

vSphere Distributed Services Engine solution

Supported hardware and code

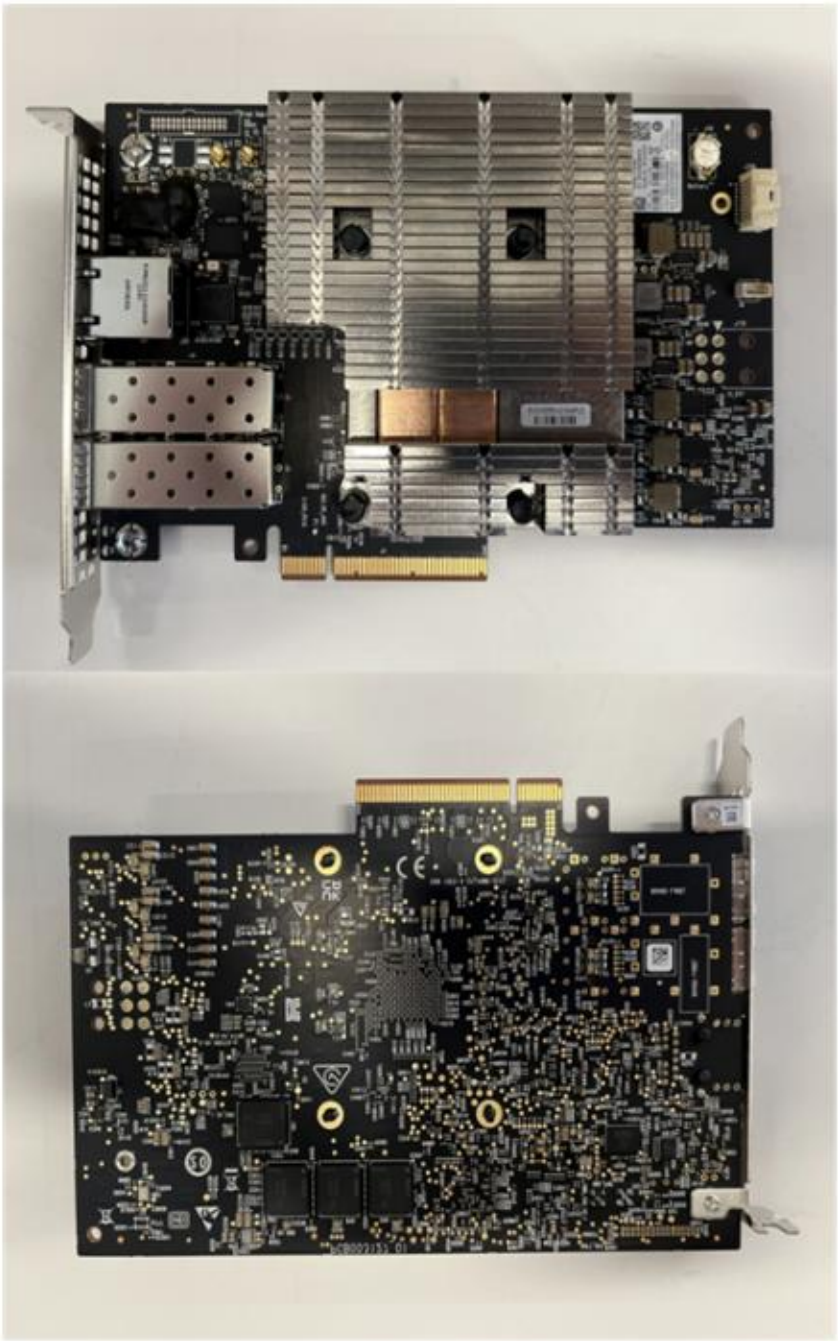
Lenovo

BlueField-2 DPU

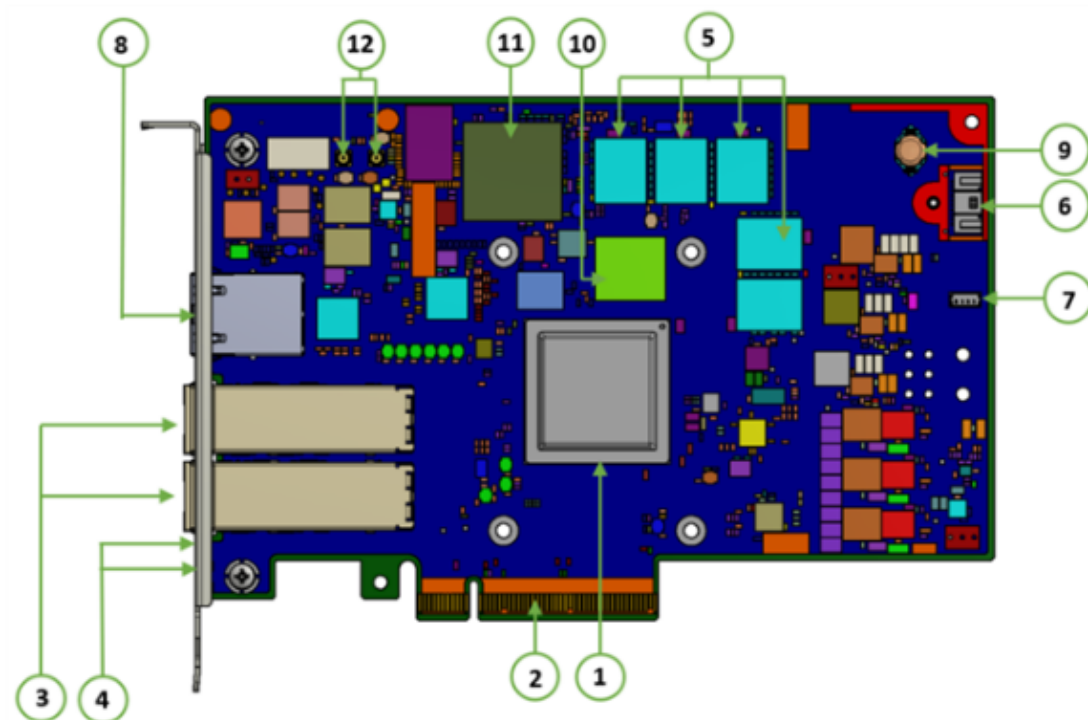
The NVIDIA BlueField-2 SmartNIC Data Processing Unit (DPU) adapter is used to improve the performance of VMware vSphere by offloading tasks from server CPUs to the DPU, thereby making data center applications more efficient.

MBF2H532C-AECOT / MBF2H532C-AESOT Specifications

BlueField-2 DPU	BlueField-2 P-Series - 8 Cores - 500MHz/2500MHz
Physical	Card Dimensions (FHHL): 2.71 in. x 6.6 in. (68.90mm x 167.65 mm) Bracket Dimensions: 4.73 in. x 0.72 in. (121.0mm x 18.4mm) Connector: Dual SFP56 (copper and optical)
Protocol Support	Ethernet: 25GBASE-R, 20GBASE-KR2, 10GBASE-LR, 10GBASE-ER, 10GBASE-CX4, 10GBASE-CR, 10GBASE-KR, SGMII, 1000BASE-CX, 1000BASE-KX, 10GBASE-SR Data Rate: 1/10/25 Gb/s Ethernet PCI Express Gen 4.0: SERDES @ 8.0GT/s / 16.0GT/s, 8 lanes (3.0, 2.0 and 1.1 compatible)
On-board Memory	Single-channel with 8 DDR4 8 bit + ECC (64bit + 8bit ECC) 32GB @ 3200MT/s, 128GB eMMC memory
Capabilities	MBF2H532C-AECOT: Crypto Enabled, Secure Boot Enabled MBF2H532C-AESOT: Crypto Enabled, Secure Boot Disabled

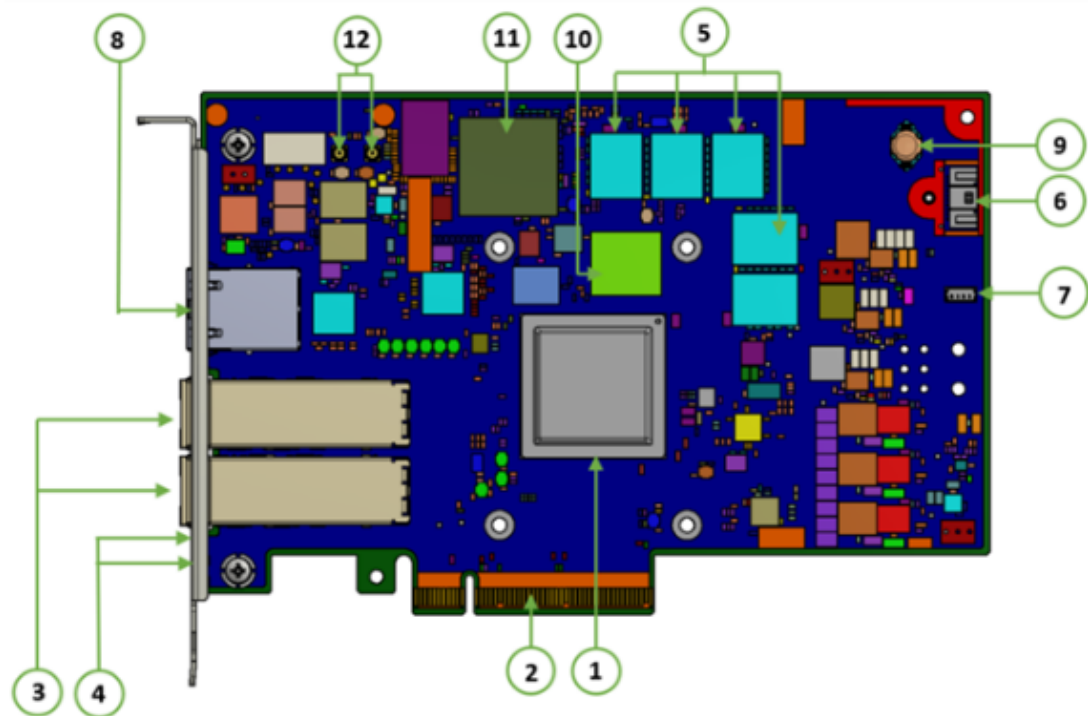


Layout of the BlueField-2 DPU



Item	Interface	Description
1	DPU	DPU IC 8 cores
2	PCI Express interface	PCIe 4.0 through an x8 edge connector
3	Networking ports	Ethernet traffic is transmitted through the DPU SFP56 connectors
4	Networking ports LED interface	One bi-color I/O LED per port to indicate link and physical status
5	DDR4 SDRAM onboard memory	Eight SDRAM units for a total of 16 GB/32 GB at 3200 MT/s on a single DDR4 channel, 64 bit + 8 bit ECC, solder-down memory
6	NC-SI management interface	Connectivity for remote sideband management (NC-SI over RBT) – the NC-SI connector type differs based on the product HW version
7	USB 4-pin vertical interface	Used for OS image loading
8	1 GbE OOB Management Interface	1 GbE BASE-T OOB management interface
9	RTC battery	Battery holder for RTC

Layout of the BlueField-2 DPU



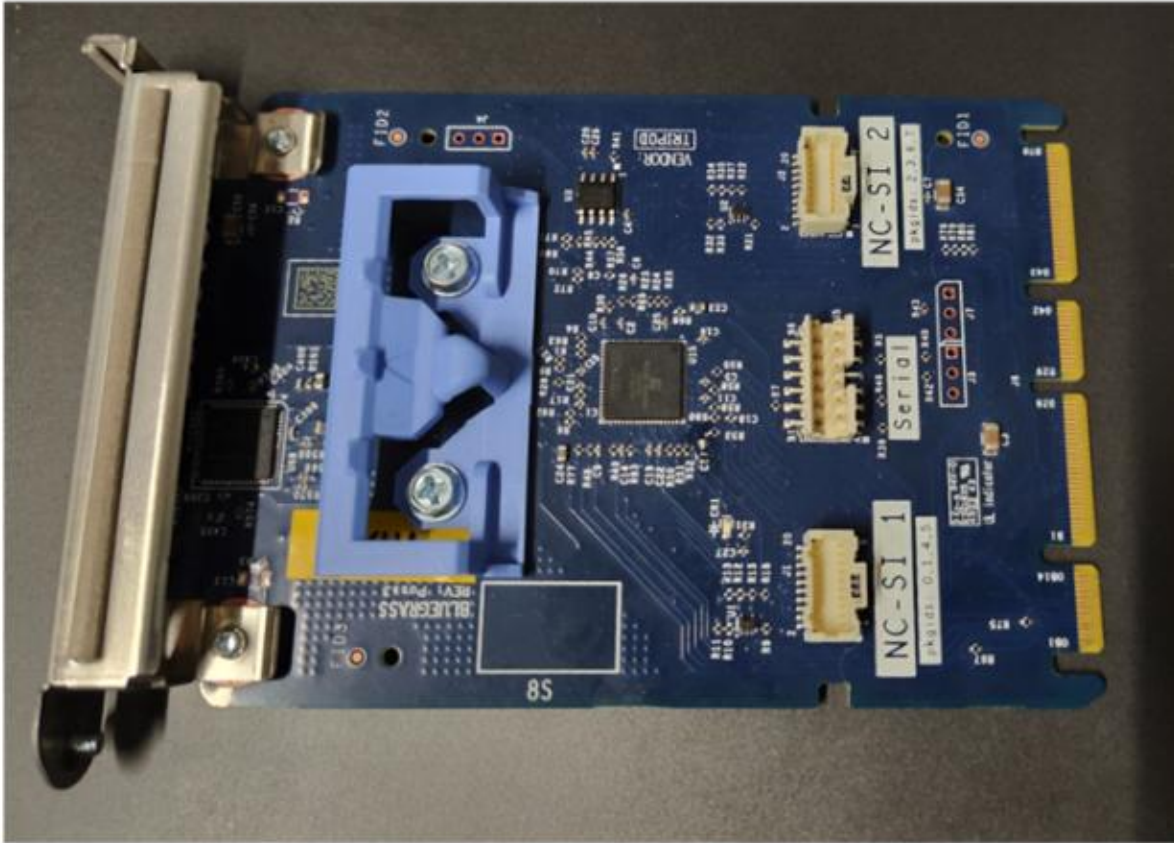
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8	1 GbE OOB Management Interface	1 GbE BASE-T OOB management interface
9	RTC battery	Battery holder for RTC
10	eMMC interface	x8 NAND flash
11	BMC	Embedded BMC on DPU
12	MMCX RAPPS IN/OUT	Enables PPS IN/OUT

Unpacking the BlueField-2 DPU



OCP Enablement Kit for vSphere DSE and cables

The following figures show the Lenovo-developed OCP Enablement Kit for vSphere DSE (code name: Bluegrass) and the cables used for the vSphere DSE solution.



OCP Enablement Kit for DSE, feature code BSH7



ThinkSystem adapter NC-SI
cable – 270 mm

Supported Lenovo servers

The Intel-based ThinkSystem SR650 V3 and ThinkAgile VX650 V3 are supported for the phase one launch of this project.

SR650 V3
VX650 V3



Supported system code versions

The code listed in the following table has been tested and verified by Lenovo or VMware.

Lenovo servers	Version tested by Lenovo	Version certified by VMware
SR650 V3, VX650 V3	UEFI Version : ESE113A/1.20 XCC Version : • ESX309F (unsigned) • ESX310V (signed) • Invgy_fw_xcc_esx309f-1.20_anyos_comp • Next build: ESX310U	Not tested – to be self-certified by Lenovo

Note: VMware vSphere DSE certifications cannot be updated beyond the scope of Lenovo and VMware certifications.

Supported code for adapters and software tools

Adapter / software	Version tested by Lenovo	Version certified by VMware
BlueField-2 NIC firmware	24.33.1246 mlnx-lnvgy_fw_nic_cx-j9bv5-0161_anyos_comp	24.33.1246
BlueField-2 UEFI (ARM) image	BlueField:18.2.0.12570	BlueField:18.2.0.12580
ThinkSystem OCP Enablement Kit for DSE (Bluegrass) FPGA	3.02	
LXCA	4.0.0.260 and patch	

Note: VMware vSphere DSE code levels cannot be updated beyond the scope of the [VMware Compatibility Guide \(VCG\)](#).

Checking compatibility with the VMware Compatibility Guide

Go to the [VMware Compatibility Guide](#) site, enter a server in the **What are you looking for** field, and then select the following requirements:

- An OS version of ESXi 8.0 U1 or above
- Distributed Services Engine from the **Features** list
- Lenovo from the **Partner Name** list

VMware Compatibility Guide

Search Compatibility Guide: ? (e.g. compatibility or esx or 3.0)

What are you looking for: Systems / Servers

Product Release Version:

- All
- ESXi 8.0 U1
- ESXi 8.0
- ESXi 7.0 U3
- ESXi 7.0 U2
- ESXi 7.0 U1

System Type:

- All
- Blade
- Mother Board
- Rack or Tower
- Rackmount
- Tower

Partner Name:

- IBM
- Ingrasys Technology Inc.
- Inspur Electronic Information Industry Co.,
- Intel Corporation
- ITRenew Inc.
- JSC Sitronics
- KAGA ELECTRONICS CO.,LTD.
- Klas Telecom
- Kns Group Llc Trademark Yadro
- Kontron AG
- KTNF
- Lenovo

Features:

- All
- Certified Memory - DRAM
- Certified Persistent Memory (PMem)
- Distributed Services Engine
- Extended Configuration Maximum
- Fault Tolerant(FT)
- Intel Optane Persistent Memory (PMem) M
- Intel SGX
- Legacy FT
- PCIe Hot-Plug Ready
- Quick Boot
- SR-IOV
- Total combined memory (PMem + DRAM)
- Trusted Platform Module (TPM)

Keyword: ?

Sample search result

This screenshot shows the search result. Click [here](#) to open the web page.

Supported adapters and firmware must be listed for the server.

The exact listed UEFI and XCC versions must be used.

VMware Compatibility Guide

The screenshot displays the VMware Compatibility Guide interface. At the top, there is a 'Back to Search Results' button and a 'Print' link. The 'Model Details' section lists the following information:

- Model: **ThinkSystem SR650 V2**
- Partner: Lenovo
- CPU Series: Intel Xeon Gold 6300/5300 (Ice-Lake-SP) Series
- System Type: Rackmount
- Number of Sockets: 2
- Max Cores per Socket: 32

Notes on the right side state: 'This page lists the specific configurations for which the server vendor has submitted certification test results to VMware, including BIOS version.' and 'These are not the only supported or recommended configurations. Best practice is generally to use the latest BIOS version available for the server, even if it is newer than listed here. For further details about BIOS, server product configurations, and best practices, please contact the server vendor.' CPU Notes mention ESXi 6.7u3 support starting at 6.7.p03.

The 'Certification Details' section shows the 'VMware Product Name' as **ESXi 8.0 U1**. Below this is a table with the following columns: BIOS, Feature Category, Features, and Feature Value.

BIOS	Feature Category	Features	Feature Value
Lenovo AFE120H-1.41 UEFI Mode (Boot Mode:UEFI)	Server	UEFI Secure Boot	
Lenovo AFE120G-1.40 UEFI Mode (Boot Mode:UEFI)	Server	SR-IOV UEFI Secure Boot Intel SGX	
Lenovo AFE118V-1.35 UEFI Mode (Boot Mode:UEFI)	Server	Trusted Platform Module (TPM) SR-IOV UEFI Secure Boot Intel SGX	TPM 2.0 with TXT
Lenovo AFE118V-1.35 UEFI Mode (Boot Mode:UEFI)	Server	Distributed Services Engine	Server BMC Firmware Version: 3.10, Server CPLD Firmware Version: 1.0A, DPU Model: 4XC7A81824-ThinkSystem NVIDIA BlueField-2 25GbE SFP56 2-Port PCIe Ethernet DPU w/BMC & Crypto, DPU NIC Firmware Version: 24.33.1246, DPU ARM Firmware Version:18.2.0.12580 bfb
Lenovo AFE118V-1.34 UEFI Mode (Boot Mode:UEFI)	Server	VM Direct Path IO	