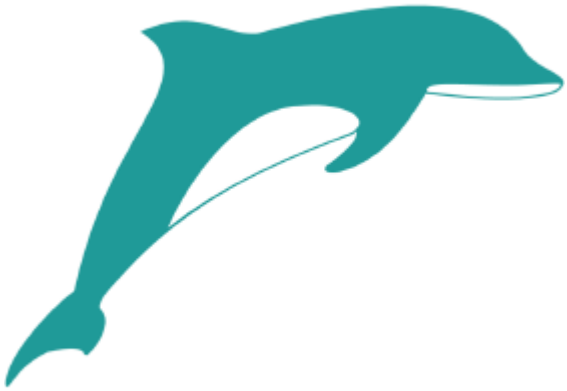

eXpressWare release for MX products

Dolphin Interconnect Solutions

October 22, 2026

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1 Definitions

Product PCIe Chipset

MX products are based on the Microchip PFX Switchtec PCIe 3.0, 4.0 and 5.0 chipsets in various configurations and topologies.

In general, but not always (see the specific product page for details):

- **MXH**: Host adapter
- **MXC**: CompactPCI Serial adapter
- **MXP**: PXIe adapter
- **MX*8XX**: PCIe 3.0 adapter
- **MX*9XX**: PCIe 4.0 adapter
- **MX*5XX**: PCIe 5.0 adapter

Release Categories

The following definitions are used for the eXpressWare software.

Prototype

Only parts of the full functionality are implemented. Minimal error handling. Intended to demonstrate limited functionality to selected customers. Not for general availability.

Alpha

All functionality is implemented. Limited error handling. Can be released to collaborating partners.

Beta

Complete with error handling and performance optimization. Nearly final product. Can be made generally available.

GA

General Availability. Fully tested and ready for shipment to OEM customers and end users.

Snapshot

A snapshot release (or code drop) can be done at any of the above defined release categories. Code distributed by an individual, as a part of an agreed collaboration etc. for the purpose of testing a fix or new functionality requested by

the other party. Snapshot releases are generally not supported by Dolphin, but used as an important part of the test and qualification of new code. The person doing the snapshot is responsible for making sure the letter «d» (for development) is added to the version string before distributing the software and to make sure the other party understands the terms (not supported) and conditions of the software release. The person doing the snapshot release should make sure to keep an exact copy of the release (by a private copy or source control tag), no other formal steps are required.

Release Version Scheme

All eXpressWare components have a version string that can easily be retrieved by users to identify the product and the release version. The version string is constructed using decimal numbers formatted like `MAJOR_VER.MINOR_VER.BUGFIX_VER` (E.g. DIS `5.23.1`).

- **MAJOR_VER**:

  Major software changes. Significant improvements or changes that may require changes to how the product is used.

- **MINOR_VER**:

  Changes to the software that significantly improves functionality. Enhancements, OS support, non-breaking improvements.

- **BUGFIX_VER**:

  Minor fixes of previously released software. No functional changes.

Types of Releases

Dolphin uses two types of releases to satisfy rapid development, long-term test requirements and concurrent external testing and stability.

Release Candidate

A pre-release version that is still undergoing final testing and qualification. It is made available to customers and partners to provide early access to updated drivers and features, without requiring them to wait for the official release. The primary distinction between a release candidate and a final release is the level of testing completed. If critical issues are discovered during release candidate testing, the release may be withdrawn. In such cases, the version string and date must be updated before a new release candidate is issued, in accordance with standard release engineering procedures.

Release

Has completed all test procedures. Typically a renamed release candidate that passes all tests, and with no new critical bugs found.

2 Dolphin eXpressWare Overview

The eXpressWare software suite includes the following components. Not all combinations of software, hardware and OS are supported. Refer to the release notes section for compatibility.

Components

- **DIS-MX**: Low-level MX device driver
- **IRM**: Interconnect Resource Manager
- **SISCI**: Shared-memory cluster interconnect infrastructure
- **SuperSockets**: Socket accelerator for PCIe
- **IPoPCIe**: TCP/IP over PCIe (Windows NDIS or Linux DISip)
- **SmartIO**: IO sharing and control. Supports Device Lending and Hot-Add (Linux)

SuperSockets

Dolphin's SuperSockets is a family of Berkeley Sockets API compliant libraries that will accelerate embedded applications written to standard networking functionality. The functionality depends on the implementation approach.

User-space Library (Windows/Linux)

The Dolphin SuperSockets user space library is currently provided for the purpose of supporting embedded applications. The Windows Winsock2 environment contains a rich set of socket functions and options. SuperSockets version 5.2 and newer adds support for connectivity to the new Linux SuperSockets user space library.

Supports:

`accept, bind, connect, getpeername, getsockname, getsockopt, listen, recv, select, send, setsockopt(TCP_NODELAY), socket, shutdown`

Windows-specific:

`closesocket, WSASendDisconnect, ioctlsocket, WSAAsyncSelect, WSAGetOverlappedResult, WSAIoctl, WSARecv, WSASend`

Linux-specific:

`close, ioctl`

Kernel-space Library (Linux)

The SuperSockets Kernel-space library is our standard recommendation for most standard applications. It implements a new socket address family `AF_SSOCKS`, and supports virtually all networked Linux applications. The software is also compliant with the Linux Kernel Sockets API and can also be used by kernel services that can be configured to use `AF_SSOCKS`. This version of SuperSockets includes automatic fail-over to Ethernet if there is a failure with the PCIe network.

UDP multicast is supported if the underlying PCIe hardware and topology support multicast. Currently, only a single receiver per node for a specific multicast group is supported. The number of available groups is hardware dependent.

More Info: https://www.dolphinics.com/software

Documentation & Support

We do take software development and product testing seriously. Please let us know your experience or any issue by contacting us at: https://www.dolphinics.com/support

- Additional info and manuals:
  - https://www.dolphinics.com/mx
  - https://docs.dolphinics.com
- SISCI API resources:
  - https://docs.dolphinics.com/sisci/guides/index.html
  - https://www.dolphinics.com/products/embedded-sisci-developers-kit.html
- SmartIO resources:
  - https://docs.dolphinics.com/smartio/introduction.html

This release note contains a summary of the important changes made to eXpressWare. Please contact Dolphin for a complete list of changes.

3 Supported Hardware & Configurations

Dolphin PCIe Adapter Cards Supported by the NTB Software

- MXH830: PCIe 3.0 NTB Host Adapter, x16, SFF-8644
- MXH910: PCIe 3.0 NTB Host Adapter, x8, iPass
- MXH912: PCIe 3.0 NTB Host Adapter, x8, iPass
- MXH914: PCIe 4.0 NTB Host Adapter, x4, SFF-8644
- MXH916: PCIe 4.0 NTB Host Adapter, x16, SFF-8644
- MXH918: PCIe 4.0 NTB Host Adapter, x8, SFF-8644
- MXH930: PCIe 4.0 NTB Host Adapter, x16, SFF-8644
- MXH940: PCIe 4.0 NTB Host Adapter, 2 x8 FireFly modules, 2 x8, x16
- MXH941: PCIe 4.0 NTB Host Adapter, 1 x8 FireFly module, x8
- MXH943: PCIe 4.0 NTB Host Adapter, 2 x4 FireFly modules, 2 x4, x8
- MXH944: PCIe 4.0 NTB Host Adapter, 1 x4 FireFly module, x4
- MXH949: PCIe 4.0 NTB Host Adapter, 4 x4 FireFly modules, 4 x4, 2 x8, x16
- MXH950: PCIe 3.0 NTB Host Adapter, 2 x8 FireFly modules, 2 x8, x16
- MXH951: PCIe 3.0 NTB Host Adapter, 1 x8 FireFly module, x8
- MXH953: PCIe 3.0 NTB Host Adapter, 2 x4 FireFly modules, 2 x4, x8
- MXH954: PCIe 3.0 NTB Host Adapter, 1 x4 FireFly module, x4
- MXH959: PCIe 3.0 NTB Host Adapter, 4 x4 FireFly modules, 4 x4, 2 x8, x16
- MXP908: PXIe PCIe 4.0 NTB Peripheral Module, x8, SFF-8644
- MXC948: PCIe 4.0 NTB / Transparent Adapter, x16, CompactPCI Serial PCIe
- MXC960: PCIe 4.0 NTB Adapter, x16, CompactPCI Serial PCIe
- MXH530: PCIe 5.0 NTB Host Adapter, x16, SFF-8614
- MXH570: PCIe 5.0 NTB Host Adapter, x16, CDFP CopprLink

Note

The MXH830 is no longer supported. Please contact Dolphin support at https://www.dolphinics.com/csp if you are using it.

Dolphin PCIe Adapter Cards Supported by the Dolphin Board Management Software

- MXH832: PCIe 3.0 Transparent Host / Target Adapter, x16, SFF-8644
- MXH833: PCIe 3.0 Transparent Host / Target Adapter, x16, SFF-8644
- MXH912: PCIe 4.0 Transparent Host / Target Adapter, x4, iPass
- MXH915: PCIe 4.0 Transparent Host / Target Adapter, x4, SFF-8644
- MXH917: PCIe 4.0 Transparent Host / Target Adapter, x16, SFF-8644
- MXH919: PCIe 4.0 Transparent Host / Target Adapter, x8, SFF-8644
- MXH932: PCIe 4.0 Transparent Host / Target Adapter, x16, SFF-8644
- MXH942: PCIe 4.0 Transparent Host / Target Adapter, 2 x8 FireFly modules, 2 x8, x16
- MXH945: PCIe 4.0 Transparent Host / Target Adapter, 4 x4 FireFly modules, 4 x4, 2 x8, x16
- MXH946: PCIe 4.0 Transparent Host / Target Adapter, 1 x8 FireFly module, x8
- MXH947: PCIe 4.0 Transparent Host / Target Adapter, 2 x4 FireFly modules, 2 x4, x8
- MXH948: PCIe 4.0 Transparent Host / Target Adapter, 1 x4 FireFly module, x4
- MXH952: PCIe 3.0 Transparent Host / Target Adapter, 2 x8 FireFly modules, 2 x8, x16
- MXH955: PCIe 3.0 Transparent Host / Target Adapter, 4 x4 FireFly modules, 4 x4, 2 x8, x16
- MXH956: PCIe 3.0 Transparent Host / Target Adapter, 1 x8 FireFly module, x8
- MXH957: PCIe 3.0 Transparent Host / Target Adapter, 2 x4 FireFly modules, 2 x4, x8
- MXH958: PCIe 3.0 Transparent Host / Target Adapter, 1 x4 FireFly module, x4
- MXP909: PXIe PCIe 4.0 Transparent Peripheral Module, x8, SFF-8644
- MXP924: PXIe PCIe 4.0 Switch Module, x16, SFF-8644
- MXC962: PCIe 4.0 Transparent Adapter, x16, CompactPCI Serial PCIe
- MXH532: PCIe 5.0 Transparent Host / Target Adapter, x16, SFF-8614
- MXH572: PCIe 5.0 Transparent Host / Target Adapter, x16, CDFP CopprLink

Third-Party Devices Supported by Dolphin Software

- MCH663
- MVH100
- MVH126
- MVH222
- MVH242

- MVH260
- MVH270
- MVH300
- MVH308
- MVH309

Note

If you are not using a listed adapter card, please use another software download.

Dolphin PCIe Switches Supported

- **MXS824**
- **MXS924**

Supported Configurations

Note

See the *Known Limitations* section about support for Intel Xeon Scalable 3rd (Ice Lake), 4th (Sapphire Rapids), 5th (Emerald Rapids) and 6th (Granite Rapids) generation processors if you plan to use any of these in a switch configuration.

General use with MXH840:

- 2 nodes using 1, 2, 4 Samtec PCIe 3.0 FireFly / cables

General use with MXH850:

- 2 nodes using 1, 2, 4 Samtec PCIe 3.0 FireFly / cables

General use with MXH940:

- 2 nodes using 1, 2, 4 Samtec PCIe 4.0 FireFly / cables

General use with MXH950:

- 2 nodes using 1, 2, 4 Samtec PCIe 4.0 FireFly / cables

General use with MXH910:

- 2 nodes using 1 x8 iPass cable

General use with MXH830:

- 2 nodes using 1, 2, 4 (x4, x8, x16) PCIe 3.0 cables
- 3 nodes using 1, 2 (x4 or x8) PCIe 3.0 cables
- 5 nodes using 1 (x4) PCIe 3.0 cables

General use with MXH930:

- 2 nodes using 1, 2, 4 (x4, x8, x16) PCIe 4.0 cables
- 3 nodes using 1, 2 (x4 or x8) PCIe 4.0 cables

- 5 nodes using 1 (x4) PCIe 4.0 cables

General use with MXH530:

- 2 nodes using 1, 2, 4 (x4, x8, x16) PCIe 5.0 cables
- 3 nodes using 1, 2 (x4 or x8) PCIe 5.0 cables
- 5 nodes using 1 (x4) PCIe 5.0 cables

General use with MXH570:

- 2 nodes using 1 PCIe 5.0 CDFP CopprLink cable

Reflective memory use with MXH830 and MXS824:

- 2 nodes using 1, 2, 4 (x4, x8, x16) PCIe 3.0 cables
- Up to 6 nodes x16 using one **MXS824** switch
- Up to 12 nodes x8 using one **MXS824** switch
- Up to 24 nodes x4 using one **MXS824** switch
- Up to 30 nodes x16 using multiple **MXS824** switches

Reflective memory use with MXH930 and MXS924:

- 2 nodes using 1, 2, 4 (x4, x8, x16) PCIe 4.0 cables
- Up to 6 nodes x16 using one **MXS924** switch
- Up to 12 nodes x8 using one **MXS924** switch
- Up to 24 nodes x4 using one **MXS924** switch
- Up to 30 nodes x16 using multiple **MXS924** switches

Reflective memory use with MXH530 and MXS924:

- 2 nodes using 1, 2, 4 (x4, x8, x16) PCIe 4.0 cables
- Up to 6 nodes x16 using one **MXS924** switch
- Up to 12 nodes x8 using one **MXS924** switch
- Up to 24 nodes x4 using one **MXS924** switch
- Up to 30 nodes x16 using multiple **MXS924** switches

PCI Express Hot Add with MXH830 (Linux only):

- MXH830 connected to MXH832 transparent target cards and endpoints
- MXH830 connected to MXS824, fan out to max 5 MXH832 transparent cards and endpoints

PCI Express Hot Add with MXH530, MXH570, MXH930, MXH940 and MXH950 (Linux only):

- **MXH530** connected to any transparent target cards and endpoints
- **MXH570** connected to any transparent target cards and endpoints
- **MXH930** connected to any transparent target cards and endpoints
- NTB **MXH94x** connected to any transparent target cards and endpoints
- NTB **MXH95x** connected to any transparent target cards and endpoints

Standard BMC Firmware Revisions

Table 1: Standard BMC firmware revisions for MXH83x

Release	MXH83x
5.27.0	8.12
5.26.2	8.12
5.26.1	8.12
5.26.0	8.12
5.25.3	8.12
5.25.2	8.12
5.25.1	8.12
5.25.0	8.12
5.24.0	8.12
5.23.0	8.12
5.22.0	8.12
5.21.4	8.12
5.21.3	8.12
5.21.2	8.12
5.21.1	8.12
5.21.0	8.12
5.20.1	8.12
5.20.0	8.12
5.19.3	8.12
5.19.2	8.12
5.19.1	8.12
5.19.0	8.12
5.18.1	8.12
5.18.0	8.12
5.17.0	8.12
5.16.0	8.10
5.15.2	8.10
5.15.1	8.10
5.15.0	8.10
5.14.0	8.10

Table 2: Standard BMC firmware revisions for MXH93x, MXH94x, MXH95x

Release	MXH930	MXH932	MXH94x	MXH95x
5.27.0	2.11	2.11	2.11	2.11
5.26.2	2.11	2.11	2.11	2.11
5.26.1	2.11	2.11	2.11	2.11
5.26.0	2.11	2.11	2.11	2.11
5.25.3	2.11	2.11	2.11	2.11
5.25.2	2.11	2.11	2.11	2.11
5.25.1	2.11	2.11	2.11	2.11
5.25.0	2.11	2.11	2.11	2.11
5.24.0	2.11	2.11	2.11	2.11
5.23.0	2.10	2.10	2.11	2.11
5.22.0	2.10	-	2.10	2.10
5.21.4	2.8	-	2.8	2.8
5.21.3	2.8	-	2.8	2.8
5.21.2	2.8	-	2.8	2.8
5.21.1	2.8	-	2.8	2.8
5.21.0	2.8	-	2.8	2.8
5.20.1	2.8	-	2.8	2.8
5.20.0	2.8	-	2.8	2.8
5.19.3	2.1	-	2.1	2.1
5.19.2	2.1	-	2.1	2.1
5.19.1	2.1	-	2.1	2.1
5.19.0	2.1	-	2.1	2.1
5.18.1	1.5	-	1.5	1.5
5.18.0	1.5	-	1.5	1.5

Table 3: Standard BMC firmware revisions for MXP90x, MXP92x

Release	MXP908	MXP909	MXP921	MXP924
5.27.0	3.12	3.12	3.12	3.12
5.26.2	3.8	3.8	3.10-rc1	3.8
5.26.1	3.8	3.8	3.10-rc1	3.8
5.26.0	3.8	3.8	3.10-rc1	3.8
5.25.3	3.8	3.8	-	3.8
5.25.2	3.7	3.7	-	3.7
5.25.1	3.7	3.7	-	3.7
5.25.0	3.6	3.6	-	3.6
5.24.0	3.4	3.2	-	3.4
5.23.0	3.2	3.2	-	3.2
5.22.0	2.8	-	-	3.2
5.21.4	2.8	-	-	2.8
5.21.3	2.8	-	-	2.8
5.21.2	2.8	-	-	2.8
5.21.1	2.8	-	-	2.8
5.21.0	2.8	-	-	2.8
5.20.1	2.8	-	-	2.8
5.20.0	2.8	-	-	2.8
5.19.3	-	-	-	2.4
5.19.2	-	-	-	2.4
5.19.1	-	-	-	2.2
5.19.0	-	-	-	2.1
5.18.1	-	-	-	2
5.18.0	-	-	-	2

Table 4: Standard BMC firmware revisions for MXC94x, MXC96x

Release	MXC948	MXC96x
5.27.0	3.6	3.12
5.26.2	3.6	3.10
5.26.1	3.6	3.10
5.26.0	3.6	3.10
5.25.3	3.6	3.6
5.25.2	3.6	3.6
5.25.1	3.6	3.6
5.25.0	3.6	3.6
5.24.0	3.2	3.4
5.23.0	3.2	3.2
5.22.0	3.2	3.1
5.21.4	3.1-rc7	3.0-rc1
5.21.3	3.1-rc7	3.0-rc1
5.21.2	3.1-rc7	3.0-rc1
5.21.1	3.1-rc7	3.0-rc1
5.21.0	3.1-rc7	3.0-rc1
5.20.1	3.0-rc1	3.0-rc1
5.20.0	2.8	2.8

Table 5: Standard BMC firmware revisions for MXH53x, MXH57x

Release	MXH530	MXH532	MXH57x
5.27.0	3.12	3.12	3.12
5.26.2	3.11	3.11	3.11
5.26.1	3.11	3.11	3.11
5.26.0	3.11	3.11	3.11
5.25.3	3.9	3.9	3.9
5.25.2	3.7	3.7	3.8-rc3
5.25.1	3.6	3.6	3.7
5.25.0	3.6	3.6	3.6
5.24.0	v3.4	v3.4	v3.4
5.23.0	v3.3	-	-

Table 6: Standard BMC firmware revisions for MXP50x, MXP52x

Release	MXP508	MXP509	MXP523	MXP526
5.27.0	3.12	3.12	3.12	3.12
5.26.2	3.8	3.8	3.8	3.8
5.26.1	3.8	3.8	3.8	3.8
5.26.0	3.8	3.8	3.8	3.8
5.25.3	3.8	3.8	3.8	3.8
5.25.2	-	-	3.7	3.8-rc3
5.25.1	-	-	3.7	3.7
5.25.0	-	-	3.6	3.6
5.24.0	-	-	-	v3.4

Microchip PFX Configuration File Revisions

The PFX configuration file version of the different adapters are listed below. For more details see the "Firmware Release Notes" document for your adapter: MX Firmware Release Notes

Table 7: PFX configuration file revisions for MXH83x

Release	MXH83x
5.27.0	VER15
5.26.2	VER15
5.26.1	VER15
5.26.0	VER15
5.25.3	VER15
5.25.2	VER15
5.25.1	VER15
5.25.0	VER15
5.24.0	VER14
5.23.0	VER14
5.22.0	VER14
5.21.4	VER16
5.21.3	VER16
5.21.2	VER16
5.21.1	VER16

continues on next page

Table 7 – continued from previous page

Release	MXH83x
5.21.0	VER14
5.20.1	VER14
5.20.0	VER14
5.19.3	VER14
5.19.2	VER14
5.19.1	VER14
5.19.0	VER14
5.18.1	VER14
5.18.0	VER14
5.17.0	VER14
5.16.0	VER14
5.15.2	VER14
5.15.1	VER14
5.15.0	VER14
5.14.0	VER14

Table 8: PFX configuration file revisions for MXH93x, MXH94x, MXH95x

Release	MXH930	MXH932	MXH94x	MXH95x
5.27.0	VER16	VER16	VER13	VER10
5.26.2	VER16	VER15	VER13	VER10
5.26.1	VER16	VER15	VER13	VER10
5.26.0	VER16	VER15	VER13	VER10
5.25.3	VER15	VER15	VER12	VER9
5.25.2	VER14	VER14	VER12	VER9
5.25.1	VER14	VER14	VER12	VER9
5.25.0	VER14	VER14	VER12	VER9
5.24.0	VER14	VER14	VER12	VER9
5.23.0	VER13	VER14	VER12	VER9
5.22.0	VER13	-	VER12	VER9
5.21.4	VER12	-	VER11	VER7
5.21.3	VER12	-	VER11	VER7
5.21.2	VER12	-	VER11	VER7
5.21.1	VER12	-	VER11	VER7
5.21.0	VER12	-	VER11	VER7
5.20.1	VER11	-	VER10	VER6
5.20.0	VER11	-	VER10	VER6
5.19.3	VER10	-	VER8	VER4
5.19.2	VER10	-	VER8	VER4
5.19.1	VER10	-	VER8	VER4
5.19.0	VER10	-	VER8	VER4
5.18.1	VER8	-	VER7	VER3
5.18.0	VER8	-	VER7	VER3
5.17.0	-	-	-	-
5.16.0	VER1	-	-	-
5.15.2	VER1	-	-	-
5.15.1	VER1	-	-	-
5.15.0	VER1	-	-	-

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Table 8 – continued from previous page

Release	MXH930	MXH932	MXH94x	MXH95x
5.14.0	VER1	-	-	-

Table 9: PFX configuration file revisions for MXH91x

Release	MXH910	MXH912	MXH914 / MXH915	MXH916 / MXH917	MXH918 / MXH919
5.27.0	VER6	VER3	VER7	VER6	VER7
5.26.2	VER6	VER3	VER7	VER6	VER7
5.26.1	VER6	VER3	VER7	VER6	VER7
5.26.0	VER6	VER3	VER7	VER6	VER7
5.25.3	VER6	VER3	VER6	VER5	VER6
5.25.2	VER6	VER3	VER6	VER5	VER6
5.25.1	VER6	VER3	VER6	VER5	VER6
5.25.0	VER6	VER3	VER6	VER5	VER6
5.24.0	VER6	VER3	VER5	VER5	VER5
5.23.0	VER6	VER3	VER4	VER4	VER4
5.22.0	VER6	VER3	VER4	VER4	VER4
5.21.4	VER1	-	VER2	VER1	VER1
5.21.3	VER1	-	VER2	VER1	VER1
5.21.2	VER1	-	VER2	VER1	VER1
5.21.1	VER1	-	VER2	VER1	VER1
5.21.0	VER1	-	VER2	VER1	VER1

Table 10: PFX configuration file revisions for MXH99x

Release	MXH992
5.27.0	VER4
5.26.2	VER4
5.26.1	VER4
5.26.0	VER4
5.25.3	VER4
5.25.2	VER3
5.25.1	VER2
5.25.0	VER2

Table 11: PFX configuration file revisions for MXP90x, MXP92x

Release	MXP908	MXP909	MXP921	MXP924
5.27.0	VER5	VER5	VER1	VER9
5.26.2	VER5	VER5	VER1	VER9
5.26.1	VER5	VER5	VER1	VER9
5.26.0	VER5	VER5	VER1	VER9
5.25.3	VER5	VER5	-	VER9
5.25.2	VER5	VER5	-	VER9
5.25.1	VER5	VER5	-	VER9
5.25.0	VER5	VER5	-	VER9
5.24.0	VER5	VER4	-	VER9
5.23.0	VER4	VER4	-	VER9
5.22.0	VER3	-	-	VER8
5.21.4	VER3	-	-	VER7
5.21.3	VER3	-	-	VER7
5.21.2	VER3	-	-	VER7
5.21.1	VER3	-	-	VER7
5.21.0	VER3	-	-	VER7
5.20.1	VER3	-	-	VER7
5.20.0	VER3	-	-	VER7
5.19.3	-	-	-	VER6
5.19.2	-	-	-	VER6
5.19.1	-	-	-	VER6
5.19.0	-	-	-	VER6
5.18.1	-	-	-	VER2
5.18.0	-	-	-	VER2

Table 12: PFX configuration file revisions for MXC94x, MXC96x

Release	MXC948	MXC96x
5.27.0	VER9	VER5
5.26.2	VER9	VER5
5.26.1	VER9	VER5
5.26.0	VER9	VER5
5.25.3	VER9	VER4
5.25.2	VER9	VER4
5.25.1	VER9	VER3
5.25.0	VER9	VER3
5.24.0	VER9	VER2
5.23.0	VER9	VER2
5.22.0	VER9	VER1
5.21.4	VER8	VER1
5.21.3	VER8	VER1
5.21.2	VER8	VER1
5.21.1	VER8	VER1
5.21.0	VER8	VER1
5.20.1	VER7	VER1
5.20.0	VER6	VER1

Table 13: PFX configuration file revisions for MXH53x, MXH57x

Release	MXH530	MXH532	MXH57x
5.27.0	VER8	VER8	VER6
5.26.2	VER8	VER7	VER6
5.26.1	VER8	VER7	VER6
5.26.0	VER8	VER7	VER6
5.25.3	VER7	VER7	VER5
5.25.2	VER7	VER7	VER4
5.25.1	VER6	VER6	VER3
5.25.0	VER5	VER5	VER2
5.24.0	VER3	VER3	VER1
5.23.0	VER2	-	-

Table 14: PFX configuration file revisions for MXP50x, MXP52x

Release	MXP508	MXP509	MXP523	MXP526
5.27.0	VER2	VER2	VER1	VER3
5.26.2	VER1	VER1	VER1	VER3
5.26.1	VER1	VER1	VER1	VER3
5.26.0	VER1	VER1	VER1	VER3
5.25.3	VER1	VER1	VER1	VER3
5.25.2	-	-	VER1	VER3
5.25.1	-	-	VER1	VER2
5.25.0	-	-	VER1	VER2
5.24.0	-	-	-	VER1

Table 15: PFX configuration file revisions for MXB5xx

Release	MXB585
5.27.0	VER2
5.26.2	VER2
5.26.1	VER2
5.26.0	VER2
5.25.3	VER2
5.25.2	VER2
5.25.1	VER2

Support for OEM Hardware

This version of Dolphin eXpressWare has general support for the Microchip PFX Switchtec PCIe 3.0, PCIe 4.0 and PCIe 5.0 chipsets in various configurations and topologies. Please contact Dolphin for details and licensing information if you would like to run eXpressWare on your own hardware.

If you already are running eXpressWare on non-Dolphin hardware, please contact your hardware vendor for additional information on how to upgrade your software.

General eXpressWare Defaults and Settings for MX

eXpressWare is tuned for general use and operations. In some cases, you need to tune some parameters to optimize resources for our use case.

SISCI Multicast

- **Default setting**: 4 groups, 2 Megabyte per segment
- **Max setting**: 16 groups, 128 Gigabyte per segment

Please consult the "Dolphin eXpressWare Installation and Reference Guide", section "Managing PCIe and eXpressWare Resources" for information on how to tune eXpressWare parameters.

Known Limitations

Support for 3rd, 4th, 5th and 6th gen Intel Xeon Scalable processors

Intel Xeon Scalable 3rd (Ice Lake), 4th (Sapphire Rapids) and 5th generation (Emerald Rapids) processors are mostly supported in back-to-back configurations.

Intel Xeon Scalable 6th generation (Granite Rapids) processors are partially supported in back-to-back configurations. These processors are currently not supported in any switch configurations. Please contact Dolphin for more information.

SmartIO is not yet supported on 3rd, 4th, 5th or 6th gen Intel Xeon Scalable processors

Certain configurations of Intel Xeon Scalable 3rd, 4th, 5th and 6th gen processors require special configurations. Please contact Dolphin support at https://www.dolphinics.com/csp if you plan to use Intel Xeon Scalable 3rd, 4th, 5th and 6th gen processors in the following ways:

- You plan on connecting more than six Intel Xeon Scalable processors to a **MXS824** or **MXS924** switch in x8 or x4 mode
- You plan on using any of the following Intel Xeon Scalable 3rd, 4th and 5th gen Xeon Platinum processors in x8 or x4 mode
  - Intel Xeon Platinum 8380
  - Intel Xeon Platinum 84xx
  - Intel Xeon Platinum 85xx

4 Change log for Linux Software

Description of content: Clustering package for Linux.

Release category: GA.

Target audience: Production systems.

Current status: Available for download from https://www.dolphinics.com/mx

> **Note**
>
> See the *Known Limitations* section about support for Intel Xeon Scalable 3rd (Ice Lake), 4th (Sapphire Rapids), 5th (Emerald Rapids) and 6th (Granite Rapids) generation processors if you plan to use any of these.

New in DIS Release 5.27.0 (Oct 22 2026)

Benchmarks

- (#8841) Added `-size` parameter to `sisci_benchmarks.sh`, defaults to 1 MiB for PIO, 8 MiB for DMA

Firmware

- (#8408) MXH992: Added a daisy chain PFX config, `MXH992_MULTICONF_DAISYCHAIN.fwimg`
- (#8408) MXH992: Released PFX config VER4. x16 configs now run at Gen4 speed
- (#8528) MXH95x: Updated firmware, adds hot-add support (Microchip MR6)
- (#8529) MXH94x: Updated firmware with hot-add support
- (#8703) MXH914: Released PFX config VER7
- (#8703) MXH916: Released PFX config VER6
- (#8703) MXH918: Released PFX config VER7
- (#8725) MXP526: Fixed TWI setting and GAS accesses in PFX configuration file
- (#8726) Updated configuration files for MXP526
- (#8727) MXP508, MXP509: Released PFX config VER2, with the unused TWI2 to TWI5 interfaces disabled
- (#8758) MXH930, MXH940, MXH950: Windows hot-add x16 configs use a 64MB non-prefetchable synthetic endpoint BAR again

- (#8759) MXH932: Released PFX config VER16, with a corrected MCU configuration
- (#8771) Updated NXP firmware to emmentaler v3.12 for MXH53x, MXH57x, MXP50x, MXP523, MXP526, MXP908, MXP909, MXP921, MXP924 and MXC96x
- (#8851) Updated configuration files for MXB585
- (#8852) Updated configuration files for MXH530
- (#8852) Updated configuration files for MXH532
- (#8854) Updated configuration files for MXH570
- (#8854) Updated configuration files for MXH572

General

- (#8494) The driver now logs a warning, not a note, when it can't preallocate the requested `ntb_memory_preallocation_size_mb`, and prints both the allocated and the requested size
- (#8665) Added option to specify which adapter card to upgrade with `upgrade_eeprom` script
- (#8710) Fixed `dis_firmwaretool pfx -M` resetting the wrong link on Gen5 MXH adapters
- (#8710) Fixed `dis_firmwaretool stm` and `eeprom` commands failing with "invalid serial provided"
- (#8710) Fixed `upgrade_eeprom.sh --smartio` for adapters behind an NTB link
- (#8710) Fixed adapter detection in `upgrade_eeprom.sh` when the driver is not loaded
- (#8730) Fixed detection of Stamford evaluation board in `dis_firmwaretool` utility
- (#8749) Reduced the default value of the `ntb_lut2_switch_max_entries` configuration option from 12 to 4
- (#8775) Fixed sporadic IOMMU faults caused by MRPC DMA
- (#8776) Added standard driver support for MXS924 x8 60-node CASCADE configs
- (#8785) Improved 60-node CASCADE configs for MXS824
- (#8814) Added optional port argument to `dis_firmwaretool pfx -e` to select the ChipLink telnet server port (default 4242)
- (#8814) Fixed `dis_firmwaretool pfx -e` exiting with status 0 when the telnet server failed to start
- (#8828) Fixed `dis_diag` not showing cable info for all cables

Installer

- (#8782) Added `--list-precompiled` to the installer, showing which precompiled libraries a package contains
- (#8782) Added `--with-precompiled` to the installer, to override which precompiled libraries are used (only for installers carrying several sets of precompiled binaries)
- (#8782) The installation log now records which precompiled libraries were chosen and why
- (#8787) Ubuntu 20.04, 22.04 and 24.04 installers now support the matching HWE kernels (no longer separate HWE installers)
- (#8859) Fixed the installer failing to build packages with `--secure-boot` when SmartIO is enabled
- (#8870) Fixed `--install-all` leaving cluster nodes other than the installing node on node ID 4 until rebooted

Platform support

- (#8590) Added support for Linux kernel 7.1
- (#8611) Improved the automatic detection of PIO requester IDs on Intel Xeon 6 Granite Rapids, including systems with more than one socket. Granite Rapids support is still experimental

- (#8651) Added support for Linux kernel 7.2

SISCI

- (#8825) Fixed PIO write performance regression for transfers of 32 KiB and larger on AMD EPYC 7003 when using the AVX2 copy function

SmartIO

- (#7683) Added iommufd/vIOMMU support for virtualization
- (#8311) Made `smartio_tool enable-p2p` "lazy", such that it can be run any time, and will set up the p2p mappings once the devices are borrowed
- (#8356) Fixed MSI setup on borrowed devices, for devices that support MSI-X. Seen as nouveau load issues on borrowed NVIDIA GPUs
- (#8356) Fixed borrowed devices getting uninitialized memory from `dma_alloc_coherent()` when the IOMMU is enabled on the borrower. Seen as `nouveau` failing to start GSP on borrowed NVIDIA GPUs
- (#8356) MSI-X is now only enabled on a lent device while a borrower uses it. Fixes missing interrupts for borrower drivers that use MSI on devices that also support MSI-X, e.g. nouveau on borrowed NVIDIA GPUs
- (#8671) Added `--iommufd` option to `smartio_tool enable-pt`
- (#8701) Disabled bare-metal borrowing while device is enabled for passthrough
- (#8710) Fixed `smartio_tool filter` printing lspci errors when no remote devices are present
- (#8740) Changed automatic DMA window calculation to consider the largest free LUT range instead of total free LUTs
- (#8757) Fixed issue where DMA mapping / unmapping counters could underflow
- (#8837) Returning a borrowed device now tears down its PCIe p2p mappings, so the lender no longer has to force unexport the device's BARs

SuperSockets

- (#8866) Fixed SuperSockets latency and throughput dropping by up to 2x in one direction when the driver was loaded while the CPU ran at a reduced clock (e.g. the schedutil or ondemand governor at boot). The slowdown lasted until the driver was reloaded

Changes in Previous Releases

DIS Release 5.26.2 (Oct 7 2026)

Benchmarks

- (#8777) Added `-bidir` flag to `dma_bench`

General

- (#8716) Fixed issue where setting required link width = 2 in dishosts.conf would cause the dishosts parser to fail
- (#8794) `dis_nodemgr` will retry initial adapter configuration for up to 120 seconds if it fails to find / resolve the host's hostname

Installer

- (#8745) Installers now use `makeself` version 2.7.1
- (#8769) Installers are now xz-compressed and require `xz` on the target
- (#8773) Added both pre- and post-stack-guard compatible binaries into the el10 installer

SuperSockets

- (#8554) Fixed kernel warning "Unpatched return thunk in use" on SuperSockets kernel module loads

DIS Release 5.26.1 (Sep 14 2026)

General

- (#8134) Added additional resource usage information to dis_diag and dis_tool
- (#8669) Fix issue where kernel module version / revision is wrong in some kernel messages

SISCI

- (#8732) Fixed an issue that could prevent the creation of more than one private SISCI segment

SmartIO

- (#8609) Fixed kernel WARN when returning a borrowed device on RHEL10, RHEL9 and Ubuntu 26.04 (not all systems affected)
- (#8663) Fix issue where SmartIO p2p mappings would not be recovered after a link reset
- (#8667) Fix null pointer dereference when borrowing device with IOMMU disabled
- (#8678) Add full device path to `smartio_tool vfio-handle`
- (#8697) Fix issue where a device return with eager IOVA management dereferences a null pointer
- (#8741) Fix issue where borrowing a device and rebooting the borrower would cause lender LUT table fragmentation, causing the following borrow attempts to fail

DIS Release 5.26.0 (Aug 31 2026)

General

- (#8058) Fix mismatch between outbound mapping table entries and vdevs in single D-Switch topology
- (#8108) Support for overriding the default copy function in both kernel (IRM) and user-space (SISCI)
- (#8145) Updated `dishosts.conf` to a new format. Run `dis_mkconf -upgrade` to upgrade an old `dishosts.conf` to the new format
- (#8174) Improved support for MXS824 CASCADE configs
- (#8362) Improved support for customers using Xeon Scalable systems demanding more than 32 requester IDs for a single system
- (#8385) Exposed tunable DMA parameters in dis_mx.conf
- (#8491) Removed unused virtual device x:00.4 which showed up in lspci with IOMMU enabled
- (#8508) Added support for PXIe adapter MXP921
- (#8522) Added support for generating a default `dishosts.conf` file using `dis_mkconf -default`
- (#8528) Updated MXH950 PFX image with hot add, NTB larger BAR2 and incoming REF clk in TARGET mode
- (#8529) Converted MXH940 and MXH942 PFX config image VER13 to MR6
- (#8529) Extended the PFX configs options for MXH940 and MXH942 with 'Hot Add' configs and Target config using incoming REF clock
- (#8536) Fix improper use of the *command* parameter for PXISA_SystemModule_SMBusOperation
- (#8537) MXH992: Added support for GreenPAK firmware upgrade in upgrade_eeprom

- (#8563) Added support for MXC960 and MXC962
- (#8568) Use separate EEPROM/Config version information for MXC960-CC-1501
- (#8574) Release of MXP921 Gen4 PXIe adapter
- (#8585) Fixed reset handling of MXC960 in NTB mode
- (#8591) Fixed Dual D-Switch FP init collision
- (#8595) Improved the fiber tuning for MXH570 and MXH572
- (#8595) Updated PFX config to VER6 and NXP version to v3.10 for MXH570 and MXH572
- (#8611) Added preliminary support for certain CPUS in the Granite Rapids CPU line (experimental)
- (#8616) Added ipv6 support to `dis_firmwaretool` PFX Telnet server
- (#8625) Updated DIS software License
- (#8630) Detection of MXH94x and MXH95x adapters might fail. The driver module fails to load. How to fix: Contact Dolphin for information about SEEPROM production update
- (#8652) Updated all MXH5xx cards to use the latest v3.11 firmware release

Installer

- (#8557) Improve the proposed hostname when inputting the list of hosts in the cluster
- (#8658) Fix issue where the installer script would exit when selecting a proposed hostname

Platform support

- (#8401) Add support for Linux kernel v7.0
- (#8401) Add support for Ubuntu 26.04
- (#8504) Removed support for Linux kernel version 2.x.x
- (#8531) Removed support for Centos 6
- (#8607) Removed support for Linux kernel versions < 3.10

SISCI

- (#7724) Fixed regression introduced in 5.19.0 to improve SCICheckSequence latency
- (#8284) Added interactive_sisci as an example program
- (#8638) Added -fixed switch to scipp to drive only one block size

SmartIO

- (#8059) Add SmartIO virtualization support for kernel 6.8
- (#8214) Add DMA statistics to procfs, found under `/proc/smartio/remote/devices/<fdid>/dma/*`
- (#8214) Improve the performance of DMA buffer allocations with IOMMU
- (#8234) Added initial support for borrowing Xilinx FPGAs
- (#8300) Add option to `smartio_tool borrow` to force the borrowed device to have a given PCI function
- (#8424) Enable virtualization support by default
- (#8473) Devices are now reset when returned to clear any faulty state
- (#8473) Receive and handle AER events from lent devices
- (#8473) Treat completion timeout, unexpected completion and completer abort non-fatal error on borrowed devices as these error may occur on NTB link down and should not be treated as fatal error on the lender

- (#8476) Resolve issue with devices and systems with ATS support
- (#8524) Fix a bug where in switch topologies borrowing many devices could cause a crash
- (#8538) Add tracking and querying for peak DMA usage for borrowed devices
- (#8539) Unmap stale IOVA entries on cores with low I/O activity
- (#8551) `smartio_tool` connect now prints error messages if connection cannot be established
- (#8555) Improve error recovery for NVIDIA GPUs
- (#8555) Resolve crash that could occur if link went down while a device was borrowed
- (#8559) Fix memory leaks related to lazy IOVA management
- (#8569) Fix a race condition related to MSI-X interrupts on the lender
- (#8570) Fix issue where `smartio_tool enable-p2p` was not working for some backported kernels related to `struct dma_ops`
- (#8571) Fix issue where running `smartio_tool unavailable` on a local device could return a borrowed device with the same remote BDF
- (#8576) Fix issue where a link reset would cause devices borrowed with SmartIO to disappear from NTB mapping tables
- (#8580) Support arbitrary memory sizes with QEMU's q35 architecture
- (#8584) Set the IOVA management policy to the IOMMU domain default. The user may override this from procfs
- (#8588) Fix a bug where a device would wrongly report that DMA is unsupported
- (#8641) Add functionality to smartio_tool for tracking max DMA usage and dumping DMA statistics
- (#8649) Fixed a bug where a failed borrow by a VM would leave resources leaked
- (#8656) Add `smartio_tool enable-pt <deviceid>` and `smartio_tool disable-pt <deviceid>` to easily manage mdev devices
- (#8656) Add `smartio_tool vfio-handle <deviceid>` to get VFIO handle for a device

DIS Release 5.25.3 (Jun 05 2026)

General

- (#8189) Added initial support for MXP508 and MXP509
- (#8224) Improved debugging capabilities
- (#8440) MXH572: Added config for cable side 4x4 (config 21)
- (#8456) Fixed MPS adjustment in DMA driver
- (#8466) Improved BMC logging capabilities on the following adapters (requires bmc update): MXH57x MXH53x MXP52x, MXP92x, MXP90x
- (#8501) Fixed issue where `dis_config` in rare cases would trigger an array access out of bounds in the IRM
- (#8519) Solves `upgrade_eeprom.sh` stability when having multiple adapters

Installer

- (#8493) Fix libdir path for la files. Use DESTDIR for make install to specify temporary install path, rather than –prefix for configure

MXP926

- (#8466) Fixed an issue where the cable link could go down sporadically in specific systems

SmartIO

- (#7582) Fixed an incorrect check if the device is already borrowed in local borrow case
- (#7582) Smartio_tool available checks if the device is already available or borrowed
- (#7818) Add support for MSI-X interrupts for devices that occupy all bar registers
- (#8409) Fix issue where borrowing multiple devices with IOMMU enabled would fail on RHEL 9 kernels
- (#8499) Fix "Failed to determine NVIDIA device minor" when running smartio_tool available on an NVIDIA GPU VF
- (#8500) Improve emulation of BAR registers for borrowed devices
- (#8500) Resolve "This PCI I/O region assigned to your NVIDIA device is invalid" for NVIDIA SR-IOV VFs

SuperSockets

- (#8002) Fixed issue where Userspace SuperSockets (`dis_ssocks_run -u`) would fail with a segmentation fault
- (#8453) Add a tunable concurrency cap for connection threads
- (#8492) Allow tuning mbox count in config file

DIS Release 5.25.2 (Apr 24 2026)

General

- (#8411) MXH57x: Fixed error messages from the IRM driver reading cable ports out of range: `MXH Cable info failed: 0x3`

Platform support

- (#8305) Add support for Linux kernel v6.19

SISCI

- (#8365) Reduce CPU usage of server node in `reflective_write` example
- (#8375) Fix edge cases in AVX2 copy function
- (#8378) Reduce CPU usage of server node in `reflective_bench` and `reflective_dma_bench` benchmarks

SmartIO

- (#8302) Solves issue where a disconnected lender results in IOMMU faults on borrower
- (#8353) Fix issue where `smartio_tool list` would show an NT-Transp device incorrectly as `in use, lender disconnected`
- (#8357) Give warnings from `smartio_tool` if GPU is active while trying to return

SuperSockets

- (#8379) Fix bug that caused config files `/etc/dis/supersockets_*.conf` to not be loaded
- (#8389) Add support for accept4(), type flags in socket(), SO_REUSEPORT (partial)
- (#8419) Fix segfault when `epoll_ctl()` is called with `event=NULL`

dis_diag

- (#8344) Implement proper CSR value printout fix
- (#8373) MXH57x: Fixed an issue where the CDFP cable temperature could get stuck

DIS Release 5.25.1 (Mar 6 2026)

Arm64

- (#8263) Add installation of 12-2 cuda toolkit for Jetson 36.3

General

- (#7617) Fixed problem with DMA pull failing between some nodes in Dual D-Switch topology
- (#7617) Fixed problems with interference of nodes in Dual D-Switch topology
- (#8133) Added initial MXS924 configs for Dual D-Switch topology. See MXS924_eeprom_versions.txt for details
- (#8274) `dis_diag` now correctly prints the root port's BDF
- (#8288) Extended PFX configuration image for MXB585
- (#8289) Added support for MXH570-B and MXH572-B Revision
- (#8291) Fixed NTB 3-nodes, 4-nodes and 5-nodes topology for MXH530. Firmware PFX configuration version 6 required
- (#8291) Release of PFX config, VER6 for MXH530 and MXH532
- (#8293) Added support for upgrading the firmware on the MXB585 ebox with upgrade_eeprom script
- (#8298) Fixed updating the serial number for MXH910 and MXH912 adapters with dis_firmwaretool
- (#8302) Virtual PCIe devices are cleaned up when remote node is lost
- (#8329) Fix issue where the build date for certain programs on RPM-based systems would show `Jan 28 2008`
- (#8342) Fixed CSR value printouts

Installer

- (#8266) Fix warning in installer output: 'grep: warning: stray \ before white space'

Platform support

- (#8258) Add support for Debian 13
- (#8285) Add support for Redhawk 9.6

SISCI

- (#8207) SCICreateMapSequence returns error when used on map of local segment
- (#8280) Improved performance for `memcpy_nt_avx2`
- (#8341) Fix arithmetic overflow inside SISCI testlib, on systems where CPU frequency is 4GHz+

SmartIO

- (#8172) Fix issue where `smartio_tool unavailable` does not make devices unavailable
- (#8249) Fixed issue where CUDA programs would fail with the assertion `Assertion failed: 0 == (physAddr & (RM_PAGE_SIZE_HUGE - 1))`
- (#8301) Add information to `smartio_tool list` when session to borrower is disconnected
- (#8302) Add information to `smartio_tool list` when session to lender is disconnected
- (#8302) Fix some bugs related to lender rebooting while borrowed device is in use
- (#8303) Report DMA window size during borrow in a more consistent way

- (#8316) Fixed a bug where mapping table entries would not be properly cleaned up after repeated borrows and returns
- (#8325) `smartio_tool connect` now persists after a borrower is rebooted

DIS Release 5.25.0 (Jan 28 2026)

Arm

- (#7068) Fixed a cache-coherency issue with DMA transfers and user allocated memory on Nvidia AGX Orins
- (#7870) Added parsing of device tree and dump useful info in dmesg
- (#7872) Improved handling of MSI interrupt addresses on ARM
- (#7873) Added initial support for LX2160 (with iommu disabled)

Benchmarks

- (#7882) Adds check for div by zero when walltime is used for dma_bench or scibench
- (#7997) Creates a benchmark analogous to `reflective_bench` but which uses DMA for sending
- (#8063) `dma_bench` regression fixed so `-veclen` parameter can be used again
- (#8075) Added `-vl` argument to `reflective_dma_bench` which can be used to increase DMA transfer vector length
- (#8094) The `sisci_benchmarks.sh` script now also runs the vectorized version of `dma_bench`

Demos

- (#7851) Added performance demo, video transfer demo, and rfm wrapper to DIS example programs

General

- (#6713) Fixed issue in the downstream cable port for MXC962
- (#6980) Fixed doorbell performance spikes by removing an unneeded loopback doorbell
- (#7317) The configuration files of DIS hosts no longer supports 'STRIPE' and 'REDUNDANT' socket adapters. A socket adapter specified with this mode will be ignored
- (#7359) Fixed issue where `*_setup` scripts would not exit with an error code on failure
- (#7550) Improved Dual D-Switch support: up to 15 hosts per switch, no power sequencing requirements
- (#7792) Added support for MXE expansion board MXB585
- (#7845) Improved stability with multi-socket Icelake configurations
- (#7887) Require that endpoint devices in same group as dolphin device is not attached by other drivers
- (#7891) Fixed problem with driver crash during dis_config for adapters with invalid hardware configurations
- (#7939) MXH530 and MXH532 PFX config release VER4
- (#7968) Fixed issue where `dis_services stop` would fail if there is no adapter installed in the system
- (#7977) Fixed a bug where a node would end up in a livelock with no session, spamming `getAliveCnt - mbxMsgQ_localHeader == NULL` to the kernel buffer
- (#7981) Improved error handling in dis_firmwaretool
- (#7982) Added driver support for MXP523
- (#8003) Added MXS924 DSWITCH configuration files with 2 DSPs

- (#8026) Fix issue where old versions of the `dis_intel_dma` kernel module would be loaded, even if the driver is not compiled with `--enable-intel-dma`
- (#8027) Fixed a bug where multicast would fail when IOMMU is enabled and the system contains a transparent adapter
- (#8029) Improve the virtual dip solution and add support for non-config virtual dips
- (#8031) Vastly improved PIO performance for the Zen3 architecture
- (#8042) Added DUAL NTB Switch support for MXS924
- (#8052) Added flag `--skip-distro-check` to eXpressWare installers
- (#8065) Added support for MXH992
- (#8083) Converted firmware to MR3 for MXH530 and MXH532. Version 5
- (#8084) Converted MXH570 and MXH572 VER2 to PFX MR3
- (#8085) Converted MXP526 to MR3
- (#8121) Released NXP firmware 3.6 and PFX configuration image VER5 for MXH530 and MXH532
- (#8122) Release of MXH570-AA and MXH572-AA with PFX configuration VER2
- (#8156) Improved the detection of adapter types in dis_firmwaretool
- (#8162) Performance enhancements for SuperSockets
- (#8173) Fixed bug in MXS824 NTB DUAL configs that prevented version 10 of the configs from working
- (#8175) Resolved potential crash when mapping table is exhausted
- (#8203) `dis_intel_dma` is now enabled by default if the driver is built with the flag `--enable-intel-dma`
- (#8221) Adds support for SFF-86xx AOC voltage readout
- (#8221) Fixed bug where SFF-86xx temperature could be wrong in dis_diag
- (#8222) Fixed serial numbers printouts in dis_firmwaretool for adapters with custom serial numbers

Platform support

- (#7790) Added support for Linux kernel 6.16
- (#8001) Added proper support for Linux kernel 6.15
- (#8182) Added support for Debian 12
- (#8182) Added support for Linux kernel 6.17
- (#8182) Added support for Linux kernel 6.18

SISCI

- (#7336) Multi-threading is now required to compile eXpressWare
- (#7501) Add “gpudirect” SISCI example using CUDA
- (#7879) Fixed off by one error in reflective_bench
- (#8001) Fix issue where SISCI would fail to load kernel modules for Linux kernel >= 6.15
- (#8044) `_REENTRANT` no longer has to be defined for SISCI-features that require multi-threading
- (#8230) Fixed a bug in `SCICreateDeviceSegment` where it would fail if called with either of the flags `SCI_FLAG_LOCAL_ONLY` or `SCI_FLAG_DEVICE_SIDE_ONLY`

SmartIO

- (#7522) Improved default DMA window size
- (#7547) Add `disable-p2p` command to `smartio_tool`. Mappings set up by `enable-p2p` are now properly cleaned up
- (#7597) Add experimental support for virtualization. See SmartIO documentation for more details
- (#7616) Fix issue where borrowed GPUs would fail to initialize CUDA with nivida-drivers >= 575
- (#7823) Fixed a small memory leak on initialization
- (#7877) Allow local borrow of other devices in an IOMMU group when a device in that group is already locally borrowed
- (#7911) Add virtualization support for Linux kernel 5.15-5.19. See the SmartIO documentation for details
- (#7941) Identified issue with AMD EPYC lenders. See the SmartIO documentation for details
- (#7953) Fix regression where `smartio_tool enable-p2p` would fail for two remote devices located in the same lender
- (#7984) Added support for Device Lending on Linux kernels >= v6.12
- (#7998) Fixed issue borrowing SR-IOV virtual functions
- (#8113) Add support for a proposed Linux patch regarding AMD EPYC lenders
- (#8175) Resolved issue with NT-Transparent causing repeated borrow/return to fail
- (#8186) Fixed an issue where two lenders borrowing each others' devices would fail with IOMMU disabled
- (#8208) Fixes bug where smartio_tool does not properly blacklist MX memory controller
- (#8226) Fixed issue with automatic DMA windows size calculation with NT-Transparent

SuperSockets

- (#7350) Systemd unit file for dis_supersocket.service changed to make it start after dis_nodemgr.service
- (#7629) Sockperf: 1 second walltime is standard measurement
- (#7629) Sockperf: Improved explanation of measurement options
- (#7878) Fixed issue where SuperSockets failed to build on RHEL/centos 10
- (#7980) Add a -size flag to network_benchmarks.sh
- (#8005) Added UDP mode to Network Benchmarks
- (#8005) Improved usability for network_benchmarks.sh
- (#8009) Fixed a memory leak related to the usage of DMA channels
- (#8071) Improvements to network_benchmarks.sh
- (#8114) Solved issue with dis_ssocks_diag that could cause segfaults on newer kernels

dis_diag

- (#7636) MXH570/MXH572: Added support in dis_diag for reading temperature, voltage, max power consumption and other cable info from CDFP cables
- (#7817) New json output when `-json` option is used
- (#7893) dis_diag output reorganized to print info per adapter
- (#8123) Make the report of the upstream link more generic in dis_diag

DIS Release 5.24.0 (Sep 17 2025)

BMC

- (#7830) Added support for the MXP526
- (#7830) Improved support for MXC products
- (#7830) Power on upstream power_enable is now implemented. Can be turned on with dip 3 on dip-switch bank 2
- (#7830) Updated BMC firmware for MXH530 and for all MXC and MXP products

Benchmarks

- (#7644) Added `-wt` (walltime) option for `dma_bench` and `scibench2`
- (#7801) Added warmup loops to `scibench2`, `dma_bench` and `dma_user_bench`
- (#7801) Fixed potential sending of too large sizes for `scibench` if offset is used
- (#7801) Made usage text more consistent for `scibench2` and `dma_bench`

General

- (#7164) Added support for MXC960
- (#7164) Added support for MXC961 (NTB version)
- (#7164) Added support for MXC962
- (#7164) Release of PFX config VER2 for MXC960 and MXC962
- (#7387) Extended internal bitmap from 64 to 256 bits to accommodate larger cluster topologies. Fixes potential bug in large architectures
- (#7402) Added support for Stamford PFX Gen4 chip MVH103. Microchip EVB-PCI1003 Stamford Evaluation board
- (#7446) Fixed reset option for MXS924, Port 5 in DSWITCH mode
- (#7468) Added support for PXIe Gen5 MXP526 adapter
- (#7468) Fixed patch table entries for MXP526
- (#7515) Added support for reading fan information (rpm, duty cycle) of MXH530 with dis_diag (under adapter status)
- (#7518) Added option to configure processor I/O requester IDs manually in the configuration files. Particularly useful for heterogenous Intel Xeon Scalable clusters
- (#7526) Fixed bug in example_to_json script
- (#7536) Check that any linux NTB drivers (e.g. switchtec for MX) are stopped before starting driver
- (#7552) Removed NXP bootloader for adapters with NXP version > Ver3.0
- (#7569) Fix installer counting the wrong number of adapters
- (#7572) Improved the IRM error handling in case a critical chip error occur. Avoid any session IOCTLs before the driver is properly initialized
- (#7581) Fixed a bug where dis_services would yield undefined behavior in some environments
- (#7586) Converted MXH930 to MR6
- (#7586) Increased the Link BAR2 from 1TB to 64TB
- (#7593) Fixed issue with make commands not always using the correct compiler if –host supplied

- (#7608) Converted MXH530 to MR2
- (#7608) Fixed GPIO 32 REFCLK_OE (from low to high) for TARGET config 4, 5 and 6
- (#7608) MXH530 and MXH532 PFX configuration VER3 release, September 2nd, 2025
- (#7609) Fixed clock GPIO setting in configuration
- (#7609) Split MXH530 and MXH532 PFX configuration images and firmware
- (#7609) Updated upgrade_eeprom.sh and upgrade_eeprom.ps1 scripts after splitting MXH530 and MXH532
- (#7636) Added support for MXH570 and MXH572
- (#7654) Disabled DMA poll thread for MX on Linux and VxWorks as default
- (#7703) Updated configuration image for MXH916 to VER5. Fixes PCIe connections for all link ports
- (#7707) Added NTB support for MXH914, MXH916 and MXH918
- (#7718) General connectivity fix for multi direct topology with different MXH5xx and MXH9xx adapter types
- (#7719) Updated configuration file for MXH918 to VER5 with MR6
- (#7721) MXH914 - MXH919 config release VER5, August 20th 2025
- (#7721) MXH914: VER5 MR6 configuration with 64TB link BAR2
- (#7723) Avoid unnecessary load of PFX CPU when doing sequence checks
- (#7726) Removed use of deprecated kernel function `flush_scheduled_work()`. Fixes kernel warning when stopping driver on kernels >= 5.19
- (#7752) Added driver support for combined NTB and TRANSP configuration for MXH930 adapters
- (#7763) Release of PFX configuration image VER5 for MXP908 and MXP909
- (#7764) Fixed bug where dis_diag reports incorrect cable capabilities when using PCIE5 cables
- (#7771) Updated NXP version to v3.4-rc13.bin to fix the fan control
- (#7777) Added dis_firmwaretool support for MVH126
- (#7781) Fixed a bug where DMA read operations would sometimes fail in clusters with Gen4 adapters connected by a Gen3 switch
- (#7784) Stop building and loading `dis_intel_dma` kernel module by default
- (#7786) Added support for MXC960 and MXC962
- (#7786) Improvements to the MXC960 D-SWITCH config
- (#7800) Added TARGET x2x2x2x2x2x2x2x2 (edge) in config 15 for MXH830
- (#7808) Added support for connecting different adapter types by an NTB switch
- (#7811) Added support for newer Jetson releases (Tested with 36.3)
- (#7831) Fix installer bug related to shell output redirection

Platform support

- (#7451) Added support for Linux kernel 6.13
- (#7507) Dropped support for Debian 7
- (#7507) Dropped support for Ubuntu 14.04
- (#7556) Added support for debian9-rt and debian10-rt
- (#7588) Added support for GCC 15

- (#7679) Added support for Rocky Linux / RHEL 10
- (#7686) Added support for kernel 6.15
- (#7768) Added support for Concurrent RedHawk 9.2

SISCI

- (#6917) Added documentation for DIS_BROADCAST_NODEID_GROUP_ALL constant for SCIConnectSegment
- (#7558) Return code fixes for SCIQuery
- (#7578) Fixed issue where requester ID added to adapter was not added to NTB switch table
- (#7591) Simplified SISCI API header file

SmartIO

- (#6092) Fixed issue with borrowing multiple NVIDIA GPUs
- (#6451) Support Device lending of devices in the same IOMMU group as the Dolphin NTB adapter
- (#7044) Add support for device lending NVIDIA 5000-series / Blackwell GPUs
- (#7044) Fixed issue with borrowing the Physical Function (PF) of an SR-IOV device. "Failed to export bar7: 22"
- (#7231) Added experimental support for peer-to-peer between borrowed- and local devices. Users of this experimental feature should be aware that P2P mappings set up with `smartio_tool enable-p2p` are not properly cleaned up until all dolphin drivers are restarted
- (#7295) Fixed issue with NVIDIA GPUs and "Can't find an IRQ for your NVIDIA card!"
- (#7394) Fixed assertion failure when disabling interrupts on some devices
- (#7394) Fixed issue where lspci showed <broken chain> for borrowed devices
- (#7452) Added initial support for hot-add on Tegra platforms
- (#7485) SmartIO now works on Linux kernels >= 5.19 when IOMMU is enabled
- (#7530) Support drivers that use dma_alloc_pages including `xhci_hcd`
- (#7542) Fixed a bug that could cause interrupts to be missed on some systems
- (#7553) Fixed bug that allowed users to lend out boot VGA devices
- (#7559) Added support for borrowing local devices
- (#7628) Fixed issue where the MPS was incorrectly downgraded after borrowing a device, causing a fatal AER error
- (#7727) Added –force option to smartio_tool available
- (#7762) Added initial support for device lending on Tegra platforms
- (#7811) Added initial support for Hot-add and Device lending on Orin platform
- (#7815) Add support for NVIDIA A100 and NVIDIA RTX 4500 PRO Blackwell
- (#7815) Add support for modern GPUs where all BAR regions are occupied

SuperSockets

- (#7645) Supersocket fix for kernel versions 6.0 and higher, fixes crash that occurred when incorrectly interpreting user memory as kernel memory

DIS Release 5.23.0 (Jan 30 2025)

General

- Added driver support for MXS924 cascade
- Added support for Gen 5 adapter MXH530 in the driver and tools
- Added support for MXC960
- Added support for license file
- Bug fix: Driver configuration now correctly exits if IOMMU initialization fails
- Bug fix: Fix issue with MXP924 reporting “Hot Plug Capability”
- Bug fix: IOMMU now works as expected on kernels >= 6.3

Improved dis_diag

- Bug fix: Fixed info readout for all firefly adapters
- Bug fix: No longer prints invalid temperature

Improved dis_nodemgr

- Unresolvable hosts are skipped and no longer stop cluster configuration

Improved dis_services

- Bug fix: dis_services now properly handles services that end up in a failure state

Improved installer

- Better error messages are printed if something goes wrong
- Bug fix: No longer loops if the –batch option is passed when no configuration file is present

SISCI

- Added interrupt support for SISCI SmartIO
- Bug fix: Fix for SCIStartDMATransferMem deadlock
- Enabled possibility for non-zero offset when calling SCIMapRemoteSegment for multicast segments

SmartIO

- Added interrupt support for SISCI SmartIO
- Added support for RHEL9-based Linux distributions
- Bug fix: Match hexadecimal BDF
- Fixed regression for devices with IO BARs
- Improved smartio_tool
- Improved support for device lending of GPUs
- Now makes all devices in the same IOMMU group available when a device in the group is made available
- Prevent adding devices upstream from a Dolphin device

DIS Release 5.22.0 (Sep 2 2024)

General

- Added support for Centos 9 and Centos 9 RT
- Added support for Intel Xeon Scalable 5th gen (“Emerald Rapids”)
- Added support for Linux kernel 6.8
- Added support for Ubuntu 22.04 HWE
- Added support for Ubuntu 24.04
- Added support for pre-retbleed Centos 7
- Added support for sanitization in upgrade-eeprom
- Improved dis_status script, now retrieves more information
- MXH91x: Applied newest Microchip patch to resolve boot issues in certain systems
- MXS824: New firmware version 10
- MXS924: New firmware version 5
- SmartIO: Increased default maximum read request size

Improved dis_diag

- Added support for json-output
- Added support for showing root port link capabilities
- Improved link error detection
- Improved reporting for central PFX switch being reset
- Now shows temperature information for Firefly
- Throttling events are now separated into relevant categories

Improved dis_firmwaretool

- Added support for virtual configurations
- Various bugfixes

Improved dis_networkmanager

- Added support for limiting maximum log file size
- Fixed CPU usage issue related to large log file sizes

Improved installer

- Bugfix in transparent configurations for Rocky 8
- Various bugfixes

Improved support for Intel Xeon Scalable 3rd

- Added support for requester ID scaling with different NUMA node configurations
- Added support for requester ID scaling with hyperthreading disabled
- Requester IDs for the CPU and link are now determined dynamically by the NTB driver

MXP924: Upgraded to NXP version 3.2

- Added support for 4x4 configuration

DIS Release 5.21.4 (Mar 15 2024)

General

- Driver now recalibrates to support both older and newest MXS824 and MXS924 switch configurations

DIS Release 5.21.3 (Dec 8 2023)

General

- Improved device detection for MX adapters

DIS Release 5.21.2 (Nov 2 2023)

General

- Identical to 5.21.1 for Linux

DIS Release 5.21.1 (Oct 6 2023)

General

- Added support for all Intel Xeon Ice Lake and Sapphire Rapids Bronze and Silver CPUs
- Added support for all Intel Xeon Ice Lake and Sapphire Rapids Gold and Platinum CPUs with up to two sockets, three UPI links and 36 cores

DIS Release 5.21.0 (May 24 2023)

EEPROM firmware version updates

- Added 128GB NTB configuration
- Added 64GB NTB configuration
- Extended the requester ids table for Ice Lake and Sapphire Rapids
- MXH930 updated to VER12
- MXH940-C updated to VER11
- MXH950-C updated to VER7

General

- Added configurations for adapter DSWITCH topology for MXH930, MXH940 and MXH950
- Added preliminary support for Intel Ice Lake and Sapphire Rapids Xeon CPUs in DIRECT topology. Limited support for MXS824/MXS924 switches
- Added support for AGX ORIN
- Added support for Linux kernel 5.19
- Added support for Linux kernel 6.0
- Added support for MXH833 in dis_firmwaretool
- Added support for MXH910 and MXH912 adapter with IPASS connector
- Added support for MXH914, MXH915, MXH916, MXH917, MXH918 and MXH919
- Added support for Secure Boot
- Fixed ‘cache line size’ detection in NT-Transparent topology

- Fixed MSI-X support regression for device lending on newer kernels (4.15 and earlier)
- Fixed installer issue for Fedora related to broken RUNPATH
- Fixed installer issue related to Cuda support on RHEL7
- Fixed x86 Spectre Mitigation V2-2 breaking compilation for Centos/Ubuntu/Debian with symbol __x86_return_thunk. This will affect all RHEL7 before kernel-3.10.0-1160.83.1 using installer built with a kernel-3.10.0-1160.83.1 or newer
- Improved Xavier/Ubuntu/Debian package platform-integration
- Improved installer functionality
- Improved session handling after re-plugging cables

MXS924

- Eeprom version updated to VER5
- Updated throttling values for DSWITCH topology

SmartIO

- Fixed SmartIO showing "Illegal Vendor ID" 0xFF for virtual functions
- Fixed kernel warning 'proc_dir_entry already registered'

DIS Release 5.20.1 (Sep 12 2022)

Bug fixes and improvements

- Fixed DISIP not working in D-Switch topology with transparent MX host card
- Fixed GUI tools regression with QString .arg() usage
- Fixed SuperSockets build_RPM failure with certain distros due to missing Module.symvers from GX
- Fixed an issue with cancelling callback threads that caused SISCI applications to deadlock
- Fixed dis_config reordering issue during configuration
- Fixed problem with SuperSockets getsockopt causing kernel error
- Fixed regressions from 5.20.0 causing crash during driver load or link reset on some systems

General

- Add support for IPv4-mapped IPv6 addresses in kernel SuperSockets
- Added 'make' package as required dependency
- Added support for -Os optimization level
- Added support for Ubuntu 22.04
- Added support in the upgrade_eeprom script to prevent an upgrade for customer specific adapters, e.g. (-0101-)
- Extended dis_diag with register information
- Improved platform integration for CentOS 8 and CentOS 9 (SELinux)
- Initial support for CentOS 9
- SmartIO: Added implementation of dma_mmap_coherent

DIS Release 5.20.0 (Jul 15 2022)

Added support for MXS924 switch topologies

- D-SWITCH
- NTB
- Transparent

Bug fixes and improvements

- Added TTY access mode to dis_firmwaretool
- Added handling of AER events for type GX_EVENT_LINK_RECEIVER_ERROR
- Added p2p_keeper in sysfs
- Created workaround to solve issue with IOMMU attachment for Linux 5.8
- Fixed GPIO reset pin assignment for MXH940 and MXH950 adapters for 2x8 NTB and 4x4 NTB configuration
- Fixed incorrect BDF being used for outbound DMA RID entry when P2P is not enabled in USP
- Fixed problem with "dis_firmwaretool pci:" not working with Linux 5.15
- Fixed problem with MPS exceeding device capabilities under rare conditions
- Fixed problem with STM firmware update and log dump not working for MXH83x adapters since release 5.19.1
- Fixed problem with dis_firmwaretool showing the wrong version for the running PFX IMG under certain conditions
- Fixed problem with module parameter ntb_mcast_alloc_groups not working as expected
- Fixed problem with shared segments not being unexported when removed.(SCIPrepareSegment failed with SCI_ERR_BUSY for multicast segments.)
- Fixed problem with traffic interruption to downstream devices when the driver is being loaded by preventing BME from being cleared
- Fixed problem with transparent MXS924 switch being erroneously detected as adapter
- Fixed problem with unbinding of DMA functions from plx_dma driver not working on Ubuntu
- Fixed regression with driver not loading properly on PowerPC
- Improved handling of memory allocation failures during driver startup
- Improved link status output for dis_diag
- Made changes to the installer to install QT5 for Ubuntu 20.04 and newer
- Made changes to the installer to install libgcc-s1 instead of libgcc1 for Debian 10 and newer
- RTSS: implement osif_kmem_get_contig2 on top of RtAllocateContiguousMemorySpecifyCache to improve large memory alignment and allocation
- RTSS: update build files to Visual Studio 2019
- Reinsert outbound DMA RID during link setup to avoid Gen4 DMA proxyid collision

General

- Add SW lock synchronize partition operations
- Add support for NXP 2.8 for MXH9xx, MXP9xx and MXC9xx adapters
- Added driver support for evaluation board from Microchip PM42100-KIT

- Added option "-userid" for example programs reflective_write and reflective_bench to allow multiple concurrent instances
- Added support for 12 port x8 in DSWITCH mode for MXS924
- Added support for 3-slot and 5-slot backplane configuration for MXH930, MXH94x, MXH95x
- Added support for Linux 5.16
- Added support for Linux 5.18
- Added support for MCU PFX config format version 2
- Added support for MVH222
- Added support for MVH242
- Added support for MXC960
- Added support for MXH330 adapter
- Added support for MXH330 in DIRECT topology
- Added support for MXH941, MXH943, MXH944, MXH945, MXH946, MXH947, MXH948 and MXH949
- Added support for MXH951, MXH953, MXH954, MXH955, MXH956, MXH957, MXH958 and MXH959
- Added support for MXP908 and MXP909
- Added support for dis_firmwaretool on the MXS924 switch
- Added support for proxy id changes in PFX Gen4 MR4 firmware release
- Changed the adapter serial number format from MXH9xx-AA-123456 to MXH9xx-AA-0001-123456
- Updated configuration files for MXH930, MXH94x, MXH95x to MR4
- dis_firmwaretool: Added option to patch IDEEPROM files

DIS Release 5.19.2 (Jan 7 2022)

General

- Added support for NT-only D-Switch ports
- Added support for adapters MXP924, MXC948, MCH663
- Added support for direct 3 and 5 node NTB topology for MXH930, MXH940, MXH950
- Added support for multicast receivers on D-Switch Downstream ports
- Fixed incorrect reporting of correctable errors

General bug fixes and improvements

- Added -link-speed to Linux installer
- Added optical support for MXS824 x4 configuration
- Fixed 32-bit compilation on 64-bit kernel
- Fixed AER Correctable Error Status offset definition
- Fixed Multicast only working with group 0 on Gen3 D-Switch
- Fixed Problem with NMI on some systems when cable is unplugged
- Fixed aborting GX/osif sysdma transfers triggering crashes
- Fixed bug that caused local io address to be set incorrectly when using System DMA + IOMMU

- Fixed crash due to missing check in DSWITCH mode
- Fixed potential small memory leak when using CUDA segments
- Fixed problem on certain systems where BME in P2P is not set
- Fixed problem with multicast not working in Gen3 D-Switch configurations
- Improved SISCI callback status for DMA
- Improved parameter checking for IRM tools to prevent crash
- Linux installer for el7 accepts fedora22-24
- MSI: install Gen4 firmware files with Transparent setup option
- Made link watchdog ignore transparent and virtual (D-Switch) links
- More conservative MPS handling by default (ntb_set_mps=1) to prevent automatic increase

Updated configuration files for MXH930, MXH940, MXH950

- MXH930 - VER10
- MXH940-B - VER8
- MXH940-C - VER8
- MXH950-B - VER4
- MXH950-C - VER4

DIS Release 5.18.0 (Apr 15 2021)

General

- Applied copy function patch for an unaligned crash issue on some ARM platforms
- General bug fixes and improvements
- Improved support for Gen4 adapters MXH930, MXH932, MXH940, MXH942, MXH950, MXH952. New firmware bundle
- Initial support for MXP924, MXC940 and MXC948
- dis_diag: Added reporting of board firmware versions and temperatures

SISCI

- Adjusted the number of dev nodes from 4096 to 255

DIS Release 5.17.0 (Sep 24 2020)

General

- Add BDF information in dis_diag and dis_tool
- Added support for Gen4 adapters MXH930, MXH932, MXH940, MXH942
- Fixed Ubuntu 18.04 installation issue
- General bug fixes and improvements

SISCI

- Added support for send-only multicast configurations
- Fixed bug in segment cleanup for shared segments that could cause segment to be unavailable for all users

- Fixed bug related to local DMA (memory to memory) with systems with IOMMU ON
- Increased max multicast segment size to 128 GB. Fixed 32 bit size limitations with internal copy function. Tested up to 4GB

DIS Release 5.16.0 (Apr 21 2020)

General

- Added support for Linux kernel >= 5.5.3. Tested on Linux kernel 5.5.8
- Added support for system DMA with IOMMU ON (Off already supported)

SISCI API

- Added support for registering more than one PCIe requester ID per SISCI descriptor
- Added support for using multiple DMA channels
- Allow SCIBorrowDevice() of PCI-PCI bridges in NT-Transp
- Fixed a crash when an invalid fdid was given to SCIBorrowDevice()

SmartIO

- Fixed crash during device lending when amd_iommu was enabled
- Fixed issue in NT-Transp detecting directly connected endpoints
- Fixed issue when some devices are behind an IOMMU, but others are not
- Fixed issue with RedHat 8 / new kernels Assertion (vdev->orig_dma_ops != NULL)
- Fixed issues with rescan when link goes up / down with multiple adapters
- More robust scanning

DIS Release 5.15.2 (Mar 11 2020)

General

- SmartIO - fixed potential assert in device scanning process

DIS Release 5.15.1 (Mar 2 2020)

General

- Fixed bug in SISCI supporting larger than 4GB segments
- Fixed multi endian issue with reflective memory test program

DIS Release 5.15.0 (Jan 9 2020)

General

- Fixed problem with slot AER errors not being logged
- Increased maximum number of adapters from 4 to 5
- SIA Installer: Fixed problem with the –install-all option
- Support for GUI on Centos/RHEL 8 (Qt5)
- Transparent driver support for MXH832

SmartIO 2.5

- Add support for `smartio_tool remove`
- Fixed bug disabling NVidia persistence mode
- Fixed issue affecting SR-IOV VFs
- Show ethernet device in `smartio_tool show`
- SmartIO SISCI functions stabilized
- Support for multi-link in NT-Transp

User-space SuperSockets

- Fixed problem with maximum number of connections decreasing over time

Included Software

SuperSockets (kernel)

- Ultra-fast, low latency Berkeley Sockets API (TCP, UDP, UDP multicast) for PCIe
- Local and remote socket communication acceleration (accelerated loop-back device supports local IP and local-host address)
- This version of SuperSockets only supports communication to other Linux systems

SuperSockets user space

- User space version of SuperSockets
- Provides lower latency than the kernel version but provides a limited number of socket functionalities.
- Currently only TCP supported
- Supports communication to Windows SuperSockets

SISCI API 2.0.2

- Shared memory (DMA, PIO, RDMA, Interrupts)
- Reflective memory/multicast
- SmartIO Extension 2.0
- PCIe peer-to-peer communication (FPGAs, GPUs, NVMe, etc.)
- Full connectivity to other systems running Windows, RTX, or VxWorks

SmartIO 2.5.1

- Device Lending
- SmartIO Hot-Add
- SISCI API SmartIO Extension

TCP/IP driver

- Full IP networking over PCIe to other nodes running Linux

Network Installer (SIA)

- Installs the above software on a cluster of computers interconnected with Ethernet

Supported Architectures

The software supports the following architectures and platforms:

- Intel x86 / x64
- ARM64
- Nvidia Xavier (only supported by MXH93x, MXH94x cards)
- NXP BlueBox

Tested and Supported OS Platforms

Dolphin strives to support all major Linux distributions and kernels from 3.10 and up. This release has been tested on the following platforms but are expected to work on many more. Please let us know if you run into problems or need another kernel.

- Linux Kernel 3.10 - 7.2

Supported Distributions:

- Ubuntu 26.04 x86_64
- Ubuntu 24.04 x86_64
- Ubuntu 22.04 x86_64
- Rocky / RHEL 10
- Rocky / RHEL 9
- Debian 13 x86_64
- Debian 12 x86_64
- Debian 11 x86_64

EOL Distributions With Available Builds:

- Ubuntu 20.04 x86_64
- Ubuntu 18.04 x86_64
- Ubuntu 16.04 x86_64
- Rocky / RHEL 8
- CentOS 8 x86_64
- CentOS 7 x86_64
- Debian 10 x86_64

Note

RedHawk Linux from Concurrent Real-Time is supported. Please contact Concurrent for access to drivers.

We also provide OpenRC init scripts as used by Gentoo and other distributions; please contact Dolphin Support for more detailed information.

Cluster Installation Requirements

- All nodes connected and properly configured with Ethernet
- Non-Ethernet configurations optional, contact Dolphin for assistance

Installation and Management

- RPM-based installation via Self Installing Archive (SIA)
- Automatic configuration via Interconnect Manager
- Centralized monitoring and diagnostic
- Both Linux and Windows supported as GUI platforms

High Availability Features

- Nodes can join and leave cluster (node reboot, power cycled) any time without disturbing communication between other nodes
- Power cycling the switch will cause SuperSockets to fail over to Ethernet while cluster is automatically reconfiguring
- Unplugging a cable will cause SuperSockets to fail over to Ethernet for all affected connections. SuperSockets will automatically re-establish communication when the cable is reinserted

Bundled (major) Management Tools

- **dis_diag**: diagnostic tool
- **dis_services**: driver service manager
- **dis_config**: configuration tool
- **dis_mkconf**: configuration file generator

Bundled (major) Demo Tools

- **Scibench2**: SISCI-based PIO throughput benchmark
- **scipp**: SISCI-based ping-pong benchmark
- **dma_bench**: SISCI-based DMA benchmark
- **interrupt_bench**: SISCI-based remote system interrupt benchmark
- **reflective_bench**: SISCI-based reflective memory benchmark
- **latency_bench**: TCP latency benchmark (runs on any IP network including SuperSockets)

Firmware Upgrade

The driver installer will detect and suggest to automatically update the firmware during installation if an update is required (new firmware may be included in software distribution).

For further instructions, please see the "Firmware Release Notes" of your adapter: MX Firmware Release Notes

Please file a support request at https://www.dolphinics.com/csp if you have any problems.

5 Change log for Windows Software

Description of content: Clustering package for Windows.

Release category: GA.

Target audience: Production systems.

Current status: Available for download from https://www.dolphinics.com/mx.

New in DIS Release 5.27.0 (Oct 22 2026)

Firmware

- (#8408) MXH992: Added a daisy chain PFX config, `MXH992_MULTICONF_DAISYCHAIN.fwimg`
- (#8408) MXH992: Released PFX config VER4. x16 configs now run at Gen4 speed
- (#8528) MXH95x: Updated firmware, adds hot-add support (Microchip MR6)
- (#8529) MXH94x: Updated firmware with hot-add support
- (#8600) MXH530: Windows hot-add x16 configs use a 64MB non-prefetchable synthetic endpoint BAR
- (#8703) MXH914: Released PFX config VER7
- (#8703) MXH916: Released PFX config VER6
- (#8703) MXH918: Released PFX config VER7
- (#8725) MXP526: Fixed TWI setting and GAS accesses in PFX configuration file
- (#8726) Updated configuration files for MXP526
- (#8727) MXP508, MXP509: Released PFX config VER2, with the unused TWI2 to TWI5 interfaces disabled
- (#8758) MXH930, MXH940, MXH950: Windows hot-add x16 configs use a 64MB non-prefetchable synthetic endpoint BAR again
- (#8759) MXH932: Released PFX config VER16, with a corrected MCU configuration
- (#8771) Updated NXP firmware to emmentaler v3.12 for MXH53x, MXH57x, MXP50x, MXP523, MXP526, MXP908, MXP909, MXP921, MXP924 and MXC96x
- (#8851) Updated configuration files for MXB585
- (#8852) Updated configuration files for MXH530

- (#8852) Updated configuration files for MXH532
- (#8854) Updated configuration files for MXH570
- (#8854) Updated configuration files for MXH572

General

- (#8629) Fixed a small resource leak in the PCIe switch filter driver during device enumeration
- (#8665) Added option to specify which adapter card to upgrade with `upgrade_eeprom` script
- (#8710) Fixed `dis_firmwaretool pfx -M` resetting the wrong link on Gen5 MXH adapters
- (#8710) Fixed `dis_firmwaretool stm` and `eeprom` commands failing with "invalid serial provided"
- (#8710) `upgrade_eeprom.ps1` no longer uses `dis_tool` for the configuration partition check
- (#8730) Fixed detection of Stamford evaluation board in `dis_firmwaretool` utility
- (#8749) Reduced the default value of the `ntb_lut2_switch_max_entries` configuration option from 12 to 4
- (#8775) Fixed sporadic IOMMU faults caused by MRPC DMA
- (#8776) Added standard driver support for MXS924 x8 60-node CASCADE configs
- (#8785) Improved 60-node CASCADE configs for MXS824
- (#8814) Added optional port argument to `dis_firmwaretool pfx -e` to select the ChipLink telnet server port (default 4242)
- (#8814) Fixed `dis_firmwaretool pfx -e` exiting with status 0 when the telnet server failed to start
- (#8828) Fixed `dis_diag` not showing cable info for all cables

Installer

- (#8800) Reject setup upgrade immediately if the current adapter type is different than the one installed. Use a meaningful error message indicating the remediation
- (#8820) Allow upgrade from **NT63** installation to **NT100**, **NT110**
- (#8820) Rename setup file from Dolphin_eXpressWare-Windows-NT63<…>.msi to Dolphin_eXpressWare-Windows-NT100<…>.msi and Dolphin_eXpressWare-Windows-NT110<…>.msi

Platform support

- (#8753) Added support for eBox Pro for Windows
- (#8820) Deploy 2 separate .msi files for Windows 10 = Server 2016, 2019, 2022 and Windows 11 = Server 2025
- (#8820) Remove support for operating systems prior to Windows 10, Server 2016

Changes in Previous Releases

DIS Release 5.26.2 (Oct 7 2026)

Benchmarks

- (#8777) Added `-bidir` flag to `dma_bench`

General

- (#8716) Fixed issue where setting required link width = 2 in dishosts.conf would cause the dishosts parser to fail
- (#8794) `dis_nodemgr` will retry initial adapter configuration for up to 120 seconds if it fails to find / resolve the host's hostname

DIS Release 5.26.1 (Sep 14 2026)

General

- (#8134) Added additional resource usage information to dis_diag and dis_tool

SISCI

- (#8732) Fixed an issue that could prevent the creation of more than one private SISCI segment

DIS Release 5.26.0 (Aug 31 2026)

General

- (#8058) Fix mismatch between outbound mapping table entries and vdevs in single D-Switch topology
- (#8145) Updated `dishosts.conf` to a new format. Run `dis_mkconf -upgrade` to upgrade an old `dishosts.conf` to the new format
- (#8174) Improved support for MXS824 CASCADE configs
- (#8314) Detect and report empty BARs on systems where "*bcdedit.exe /set usefirmwarepcisettings on"* is configured
- (#8362) Improved support for customers using Xeon Scalable systems demanding more than 32 requester IDs for a single system
- (#8385) Exposed tunable DMA parameters in dis_mx.conf
- (#8491) Removed unused virtual device x:00.4 which showed up in lspci with IOMMU enabled
- (#8508) Added support for PXIe adapter MXP921
- (#8520) Hot-Add deep daisy chain support
- (#8522) Added support for generating a default `dishosts.conf` file using `dis_mkconf -default`
- (#8528) Updated MXH950 PFX image with hot add, NTB larger BAR2 and incoming REF clk in TARGET mode
- (#8529) Converted MXH940 and MXH942 PFX config image VER13 to MR6
- (#8529) Extended the PFX configs options for MXH940 and MXH942 with 'Hot Add' configs and Target config using incoming REF clock
- (#8535) Add missing PDO dereference when IRM FDO is not present, for Management EP function
- (#8536) Fix improper use of the *command* parameter for PXISA_SystemModule_SMBusOperation
- (#8537) MXH992: Added support for GreenPAK firmware upgrade in upgrade_eeprom
- (#8541) Allow regular users access to the IRM and dis_diag without administrative privileges
- (#8542) PCIe Max Payload Size is now configurable in Hot-Add configurations
- (#8563) Added support for MXC960 and MXC962
- (#8568) Use separate EEPROM/Config version information for MXC960-CC-1501
- (#8574) Release of MXP921 Gen4 PXIe adapter
- (#8578) Add support for running dis_firmwaretool server for ChipLink
- (#8585) Fixed reset handling of MXC960 in NTB mode
- (#8591) Fixed Dual D-Switch FP init collision
- (#8595) Improved the fiber tuning for MXH570 and MXH572

- (#8595) Updated PFX config to VER6 and NXP version to v3.10 for MXH570 and MXH572
- (#8600) Added Windows Hot-Add support for MXH916
- (#8613) Fixed dis_diag legacy dishosts.conf upgrade instructions to print the full path to dis_mkconf.exe and recommend a reboot instead of the non-existent dis_services command
- (#8616) Added ipv6 support to `dis_firmwaretool` PFX Telnet server
- (#8620) Added stability for Windows Hot-Add when DPC is not enabled
- (#8625) Updated DIS software License
- (#8630) Detection of MXH94x and MXH95x adapters might fail. The driver module fails to load. How to fix: Contact Dolphin for information about SEEPROM production update
- (#8652) Updated all MXH5xx cards to use the latest v3.11 firmware release

SISCI

- (#7724) Fixed regression introduced in 5.19.0 to improve SCICheckSequence latency
- (#8284) Added interactive_sisci as an example program
- (#8638) Added -fixed switch to scipp to drive only one block size

DIS Release 5.25.3 (Jun 05 2026)

General

- (#8189) Added initial support for MXP508 and MXP509
- (#8224) Improved debugging capabilities
- (#8440) MXH572: Added config for cable side 4x4 (config 21)
- (#8466) Improved BMC logging capabilities on the following adapters (requires bmc update): MXH57x MXH53x MXP52x, MXP92x, MXP90x
- (#8478) Windows Hot-Add: Add support for MXH930
- (#8501) Fixed issue where `dis_config` in rare cases would trigger an array access out of bounds in the IRM

MXP926

- (#8466) Fixed an issue where the cable link could go down sporadically in specific systems

DIS Release 5.25.2 (Apr 24 2026)

General

- (#8411) MXH57x: Fixed error messages from the IRM driver reading cable ports out of range: `MXH Cable info failed:  0x3`

SISCI

- (#8365) Reduce CPU usage of server node in `reflective_write` example
- (#8378) Reduce CPU usage of server node in `reflective_bench` and `reflective_dma_bench` benchmarks

dis_diag

- (#8344) Implement proper CSR value printout fix
- (#8373) MXH57x: Fixed an issue where the CDFP cable temperature could get stuck

DIS Release 5.25.1 (Mar 6 2026)

General

- (#7617) Fixed problem with DMA pull failing between some nodes in Dual D-Switch topology
- (#7617) Fixed problems with interference of nodes in Dual D-Switch topology
- (#8133) Added initial MXS924 configs for Dual D-Switch topology. See MXS924_eeprom_versions.txt for details
- (#8274) `dis_diag` now correctly prints the root port's BDF
- (#8288) Extended PFX configuration image for MXB585
- (#8289) Added support for MXH570-B and MXH572-B Revision
- (#8291) Fixed NTB 3-nodes, 4-nodes and 5-nodes topology for MXH530. Firmware PFX configuration version 6 required
- (#8291) Release of PFX config, VER6 for MXH530 and MXH532
- (#8293) Added support for upgrading the firmware on the MXB585 ebox with upgrade_eeprom script
- (#8298) Fixed updating the serial number for MXH910 and MXH912 adapters with dis_firmwaretool
- (#8302) Virtual PCIe devices are cleaned up when remote node is lost
- (#8342) Fixed CSR value printouts

SISCI

- (#8207) SCICreateMapSequence returns error when used on map of local segment
- (#8280) Improved performance for `memcpy_nt_avx2`
- (#8341) Fix arithmetic overflow inside SISCI testlib, on systems where CPU frequency is 4GHz+

DIS Release 5.25.0 (Jan 28 2026)

Arm

- (#7068) Fixed a cache-coherency issue with DMA transfers and user allocated memory on Nvidia AGX Orins

Benchmarks

- (#7882) Adds check for div by zero when walltime is used for dma_bench or scibench
- (#7997) Creates a benchmark analogous to `reflective_bench` but which uses DMA for sending
- (#8063) `dma_bench` regression fixed so `-veclen` parameter can be used again
- (#8075) Added `-vl` argument to `reflective_dma_bench` which can be used to increase DMA transfer vector length

Demos

- (#7851) Added performance demo, video transfer demo, and rfm wrapper to DIS example programs

General

- (#6713) Fixed issue in the downstream cable port for MXC962
- (#6980) Fixed doorbell performance spikes by removing an unneeded loopback doorbell
- (#7317) The configuration files of DIS hosts no longer supports 'STRIPE' and 'REDUNDANT' socket adapters. A socket adapter specified with this mode will be ignored
- (#7550) Improved Dual D-Switch support: up to 15 hosts per switch, no power sequencing requirements

- (#7753) Windows Hot-Add support
- (#7792) Added support for MXE expansion board MXB585
- (#7845) Improved stability with multi-socket Icelake configurations
- (#7891) Fixed problem with driver crash during dis_config for adapters with invalid hardware configurations
- (#7939) MXH530 and MXH532 PFX config release VER4
- (#7968) Fixed issue where `dis_services stop` would fail if there is no adapter installed in the system
- (#7977) Fixed a bug where a node would end up in a livelock with no session, spamming `getAliveCnt - mbxMsgQ_localHeader == NULL` to the kernel buffer
- (#7981) Improved error handling in dis_firmwaretool
- (#7982) Added driver support for MXP523
- (#8003) Added MXS924 DSWITCH configuration files with 2 DSPs
- (#8019) Initial MXH530 Windows Hot-Add support. Known issue: When cable is present to host and target at power cycle, power-on of the chassis might not trigger Hot Plug event. Scan for hardware changes in device manager to resolve
- (#8020) Improved stability in driver startup
- (#8031) Vastly improved PIO performance for the Zen3 architecture
- (#8042) Added DUAL NTB Switch support for MXS924
- (#8065) Added support for MXH992
- (#8083) Converted firmware to MR3 for MXH530 and MXH532. Version 5
- (#8084) Converted MXH570 and MXH572 VER2 to PFX MR3
- (#8085) Converted MXP526 to MR3
- (#8121) Released NXP firmware 3.6 and PFX configuration image VER5 for MXH530 and MXH532
- (#8122) Release of MXH570-AA and MXH572-AA with PFX configuration VER2
- (#8152) Added Windows Hot-Add support for MXH914
- (#8156) Improved the detection of adapter types in dis_firmwaretool
- (#8173) Fixed bug in MXS824 NTB DUAL configs that prevented version 10 of the configs from working
- (#8175) Resolved potential crash when mapping table is exhausted
- (#8204) Added Windows Hot-Add support for MXH918
- (#8221) Adds support for SFF-86xx AOC voltage readout
- (#8221) Fixed bug where SFF-86xx temperature could be wrong in dis_diag
- (#8222) Fixed serial numbers printouts in dis_firmwaretool for adapters with custom serial numbers
- (#8240) During **MSI** upgrade, the internal configuration files must be preserved. *dishosts.conf* is kept, while **dis_<adapter>.conf** and **dis_irm.conf** are overwritten

SISCI

- (#7336) Multi-threading is now required to compile eXpressWare
- (#7879) Fixed off by one error in reflective_bench
- (#8230) Fixed a bug in `SCICreateDeviceSegment` where it would fail if called with either of the flags `SCI_FLAG_LOCAL_ONLY` or `SCI_FLAG_DEVICE_SIDE_ONLY`

SmartIO

- (#8175) Resolved issue with NT-Transparent causing repeated borrow/return to fail
- (#8186) Fixed an issue where two lenders borrowing each others' devices would fail with IOMMU disabled
- (#8226) Fixed issue with automatic DMA windows size calculation with NT-Transparent

SuperSockets

- (#7629) Sockperf: 1 second walltime is standard measurement
- (#7629) Sockperf: Improved explanation of measurement options
- (#8009) Fixed a memory leak related to the usage of DMA channels

dis_diag

- (#7636) MXH570/MXH572: Added support in dis_diag for reading temperature, voltage, max power consumption and other cable info from CDFP cables
- (#7817) New json output when `-json` option is used
- (#7893) dis_diag output reorganized to print info per adapter
- (#8074) Windows Hot-Add information is displayed in dis_diag
- (#8105) Added support for reading cable temperature for supported cables with MXH93x
- (#8123) Make the report of the upstream link more generic in dis_diag

DIS Release 5.24.0 (Sep 17 2025)

BMC

- (#7830) Added support for the MXP526
- (#7830) Improved support for MXC products
- (#7830) Power on upstream power_enable is now implemented. Can be turned on with dip 3 on dip-switch bank 2
- (#7830) Updated BMC firmware for MXH530 and for all MXC and MXP products

Benchmarks

- (#7644) Added `-wt` (walltime) option for `dma_bench` and `scibench2`
- (#7801) Added warmup loops to `scibench2`, `dma_bench` and `dma_user_bench`
- (#7801) Fixed potential sending of too large sizes for `scibench` if offset is used
- (#7801) Made usage text more consistent for `scibench2` and `dma_bench`

General

- (#7164) Added support for MXC960
- (#7164) Added support for MXC961 (NTB version)
- (#7164) Added support for MXC962
- (#7164) Release of PFX config VER2 for MXC960 and MXC962
- (#7387) Extended internal bitmap from 64 to 256 bits to accommodate larger cluster topologies. Fixes potential bug in large architectures
- (#7402) Added support for Stamford PFX Gen4 chip MVH103. Microchip EVB-PCI1003 Stamford Evaluation board

- (#7446) Fixed reset option for MXS924, Port 5 in DSWITCH mode
- (#7468) Added support for PXIe Gen5 MXP526 adapter
- (#7468) Fixed patch table entries for MXP526
- (#7491) Verify presence of IOMMU OS mitigation for PCIe devices
- (#7505) Fix buffer overrun resulting in potential Requester ID corruption
- (#7515) Added support for reading fan information (rpm, duty cycle) of MXH530 with dis_diag (under adapter status)
- (#7518) Added option to configure processor I/O requester IDs manually in the configuration files. Particularly useful for heterogenous Intel Xeon Scalable clusters
- (#7552) Removed NXP bootloader for adapters with NXP version > Ver3.0
- (#7572) Improved the IRM error handling in case a critical chip error occur. Avoid any session IOCTLs before the driver is properly initialized
- (#7586) Converted MXH930 to MR6
- (#7586) Increased the Link BAR2 from 1TB to 64TB
- (#7608) Converted MXH530 to MR2
- (#7608) Fixed GPIO 32 REFCLK_OE (from low to high) for TARGET config 4, 5 and 6
- (#7608) MXH530 and MXH532 PFX configuration VER3 release, September 2nd, 2025
- (#7609) Fixed clock GPIO setting in configuration
- (#7609) Split MXH530 and MXH532 PFX configuration images and firmware
- (#7609) Updated upgrade_eeprom.sh and upgrade_eeprom.ps1 scripts after splitting MXH530 and MXH532
- (#7636) Added support for MXH570 and MXH572
- (#7667) Fix connection issue between adapter and switch on IceLake+ systems
- (#7703) Updated configuration image for MXH916 to VER5. Fixes PCIe connections for all link ports
- (#7707) Added NTB support for MXH914, MXH916 and MXH918
- (#7718) General connectivity fix for multi direct topology with different MXH5xx and MXH9xx adapter types
- (#7719) Updated configuration file for MXH918 to VER5 with MR6
- (#7721) MXH914 - MXH919 config release VER5, August 20th 2025
- (#7721) MXH914: VER5 MR6 configuration with 64TB link BAR2
- (#7723) Avoid unnecessary load of PFX CPU when doing sequence checks
- (#7752) Added driver support for combined NTB and TRANSP configuration for MXH930 adapters
- (#7763) Release of PFX configuration image VER5 for MXP908 and MXP909
- (#7764) Fixed bug where dis_diag reports incorrect cable capabilities when using PCIE5 cables
- (#7771) Updated NXP version to v3.4-rc13.bin to fix the fan control
- (#7777) Added dis_firmwaretool support for MVH126
- (#7781) Fixed a bug where DMA read operations would sometimes fail in clusters with Gen4 adapters connected by a Gen3 switch
- (#7786) Added support for MXC960 and MXC962

- (#7786) Improvements to the MXC960 D-SWITCH config
- (#7800) Added TARGET x2x2x2x2x2x2x2x2 (edge) in config 15 for MXH830
- (#7808) Added support for connecting different adapter types by an NTB switch

SISCI

- (#6917) Added documentation for DIS_BROADCAST_NODEID_GROUP_ALL constant for SCIConnectSegment
- (#7558) Return code fixes for SCIQuery
- (#7578) Fixed issue where requester ID added to adapter was not added to NTB switch table
- (#7591) Simplified SISCI API header file

DIS Release 5.23.0 (Jan 30 2025)

General

- Added support for Gen 5 adapter MXH530 in the driver and tools
- Added support for MXC960
- Added support for MXS924 cascade
- Bug fix: Driver configuration now correctly exits if IOMMU initialization fails
- Bug fix: Fix issue with MXP924 reporting "Hot Plug Capability"
- Bug fix: IOMMU now works as expected on kernels >= 6.3
- Bug fix: Updated BAR computation on transparent devices

Improved dis_diag

- Bug fix: Fixed info readout for all firefly adapters
- Show PCIe parent link capability

Improved dis_nodemgr

- Unresolvable hosts are skipped and no longer stop cluster configuration

SISCI

- Bug fix: Fix for SCIStartDMATransferMem deadlock
- Enabled possibility for non-zero offset when calling SCIMapRemoteSegment for multicast segments

DIS Release 5.22.0 (Sep 2 2024)

General

- Added support for Intel Xeon Scalable 5th gen ("Emerald Rapids")
- Added support for Windows 11, Server 2022
- Added support for sanitization in upgrade-eeprom
- Added support for virtual configuration through dis_firmwaretool
- Fixed logging issue with dis_networkmanager
- Improved dis_status script, now retrieves more information
- Improved support for daisy chain configurations

- MXH930: Fixed a bug where Windows 10 Enterprise LTSC occupies BAR0 for the DMA

Improved dis_diag

- Added support for json-output
- Improved link error detection
- Now shows temperature information for Firefly

Improved installer

- Fixed bug for transparent install on GUI installer
- Various bugfixes

DIS Release 5.21.4 (Mar 15 2024)

General

- The driver now recalibrates to support both older and newest MXS824 and MXS924 switch configurations

DIS Release 5.21.3 (Dec 8 2023)

General

- Improved device detection for MX

DIS Release 5.21.2 (Nov 2 2023)

General

- Added support for all Intel Xeon Ice Lake and Sapphire Rapids Bronze and Silver CPUs
- Added support for all Intel Xeon Ice Lake and Sapphire Rapids Gold and Platinum CPUs with up to two sockets, three UPI links and 36 cores

DIS Release 5.21.0 (May 24 2023)

General

- Enable option to sign drivers with a self-sign certificate
- Fixed BAR2 mapping on systems where a bogus BAR1 is allocated
- Fixed internal DMA channels being improperly computed
- Fixes to prevent potential leaks during driver failure
- Remove dishosts.conf during uninstallation of Windows drivers
- Removed dis_coinstaller from the driver package

DIS Release 5.20.1 (Sep 12 2022)

Bug fixes and improvements

- Fixed initial adapterno value for IRM transparent inf files
- Reset the Completion Timeout on root ports in cases where more than 1 transparent adapter are installed

DIS Release 5.20.0 (Jul 15 2022)

Bug fixes and improvements

- Added TTY access mode to dis_firmwaretool
- Generate .nupkg for MX Windows x64 builds

DIS Release 5.19.2 (Jan 7 2022)

General

- Increased max number of transparent adapters from 5 to 20

General bug fixes and improvements

- Firmware upgrade
- Fixed crash on management EP if there is not enough contiguous memory
- Reset completion timeout on Root Port for transparent adapters

dis_firmwaretool

- Added support for 'pci:' communicator

DIS Release 5.18.0 (Apr 15 2021)

General

- General bug fixes and improvements
- Improved support for Gen4 adapters MXH930, MXH932, MXH940, MXH942, MXH950, MXH952

DIS Release 5.17.0 (Sep 24 2020)

General

- 5.17.0 for Windows was not released due to a regression test issue
- Added support for Gen4 adapters MXH930, MXH932, MXH940, MXH942

SISCI

- Added support for send-only multicast configurations
- Fixed bug in segment cleanup for shared segments that could cause segment to be unavailable for all users
- Increased max multicast segment size to 128 GB. Fixed 32 bit size limitations with internal copy function

DIS Release 5.16.0 (Apr 21 2020)

General

- Prevent Board Management Software installation on Compute nodes

SISCI API

- Added support for registering more than one PCIe requester ID per SISCI descriptor
- Added support for using multiple DMA channels

DIS Release 5.15.1 (Mar 2 2020)

General

- Fixed bug in SISCI supporting larger than 4GB segments
- Fixed multi endian issue with reflective memory test program

DIS Release 5.15.0 (Jan 9 2020)

General

- Fixed problem with slot AER errors not being logged
- Increase max number of adapters from 4 to 5
- User-space SuperSockets: added a listen thread to accept incoming connections

Included Software

SuperSockets

- Ultra-fast, low latency WinSock2 Sockets API (TCP) for PCIe
- Local and remote socket communication acceleration (accelerated loop-back device supports local IP and local-host address)
- Connectivity to other systems running Linux user space SuperSockets

SISCI API 2.0.2

- Shared memory (DMA, PIO, RDMA, Interrupts)
- Reflective memory/multicast
- PCIe peer-to-peer communication (FPGAs, GPUs, etc.)
- Full connectivity to other systems running Linux, RTX or VxWorks

TCP/IP driver (IPoPCIe)

- Private network to other nodes running Windows
- Routing to other network (Connect your PCIe cluster to a 10G Ethernet up-link)

Supported OS Platforms

- Windows Server 2016 - 64 bit
- Windows Server 2019 - 64 bit
- Windows Server 2022 - 64 bit
- Windows Server 2025 - 64 bit
- Windows 10 - 64 bit
- Windows 11 - 64 bit

Cluster Installation Requirements

- All nodes connected and properly configured with Ethernet
- Non-Ethernet configurations optional, contact Dolphin for assistance

Installation and Management

- Windows MSI Installer package
- Automatic configuration via Interconnect manager
- Centralized monitoring and diagnostic
- Both Linux and Windows supported as GUI platforms

High Availability Features

- SuperSockets will fail-over to Ethernet if Dolphin eXpressWare network is unavailable during application startup

Bundled (major) Management Tools

- **dis_diag**: diagnostic tool
- **dis_services**: driver service manager
- **dis_config**: configuration tool
- **dis_mkconf**: configuration file generator

Bundled (major) Demo Tools

- **Scibench2**: SISCI-based PIO throughput benchmark
- **scipp**: SISCI-based ping-pong benchmark
- **dma_bench**: SISCI-based DMA benchmark
- **interrupt_bench**: SISCI-based remote system interrupt benchmark
- **reflective_bench**: SISCI-based reflective memory benchmark
- **latency_bench**: TCP latency benchmark (runs on any IP network including SuperSockets)

Firmware Upgrade

The driver installer will detect and suggest to automatically update the firmware during installation if an update is required (new firmware may be included in software distribution).

For further instructions, please see the "Firmware Release Notes" of your adapter: https://www.dolphinics.com/download/MX/RELEASE/PW_DOC/download-mx-doc.html

Please file a support request at https://www.dolphinics.com/csp if you have any problems.

6 Change log for RTX Software

Description of content: Clustering package for RTX (64-bit only).

Release category: Beta.

Current status: Please contact Dolphin for updated status.

Currently supported versions:

- IntervalZero RTX64 v4.2+

New in DIS Release 5.27.0 (Oct 22 2026)

Firmware

- (#8408) MXH992: Added a daisy chain PFX config, `MXH992_MULTICONF_DAISYCHAIN.fwimg`
- (#8408) MXH992: Released PFX config VER4. x16 configs now run at Gen4 speed
- (#8528) MXH95x: Updated firmware, adds hot-add support (Microchip MR6)
- (#8529) MXH94x: Updated firmware with hot-add support
- (#8703) MXH914: Released PFX config VER7
- (#8703) MXH916: Released PFX config VER6
- (#8703) MXH918: Released PFX config VER7
- (#8725) MXP526: Fixed TWI setting and GAS accesses in PFX configuration file
- (#8726) Updated configuration files for MXP526
- (#8727) MXP508, MXP509: Released PFX config VER2, with the unused TWI2 to TWI5 interfaces disabled
- (#8758) MXH930, MXH940, MXH950: Windows hot-add x16 configs use a 64MB non-prefetchable synthetic endpoint BAR again
- (#8759) MXH932: Released PFX config VER16, with a corrected MCU configuration
- (#8771) Updated NXP firmware to emmentaler v3.12 for MXH53x, MXH57x, MXP50x, MXP523, MXP526, MXP908, MXP909, MXP921, MXP924 and MXC96x
- (#8851) Updated configuration files for MXB585
- (#8852) Updated configuration files for MXH530

- (#8852) Updated configuration files for MXH532
- (#8854) Updated configuration files for MXH570
- (#8854) Updated configuration files for MXH572

General

- (#8665) Added option to specify which adapter card to upgrade with `upgrade_eeprom` script
- (#8710) Fixed `dis_firmwaretool pfx -M` resetting the wrong link on Gen5 MXH adapters
- (#8710) Fixed `dis_firmwaretool stm` and `eeprom` commands failing with "invalid serial provided"
- (#8730) Fixed detection of Stamford evaluation board in `dis_firmwaretool` utility
- (#8749) Reduced the default value of the `ntb_lut2_switch_max_entries` configuration option from 12 to 4
- (#8775) Fixed sporadic IOMMU faults caused by MRPC DMA
- (#8776) Added standard driver support for MXS924 x8 60-node CASCADE configs
- (#8785) Improved 60-node CASCADE configs for MXS824
- (#8814) Added optional port argument to `dis_firmwaretool pfx -e` to select the ChipLink telnet server port (default 4242)
- (#8814) Fixed `dis_firmwaretool pfx -e` exiting with status 0 when the telnet server failed to start
- (#8828) Fixed `dis_diag` not showing cable info for all cables

Changes in Previous Releases

DIS Release 5.26.2 (Oct 7 2026)

Benchmarks

- (#8777) Added `-bidir` flag to `dma_bench`

General

- (#8716) Fixed issue where setting required link width = 2 in dishosts.conf would cause the dishosts parser to fail
- (#8794) `dis_nodemgr` will retry initial adapter configuration for up to 120 seconds if it fails to find / resolve the host's hostname

DIS Release 5.26.1 (Sep 14 2026)

General

- (#8134) Added additional resource usage information to dis_diag and dis_tool

SISCI

- (#8732) Fixed an issue that could prevent the creation of more than one private SISCI segment

DIS Release 5.26.0 (Aug 31 2026)

General

- (#8058) Fix mismatch between outbound mapping table entries and vdevs in single D-Switch topology
- (#8145) Updated `dishosts.conf` to a new format. Run `dis_mkconf -upgrade` to upgrade an old `dishosts.conf` to the new format
- (#8174) Improved support for MXS824 CASCADE configs

- (#8362) Improved support for customers using Xeon Scalable systems demanding more than 32 requester IDs for a single system
- (#8385) Exposed tunable DMA parameters in dis_mx.conf
- (#8491) Removed unused virtual device x:00.4 which showed up in lspci with IOMMU enabled
- (#8508) Added support for PXIe adapter MXP921
- (#8522) Added support for generating a default `dishosts.conf` file using `dis_mkconf -default`
- (#8528) Updated MXH950 PFX image with hot add, NTB larger BAR2 and incoming REF clk in TARGET mode
- (#8529) Converted MXH940 and MXH942 PFX config image VER13 to MR6
- (#8529) Extended the PFX configs options for MXH940 and MXH942 with 'Hot Add' configs and Target config using incoming REF clock
- (#8536) Fix improper use of the *command* parameter for PXISA_SystemModule_SMBusOperation
- (#8563) Added support for MXC960 and MXC962
- (#8568) Use separate EEPROM/Config version information for MXC960-CC-1501
- (#8574) Release of MXP921 Gen4 PXIe adapter
- (#8575) Support IntervalZero wRTOS subsystem
- (#8583) Remove RTX64 version 3.7 support
- (#8585) Fixed reset handling of MXC960 in NTB mode
- (#8591) Fixed Dual D-Switch FP init collision
- (#8595) Improved the fiber tuning for MXH570 and MXH572
- (#8595) Updated PFX config to VER6 and NXP version to v3.10 for MXH570 and MXH572
- (#8625) Updated DIS software License
- (#8630) Detection of MXH94x and MXH95x adapters might fail. The driver module fails to load. How to fix: Contact Dolphin for information about SEEPROM production update
- (#8652) Updated all MXH5xx cards to use the latest v3.11 firmware release

SISCI

- (#7724) Fixed regression introduced in 5.19.0 to improve SCICheckSequence latency
- (#8284) Added interactive_sisci as an example program
- (#8638) Added -fixed switch to scipp to drive only one block size

DIS Release 5.25.3 (Jun 05 2026)

General

- (#8189) Added initial support for MXP508 and MXP509
- (#8224) Improved debugging capabilities
- (#8440) MXH572: Added config for cable side 4x4 (config 21)
- (#8466) Improved BMC logging capabilities on the following adapters (requires bmc update): MXH57x MXH53x MXP52x, MXP92x, MXP90x
- (#8501) Fixed issue where `dis_config` in rare cases would trigger an array access out of bounds in the IRM

MXP926

- (#8466) Fixed an issue where the cable link could go down sporadically in specific systems

DIS Release 5.25.2 (Apr 24 2026)

General

- (#8411) MXH57x: Fixed error messages from the IRM driver reading cable ports out of range: `MXH Cable info failed:  0x3`

SISCI

- (#8365) Reduce CPU usage of server node in `reflective_write` example
- (#8378) Reduce CPU usage of server node in `reflective_bench` and `reflective_dma_bench` benchmarks

dis_diag

- (#8344) Implement proper CSR value printout fix
- (#8373) MXH57x: Fixed an issue where the CDFP cable temperature could get stuck

DIS Release 5.25.1 (Mar 6 2026)

General

- (#7617) Fixed problem with DMA pull failing between some nodes in Dual D-Switch topology
- (#7617) Fixed problems with interference of nodes in Dual D-Switch topology
- (#8133) Added initial MXS924 configs for Dual D-Switch topology. See MXS924_eeprom_versions.txt for details
- (#8274) `dis_diag` now correctly prints the root port's BDF
- (#8288) Extended PFX configuration image for MXB585
- (#8289) Added support for MXH570-B and MXH572-B Revision
- (#8291) Fixed NTB 3-nodes, 4-nodes and 5-nodes topology for MXH530. Firmware PFX configuration version 6 required
- (#8291) Release of PFX config, VER6 for MXH530 and MXH532
- (#8293) Added support for upgrading the firmware on the MXB585 ebox with upgrade_eeprom script
- (#8298) Fixed updating the serial number for MXH910 and MXH912 adapters with dis_firmwaretool
- (#8302) Virtual PCIe devices are cleaned up when remote node is lost
- (#8342) Fixed CSR value printouts

SISCI

- (#8207) SCICreateMapSequence returns error when used on map of local segment
- (#8280) Improved performance for `memcpy_nt_avx2`
- (#8341) Fix arithmetic overflow inside SISCI testlib, on systems where CPU frequency is 4GHz+

DIS Release 5.25.0 (Jan 28 2026)

Arm

- (#7068) Fixed a cache-coherency issue with DMA transfers and user allocated memory on Nvidia AGX Orins

Benchmarks

- (#7882) Adds check for div by zero when walltime is used for dma_bench or scibench
- (#7997) Creates a benchmark analogous to `reflective_bench` but which uses DMA for sending
- (#8063) `dma_bench` regression fixed so `-veclen` parameter can be used again
- (#8075) Added `-vl` argument to `reflective_dma_bench` which can be used to increase DMA transfer vector length

Demos

- (#7851) Added performance demo, video transfer demo, and rfm wrapper to DIS example programs

General

- (#6713) Fixed issue in the downstream cable port for MXC962
- (#6980) Fixed doorbell performance spikes by removing an unneeded loopback doorbell
- (#7317) The configuration files of DIS hosts no longer supports 'STRIPE' and 'REDUNDANT' socket adapters. A socket adapter specified with this mode will be ignored
- (#7550) Improved Dual D-Switch support: up to 15 hosts per switch, no power sequencing requirements
- (#7792) Added support for MXE expansion board MXB585
- (#7845) Improved stability with multi-socket Icelake configurations
- (#7891) Fixed problem with driver crash during dis_config for adapters with invalid hardware configurations
- (#7939) MXH530 and MXH532 PFX config release VER4
- (#7968) Fixed issue where `dis_services stop` would fail if there is no adapter installed in the system
- (#7977) Fixed a bug where a node would end up in a livelock with no session, spamming `getAliveCnt - mbxMsgQ_localHeader == NULL` to the kernel buffer
- (#7981) Improved error handling in dis_firmwaretool
- (#7982) Added driver support for MXP523
- (#8003) Added MXS924 DSWITCH configuration files with 2 DSPs
- (#8031) Vastly improved PIO performance for the Zen3 architecture
- (#8042) Added DUAL NTB Switch support for MXS924
- (#8065) Added support for MXH992
- (#8083) Converted firmware to MR3 for MXH530 and MXH532. Version 5
- (#8084) Converted MXH570 and MXH572 VER2 to PFX MR3
- (#8085) Converted MXP526 to MR3
- (#8121) Released NXP firmware 3.6 and PFX configuration image VER5 for MXH530 and MXH532
- (#8122) Release of MXH570-AA and MXH572-AA with PFX configuration VER2
- (#8156) Improved the detection of adapter types in dis_firmwaretool
- (#8173) Fixed bug in MXS824 NTB DUAL configs that prevented version 10 of the configs from working

- (#8175) Resolved potential crash when mapping table is exhausted
- (#8221) Adds support for SFF-86xx AOC voltage readout
- (#8221) Fixed bug where SFF-86xx temperature could be wrong in dis_diag
- (#8222) Fixed serial numbers printouts in dis_firmwaretool for adapters with custom serial numbers

SISCI

- (#7336) Multi-threading is now required to compile eXpressWare
- (#7879) Fixed off by one error in reflective_bench
- (#8230) Fixed a bug in `SCICreateDeviceSegment` where it would fail if called with either of the flags `SCI_FLAG_LOCAL_ONLY` or `SCI_FLAG_DEVICE_SIDE_ONLY`

SmartIO

- (#8175) Resolved issue with NT-Transparent causing repeated borrow/return to fail
- (#8186) Fixed an issue where two lenders borrowing each others' devices would fail with IOMMU disabled
- (#8226) Fixed issue with automatic DMA windows size calculation with NT-Transparent

SuperSockets

- (#7629) Sockperf: 1 second walltime is standard measurement
- (#7629) Sockperf: Improved explanation of measurement options
- (#8009) Fixed a memory leak related to the usage of DMA channels

dis_diag

- (#7636) MXH570/MXH572: Added support in dis_diag for reading temperature, voltage, max power consumption and other cable info from CDFP cables
- (#7817) New json output when `-json` option is used
- (#7893) dis_diag output reorganized to print info per adapter
- (#8123) Make the report of the upstream link more generic in dis_diag

DIS Release 5.24.0 (Sep 17 2025)

BMC

- (#7830) Added support for the MXP526
- (#7830) Improved support for MXC products
- (#7830) Power on upstream power_enable is now implemented. Can be turned on with dip 3 on dip-switch bank 2
- (#7830) Updated BMC firmware for MXH530 and for all MXC and MXP products

Benchmarks

- (#7644) Added `-wt` (walltime) option for `dma_bench` and `scibench2`
- (#7801) Added warmup loops to `scibench2`, `dma_bench` and `dma_user_bench`
- (#7801) Fixed potential sending of too large sizes for `scibench` if offset is used
- (#7801) Made usage text more consistent for `scibench2` and `dma_bench`

General

- (#7164) Added support for MXC960

- (#7164) Added support for MXC961 (NTB version)
- (#7164) Added support for MXC962
- (#7164) Release of PFX config VER2 for MXC960 and MXC962
- (#7387) Extended internal bitmap from 64 to 256 bits to accommodate larger cluster topologies. Fixes potential bug in large architectures
- (#7402) Added support for Stamford PFX Gen4 chip MVH103. Microchip EVB-PCI1003 Stamford Evaluation board
- (#7446) Fixed reset option for MXS924, Port 5 in DSWITCH mode
- (#7468) Added support for PXIe Gen5 MXP526 adapter
- (#7468) Fixed patch table entries for MXP526
- (#7491) Implement iommu_verify.exe as precondition for driver start
- (#7505) Fix buffer overrun resulting in potential Requester ID corruption
- (#7515) Added support for reading fan information (rpm, duty cycle) of MXH530 with dis_diag (under adapter status)
- (#7518) Added option to configure processor I/O requester IDs manually in the configuration files. Particularly useful for heterogenous Intel Xeon Scalable clusters
- (#7552) Removed NXP bootloader for adapters with NXP version > Ver3.0
- (#7572) Improved the IRM error handling in case a critical chip error occur. Avoid any session IOCTLs before the driver is properly initialized
- (#7586) Converted MXH930 to MR6
- (#7586) Increased the Link BAR2 from 1TB to 64TB
- (#7608) Converted MXH530 to MR2
- (#7608) Fixed GPIO 32 REFCLK_OE (from low to high) for TARGET config 4, 5 and 6
- (#7608) MXH530 and MXH532 PFX configuration VER3 release, September 2nd, 2025
- (#7609) Fixed clock GPIO setting in configuration
- (#7609) Split MXH530 and MXH532 PFX configuration images and firmware
- (#7609) Updated upgrade_eeprom.sh and upgrade_eeprom.ps1 scripts after splitting MXH530 and MXH532
- (#7636) Added support for MXH570 and MXH572
- (#7703) Updated configuration image for MXH916 to VER5. Fixes PCIe connections for all link ports
- (#7707) Added NTB support for MXH914, MXH916 and MXH918
- (#7718) General connectivity fix for multi direct topology with different MXH5xx and MXH9xx adapter types
- (#7719) Updated configuration file for MXH918 to VER5 with MR6
- (#7721) MXH914 - MXH919 config release VER5, August 20th 2025
- (#7721) MXH914: VER5 MR6 configuration with 64TB link BAR2
- (#7723) Avoid unnecessary load of PFX CPU when doing sequence checks
- (#7752) Added driver support for combined NTB and TRANSP configuration for MXH930 adapters
- (#7763) Release of PFX configuration image VER5 for MXP908 and MXP909
- (#7764) Fixed bug where dis_diag reports incorrect cable capabilities when using PCIE5 cables

- (#7771) Updated NXP version to v3.4-rc13.bin to fix the fan control
- (#7777) Added dis_firmwaretool support for MVH126
- (#7781) Fixed a bug where DMA read operations would sometimes fail in clusters with Gen4 adapters connected by a Gen3 switch
- (#7786) Added support for MXC960 and MXC962
- (#7786) Improvements to the MXC960 D-SWITCH config
- (#7800) Added TARGET x2x2x2x2x2x2x2x2 (edge) in config 15 for MXH830
- (#7808) Added support for connecting different adapter types by an NTB switch
- (#7810) Minor update on RtssStack.ps1 to keep support for RTX64 v3.7

SISCI

- (#6917) Added documentation for DIS_BROADCAST_NODEID_GROUP_ALL constant for SCIConnectSegment
- (#7558) Return code fixes for SCIQuery
- (#7578) Fixed issue where requester ID added to adapter was not added to NTB switch table
- (#7591) Simplified SISCI API header file

DIS Release 5.23.0 (Jan 30 2025)

General

- General bug fixes and improvements

DIS Release 5.22.0 (Sep 2 2024)

SISCI

- General bug fixes and improvements

DIS Release 5.20.1 (Sep 12 2022)

General

- General bug fixes and improvements

DIS Release 5.20.0 (Jul 15 2022)

General

- General bug fixes and improvements

DIS Release 5.19.2 (Jan 7 2022)

General

- General bug fixes and improvements

DIS Release 5.18.0 (Apr 15 2021)

General

- General bug fixes and improvements

DIS Release 5.17.0 (Sep 24 2020)

General

- General bug fixes and improvements

SISCI

- Added support for send-only multicast configurations
- Fixed bug in segment cleanup for shared segments that could cause segment to be unavailable for all users
- Increased max multicast segment size to 128 GB. Fixed 32 bit size limitations with internal copy function

DIS Release 5.15.2 (Mar 11 2020)

General

- Fixed problem with slot AER errors not being logged
- Increase max number of adapters from 4 to 5

Included Software

SISCI API 2.0.2

- Shared memory (DMA, PIO, RDMA, Interrupts)
- PCIe peer-to-peer communication (FPGAs, GPUs, etc.)
- Full connectivity to other systems running Linux, Windows or VxWorks

Supported OS Platforms

- Windows 10 - 64 bit
- Windows 11 - 64 bit

Installation and Management

- Windows MSI Installer package

High Availability Features

- Nodes can join and leave cluster (node reboot, power cycled) any time without disturbing communication between other nodes

Bundled (major) Management Tools

- **dis_diag**: diagnostic tool
- **dis_config**: configuration tool

Bundled (major) Demo Tools

- **Scibench2**: SISCI-based PIO throughput benchmark
- **scipp**: SISCI-based ping-pong benchmark
- **dma_bench**: SISCI-based DMA benchmark
- **interrupt_bench**: SISCI-based remote system interrupt benchmark
- **reflective_bench**: SISCI-based reflective memory benchmark

Firmware Upgrade

The driver installer will detect and suggest to automatically update the firmware during installation if an update is required (new firmware may be included in software distribution).

For further instructions, please see the "Firmware Release Notes" of your adapter: https://www.dolphinics.com/download/MX/RELEASE/PW_DOC/download-mx-doc.html

Please file a support request at https://www.dolphinics.com/csp if you have any problems.

7 Change log for VxWorks Software

Description of content: Clustering package for VxWorks.

Release category: GA.

Current status: Contact Dolphin.

New in DIS Release 5.27.0 (Oct 22 2026)

Firmware

- (#8408) MXH992: Added a daisy chain PFX config, `MXH992_MULTICONF_DAISYCHAIN.fwimg`
- (#8408) MXH992: Released PFX config VER4. x16 configs now run at Gen4 speed
- (#8528) MXH95x: Updated firmware, adds hot-add support (Microchip MR6)
- (#8529) MXH94x: Updated firmware with hot-add support
- (#8703) MXH914: Released PFX config VER7
- (#8703) MXH916: Released PFX config VER6
- (#8703) MXH918: Released PFX config VER7
- (#8725) MXP526: Fixed TWI setting and GAS accesses in PFX configuration file
- (#8726) Updated configuration files for MXP526
- (#8727) MXP508, MXP509: Released PFX config VER2, with the unused TWI2 to TWI5 interfaces disabled
- (#8758) MXH930, MXH940, MXH950: Windows hot-add x16 configs use a 64MB non-prefetchable synthetic endpoint BAR again
- (#8759) MXH932: Released PFX config VER16, with a corrected MCU configuration
- (#8771) Updated NXP firmware to emmentaler v3.12 for MXH53x, MXH57x, MXP50x, MXP523, MXP526, MXP908, MXP909, MXP921, MXP924 and MXC96x
- (#8851) Updated configuration files for MXB585
- (#8852) Updated configuration files for MXH530
- (#8852) Updated configuration files for MXH532
- (#8854) Updated configuration files for MXH570

- (#8854) Updated configuration files for MXH572

General

- (#8665) Added option to specify which adapter card to upgrade with `upgrade_eeprom` script
- (#8710) Fixed `dis_firmwaretool pfx -M` resetting the wrong link on Gen5 MXH adapters
- (#8710) Fixed `dis_firmwaretool stm` and `eeprom` commands failing with "invalid serial provided"
- (#8730) Fixed detection of Stamford evaluation board in `dis_firmwaretool` utility
- (#8749) Reduced the default value of the `ntb_lut2_switch_max_entries` configuration option from 12 to 4
- (#8775) Fixed sporadic IOMMU faults caused by MRPC DMA
- (#8776) Added standard driver support for MXS924 x8 60-node CASCADE configs
- (#8785) Improved 60-node CASCADE configs for MXS824
- (#8814) Added optional port argument to `dis_firmwaretool pfx -e` to select the ChipLink telnet server port (default 4242)
- (#8814) Fixed `dis_firmwaretool pfx -e` exiting with status 0 when the telnet server failed to start
- (#8828) Fixed `dis_diag` not showing cable info for all cables

Changes in Previous Releases

DIS Release 5.26.2 (Oct 7 2026)

Benchmarks

- (#8777) Added `-bidir` flag to `dma_bench`

General

- (#8716) Fixed issue where setting required link width = 2 in dishosts.conf would cause the dishosts parser to fail
- (#8794) `dis_nodemgr` will retry initial adapter configuration for up to 120 seconds if it fails to find / resolve the host's hostname

DIS Release 5.26.1 (Sep 14 2026)

General

- (#8134) Added additional resource usage information to dis_diag and dis_tool

SISCI

- (#8732) Fixed an issue that could prevent the creation of more than one private SISCI segment

DIS Release 5.26.0 (Aug 31 2026)

General

- (#8058) Fix mismatch between outbound mapping table entries and vdevs in single D-Switch topology
- (#8145) Updated `dishosts.conf` to a new format. Run `dis_mkconf -upgrade` to upgrade an old `dishosts.conf` to the new format
- (#8174) Improved support for MXS824 CASCADE configs
- (#8362) Improved support for customers using Xeon Scalable systems demanding more than 32 requester IDs for a single system

- (#8385) Exposed tunable DMA parameters in dis_mx.conf
- (#8491) Removed unused virtual device x:00.4 which showed up in lspci with IOMMU enabled
- (#8508) Added support for PXIe adapter MXP921
- (#8522) Added support for generating a default `dishosts.conf` file using `dis_mkconf -default`
- (#8528) Updated MXH950 PFX image with hot add, NTB larger BAR2 and incoming REF clk in TARGET mode
- (#8529) Converted MXH940 and MXH942 PFX config image VER13 to MR6
- (#8529) Extended the PFX configs options for MXH940 and MXH942 with 'Hot Add' configs and Target config using incoming REF clock
- (#8536) Fix improper use of the *command* parameter for PXISA_SystemModule_SMBusOperation
- (#8563) Added support for MXC960 and MXC962
- (#8568) Use separate EEPROM/Config version information for MXC960-CC-1501
- (#8574) Release of MXP921 Gen4 PXIe adapter
- (#8585) Fixed reset handling of MXC960 in NTB mode
- (#8591) Fixed Dual D-Switch FP init collision
- (#8595) Improved the fiber tuning for MXH570 and MXH572
- (#8595) Updated PFX config to VER6 and NXP version to v3.10 for MXH570 and MXH572
- (#8625) Updated DIS software License
- (#8630) Detection of MXH94x and MXH95x adapters might fail. The driver module fails to load. How to fix: Contact Dolphin for information about SEEPROM production update
- (#8652) Updated all MXH5xx cards to use the latest v3.11 firmware release

SISCI

- (#7724) Fixed regression introduced in 5.19.0 to improve SCICheckSequence latency
- (#8284) Added interactive_sisci as an example program
- (#8638) Added -fixed switch to scipp to drive only one block size

DIS Release 5.25.3 (Jun 05 2026)

General

- (#8189) Added initial support for MXP508 and MXP509
- (#8224) Improved debugging capabilities
- (#8436) Fixed an issue with spinlock usage that could cause crashes and/or errors in certain scenarios
- (#8440) MXH572: Added config for cable side 4x4 (config 21)
- (#8456) Added root port detection and MPS adjustment
- (#8466) Improved BMC logging capabilities on the following adapters (requires bmc update): MXH57x MXH53x MXP52x, MXP92x, MXP90x
- (#8497) Fixed an issue with dis_diag that made the application fail if verbosity level was specified
- (#8501) Fixed issue where `dis_config` in rare cases would trigger an array access out of bounds in the IRM

MXP926

- (#8466) Fixed an issue where the cable link could go down sporadically in specific systems

SISCI

- (#8412) Fixed an issue where SISCI benchmarks would report incorrect performance numbers on x86

DIS Release 5.25.2 (Apr 24 2026)

General

- (#8295) Added support for SR640, SR660, 23.03 with Clang
- (#8411) MXH57x: Fixed error messages from the IRM driver reading cable ports out of range: `MXH Cable info failed:  0x3`

SISCI

- (#8365) Reduce CPU usage of server node in `reflective_write` example
- (#8378) Reduce CPU usage of server node in `reflective_bench` and `reflective_dma_bench` benchmarks

dis_diag

- (#8344) Implement proper CSR value printout fix
- (#8373) MXH57x: Fixed an issue where the CDFP cable temperature could get stuck

Included Software

SISCI API 2.0.2

- Shared memory (DMA, PIO, RDMA, Interrupts)
- Reflective memory/multicast
- PCIe peer-to-peer communication (FPGAs, GPUs, NVMe, etc.)
- Full connectivity to other systems running Linux, RTX or Windows

Supported OS Platforms

- VxWorks 23.03
- VxWorks 7 SR0640
- VxWorks 7 SR0660

Note

VxWorks 7 SR0640/SR0660 are expected to work, but have not been validated by Dolphin. Please contact Dolphin support for specific platform support: https://www.dolphinics.com/csp

Note

AMP and User-Space communication not supported.

Installation and Management

- Windows MSI Installer package
- Linux ZIP file

High Availability Features

- Nodes can join and leave cluster (node reboot, power cycled) any time without disturbing communication between other nodes

Bundled (major) Management Tools

- **dis_diag**: diagnostic tool
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- **dma_bench**: SISCI-based DMA benchmark
- **interrupt_bench**: SISCI-based remote system interrupt benchmark
- **reflective_bench**: SISCI-based reflective memory benchmark

Firmware Upgrade

The driver installer will detect and suggest to automatically update the firmware during installation if an update is required (new firmware may be included in software distribution).

Please run the command

```
upgrade_eeprom.cmd --upgrade
```

to upgrade the firmware. A reboot is required after upgrading the firmware.

Please file a support request at https://www.dolphinics.com/csp if you have any problems.

8

Change log for QNX Software

Description of content: Clustering package for QNX.

Release category: GA.

Current status: Contact Dolphin.

New in DIS Release 5.27.0 (Oct 22 2026)

Firmware

- (#8408) MXH992: Added a daisy chain PFX config, `MXH992_MULTICONF_DAISYCHAIN.fwimg`
- (#8408) MXH992: Released PFX config VER4. x16 configs now run at Gen4 speed
- (#8528) MXH95x: Updated firmware, adds hot-add support (Microchip MR6)
- (#8529) MXH94x: Updated firmware with hot-add support
- (#8703) MXH914: Released PFX config VER7
- (#8703) MXH916: Released PFX config VER6
- (#8703) MXH918: Released PFX config VER7
- (#8725) MXP526: Fixed TWI setting and GAS accesses in PFX configuration file
- (#8726) Updated configuration files for MXP526
- (#8727) MXP508, MXP509: Released PFX config VER2, with the unused TWI2 to TWI5 interfaces disabled
- (#8758) MXH930, MXH940, MXH950: Windows hot-add x16 configs use a 64MB non-prefetchable synthetic endpoint BAR again
- (#8759) MXH932: Released PFX config VER16, with a corrected MCU configuration
- (#8771) Updated NXP firmware to emmentaler v3.12 for MXH53x, MXH57x, MXP50x, MXP523, MXP526, MXP908, MXP909, MXP921, MXP924 and MXC96x
- (#8851) Updated configuration files for MXB585
- (#8852) Updated configuration files for MXH530
- (#8852) Updated configuration files for MXH532
- (#8854) Updated configuration files for MXH570

- (#8854) Updated configuration files for MXH572

General

- (#8665) Added option to specify which adapter card to upgrade with `upgrade_eeprom` script
- (#8710) Fixed `dis_firmwaretool pfx -M` resetting the wrong link on Gen5 MXH adapters
- (#8710) Fixed `dis_firmwaretool stm` and `eeprom` commands failing with "invalid serial provided"
- (#8730) Fixed detection of Stamford evaluation board in `dis_firmwaretool` utility
- (#8749) Reduced the default value of the `ntb_lut2_switch_max_entries` configuration option from 12 to 4
- (#8775) Fixed sporadic IOMMU faults caused by MRPC DMA
- (#8776) Added standard driver support for MXS924 x8 60-node CASCADE configs
- (#8785) Improved 60-node CASCADE configs for MXS824
- (#8814) Added optional port argument to `dis_firmwaretool pfx -e` to select the ChipLink telnet server port (default 4242)
- (#8814) Fixed `dis_firmwaretool pfx -e` exiting with status 0 when the telnet server failed to start
- (#8828) Fixed `dis_diag` not showing cable info for all cables

SISCI

- (#8849) Fixed an issue for ARM-platforms that would cause incorrect measurements to be displayed in SISCI benchmarks

Changes in Previous Releases

DIS Release 5.26.2 (Oct 7 2026)

Benchmarks

- (#8777) Added `-bidir` flag to `dma_bench`

General

- (#8716) Fixed issue where setting required link width = 2 in dishosts.conf would cause the dishosts parser to fail
- (#8794) `dis_nodemgr` will retry initial adapter configuration for up to 120 seconds if it fails to find / resolve the host's hostname

DIS Release 5.26.1 (Sep 14 2026)

General

- (#8134) Added additional resource usage information to dis_diag and dis_tool

SISCI

- (#8732) Fixed an issue that could prevent the creation of more than one private SISCI segment

DIS Release 5.26.0 (Aug 31 2026)

General

- (#8058) Fix mismatch between outbound mapping table entries and vdevs in single D-Switch topology
- (#8145) Updated `dishosts.conf` to a new format. Run `dis_mkconf -upgrade` to upgrade an old `dishosts.conf` to the new format

- (#8174) Improved support for MXS824 CASCADE configs
- (#8362) Improved support for customers using Xeon Scalable systems demanding more than 32 requester IDs for a single system
- (#8385) Exposed tunable DMA parameters in dis_mx.conf
- (#8491) Removed unused virtual device x:00.4 which showed up in lspci with IOMMU enabled
- (#8508) Added support for PXIe adapter MXP921
- (#8522) Added support for generating a default `dishosts.conf` file using `dis_mkconf -default`
- (#8528) Updated MXH950 PFX image with hot add, NTB larger BAR2 and incoming REF clk in TARGET mode
- (#8529) Converted MXH940 and MXH942 PFX config image VER13 to MR6
- (#8529) Extended the PFX configs options for MXH940 and MXH942 with 'Hot Add' configs and Target config using incoming REF clock
- (#8536) Fix improper use of the *command* parameter for PXISA_SystemModule_SMBusOperation
- (#8563) Added support for MXC960 and MXC962
- (#8568) Use separate EEPROM/Config version information for MXC960-CC-1501
- (#8574) Release of MXP921 Gen4 PXIe adapter
- (#8585) Fixed reset handling of MXC960 in NTB mode
- (#8591) Fixed Dual D-Switch FP init collision
- (#8595) Improved the fiber tuning for MXH570 and MXH572
- (#8595) Updated PFX config to VER6 and NXP version to v3.10 for MXH570 and MXH572
- (#8625) Updated DIS software License
- (#8630) Detection of MXH94x and MXH95x adapters might fail. The driver module fails to load. How to fix: Contact Dolphin for information about SEEPROM production update
- (#8652) Updated all MXH5xx cards to use the latest v3.11 firmware release

SISCI

- (#7724) Fixed regression introduced in 5.19.0 to improve SCICheckSequence latency
- (#8284) Added interactive_sisci as an example program
- (#8638) Added -fixed switch to scipp to drive only one block size

DIS Release 5.25.3 (Jun 05 2026)

General

- (#8189) Added initial support for MXP508 and MXP509
- (#8224) Improved debugging capabilities
- (#8440) MXH572: Added config for cable side 4x4 (config 21)
- (#8466) Improved BMC logging capabilities on the following adapters (requires bmc update): MXH57x MXH53x MXP52x, MXP92x, MXP90x
- (#8501) Fixed issue where `dis_config` in rare cases would trigger an array access out of bounds in the IRM

MXP926

- (#8466) Fixed an issue where the cable link could go down sporadically in specific systems

DIS Release 5.25.2 (Apr 24 2026)

General

- (#8411) MXH57x: Fixed error messages from the IRM driver reading cable ports out of range: `MXH Cable info failed:  0x3`

SISCI

- (#8365) Reduce CPU usage of server node in `reflective_write` example
- (#8378) Reduce CPU usage of server node in `reflective_bench` and `reflective_dma_bench` benchmarks

dis_diag

- (#8344) Implement proper CSR value printout fix
- (#8373) MXH57x: Fixed an issue where the CDFP cable temperature could get stuck

DIS Release 5.25.1 (Mar 6 2026)

General

- (#7617) Fixed problem with DMA pull failing between some nodes in Dual D-Switch topology
- (#7617) Fixed problems with interference of nodes in Dual D-Switch topology
- (#8133) Added initial MXS924 configs for Dual D-Switch topology. See MXS924_eeprom_versions.txt for details
- (#8274) `dis_diag` now correctly prints the root port's BDF
- (#8288) Extended PFX configuration image for MXB585
- (#8289) Added support for MXH570-B and MXH572-B Revision
- (#8291) Fixed NTB 3-nodes, 4-nodes and 5-nodes topology for MXH530. Firmware PFX configuration version 6 required
- (#8291) Release of PFX config, VER6 for MXH530 and MXH532
- (#8293) Added support for upgrading the firmware on the MXB585 ebox with upgrade_eeprom script
- (#8298) Fixed updating the serial number for MXH910 and MXH912 adapters with dis_firmwaretool
- (#8302) Virtual PCIe devices are cleaned up when remote node is lost
- (#8342) Fixed CSR value printouts

SISCI

- (#8207) SCICreateMapSequence returns error when used on map of local segment
- (#8280) Improved performance for `memcpy_nt_avx2`
- (#8341) Fix arithmetic overflow inside SISCI testlib, on systems where CPU frequency is 4GHz+

DIS Release 5.25.0 (Jan 28 2026)

Arm

- (#7068) Fixed a cache-coherency issue with DMA transfers and user allocated memory on Nvidia AGX Orins

Benchmarks

- (#7882) Adds check for div by zero when walltime is used for dma_bench or scibench
- (#7997) Creates a benchmark analogous to `reflective_bench` but which uses DMA for sending
- (#8063) `dma_bench` regression fixed so `-veclen` parameter can be used again
- (#8075) Added `-vl` argument to `reflective_dma_bench` which can be used to increase DMA transfer vector length

Demos

- (#7851) Added performance demo, video transfer demo, and rfm wrapper to DIS example programs

General

- (#6713) Fixed issue in the downstream cable port for MXC962
- (#6980) Fixed doorbell performance spikes by removing an unneeded loopback doorbell
- (#7317) The configuration files of DIS hosts no longer supports 'STRIPE' and 'REDUNDANT' socket adapters. A socket adapter specified with this mode will be ignored
- (#7550) Improved Dual D-Switch support: up to 15 hosts per switch, no power sequencing requirements
- (#7554) Added support for QNX
- (#7689) Minor improvements for multi-cpu systems
- (#7792) Added support for MXE expansion board MXB585
- (#7845) Improved stability with multi-socket Icelake configurations
- (#7881) Minor improvements
- (#7891) Fixed problem with driver crash during dis_config for adapters with invalid hardware configurations
- (#7939) MXH530 and MXH532 PFX config release VER4
- (#7968) Fixed issue where `dis_services stop` would fail if there is no adapter installed in the system
- (#7977) Fixed a bug where a node would end up in a livelock with no session, spamming `getAliveCnt - mbxMsgQ_localHeader == NULL` to the kernel buffer
- (#7981) Improved error handling in dis_firmwaretool
- (#7982) Added driver support for MXP523
- (#8003) Added MXS924 DSWITCH configuration files with 2 DSPs
- (#8031) Vastly improved PIO performance for the Zen3 architecture
- (#8042) Added DUAL NTB Switch support for MXS924
- (#8065) Added support for MXH992
- (#8083) Converted firmware to MR3 for MXH530 and MXH532. Version 5
- (#8084) Converted MXH570 and MXH572 VER2 to PFX MR3
- (#8085) Converted MXP526 to MR3
- (#8121) Released NXP firmware 3.6 and PFX configuration image VER5 for MXH530 and MXH532
- (#8122) Release of MXH570-AA and MXH572-AA with PFX configuration VER2
- (#8156) Improved the detection of adapter types in dis_firmwaretool
- (#8173) Fixed bug in MXS824 NTB DUAL configs that prevented version 10 of the configs from working
- (#8175) Resolved potential crash when mapping table is exhausted

- (#8221) Adds support for SFF-86xx AOC voltage readout
- (#8221) Fixed bug where SFF-86xx temperature could be wrong in dis_diag
- (#8222) Fixed serial numbers printouts in dis_firmwaretool for adapters with custom serial numbers

SISCI

- (#7336) Multi-threading is now required to compile eXpressWare
- (#7879) Fixed off by one error in reflective_bench
- (#8230) Fixed a bug in `SCICreateDeviceSegment` where it would fail if called with either of the flags `SCI_FLAG_LOCAL_ONLY` or `SCI_FLAG_DEVICE_SIDE_ONLY`

SmartIO

- (#8175) Resolved issue with NT-Transparent causing repeated borrow/return to fail
- (#8186) Fixed an issue where two lenders borrowing each others' devices would fail with IOMMU disabled
- (#8226) Fixed issue with automatic DMA windows size calculation with NT-Transparent

SuperSockets

- (#7629) Sockperf: 1 second walltime is standard measurement
- (#7629) Sockperf: Improved explanation of measurement options
- (#8009) Fixed a memory leak related to the usage of DMA channels

dis_diag

- (#7636) MXH570/MXH572: Added support in dis_diag for reading temperature, voltage, max power consumption and other cable info from CDFP cables
- (#7817) New json output when `-json` option is used
- (#7893) dis_diag output reorganized to print info per adapter
- (#8123) Make the report of the upstream link more generic in dis_diag

Included Software

SISCI API 2.0.2

- Shared memory (DMA, PIO, RDMA, Interrupts)
- Reflective memory/multicast
- PCIe peer-to-peer communication (FPGAs, GPUs, NVMe, etc.)
- Full connectivity to other systems running Linux, Windows, RTX, or VxWorks

Supported Architectures

The software supports the following architectures and platforms:

- ARM64

Supported OS Platforms

- QNX 7.1
- QNX 8.0