCIA...
<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<
<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<
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<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<
Image copied to high PCMCIA flash successfully.
 >
```

2 Load the `lvs.m60` image into internal flash with the `tload -i` debug monitor command to support the backup image.
For example:

```
> tload -i <tftp-server> lvs.m60
saving config to flash
.........................................
.

loading code from 192.168.21.44
file lvs.m60...
.
.

tftp download complete. Verifying image...
Downloaded image is OK.
```

Using TFTP to upgrade a MAX 3000 unit



Caution: If you are upgrading from a TAOS release prior to 9.0.2, you must first upgrade to the 9.0.2 version using the steps below. In step 4 on page 11, ensure that the file name used for 9.0.2 is the same software binary file as is currently loaded. Refer to the `Sys Options` menu to find that software binary file. Then, repeat the steps to upgrade to 9.1.5 from 9.0.2 using a software binary file.

Since the MAX 3000 unit does not require an external PCMCIA flash card, you will use the unit's internal flash memory to upgrade to the 9.1.5 version of TAOS. The internal flash on a MAX 3000 provides automatic redundant support, so if you load a bad image, the unit will revert to the other saved image on the internal flash. No action is required by the user.

To upgrade using TFTP, you must enter a few commands in the correct sequence. If you do not enter them in the correct sequence, you could lose the MAX unit's configuration.

To upgrade system software using TFTP:

1 Locate the following and place them in the TFTP server home directory:

- The configuration for the unit that is compatible with the version of TAOS to which you want to upgrade.
- The builds of the system software version to which you want to upgrade.

2 From the unit's VT100 interface, press Ctrl-D to invoke the DO menu and select `D=Diagnostics`.

3 At the `>` prompt, use the `tsave -m` command to save your current configuration in a way that allows you to match it with the version of system software with which it is compatible. For example, the following command saves the configuration into the previously-named `config803.cfg` in the TFTP home directory of the server named `tftp-server`:

```
tsave -m tftp-server config803.cfg
```



Caution: The MAX unit's internal flash storage is limited. Use the `tsave -m` command to ensure that the configuration you save is as small as possible. You must retain the saved configuration file permanently. You will need this file if it ever becomes necessary to revert back to the older version after you upgrade the unit to TAOS 9.1.5. The file you save with the `tsave` command contains all the passwords in clear text. Move this file from the TFTP directory to a secure location after the upgrade procedure is complete.

4 Enter the following command to load the software binary:

```
tloadcode hostname filename
```

where ***hostname*** is the name or IP address of your TFTP server, and ***filename*** is the name of the system software on the server (relative to the TFTP home directory).

For example, the command

```
tloadcode tftp-server ebiv.m30
```

places `ebiv.m30` into flash from the machine named `tftp-server`.

5 Enter the following command immediately after executing the `tload` command to save your current configuration to internal flash memory so that it can be recovered after Step 6:

```
> fsave
```

Failure to perform this step might result in the loss of all previous configuration data (including the IP address) and you might not be able to access this MAX 3000 via telnet.

6 Enter the following command to clear NVRAM memory so that the configuration saved in internal flash in Step 5 is restored to NVRAM upon the next reset cycle:

```
> nvramclear
```

After the unit clears NVRAM memory, the unit automatically resets itself two times.

This completes the procedure for upgrading to TAOS 9.1.5.

Using TFTP to upgrade a MAX 6000



Note: The following upgrade steps assume you have not used the MultiVoice® binaries to upgrade to release 9.1.5. If you used the MultiVoice® binaries, you must downgrade to a previous TAOS release (see "Using TFTP to downgrade" on page 14) before proceeding with the upgrade steps in this section.

To upgrade using TFTP, you must enter a few commands in the correct sequence. If you do not enter them in the correct sequence, you could lose the MAX unit's configuration.

To upgrade system software using TFTP:

1 Locate the following and place them in the TFTP server home directory:

- The configuration for the unit that is compatible with the version of TAOS to which you want to upgrade.
- The builds of the system software version to which you want to upgrade.

2 From the unit's VT100 interface, press Ctrl-D to invoke the DO menu and select `D=Diagnostics`.

3 At the `>` prompt, use the `tsave-m` command to save your current configuration in a way that allows you to match it with the version of system software with which it is compatible. For example, the following command saves the previously-named configuration `config803.cfg` in the TFTP home directory of the server named `tftp-server`:

```
tsave -m tftp-server config803.cfg
```



Caution: The MAX unit's internal flash storage is limited. Use the `tsave -m` command to assure that the configuration you save is as small as possible. You must retain the saved configuration file permanently. You will need this file if it ever becomes necessary to revert back to the older version after you upgrade the unit to TAOS 9.1.5. The file you save with the `tsave` command contains all the passwords in clear text. Move this file from the TFTP directory to a secure location after the upgrade procedure is complete.

4 Enter the following command:

```
tloadcode hostname filename
```

where ***hostname*** is the name or IP address of your TFTP server, and ***filename*** is the name of the system software on the server (relative to the TFTP home directory).

For example, the command

```
tloadcode tftp-server ebixk.m60
```

places `ebixk.m60` into external flash from the machine named `tftp-server`.

5 Enter the following command immediately after executing the `tload` command to save your current configuration to internal flash memory so that it can be recovered after Step 6:

```
> fsave
```

Failure to perform this step might result in the loss of all previous configuration data (including the IP address) and you might not be able to access this MAX 6000 via telnet.

6 Enter the following command to clear NVRAM memory so that the configuration saved in internal flash in Step 5 is restored to NVRAM upon the next reset cycle:

```
> nvramclear
```

After the unit clears NVRAM memory, the unit automatically resets itself two times.

This completes the procedure for upgrading to TAOS 9.1.5.

Using TFTP to upgrade a MAX 6000 for MultiVoice® binaries



Note: The MAX 6000 unit's software binary files that support MultiVoice® are too large to fit on the internal flash. To support the new features offered by this software binary file, you must have an external PCMCIA flash card installed in the unit to upgrade. The MAX 6000 requires a Lucent-approved external PCMCIA card. The MAX 3000 unit does not have an external PCMCIA flash card.

To upgrade using TFTP, you must enter a few FAT flash filesystem commands in the correct sequence. If you do not enter them in the correct sequence, you could lose the MAX unit's configuration.

To upgrade system software by way of TFTP:

1 Locate the following and place them in the TFTP server home directory:

- The configuration for the unit that is compatible with the version of TAOS to which you want to upgrade.
- The builds of the system software version to which you want to upgrade.

2 From the unit's VT100 interface, press Ctrl-D to invoke the DO menu and select `D=Diagnostics`.

3 Ensure that a flash card is present in the PCMCIA slot and at the > prompt, format the external flash card:

```
format -b
```



Caution: Reformatting the external flash card deletes any voice announcements that are currently stored on the card. After completing the upgrade procedure, you will need to re-download your voice announcements. For more, see the documentation that came with your MAX unit.

4 Use the `tsave -m` command to save your current configuration in a way that allows you to match it with the version of system software with which it is compatible. For example, the following command saves the configuration for TAOS 9.1.5 into the previously-named `config803.cfg` in the TFTP home directory of the server named `tftp-server`:

```
tsave -m tftp-server config803.cfg
```



Caution: The MAX unit's internal flash storage is limited. Use the `tsave -m` command to assure that the configuration you save is as small as possible. You must retain the saved configuration file permanently. You will need this file if it ever becomes necessary to revert back to the older version after you upgrade the unit to TAOS 9.1.5. The

file you save with the `tsave` command contains all the passwords in clear text. Move this file from the TFTP directory to a secure location after the upgrade procedure is complete.

5 Load the standalone handler to the space reserved at the beginning of the external flash card. Enter the following command:

```
tload -b tftp-server m60handler.bin
```

6 Make a `/current` directory on the external flash card:

```
mkdir /current
```

7 With the `fload` command, load a binary into the `/current` directory:

```
fload tftp-server tbiv6.m60 /current/tbiv.bin
```

where ***tbiv.*****bin** is an arbitrary name that must be followed by `.bin` and it must be placed in the `/current` directory. During reset, the first `*.bin` file the unit finds in the `/current` directory of the formatted external flash card will be run.

8 Enter the following command immediately after executing the `fload` command to save your current configuration from NVRAM to internal flash memory so that it can be recovered after Step 9:

```
> fsave
```

Failure to perform this step might result in the loss of all previous configuration data (including the IP address) and you might not be able to access this MAX 6000 via telnet.

9 Enter the following command to clear NVRAM memory so that the configuration saved in internal flash in Step 8 is restored to NVRAM upon the next reset cycle:

```
> nvramclear
```

After the unit clears NVRAM memory, the unit automatically resets itself two times.



Caution: While the unit resets, it searches for the image on the external PCMCIA flash card. If available, the unit uses the image. Otherwise, if the image is not available (for example, the flash card is unplugged), then the image on the internal flash is used. If the image on the internal flash memory is an older version of TAOS (that is, previous to 9.1.5), your configuration might be corrupted.

This completes the procedure for upgrading to TAOS 9.1.5.

Using TFTP to downgrade

To downgrade system software using TFTP, you must follow the same basic steps as you did when you upgraded TAOS, with one exception.

1 Instead of using the `fsave` command, as described in the previous upgrade procedures, enter the following command to restore the compatible configuration to flash memory:

```
trestore -f hostname savedConfig
```

where ***hostname*** is the name or IP address of your TFTP server, and ***savedConfig*** is the compatible configuration on the server (relative to the TFTP home directory).

For example, the command:

```
trestore -f tftp-server Config803
```

restores `Config803`, a configuration compatible with TAOS 8.0.3, from the unit named `tftp-server`.



Note: The `-f` argument is necessary in this step. Failure to use the `-f` argument will cause `trestore` to place the configuration in binary format into NVRAM, rendering the configuration unusable to the MAX unit.

2 On the MAX 6000 only, reformat the external flash card:

```
format -e
```



Caution: Reformatting the external flash card deletes the voice announcements that are currently stored on the card. After completing the upgrade procedure, you need to re-download your voice announcements. For more, see the documentation that came with your MAX unit.

3 Refer to the upgrade procedures in the release note for the software version you are downgrading to.

Using the serial port to upgrade or downgrade



Caution: You can upgrade system software using the serial console only on a MAX 6000 unit, and doing so deletes all existing profiles. Save your current profile settings to your hard disk before you begin upgrading system software. After the upgrade, restore your profiles from the backup file you created. For security reasons, password information is not stored in backup files. If you have many passwords, you should consider using TFTP to upgrade your software. (See “Using TFTP to upgrade or downgrade” on page 9.)



Note: The MAX 3000 currently does not support download via the serial console port.



Note: Using the serial port to upgrade is no longer supported for MultiVoice® because the internal flash is not large enough to support the downloading of 9.1.5 MultiVoice® binaries.

Before upgrading your MAX 6000 through the serial port, make sure you have the following equipment, software, and configuration settings:

- An IBM compatible PC or Macintosh system with a serial port capable of connecting to the MAX unit’s Console port.
- A straight-through serial cable.
- Data communications software for your system with appropriate communications software (for example, Procomm Plus, HyperTerminal for the PC, or ZTerm for the Macintosh). Verify that the line-width settings of the communications software are set to at least 80 characters.
- Verify that the `Term Rate` parameter, located in the `Sys Config` menu, specifies `57600`.
- Verify that the baud rate of your data communications software is set to the default value of `57600`.



Caution: If you use a Windows-based terminal emulator such as Windows Terminal or HyperTerminal, disable any screen savers or other programs or applications that could interrupt the file transfer. Failure to do so might cause the file transfer to halt, and can render the MAX unit unusable.

Verify that your terminal emulation program has a disk capture feature. Disk capture allows your emulator to capture the ASCII characters it receives to disk at its serial port. You should also verify that the data rate of your terminal emulation program is set to the same rate as the Term Rate parameter in `System` > `Sys Config`.

You can cancel the backup process at any time by pressing `Ctrl-C`.

Saving the current system configuration

To save the MAX 6000 unit's configuration (except passwords) to disk:

1. Open the **`Sys Diag`** menu.
2. Select **`Save Config`**, and press **`Enter`**.

   The following message appears:

   ```
   Ready to download - type any key to start....
   ```
3. Turn on the Capture feature of your communications program, and supply a filename for the saved profiles. (Consult the documentation for your communications program if you have any questions about how to turn on the Capture feature.)
4. Press any key to start saving your configured profiles.

   Rows of configuration information appear on the screen as the configuration file is transferred to your hard disk. When the file has been saved, your communications program displays a message indicating the transfer is complete.
5. Turn off the Capture feature of your communications program.
6. Print a copy of your configured profile and examine the saved configuration file.

Upgrading system software

To upgrade the software using the MAX 6000 unit's serial port:

1. Type the following four-key sequence in rapid succession (press each key in the sequence shown, one after the other, as quickly as possible):

   `Esc [Esc -`

   (Press the escape key, the left bracket key, the escape key, and the minus key, in that order, in rapid succession.) The following string of Xmodem control characters appears:

   `CKCKCKCK`

   If you do not see these characters, you probably did not press the four-key sequence quickly enough. Try again. Most people use both hands and keep one finger on the escape key.
2. Use the Xmodem file-transfer protocol to send the system file to the unit.

   Your communications program normally takes anywhere from 5 to 15 minutes to send the file to the unit. The time displayed on the screen does not represent real time. Do not worry if your communication program displays several bad-batch messages. This is normal.

Restoring the configuration

To restore the configuration, you must have administrative privileges that include `Field Service` (such as the `Full Access` profile, for example). You use the `restore Cfg` command to restore a full configuration that you saved by using the `save Cfg` command, or to gather more specific configuration information obtained from Lucent Technologies (for example, a single filter stored in a special configuration file).

1. From the MAX 6000 unit's VT100 interface, access the diagnostics monitor by pressing Ctrl-D to invoke the `DO` menu, and select `D=Diagnostics`.
2. At the `>` prompt, enter the `fclear` command to clear the configuration from the internal flash:

   `> fclear`
3. At the `>` prompt, enter the `nvramclear` command:

   `> nvramclear`

   This causes the system to reset. When it comes back up, continue restoring your configuration.
4. Enter **`quit`** to exit the `Diagnostic` interface.
5. Open the `Sys Diag` menu.
6. Select `Restore Cfg`, and press `Enter`.

   The following message appears:

   ```
   Waiting for upload data...
   ```

   Use the Send ASCII File feature of the communications software to send the configuration file to the unit.



Caution: The compatible configuration file is not the one that you saved at the beginning of these steps. Use the saved configuration file in the event you downgrade from TAOS 9.1.5.

If you have any questions about how to send an ASCII file, consult the documentation for your communications program.

7. When the restore has been completed, the following message appears:

   ```
   Restore complete - type any key to return to menu
   ```

   Press any key to return to the configuration menus.
8. Reset the unit by selecting `System > Sys Diag > Sys Reset` and confirming the reset.

Downgrading the software

To downgrade the system software:

1. Type the following four-key sequence in rapid succession (press each key in the sequence shown, one after the other, as quickly as possible):

   `<Esc> [<Esc> -`

   (Press the `escape` key, the `left bracket` key, the `escape` key, and the `minus` key, in that order, in rapid succession.) The following string of Xmodem control characters appears:

CKCKCKCK

If you do not see these characters, you probably did not press the four-key sequence quickly enough. Try again. Most people use both hands and keep one finger on the escape key.

2 Use the Xmodem file-transfer protocol to send the system file to the MAX.

Your communications program normally takes anywhere from 5 to 15 minutes to send the file to your MAX. The time displayed on the screen does not represent real time. Ignore *bad batch* messages from your communication program. These are normal messages.

After the file transfer, the MAX 6000 unit resets. Upon completion of the self-test, the MAX 6000 unit's initial menu appears in the Edit window with all parameters set to default values.

If the file transfer fails during the transfer, try obtaining another copy of the binary image from the Lucent Technologies FTP server and downgrade the software again. If you continue to have problems, contact Lucent Technologies technical support for assistance.

Restoring passwords

For security, passwords are not written to configuration files created through the serial console. A configuration file created using the `tsave` command, however, *does* contain the system passwords. You can restore the `tsave` configuration file using the serial console.

After upgrading you might have to re-enter all the passwords on your system. If you edit your saved configuration file, however, and enter passwords in the appropriate fields (by replacing the word *SECURE* in each instance), these passwords will be restored. But note that if you do choose to edit your configuration file, you must save it as text only or you will not be able to transfer it into your unit.

If you restored a complete configuration, the passwords used in your Security profiles have been wiped out. To reset them:

1 Press Ctrl-D to invoke the DO menu, select `Password`, and choose the Full Access profile.

2 When you are prompted to enter the password, press Enter (the null password).

After you have restored your privileges by entering the null password, you should immediately open the Connection profiles, Security profiles, and Ethernet profile (Mod Config menu), and reset the passwords to their previous values.

Firmware versions

This release supports the following firmware versions:

Series56 digital modules—Mindspeed Technologies (a Conexant Systems company), V2.0982-K56_DLP_CSM firmware includes support for V.90, K56flex, K56plus, and all slower, standard modem speeds.

V.90 Series56 III modules—Mindspeed Technologies firmware version V5.8177 includes support for K56flex, K56plus, and all slower, standard modem speeds.

MultiDSP modules—Analog Devices, Inc. (ADI) firmware versions include:

- V0.1.59 (Controller)
- V0.1903.0 (RAS)
- V3.6.2 (VoIP)

Notices and known issues

Following are notices and known issues for MAX units, voice DSP modules, MultiVoice® and Data and RAS services.

Notice of TAOS license and upgrade changes

Starting with the release of TAOS 9.1, 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 the TAOS 9.1, MAX 3000, MAX 6000, MAX TNT®, and APX 8000™ hardware 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 software on the specific platform purchased.



Note: The right to upgrade to a subsequent TAOS minor or major software release that includes new operating system software enhancements is no longer included as part of the base TAOS software license.

Price change for upgrades and maintenance to TAOS 9.1 software

Upgrades to TAOS 9.1 software and subsequent releases for the MAX 3000, MAX 6000, MAX TNT®, and APX 8000™ 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 (or *hash codes*), updates, upgrades, and support
- Remote technical support
- Hardware maintenance and return



Note: Only customers with an established Software Upgrade and Maintenance Service contract are authorized to upgrade designated TAOS-enabled units to TAOS 9.1 and to download the required TAOS 9.1 software files.

Distribution change for TAOS 9.1 software

TAOS 9.1 and subsequent general-availability TAOS software releases are no longer available from `ftp.ascend.com`. Upgrades to TAOS 9.1 and all subsequent releases and updates

(maintenance releases) are available instead from the Lucent OnLine Customer Support at `http://www.lucent.com/support`.

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 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.

Support to end for voice DSP modules ends

TAOS support for voice DSP modules ends on May 17, 2002. Until that time, only maintenance releases for TAOS 9.0 and TAOS 9.1 will include support for the voice-only modules. For example, TAOS 9.1.5 includes enhancements and problem corrections for voice DSP modules.

TAOS releases after the 9.1.x will not support voice DSP modules and no enhancements or problem corrections will be developed for them. However, later TAOS releases continue to provide MultiDSP modules with support for MultiVoice® Gateways, voice over IP, and fax over IP when the modules are installed in MAX 6000 or MAX 3000 units.

A voice DSP module's product warranty, repair, and technical support programs continue for the duration of existing contracts.

Data and RAS known issues

Data and RAS known issues you should be aware of before loading release 9.1.5 include the following:

- Always check a MAX 3000 unit’s real-time clock settings, located in the `System > Sys Config` menu, immediately after the unit completes a power-on self test (POST).
- TAOS 9.1.5 for MAX does not support AppleTalk. Do not upgrade to TAOS 9.1.5 if your network requirements include support for AppleTalk.
- After you upgrade a MAX unit from the TAOS 8.0-118 Limited Availability Release to TAOS 9.1.5, you must reenter the settings you want to specify for the Modem Ans N# parameter (located in the Call Numbers profile). The unit does not automatically transfer the values you previously specified for the parameter.
- Change in Call Logging packet format

  In releases prior to 7.2.0, the format of Call Logging packets are identical to RADIUS Accounting packets. With the introduction of 7.2.0, Call Logging is no longer compatible with RADIUS, although Lucent Technologies’ Navis™Access product fully supports

Call Logging. The MAX continues to support RADIUS accounting, SNMP and SYSLOG functionality.

Because of the proprietary nature of and potential modification to Call Logging packets, you should not use Call Logging packets with any application other than Lucent Technologies' Navis™Access.

- Some multimedia enhancements are not supported in this release. Customers using the following enhancements should not upgrade to 9.1.5:
  - AIM/BONDING
  - Time-of-day calling
  - Backup and overflow
- The default value for the parameter `CBCP Trunk group` was out of the valid range. The default value has been changed from 0 to 4. This correction might cause a previously saved profile to yield a different value when this release is loaded.
- In an E1 environment, the MultiDSP module can exhibit a lower-than-expected call connection rate as it terminates modem calls placed to the MAX unit.
  Lucent Technologies recommends that you specify `S202=66+A8E=,,,0;` for the AT Answer String parameter, located in the unit's Sys Config profile.
- The MultiDSP module does not currently support any version of Personal Handyphone System (PHS), V.110, or High-Level Data Link Control (HDLC).
- In MAX units, data flows between T1 or E1 WAN ports and host devices such as modems and HDLC ports using a limited group of internal data pathways. The capacity of these pathways is sufficient to accommodate the built-in WAN ports of the MAX. When BRI cards are installed in the system, pathways normally allocated for built-in T1/E1 ports are used to support the BRI WAN ports, and are not available for T1/E1 usage.



Note: More than 64 digital (HDLC) calls requires an optional HDLC module and no more than 96 digital calls are supported under any circumstances.

Table 1 summarizes how the addition of BRI cards affects the availability of built-in WAN ports in various MAX units. These limits apply regardless of the type of BRI card used (Net, Host, IDSL, etc.).

Table 1. WAN ports available when BRI cards are in use

MAX unit	Number of BRI cards	WAN ports available
MAX 6000	0	1, 2, 3, 4
	1	1, 2, 3
	2, 3	1, 2
	4	1
	5, 6	None
MAX 3000	0	1, 2
	1	2

MultiVoice® known issues

Known issues you should be aware of before upgrading a MAX 6000 unit to TAOS 9.1.5 include the following:

- Voice DSP and MultiDSP modules cannot co-exist on the same MAX unit.
- When a MultiDSP module is used with the G.711 audio codec, you must set the Frames-Per-Packet parameter in the VOIP Options profile to a value of 4 or more.
- If one or more voice DSP modules (MXV-SL-DSP8, MXV-SL-DSP12, or MXV-SL-DSP16) are configured in a MAX 6000 unit, the Navis™ QOS and RFC 2833 features introduced with TAOS 9.1.5 is not supported.
- A MAX 6000 unit supports voice announcements that are stored on the external PCMCIA flash card. Break-in announcements, multiple languages, and the branding of voice announcements are supported on the unit.
- The maximum supported configuration for a MAX 6000 unit is two T1 PRI or two E1 PRI interfaces, 48 or 60 calls respectively.
- If you have a MultiDSP module in a MAX 6000 unit, and at least one card is configured to support MultiVoice® using simple audio codecs (for example, G.711), then all VoIP calls will be restricted to use simple audio codecs as well.

9.1.3 Corrections

Following are the problems corrected in release 9.1.3. There are no enhancements.

TR	Problem corrected
6002315	MAX with MultiDSP installed did not accept analog calls from the BRI card.
6002471	MAX displayed wrong HDLC channel information from the “show users" command.
6002496	MAX displayed incorrect source and destination information in the Telnet TERMINATE syslog message.
7006398	Using T1 with inband signalling with CSM3 cards installed, L2TP calls would fail.
7000112	When authenticating using local profiles, regardless of what value was set in the local X25/PAD connection profile for the X.3 parmeter profile to use, it always returned to the value CRT.
7000099	MAX 3000 occasionally reset with Warning 561, Warning 109, Fatal Error 18.

9.1.2 Correction

Following is a Data and RAS problem corrected from release 9.1.2.

Data and RAS problem corrected

Table 3 shows corrected problems with their assigned trouble report (TR) numbers.

Table 2. Data and RAS problems corrected

TR	Problem corrected
NA	On MultiDSP cards taking data calls, a problem occurred when processing packet sizes smaller than 32 bytes.

9.1.1 Corrections and enhancements

Following are Data and RAS, and MultiVoice® problems corrected from previous releases.

Data and RAS problems corrected

Table 3 shows corrected problems with their assigned trouble report (TR) numbers.

Table 3. Data and RAS problems corrected

TR	Problem corrected
6000743	A MAX unit incorrectly limited the maximum number of simultaneous X.25 sessions to 64.
6001214	Modems failed to connect to a MultiDSP module.
6001235	A MAX unit configured to support V.90 modulation, modem failed to connect to a MultiDSP module.
6001445	A MAX unit's MultiDSP modules disconnected calls and issued disconnect code `11` and progress codes `60` and `65`.
6001678	When a MAX unit reestablished a nailed MPP link, the unit did not correctly bundle the link's two channels.
6001773	A MAX unit did not allow the specification `Always` or `Active` for the `Proxy Mode` parameter.
6001795	A MAX unit's MultiDSP modules did not complete connections when V.23 was enabled and automode was disabled.
6001936	A MAX 6000 unit running MPP and stacking occasionally reset with `FE 40` and a `Warning 179`.
6002100	A MAX 6000 unit using MPP could not connect more than one modem call to another unit.
6002141	Immediate modem services parameters did not work correctly on a MAX 3000 unit.
6002170	A MAX unit ignored the subaddress specified for BACP call back when the unit added MP channels.
6002242	A MAX unit's MultiDSP modules was incompatible with some manufacturers' modems.
6002245	A MAX 3000 unit configured to support BRI required reinstallation of the unit's modem firmware.
6002261	A MAX unit did not alert you when you stacked the unit with another unit which ran a different version of TAOS.
6002284	A MAX unit's MultiDSP modules exhibited lower successful connection rates than other modem modules installed on the unit.
6002352	A MAX 3000 unit did not correctly support the `Shared Prof` parameter.

Table 3. Data and RAS problems corrected (continued)

TR	Problem corrected
6002354	A MAX unit with installed V.90 S56 Series III Digital Modem modules issued `Warning 999`.
6002366	A MAX unit truncated long `Syslog` messages.
6002369	Two-channel MPP calls failed to connect over two nailed T1 lines.
6002456	The process of upgrading to TAOS 9.1 corrupted a MAX 6000 unit's internal flash memory.
6002457	A MAX 6000-E1 unit displayed a `corrupted load id` error message.
6002477	A Max 6000 unit with installed MultiDSP modules did not correctly support the `modemdiag` command.
6002537	A MAX unit configured to support ATMP did not correctly support RADIUS Attribute 23 (`Framed-IPX-Network`).
6002539	A MAX unit did not correctly support E1-PRI signaling for Taiwan.
6002540	A MAX unit's MultiDSP modules disconnected some V.22 modulated calls with disconnect and progress codes `25/40` and `185/47`.

MultiVoice® problems corrected

Table 4 shows corrected problems with their assigned trouble report (TR) numbers.

Table 4. MultiVoice® problems corrected

TR	Problem corrected
N/A	A MAX unit configured to use G.729(A) as the audio codec with 1 or 3 Frames Per Packet did not perform correctly.
N/A	Audibility is lost in DRQ messages (forced drop calls) but successful in PIN and DNIS requests.
6002133	When configured to use two-stage dialing, the MultiVoice® Gateway did not prompt the user for the endpoint phone number.
6002143	A MultiVoice® Gateway did not successfully place fax calls to some destinations.
6002233	A MultiVoice® Gateway incorrectly detected a phase-reversal CED and failed to report fax V.21 flags.

Table 4. MultiVoice® problems corrected (continued)

TR	Problem corrected
6002423	For Brazilian installations, a MultiVoice® Gateway was configured to use B3 for busy tones and when the signaling mode was set for Brazil, the egress Gateway did not recognize a busy tone and CC 17 in the disconnect message. B2 is now being used as a busy tone for Brazilian installations.
6002504	A wrong LCN was being returned by a MultiVoice® Gateway in a FastStart element.
6002505	H.323 calls made by a MultiVoice® Gateway configured with video codecs that included CIFs were resetting.

Enhancements

Differentiated services code point (DSCP) support

Differentiated services code point (DSCP) support enables a MAX 6000 unit to mark packets so that other network devices can make decisions on the basis of quality of service (QoS). To verify DSCP marking, you set parameters in the VOIP Options profile. The unit does not support complete Differentiated Services (DS) node compliance defined in RFC 2474. For example, the unit does not support queuing strategies, per-hop behaviors, or any other QoS strategies.

Packet handling

The second octet in the IP datagram header indicates type of service (TOS) parameters that are associated with the packet. Those parameters identify how the MAX unit handles the packet by using devices within the network that are capable of recognizing the packets and acting upon them. Previously, RFC 791 defined the first six bits in the second octet for TOS marking.

This release supports RFC 2474, which defines a less structured method of using these six bits in the second octet of the IP datagram header to differentiate services and identify how the software handles the packet. This less-structured method is known as DSCP marking.

This version of TAOS allows DSCP information specified to be set so that it can be acted upon by other network devices. The current software does not support interpretation or utilization of DSCP information by the MAX unit.

Two new parameters

Following are two parameters that have been added to the `VOIP Options` profile.

Marking Type (VOIP Options)

Description: Specifies whether the MAX 6000 unit uses TOS or DSCP marking to process voice over IP calls.

Usage: Specify one of the following values:

- `Precedence-TOS` (the default)—The precedence and type-of-service values are used to set the bits within the second octet of the IP packet header in accordance with RFC 791.
- `DSCP`— Bits within the second octet of the IP packet header are set according to the hexidecimal value specified for the DSCP parameters.

Dependencies: The value you specify for the Marking Type parameter is effective once the profile is saved for new calls. This parameter is not applicable in the `VOIP Options` profile if `TOS-Enabled=No`.

Location: Ethernet > Mod Config > VOIP Options

DSCP (VOIP Options)

Description: Specifies the hexadecimal value of the DSCP bits if you choose DSCP marking.



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

Usage: Specify a hexidecimal numeral from `00` (the default) to `FF`. The value you specify sets the bits in the second octet of the IP packet header. The change comes into effect once the profile has been saved for new calls.

Dependencies: This parameter is not applicable in the `VOIP Options` profile if `Marking Type=Precedence-TOS`

Location: Ethernet > Mod Config > VOIP Options

New default value for the Log Call Progress parameter

In order to maximize the efficiency of outbound and inband call placement, the default value of the `Log Call Progress` parameter has been set to No. This parameter is located in `Ethernet > Mod Config > Log`. If you have been using `Log Call Progress`, and want to continue to do so, you will need to reenable this enhancement after installing this version of TAOS. This release removes the default restriction on parallel-dialing. With this restriction removed, the number of calls per second which can be supported increases by 10% to 20%.

Voice DSP modules supported

On a MAX 6000 unit, TAOS release 9.1.5 now provides support for these voice DSP modules:

- MXV-SL-DSP8
- MXV-SL-DSP12
- MXV-SL-DSP16

The last digits indicate the number of voice ports available on the module.

Upgrading a MAX 6000 unit to support voice DSP modules

Caution: A MAX 6000 unit does not recognize a voice DSP modules until you have successfully upgraded the operating system to the release described in this release note. Be careful to upgrade with the correct binary. If a voice DSP module is installed into a MAX 6000 with the `tbiv.m60` binary, the voice DSP module will not be recognized. Similarly, if a MultiDSP module is installed into a MAX 6000 with the `tbiv6.m60` binary, the MultiDSP module is not recognized.

Caution: Voice DSP and MultiDSP modules cannot co-exist on the same MAX unit.

To change a MAX 6000 unit's operating system software so that the unit can be configured to support a voice DSP module, follow these steps:

1. Acquire TAOS 9.1.5 software at `http://www.lucent.com/support`.
2. Change the unit's operating system software to TAOS 9.1.5 by applying the instructions in the "Changing operating system software" on page 8 of this release note.

   The software binaries that provide support for the voice DSP modules end with the numeral "6" before the prefix (for example, `tbiv6.m60`). To support a voice DSP module on a MAX 6000 unit, use one of the following software binary files:

   - `tbiv6.m60`
   - `ebiv6.m60`

Identifying a voice DSP module

MAX 6000 units currently support three types of voice DSP modules — VOIP-8 (labeled MXV-SL-DSP8), VOIP-12 (labeled MXV-SL-DSP12), and VOIP-16 (labeled MXV-SL-DSP16). Figure 1 shows the voice DSP module. Other than labels, there are no external interfaces or visual indicators to differentiate the versions.

Figure 1. Voice DSP module



In a MAX 6000 unit's profiles and parameters, the voice DSP module is identified as `VOIP-8, VOIP-12,` or `VOIP-16`. The unit automatically detects the number of ports and displays them in the Main Edit Menu. For example:

```
Main Edit Menu
  00-000 System
  10-000 Net/T1
 >20-000 VOIP-16
  30-000 VOIP-16
  40-000 VOIP-16
  50-000 Empty
  60-000 Empty
```

```
70-000 Empty
80-000 Empty
90-000 Ethernet
A0-000 Ether Data
B0-000 Ether Data
```

In this example, the unit has detected VOIP-16 modules.

Support for voice over IP services

Voice over IP (VoIP) is a service that offers voice telephony across IP network infrastructures. The voice DSP module's VoIP implementation relies on the MAX MultiVoice® Gateway to connect calls to public and private packet networks. The module's VoIP implementation supports the International Telecommunication Union Telecommunication Standardization Sector (ITU-T) standard for H.323 signaling and messaging.

VoIP enhancements supported by a voice DSP module include the following:

- ITU-T H.323 signaling and messaging.
- Voice compression and packetization.
- Connection of each port to a single DS0 channel (voice calls).
- Cut-through of progress tone signals from the distant Public Switched Telephone Network (PSTN).
- Encoding schemes G.711 A-Law, G.711 μ-Law, and G.729.
- Silence suppression and detection for G.729, configured through the MAX unit's `VOIP Options` profile. Silence suppression is automatically enabled for G.723.1.

A VoIP software license is required for DSP support of the VoIP service. An additional software license is required for support of the real-time fax function.

VoIP functions are configured through the unit's `VOIP Options` profile. On a MAX 6000 unit, real-time fax is configured in a separate profile in the `Ethernet > Mod Config > RT Fax Options` menu.

Using Answer profiles

You can specify up to four answer numbers per call type by editing the MAX 6000 unit's `Mod Config` profile.

Use a `Call Numbers` subprofile, in the unit's `Mod Config` menu, to specify the answer numbers for each call type a module supports, as in the following example:

```
20-100 Mod Config
 Call Numbers...
 >VoIP Ans 1#=
  VoIP Ans 2#=
  VoIP Ans 3#=
  VoIP Ans 4#=
```

Each entry is of the standard telephone number type as found in the MAX 6000 unit's modem configuration menu.

Using a MAX 6000 unit's diagnostics to administer voice DSP module

The `lanport vdsp` diagnostic command, in the MAX unit's Diagnostic command line interface, displays a report on the status of the availability of ports in the voice DSP module. Each time you enter `lanport vdsp`, you get a snapshot of current port states. The command is particularly helpful in troubleshooting connection problems, for which you must focus on the ability of individual ports to successfully connect with users.

Each port can be placed in one of six lists the unit generates when you enter the `lanport vdsp` diagnostic command:

- `Available`—The unit places a port in its list of available ports whenever none of the other conditions apply.
- `Suspect`—A port is moved to the suspect list if its first four calls fail, or if it experiences eight failed (bad) calls in a row. Ports on the suspect list can still be used if all available ports are in use. Any subsequent successful call to a suspect port places that port back on the available ports list.
- `Disabled`—If the unit's administrator removed the port from the unit's list of available ports, the port appears in the disabled list. The port is not available until the unit's administrator changes the status of the port to available.
- `Dead`—A port that failed at the time of the power-on self test (POST) or during the course of processing calls appears in the dead list.
- `Busy`—A port that is currently processing an active call appears in the busy list. This port becomes available when the active call is cleared and the port is added to the available list. The `dir` parameter indicates the direction of the last call into each modem. It can have one of the following settings:

  1—Call direction unknown.

  2—Call was outgoing.

  3—Call was incoming.
- `Downed`—Calls to this port failed and the port is not reliable for normal call processing. A port is moved to the downed list if it experiences 12 bad calls in a row.



Note: A call that has been categorized as bad does not necessarily indicate a port problem with the voice DSP module. Poor line quality, software problems with the calling port, wrong numbers, and forgotten passwords all can generate calls that appear as bad calls but that have nothing to do with ports on the module.

In the following example, the only ports unavailable are those that are busy:

```
> lanport vdsp
Dump of Available ports list
03:58    16 unused      89 calls,     0 bad, last 32:ffffffff
Dump of Suspect ports list
Dump of Disabled ports list
Dump of Dead ports list
Dump of Busy ports list
03:01 10      carrier      90 calls,     0 bad, last 32:fefbeffe inc
03:10 16      carrier      83 calls,     0 bad, last 32:ffffffff inc
03:16 5      carrier      90 calls,     0 bad, last 32:ffffffff inc
03:02 11      carrier      90 calls,     0 bad, last 32:ffffffff inc
03:5 4      carrier      88 calls,     0 bad, last 32:ffffffff inc
03:3 2      carrier      90 calls,     0 bad, last 32:ffffffff inc
03:06 15      carrier      89 calls,     0 bad, last 32:ffffffff inc
03:15 3      carrier      90 calls,     0 bad, last 32:ffffffff inc
```

```
03:08 7      carrier      89 calls,     0 bad, last 32:ffffffff inc
03:03 6      carrier      89 calls,     0 bad, last 32:ffffffff inc
03:09 13      carrier      90 calls,     0 bad, last 32:ffffffff inc
03:05 14      carrier      90 calls,     0 bad, last 32:ffffffff inc
03:13 8      carrier      90 calls,     0 bad, last 32:ffffffff inc
03:12 1      carrier      90 calls,     0 bad, last 32:ffffffff inc
03:04 12      carrier      90 calls,     0 bad, last 32:ffffffff inc
03:11 9      carrier      90 calls,     0 bad, last 32:ffffffff inc
Dump of Downed ports list
>
```

To evaluate, for example, port one in slot three (designated 3:01), you must convert the eight-character hexadecimal number to binary to indicate how many of the last 32 calls were successful:

```
fefbeffe = 11111110111110111110111111111110
```

The zeroes show that port 3:01 has had four unsuccessful calls, including the last call.