



DarkStar®

Lighting the path to network independence

Release Notes v2.3



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Release Notes

This chapter highlights release information for v2.3 DarkStar products.

1.1 DXMOS Upgrade Instructions

The following information details the procedure for upgrading from DXMOS v2.2.x to DXMOS v2.3.0.

1.1.1 Requirements

This upgrade is intended only for DXM10 systems. DXMOS v2.2.x is the final release supporting DXM3 and DXMh systems.

1.1.2 Introduction

Upgrade-2.3.0 is a software tool that contains all data necessary to upgrade from DXMOS v2.2.x to DXMOS v2.3.0 software and gateway. This installation program must be run from the console; it will not work over telnet or ssh.

It may be helpful to understand that DXMOS software is stored redundantly on two independent flash chips on DarkStar systems, known as "startup flash" and "factory flash." Startup flash stores the software that runs the system. Factory flash stores a backup copy of the software that can be used to restore startup flash.

Installation of DXMOS v2.3.0 with the Upgrade-2.3.0 tool is a one-step process. Upgrade runs on startup flash only. The program will not upgrade the contents of factory flash. As a prerequisite to running DXMOS v2.3.0, the system must first have DXMOS v2.2.x installed on both startup and factory flash. If you are not running DXMOS v2.2.0, visit the XKL web site and follow the upgrade procedures, which are included in v2.2 Release Notes.

Upgrade-2.3.0 should preserve custom system configurations on the startup flash chip.

1.1.3 Download

You can obtain Upgrade-2.3.0 via XKL's web site in the Support section. DarkStar support customers will receive notifications of updates as they become available, which will include login credentials for the download and further detailed instructions.

Once you obtain the update files, place the upgrade.exe file on the target TFTP server. Then verify the integrity of the file using the checksum included in the upgrade kit.

1.1.4 Upgrade Procedures

To upgrade to DXMOS v2.3.0, carefully follow these procedures:

1. Back Up DXMOS Configuration

Create a remote backup of the DXMOS configuration file.

2. Establish Server Connection

Ensure the DXMOS system can reach the TFTP server, either by being on the same subnet or by provisioning static routes. The TFTP boot facility cannot use dynamic RIP routes. If you change any network configurations to ensure connectivity, be certain to save the settings using the `write memory` command.

3. Start Boot

Bring up the Boot prompt by entering enabled mode and issuing a reload command from within DXMOS. Boot starts and attempts to load DXMOS. While attempting to load, the following message appears for 10 seconds:

```
[Type Ctrl-C to abort, or any other key to boot now.]
```

Type CTRL-C to halt the process and leave the system at the Boot prompt.

4. Download Installer

Download the Upgrade-2.3.0 from the TFTP server using the following command where the network address in the example is replaced with that of the TFTP server. This process will last several minutes, during which time, console output will display a succession of periods (.....) indicating that the transfer is in progress.

```
Boot> boot tftp 10.1.1.1 upgrade.exe
```

Do not interrupt the TFTP transfer. If the process is interrupted, you must reload boot using the following commands:

```
Boot> enable wheel
```

```
Boot# reload
```

```
Reload DIP (set for Startup) gateway, Warm. Press Enter to confirm: <Enter>
```

5. Run Startup Flash Upgrade

After Boot has loaded Upgrade-2.3.0, the program will run and prompt a last-chance abort message before proceeding. Upgrade provides a 30-second window to abort the process. If you do not abort during this window, upgrade will ignore all subsequent keyboard input. The upgrade process will last several minutes and console output will change as the procedure progresses. A full sample of console output during a successful upgrade is available in the upgrade kit.



WARNING

Do not interrupt the upgrade process. Doing so may cause serious errors.

When Upgrade-2.3.0 runs on the startup flash, the following events occur:

- Saves current software
- Saves configuration file and SSH key files

- Installs DXMOS v2.3 software
- Reloads the system

When the installation is completed, the system will reload. Boot will then load the new DXMOS v2.3 software and run it.

6. Verify Startup Flash Upgrade

Once reload is completed, verify the software version using the following command:

```
localhost> show version
```

In the console output, verify the following:

- Gateware is startup-gateware
- Version is V2.3.0

If this procedure was unsuccessful, the reload will fail to load the new software and will instead revert to the original factory flash. Beware that if the system reverts to factory flash, you may lose custom configurations, which may also result in a loss of traffic.

7. Downgrade (if required)

In the unlikely event that the upgrade procedure fails, you may want to downgrade to the previously running version of DXMOS. Upgrade-2.3.0 can restore the original installation using files saved during the upgrade process. To perform a downgrade, use the following command at the Boot prompt:

```
Boot> boot tftp 10.1.1.1 'upgrade.exe'/s:+4
```

Do not interrupt upgrade. Once the downgrade is complete, the system will return to the Boot prompt and you must reload manually using the following commands:

```
Boot> enable wheel
Boot# reload
Reload DIP (set for Startup) gateware, Warm. Press Enter to confirm: <Enter>
```

8. Post-Installation Configuration

If special modifications were made to network settings in the step described in section 1.1.4.2, be certain to restore them at this time.

If a DXM system was previously installed with DXMOS v2.1.3 or earlier, the DXM configuration may include `boot` commands that are no longer recognized by DXMOS v2.3. This condition is not a cause for concern initially because upgraded Boot software will recognize these commands and boot DXMOS properly.

Upon booting to DXMOS v2.3.0, the running configuration will not preserve pre-v2.2 `boot` commands. Change the configuration so that commands such as `boot flash startup-image`, `boot flash backup1-image`, `boot flash backup2-image`, and `boot flash factory-image` are eliminated from all saved configurations, whether they are local, remote, or backups.



If you modify boot commands, remember to `write memory` before reloading.

1.2 New Features

The following features have been added in DXMOS v2.3.

1.2.1 Terminal Pager

The terminal pager displays 24 lines of console output at a time and then pauses. Thereafter, pressing any key displays the next page of console output. The length of the output can be set using the `terminal pager` command.

1.2.2 DXM 2- and 4-Port Systems

DarkStar DXM systems are now additionally available with 2- and 4-port configurations.

1.2.3 `snmp-server disablev2c` Command

The `snmp-server disablev2c` command disables SNMP responses to version 2c requests.

1.2.4 SNMP Bulk Requests

DXMOS 2.3 has added support for SNMPv2c to respond to bulk requests as specified in section 4.2.3 of RFC 1905.

1.3 Updates

Updates in this release resolve the following caveats noted in v2.2.

1.3.1 BERT on DXM10 Systems

On DXM10 systems, bert transmit on any transport interface will no longer by default cause other unused wave transport interfaces with matching encapsulation to lock and generate the same PRBS test pattern. Unused transport interfaces which do not match the encapsulation of the interface with which bert transmit was issued will no longer report unexpected line status such as `Down`.

1.3.2 `clear counter`

The `clear counter` command now works for transport interfaces and correctly targets individual interfaces if specified.

1.3.3 RADIUS & Syslog

When logging a failed RADIUS attempt to Syslog, the RADIUS server IP address reported will be correct.

1.3.4 NAS-IP-Address

The NAS-IP-Address will be correct on systems originating an AAA packet from an interface with an address between 128.0.0.0 and 255.255.255.255.

1.3.5 show edfa Setpoint Reporting Error

The output of `show edfa` displays the configured setpoint value.

1.3.6 no apr osc detection Command

Using the `no apr osc detection` command no longer prevents the Raman amplifier from completing the autostartup procedure. However, it is still recommended that this feature not be disabled in most installations.

1.3.7 Default Redistribute Static Metric Value

If the `redistribute static` command is run without a metric value, it will reset to its default value of 1.

1.3.8 Remote tftp Files

Remote tftp files for both `put` and `get` operations may be located within any tftp subdirectories.

1.3.9 show led Command

The `show led` command will accurately reflect issues with fan modules that may be causing led blinking.

1.3.10 Copying over /dump/dump.exe

The file `/dump/dump.exe` is now mounted as a read-only file and cannot be overwritten.

1.4 Caveats

The following caveats related to the release of DXMOS v2.3 should be observed.

1.4.1 AAA Administration

The following caveats related to AAA behavior should be noted.

1.4.1.1 AAA RADIUS Server Hostname Restriction

When configuring a RADIUS server, using a hostname defined by the `ip host` command will not function properly. Instead, the RADIUS server should either be identified by IP address or a hostname which is looked up via DNS.

1.4.1.2 Constant Login Attempts

Constant login attempts may casue radius accounting packets to be missing the relevant user id.

1.4.1.3 aaa authentication

When AAA authentication is not required, username and password prompts still appear, however authentication is not performed.

1.4.2 Amplification

The following caveats related to amplification behavior should be noted.

1.4.2.1 Raman & EDFA Value Discrepancy

When a Raman or EDFA system reports values via `show edfa` or `show raman` commands, if the value is between the range of -0.9 and -0.1, it will not display the negative sign and will be reported between 0.1 and 0.9.

1.4.2.2 Raman Status Reporting

Raman amplifiers may report amplification down while pumps are on in manual mode.

1.4.2.3 EDFA Output

Upon initial power-up of the system, EDFA output will be enabled by default until system software is loaded. This behavior could present operational or diagnostic issues the output of the amplifier during this period may present unexpected values.

1.4.2.4 LED Operation with DRA-EDFA

In DRA systems that also contain an EDFA, LED lights pertaining to EDFA operation will not function.

1.4.2.5 Commands to Non-Existent Amplifiers

Issuing commands to non-existent amplifiers will not return an error message. Therefore, otherwise verify the existence of amplifiers in the system and do not depend upon command-line responses.

1.4.3 APP (Automatic Path Protection)

The following caveats related to APP should be noted:

1.4.3.1 APP Error Messages

If a reload occurs while an app is using the protection interface due to failure of the primary interface, spurious switch connect error messages may occur. These messages may be ignored. They only occur because the required connection already exists. The following is an example of such a message:

```
Switch Connect Error: Can't connect, interface already member of another connection.  
(Client 0, Wave West 0)
```

```
Blocked by connection Client 0 -> Wave East 0
```

```
Switch Connect Error: Can't connect (Client 4, Wave East 4) due to APP resource con-  
flict.
```

1.4.3.2 APP Group & write memory Command

If an `app group` is configured and is currently using the protection interface, running the `write memory` command will incorrectly save the protection interface as the primary interface.

If an app protection switch occurs followed by a reload and then the `write memory` command is not issued, it will result in display of the wrong interface in use for the app group. Moreover, if the app group is not revertive, the next APP switch event will fail to occur and traffic will drop. Always saving the APP configuration with the `write memory` command prior to reload will prevent this behavior and preserve the correct APP setting.

1.4.4 BERT

The following caveats related to BERT behavior should be noted.

1.4.4.1 Rapid Toggling of BERT

Rapid toggling of BERT capabilities on and off may generate continuous warning messages that require a system reload to stop them.

1.4.4.2 Error Messages upon Ending BERT

When a BERT is ended, either by using the `no bert receive` command or due to a reload while running, the resulting report may include multiple occurrences of the following error messages, which are spurious and may be ignored:

```
VSC8479: Error 2 in I2C__LoadValueWait
```

1.4.4.3 BERT Setup Errors

During the BERT setup process, command errors that occur are most likely caused by existing switch connections and will be indicated with a numerical code.

1.4.4.4 BERT Results

The `bert` command is still under development. On DarkStar systems that support BERT, only tests with a result of 0 errors can be considered accurate. If the BERT results in anything other than 0, it may be preferable to conduct BERT with external equipment.

1.4.5 Boot

The following caveats related to boot behavior should be noted.

1.4.5.1 LED Code

During system reload, front-panel lights may not correctly represent the system state. Once the system is fully operational, they will be accurate.

1.4.5.2 Infinite Loop

If a DarkStar system is configured exclusively with invalid boot targets that are then saved to startup-config using the `write memory` command or which are present in the remote configuration acquired through DHCP and TFTP, the bootloader software enters an infinite loop of failed boot attempts. When this happens, messages such as the following appear on the con-

sole:

```
Boot has exhausted its collection of executable images.  
[Delaying AUTO-BOOT for 600. seconds.]  
[Type Ctrl-C to abort or any other key to boot now.]
```

To interrupt the reboot cycle, press CTRL+C, then enter a boot command at the Boot> prompt. The most typical valid boot command is `boot flash startup-image`.

1.4.6 Configuration

The following caveats related to configuration behavior should be noted.

1.4.6.1 E.U. DST

In the European Union, Daylight Savings Time transitions will occur at 1:00 a.m. local time instead of 1:00 a.m. UTC.

1.4.7 DHCP

When setting up a network in a DHCP pool, ensure that the specified network matches the same network and mask length of the interface on which DHCP will be active. In addition, DHCP should only be used on /29 and larger subnets.

1.4.8 DXM Show Commands

The `show interfaces wave` command may report incorrect temperature readings in the `Aux1` field for some lasers, since there is variation in the way that lasers from different manufacturers report temperature data. Instead, use the value reported in the `Temperature` field.

1.4.9 File Management

The following caveats related to the file system should be noted.

1.4.9.1 tftp Transfer with Small Files

With small files, the full tftp transfer may occur before the flash write is even started. The message `File transferred successful...Completing flash write` merely indicates the network transfer is successful. If subsequent to seeing this message the write fails, for example because flash is full, an error message may not be reported to the user.

1.4.9.2 tftp & copy Commands with Full File System

If the file system on a system becomes nearly or completely full on the DXMFS(P) type partition on flash 0, `tftp` and `copy` commands will not operate reliably and may possibly fail to report an error message. Output of `show file system` will allow one to see current filesystem usage. If such difficulties arise, please remove unneeded files from the system with the `delete` command to allow for proper operation.

1.4.10 Hardware

The following caveats related to hardware on DarkStar systems and networks should be noted.

1.4.10.1 Reloading During Flash Memory Operation

Do not reload a system, either via a warm or cold reboot, while flash memory is reading or writing data. Doing so may cause the flash memory to become unresponsive and the system may revert to factory reload or the recovery console upon reload. The solution to this issue is to reload the system a second time after such an error, which should allow it to reload correctly.

1.4.10.2 Power Message

It is possible when unplugging the power supplies to see the `Power Supply n` has no AC messages twice in rapid succession.

1.4.11 Loopbacks

The following caveats related to loopbacks should be noted:

1.4.11.1 Loopback in DXMOS Configuration

If configured, a loopback interface will appear in a DXMOS configuration twice rather than the one expected occurrence. This behavior is harmless.

1.4.12 Management Ethernet & OSC Interfaces

The following caveats related to management Ethernet & OSC interface behavior should be noted.

1.4.12.1 Help Error

With some commands, typing `?` after entering an invalid argument does not return help text as expected and may only partially refresh the prompt. If the prompt becomes garbled, type `CTRL+R` to refresh the prompt.

1.4.12.2 Reporting Inactive OSC Interface

The output of `show ip route` on a network will still output the IP address of an OSC interface even when the OSC interface has been removed with the `no ip address` command. To entirely remove reference to the inactive route, use the `no interface osc n` command while the IP address is still configured.

1.4.12.3 ssh Sessions & System Performance

An active ssh session may impact system performance. The impact may also increase in proportion to the number of active sessions. For time-consuming operations, such as tftp transfers of large files, minimizing the number of active ssh sessions may improve system performance.

1.4.12.4 Removing OSC Interface IP Address

Removing the IP address of an OSC interface will leave the inactive route in the output report of `show ip route`. However, removing the interface while the IP address is present should remove the entire entry from the `show ip route` output.

1.4.12.5 Ethernet / OSC Peer Result

If gateway is reloaded, the Ethernet and/or OSC ports will be reset, which may cause connection peers to purge routing tables.

1.4.12.6 OSC Flapping

If an OSC interface displays periodic line `DOWN-UP` bouncing, it may be a sign that the remote OSC is unable to reach a line up state, thus indicating an issue between the local OSC transmitter and the remote OSC receiver.

1.4.12.7 AOC Tech SFP Diagnostic Values

AOC Tech SFP modules report incorrect digital diagnostic values. Temperature, Rx Power, and Tx Power may be inaccurately reported. This issue only pertains to OSC modules. It is possible to determine if the DarkStar system contains these modules by running the `show memory int osc` command.

1.4.12.8 Management Ethernet Port Packet Loss

The management Ethernet port may drop packets under high-volumes of traffic. Under normal operating conditions, it is unusual for high volumes of traffic to occur on the management Ethernet port and therefore this behavior will usually not present an issue.

1.4.13 Management Access

The following caveats related to management network access should be noted.

1.4.13.1 Banner Output Error

When configuring a message of the day banner with the `banner motd` command, messages exceeding 2000 characters will be truncated when a user logs in via ssh and messages exceeding 6700 characters will be truncated when logging in via telnet.

1.4.13.2 Character Sets

DarkStar software only supports ASCII characters. Inputting non-ASCII characters may render the terminal unusable. If that is the case, reset the terminal and reconnect to the system as appropriate.

1.4.13.3 Console Output

After commands that print large amounts of text to the console, it is possible that the system prompt will not be fully displayed upon completion. Hitting enter will refresh the prompt to its normal state.

1.4.13.4 SSH Message

During ssh connections, the message `server_request_session: channel_new failed` may be printed to the console. This can safely be ignored.

1.4.13.5 Debug Output with vty

If vty monitor is enabled, debug output will be printed to a telnet session before authentication has been completed.

1.4.13.6 Unresponsive vty Session

In the event a vty session becomes unresponsive, one can clear the vty with the `clear line` command from the console or another vty, or disconnect the vty session by terminating the remote client. In the second case it may be necessary to wait for a network timeout depending on the state of the session.

1.4.14 Monitoring

The following caveats related to monitoring DarkStar systems and networks should be noted.

1.4.14.1 Syslog or SNMP Error Messages

If Syslog or SNMP is configured on a system that does not have a valid network route to the logging hosts, the following error messages may occur when sending packets from these protocols. Removing those hosts from the configuration or re-establishing the network connection should stop these error messages from appearing. The following is an example of such an error message:

```
File sys.c line 756 inFile sys.c line 757fo File sys.c line 4075
75      4b      113
info      75      4b      113
info      0      0      0
```

1.4.14.2 Debug Reporting Errors

Enabling debug output in scenarios that generates large amounts of debug statements at high speeds may result in messages containing many dropped characters after a saturation level to the output buffer is reached. Turning off debug modes with `undebug all` will return the system to normal.

1.4.14.3 Monitoring SSH Service

If automatic service monitoring is used to monitor the SSH service of a DarkStar system, you may see spurious console messages similar to:

```
VTY: Attempted connection to VTY0 recorded.
Connection closed by UNKNOWN:
```

1.4.14.4 Logging Rate Limit

The `logging rate-limit` is effective only in holding off the first packet in a set of packets sent. For example, `logging rate-limit 1` will hold off 1 second before sending another packet, but then will ignore the limit.

1.4.15 Network Counters

Certain network counters are not entirely accurate, including TCP checksum error counts and IP forwarded counts.

1.4.16 Optical Modules

The following caveats related to the performance and management of optical modules should be noted.

1.4.16.1 show interface Reporting

Some reports produced by `show interface` commands only display available switch transport interfaces, rather than the interface group specified as part of the command. More specifically, this behavior may be applicable to the following commands:

```
show interfaces osc
show interfaces ethernet
show interfaces all
```

```
show interfaces ethernet <interface number> all
show interfaces osc <interface number> all
show interfaces loopback <interface number> all
```

1.4.16.2 OSC laser shutdown

The OSC `laser shutdown` command is not currently a part of the stored system configuration and therefore will be enabled by default during a system reload.

1.4.16.3 laser shutdown

When a transport interface is shut down with `laser shutdown` and restarted with `no laser shutdown`, some lasers may briefly display a `Down` line status and a `Fault` alarm status in the `show interface` display. This result is usually a transient condition and does not represent a problem with the laser. If you run `show interface` again a few seconds later, the line will be up and its alarm status will no longer be `Fault`.

1.4.16.4 XFP Error-Forward Reporting

Some XFP modules may report incorrect statuses when error forwarding occurs. Therefore, it may be possible for different modules, even if the modules are the same model, to report different line statuses.

1.4.16.5 Error-Forwarding Propagation

In the absence of client signals, error forwarding across the wave interfaces may result in client equipment reporting unusual errors, such as a loss of frame.

1.4.16.6 XFP Auxiliary Values

Auxiliary values reported by XFP modules are dependent on vendor settings and vary in reliability/what is being reported between vendors and specific modules.

1.4.16.7 Uni-Directional Data Flow

A uni-directional data flow may cause an interface to report a false up state. This only applies to XFP modules.

1.4.16.8 Incorrect Wave Receive Power Reporting

Wave modules that are not connected to client modules may report incorrect receive power values. This condition self-corrects as soon as client traffic is detected.

1.4.16.9 Incorrect XFP Receive Power Values

If an external BERT is connected to the system while the system's clock is running at a different rate or if there is excessive uncompensated dispersion in the link, the system may report erroneous XFP receive power values.

1.4.17 Ping Command

DarkStar systems do not allow communications via the network to its own interfaces. As a result, attempting to use the ping command on a localhost IP address fails.

1.4.18 Recovery Mode

The following caveats related to recovery mode should be noted.

1.4.18.1 “Command Aborted” Message

When continuing from recovery mode, it is possible that you may see one or more `command aborted!` messages on the console. These messages may be ignored. The configuration file itself is processed correctly.

1.4.18.2 “File Transferred Is Empty” Message

If a `configure network` command is successfully issued after DXMOS enters recovery mode and the remote configuration file is zero length, DXMOS will issue a message stating that `file transferred is empty` and will proceed to full operational mode without applying any configuration, even if Boot successfully acquired a configuration via DHCP/TFTP.

1.4.19 Routing

The following caveats related to routing behavior should be noted.

1.4.19.1 Removing RIP Interface

When removing an interface which is running RIP via the `no interface ethernet n` command, it may be necessary to stop and restart the RIP services on the box to be able to correctly receive a route to the now disconnected network via another RIP session. This procedure can be accomplished with `no router rip` followed by all necessary commands to rebuild the RIP configuration, or by reloading the system.

1.4.19.2 Invalid RIP Route Address

RIP incorrectly accepts the invalid route address 240.0.0.0/8.

1.4.19.3 Loopback Interface RIP Reporting

If RIP is set up on a loopback interface, and then that interface is removed, the `show ip routes` command incorrectly reports that a RIP route still exists to the missing interface. This does not adversely affect the operation of routing behavior, although it does affect the information reported by the `show ip routes` command. To restore the display so it shows the correct information, disable the RIP route with the `no router rip` command.

1.4.19.4 no router rip Default

`no router rip` mode will return global RIP version to its default of both versions 1 and 2, regardless of the version number supplied in the command.

1.4.20 SNMP

The following caveats related to SNMP behavior should be noted.

1.4.20.1 SNMP Power Reporting Error

The values for `xklPowerVoltage` and `xklPowerCurrent` reported via SNMP are not accurate. The correct values may be obtained from `show environment power`.

1.4.20.2 Loopback Reporting

The loopback interface is not reported by SNMP.

1.4.20.3 SNMP Trap Logging

During system start-up, SNMP traps and syslog messages may not be received because the network routes required to send the traps are not yet initialized.

1.4.20.4 ifInUnknownProto SNMP Metric

The SNMP metric ifInUnknownProtos is not currently reliable in counting layer 3 packets that DarkStar systems do not support.

1.4.20.5 SNMP Diagnostic Queries

Although infrequent, SNMP queries used to gather diagnostic information may report incorrect data for certain OID values. For this reason, it is preferable to use the command line to gather critical diagnostic information. However, SNMP results in general are still useful for determining long-term system patterns and trends.

1.4.21 Static Host Name

When deleting a static host name entry with the `no ip host` command, you must include the IP address of the entry to be removed. For example, the following command uses 10.9.0.30 as myhost:

```
localhost CONF# no ip host myhost 10.9.0.30
```

1.4.22 Syslog

The following caveats related to Syslog should be noted.

1.4.22.1 Interface Name in Link Up/Down Messages

Some system configurations may produce Syslog messages omit interface name from Link Up/Down messages. For example, rather than seeing Link Up: Interface Ethernet 0 0.0.0.0 one would see Link Up: Interface 0.0.0.0.

1.4.23 Virtualight

XKL recommends leaving Virtualight mode enabled for client interfaces, which is its default setting. If client interfaces are set up with loopbacks and they have Virtualight disabled, the interfaces may cycle rapidly between up and down states.