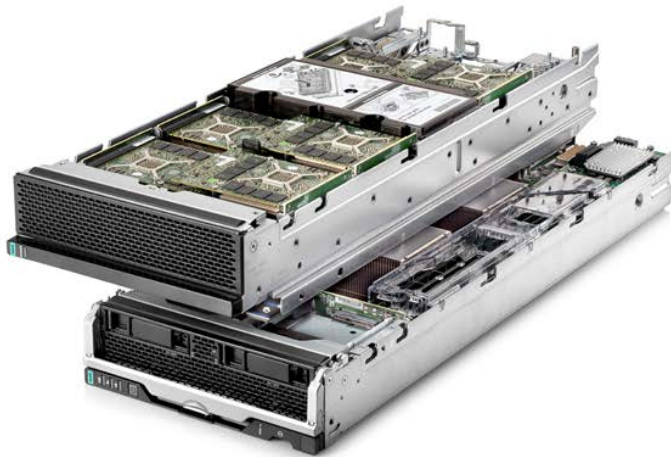# QuickSpecs

Overview

HPE Synergy Graphics Accelerator Options

HPE Synergy 480 Compute and Graphics Expansion Module

Summary

The HPE Synergy 480 Graphics Gen 10 Accelerator Options deliver data center deployments of graphics workstations to improve the user experience for designers and geophysicists with 3D visualization requirements or high density task and knowledge-worker deployments of VDI and virtualized application supporting thousands user sessions per rack.

The Graphics Accelerator Options are paired with HPE Synergy 480 Compute Module. To provide a wide variety of deployment options, operating environments and remote access methods. If applications require GPU acceleration, the Synergy platform provides the most-popular options to meet the needs of virtually any environment.

The Graphics Accelerators are supported in three different form factors: Compute Module Mezzanine Adapter, Multi MXM Expansion Module and x16 PCIe Expansion Module.

What's New

- The SY 480 Gen10 PCIe x4 Expansion Module. Support 2 or 4 full height, full length single wide GPU's
- Support for new Intel Processors
- High GPU density. Up to seven 100 watt MXM format, two full-length, full height, double wide 300 watt PCIe or up to 4 full height, full length single wide GPU's
- The Multi MXM module supports the installation of the HPE Synergy D3940 storage module with P416ie-m Smart Array Controller.
- Supports the most common desktop and SBC virtualization environments, including VMware ESXi, vSphere, Horizon View, Citrix, XenServer, XenDesktop and XenApp and HP, Inc RGS
- Support for the NVIDIA Quadro RTX6000 and NVIDIA Tesla RTX6000 Graphics Card
- Support for the NVIDIA Tesla T4

Standard Features

The Synergy 480 Graphics Option Modules in Detail

Graphics Accelerators are supported in three different form factors: Compute Module Mezzanine Adapter, Multi MXM Expansion Module and x16 PCIe Expansion Module.

Mezzanine Graphics Adapter

The GPU Mezzanine adapter is installed in the Synergy 480 Compute Module in the Mezz1 slot. Available GPU options include the NVIDIA® Tesla® P6 – NVIDIA Grid compatible MXM server GPU, NVIDIA Quadro® M3000SE GPU. A maximum of one GPU can be installed in the Compute Module.

HPE SY 480 Gen10 Multi MXM FIO Exp Mod PCIe

The Synergy 480 Multi MXM Graphics Expansion Module provides high GPU density with up to six – 100 watt MXM form factor GPUs in a single-wide, half height Module that attaches to the HPE Synergy 480 Compute Module via the Mezz1 slot. GPUs can be added in the field in pairs. So a minimum configuration can be field upgraded to add four or six GPUs. Supported GPUs include the NVIDIA® Tesla® P6 and the NVIDIA Quadro® M3000SE.

The MultiMXM module has two pass-through Mezz slots (4 and 5) that allow pass-through connection of modules to the Mezz 1 and 2 slots on the Compute Module.

Standard Features

HPE SY 480 Gen10 PCIe FIO Exp Module and the HPE SY 480 Gen10 PCIe x4 Exp module

The HPE SY 480 Gen10 PCIe FIO Expansion Module supports either one or two full length, full-height, double-wide GPUs. Each GPU can be up to 300 watts each. Currently the NVIDIA Tesla P40, M10, M60 RAF, V100 or Quadro P6000, RTX6000 are supported.

The HPE SY 480 Gen10 PCIe x4 Expansion Module support 2 or 4 full height, full length single wide GPU's.Each GPU can be up to 150 watts each. Currently the NVIDIA Tesla T4 and the Quadro RTX4000 are supported.

About the HPE Synergy Platform

NOTE: This document covers the HPE Synergy 480 Graphics Options. For information on HPE Synergy Modules and Frames HPE Synergy QuickSpecs:
- HPE Synergy 12000 Frame QuickSpecs at
  https://www.hpe.com/h20195/v2/GetPDF.aspx/c04815113.pdf
- HPE Synergy Interconnect Modules
  https://www.hpe.com/h20195/v2/getpdf.aspx/c04815119.pdf?ver=2
  https://www.hpe.com/h20195/v2/GetDocument.aspx?docname=c04815127
- HPE Synergy Configuration and Compatibility Guide
- **https://support.hpe.com/hpsc/doc/public/display?sp4ts.oid=1008615198&docId=emr_na-c05061206&docLocale=en_US**

Standard Features

Graphics Accelerators Mezzanine Graphics Adapters for Compute Module Installation:

- NVIDIA Tesla P6 MXM server graphics
  - Workstation class performance for high-end professional 3D graphics
  - Supports pass-through and vGPU with NVIDIA Grid
  - Single Mezzanine adapter
  - Supported Environments (Refer to "Technical Specification" section at end of document for full listing per graphics adapter)
    - Server / Hypervisor
      - VMware® ESXi® version 6.5
      - Citrix XenServer version 7.1

- NVIDIA Quadro M3000SE MXM server graphics
  - Workstation class performance for high-end professional 3D graphics
  - Supports bare metal and pass-through
  - Single Mezzanine adapter
  - Supported Environments (Refer to "Technical Specification" section at end of document for full listing per graphics adapter)
    - Bare Metal Client Operating System – Non Virtualized
      - Microsoft ® Windows 10®
      - Red Hat® Enterprise Linux 6.9/7.3
    - Server / Hypervisor
      - VMware® ESXi® version 6.5

MXM Graphics Card Options for use In the Multi MXM Expansion Module

NOTE: All graphics card options for the Multi MXM Expansion Module are sold in pairs of GPUs. If there are GPU slots available in either the Multi MXM or PCIe Expansion Modules, they can be field upgraded with additional GPUs. Note all GPUs must be of the same type, mixing GPUs is not supported.

- NVIDIA Tesla P6 MXM server graphics
  - Workstation class performance for high-end professional 3D graphics
  - Supports pass-through and NVIDIA vGPU with NVIDIA Grid
  - Supported Environments (Refer to "Technical Specification" section at end of document for full listing per graphics adapter)
    - Server / Hypervisor
      - VMware® ESXi® version 6.5
      - Citrix XenServer 7.1
      - Microsoft Windows Server 2012 R2 (64 bit)
      - Microsoft Windows Server 2016 (64 bit)

- NVIDIA Quadro M3000SE MXM server graphics
  - Workstation class performance for high-end professional 3D grap
  - Supports pass-through
  - Supported Environments (Refer to "Technical Specification" section at end of document for full listing per graphics adapter)
    - Server / Hypervisor
      - VMware® ESXi® version 6.5
      - Citrix XenServer 7.1
      - Microsoft Windows Server 2012 R2 (64 bit)
      - Microsoft Windows Server 2016 (64 bit)

Standard Features

PCIe Graphics Card Options for use In the HPE SY 480 Gen10 PCIe FIO Exp Module

- NVIDIA Quadro P40 (double-width PCIe x16 in PCIe Expansion Module)
    - For professional ultra-high-end 3D graphics and VDI acceleration
    - Two P40 are supported with a virtualized SY 480 Compute Module
    - Supported Environments (Refer to "Technical Specification" section at end of document for full listing per graphics adapter)
        - Bare Metal Client Operating System – Non Virtualized
            - Microsoft ® Windows 10
            - Red Hat Enterprise Linux (RHEL) 6.9 or 7.3 (64 bit only)
        - Server / Hypervisor
            - VMware vSphere6.0 or later
            - Microsoft® Windows Server 2012 R2 (64-bit)
            - Microsoft® Windows Server 2016 (64-bit)
            - Citrix XenServer 7.1, 7.2

- NVIDIA Quadro P6000 (double-width PCIe x16 in PCIe Expansion Module)
    - For professional ultra-high-end 3D graphics and VDI acceleration
    - Two P6000 are supported with a virtualized SY 480 Compute Module
    - Supported Environments (Refer to "Technical Specification" section at end of document for full listing per graphics adapter)
        - Bare Metal Client Operating System – Non Virtualized
            - Microsoft ® Windows 10
            - Red Hat Enterprise Linux (RHEL) 6.9 or 7.3 (64 bit only)
        - Server / Hypervisor
            - VMware vSphere5.5 or later
            - Microsoft® Windows Server 2012 R2 (64-bit)
            - Microsoft® Windows Server 2016 (64-bit)
            - Citrix XenServer 7.1

- NVIDIA Tesla M60 (double-width PCIe x16 in PCIe Expansion Module)
    - For professional high-end 3D graphics and VDI acceleration
    - PCIe Gen3, x16 single-width card two per PCIe Expansion Module can be supported)
    - Supported Environments (Refer to "Technical Specification" section at end of document for full listing per graphics adapter)
        - Server / Hypervisor
            - VMware vSphere 6.5
            - Citrix XenServer 7.1
            - Microsoft Windows Server 2012 R2 (64 bit)
            - Microsoft Windows Server 2016 (64 bit)

- NVIDIA Tesla M10 (double-width PCIe x16 in PCIe Expansion Module)
    - For high-density VDI deployments
    - PCIe Gen3, x16 single-width card (two per PCIe Expansion Module can be supported)
    - Supported Environments (Refer to "Technical Specification" section at end of document for full listing per graphics adapter)
        - Server / Hypervisor
        - VMware vSphere 6.5
        - Microsoft® Windows Server 2012 R2 (64-bit)
        - Microsoft® Windows Server 2016 (64-bit)
        - Citrix XenServer 7.1

- NVIDIA Tesla V100 32 GB (double-width in PCIe Expansion Module)
    - AL Inferencing, Training

Standard Features

- Video Transcoding
- Computational Science and Scientific Simulati
- Supported Environments (Refer to "Technical Specification" section at end of document for full listing per graphics adapter)
  - RHEL Enterprise 7.6
  - SLES Enterprise 12 SP3

NOTE: V100 Standard Operating Temperature 10º to 35ºC System performance during standard operating support may be reduced if operating with a fan fault or above 25ºC

- NVIDIA Quadro RTX 6000 24 GB (Double-width GPU supported in PCIe Expansion Module)
  - Two RTX 6000 are supported with a virtualized SY 480 Compute Module
  - Supported Environments (Refer to "Technical Specification" section at end of document for full listing per graphics adapter)
    - RHEL Enterprise WS 7.6
    - Windows 10 (Single GPU only)
    - Windows Server 2016
    - Citrix XenServer 7.1
      - VMware vSphere 6.7

PCIe Graphics Card Options for use In the HPE SY 480 Gen10 PCIe x4 Exp Module

- NVIDIA Tesla T4
  - Universal accelerator for distributed computing environments
  - Two or Four T4's
  - Machine learning, deep learning and virtual desktops
  - Supported Environments (Refer to "Technical Specification" section at end of document for full listing per graphics adapter)
    - RHEL Enterprise WS 7.6
    - Windows Server 2016
    - Citrix XenServer 7.1
  - NVIDIA Turing Architecture

Service and Suppo

Service and Support	**Protect your business beyond warranty with HPE Support Services**
	HPE Technology Services delivers confidence, reduces risk and helps customers realize agility and stability. Connect to HPE to help prevent problems and solve issues faster. HPE Support Services enable you to choose the right service level, length of coverage and response time as you purchase your new server, giving you full entitlement to the support you need for your IT and business.
Optimized Support recommendation	**HPE Proactive Care Advanced* - 24x7 coverage, three year Support Service**
	HPE Proactive Care gives customers an enhanced call experience. When your products are connected to HPE, Proactive Care helps prevent problems and maintains IT stability by utilizing personalized proactive reports with recommendations and advice This Service combines three years proactive reporting and advice with our 24x7 coverage, four hour hardware response time when there is a problem. This service also includes collaborative software support for Independent Software Vendors (ISVs), Red Hat, VMWare, Microsoft, etc. running on your HPE servers.
	https://www.hpe.com/h20195/v2/GetPDF.aspx/4AA3-8855ENW.pdf
Standard Support	**HPE Proactive Care* with 24x7 coverage, three year Support Service**
	This service helps achieve a higher return on your product investment with personalized support from a local assigned Account Support Manager who will share best practice advice and personalized recommendations designed to help improve availability and performance to increase stability and reduce unplanned downtime. Leverage your system's ability to connect to HPE for pre-failure alerts, automatic call logging and parts dispatch. For business critical incidents, this service offers critical event management to reduce mean time to resolution. This recommendation provides 24x7 coverage with four-hour response for hardware and collaborative support that offers two-hour callback for supported software issues. Collaborative software management is included with independent software vendors unless you have your software support from HPE where we own all cases from start through to resolution.
	https://www.hpe.com/h20195/v2/getdocument.aspx?docname=4AA5-3259ENW
Deploy and integrate	**HPE Factory Express for Synergy Initial Frame service** is an all-inclusive solution deployment service for HPE Synergy that includes configuration, integration, and installation onsite. Factory Express for Synergy is based on Industry best practices and provides an Implementation Project Manager to oversee the solution deployment end to end. Detailed documentation on the solution and the service deliverables will be provided to the customer.
	HPE Factory Express Synergy Additional Frame Service for Synergy
	Add additional frames to your HPE Synergy Factory Express service or expand your existing HPE Synergy Infrastructure.
HPE Education Services	Keep your IT staff trained making sure they have the right skills to deliver on your business outcomes. Book on a class today and learn how to get the most from your technology investment. **http://www.hpe.com/ww/learn**
For more information	Additional Support Services can be found at: **http://www.hpe.com/services**

Service and Support

HPE Synergy Support for Bare Metal Client Operating Systems

HPE supports client operating systems on its Synergy compute modules. The term "Bare Metal" refers to the OS being installed directly on hardware, for example, Windows 10 installed on a Synergy 480 where the add-in GPU is used as the primary graphics device, without the use of virtualization. This support is restricted to a select set of configurations and options.

Systems supporting client operating systems
- HPE Synergy 480 Compute Blade with graphics option

Client operating systems supported
- Microsoft Windows 7, 8.1, 10 (Support varies depending on model and graphics card used)
- RHEL Workstation 6, 7 (Support varies depending on model and graphics card used)

Support restrictions and guidelines based on model
- General guidelines
  - HPE supports client operating systems to be run on select systems with reduced set of available tested configurations and options. This support gives equivalent options to what would be expected in a desk side workstation. HPE only tests and supports client operating system with basic options and no support for some advanced "server" technologies.
- Supported system option restrictions
  - HPE Synergy 480 support only Broadcom (formerly QLogic) network adapters when running client operating systems and only supports basic network connectivity and not advanced HPE FlexFabric SAN options.
  - HPE does not test or support running client OS's in production mode using the embedded graphics, an add-in GPU option is required.
- Supported Network Adapters
  - HPE Synergy 480 Gen10
    - HPE Synergy 3820C 10/20Gb Converged Network Adapter
    - HPE Synergy 2820C 10Gb Converged Network Adapter
- Options/Feature NOT supported when running bare metal client operating system.
  - SAN/HBA cards or FlexFabric SAN connections except for software iSCSI initiator
  - HPE I/O Accelerator Options

Service and Support

HPE Synergy 480 Support for Windows Client Operating System

HPE supports Microsoft Windows client operating systems (Microsoft Windows 7, and 10) running bare metal (Installed direct on system, no virtualization) where the add-in GPU is used as the primary graphics device on Synergy compute modules. This support is restricted to a select set of configurations as follows. This table is a reference for Microsoft Windows client operating systems only (Microsoft Windows 7/10) and is not a reference for Microsoft Server, Hypervisors or other operating systems.

NOTE: Running client OS's in production mode using the imbedded graphics and not an add-on GPU is not tested or supported

Table X – Microsoft Windows 7/10 Client OS Bare Metal Support Matrix for Synergy 480 compute modules. In the following table "7" and "10" represent Windows 7/10 support respectfully.

Table 1 – Windows Client OS Bare Metal Support Matrix for HPE Synergy 480

	NVIDIA Quadro RTX6000	NVIDIA Quadro M3000SE MXM	NVIDIA Quadro P6000	NVIDIA Tesla M6 MXM	NVIDIA Quadro RTX4000	NVIDIA Quadro M6000 M5000 K6000 K5000 K4000
Synergy 480 Gen10 Intel Skylake CPU	NO	10[1]	10[1,2]	10[1,6]	NO[7]	NO
Synergy 480 Gen10 Intel Cascade Lake CPU	10[1,2]	10[1]	10[1,2]	NO	NO[7]	NO

NOTE[1] : Only supported in the single wide configuration with GPU as Mezzanine option or as single GPU installed in graphics expansion. Not supported in HPE MultiGPU configurations when used with bare metal client OS configurations (Windows 7/10)

NOTE[2]: Requires the HPE Graphics Expansion to support full size cards. Only tested and support with single card on Bare Metal Client OS (Windows 10)

NOTE[3]:These cards are supported in certain configurations of WS460 Gen9 and Synergy 480 Gen9/10 but are not supported for bare metal client operating systems configurations, they are support only in virtualized environments or when used in compute mode only (NVIDIA Tesla Cards)

NOTE[4]: For Bare Metal NVIDIA Tesla M6 deployments. HP Inc. RGS is the only tested and supported remoting protocol and special configuration is required.

NOTE[5]: Only supported for Intel Skylake product model configuration

NOTE[6]: Requires special configuration, see quick start guide included with driver download

NOTE[7]: GPU only supported in multi-card configuration for virutalization (GPU Pass-Through

Service and Support

HPE Synergy 480 Bare Metal Linux Client OS Support

HPE supports Redhat client operating systems (Workstation) where the add-in GPU is used as the primary graphics device on Synergy compute modules. This support is restricted to a select set of configurations as follows. This table is a reference for Linux RHEL client operating systems only and not a reference for Linux Server, Hypervisors or other operating systems. If the operating system is not listed below for a specific configuration, it is not supported.

Table 2 – RHEL Workstation Bare Metal Support Matrix for HPE Synergy 480

	NVIDIA Quadro RTX6000	NVIDIA Quadro M3000SE MXM	NVIDIA Quadro P6000	NVIDIA Tesla M6 MXM	NVIDIA Quadro RTX4000	NVIDIA Quadro M6000 M5000 K6000 K5000 K4000
Synergy 480 Gen10 Intel Skylake CPU	NO	6.9+ 7.3+[1]	6.9+ 7.3+[1]	6.9+ 7.3+[1]	NO[5]	NO
Synergy 480 Gen10 Intel Cascade Lake CPU	7.6+	7.6+	7.6+[1]	NO	NO[5]	NO

NOTE[1]: Only supported in the single wide configuration with GPU as Mezzanine option or as single GPU installed in graphics expansion. Not supported in HPE MultiGPU configurations when used with bare metal client OS configurations (Windows 7/10)

NOTE[2]: Requires the HPE Graphics Expansion to support full size cards. Only tested and support with single card on Bare Metal Client OS (Windows 10)

NOTE[3]:These cards are supported in certain configurations of WS460 Gen9 and Synergy 480 Gen9/10 but are not supported for bare metal client operating systems configurations, they are support only in virtualized environments or when used in compute mode only (NVIDIA Tesla Cards)

NOTE[4]: For Bare Metal NVIDIA Tesla M6 deployments. HP Inc. RGS is the only tested and supported remoting protocol and special configuration is required.

NOTE[5]: GPU only supported in multi-card configuration for virutalization (GPU Pass-Through)

Service and Support

HPE Synergy 480 Bare Metal Client OS Remoting Protocol Support

When running client operating system on HPE Synergy systems, a remoting protocol supporting graphics acceleration is required. The following table lists the supported and tested options. Other protocols and solutions are available and may work but are not tested and supported by HPE.

NOTE: This table is only reference for support on client operating systems running bare metal on HPE systems and is not reference for virtualized environments.

NOTE: This table is only reference for support on client operating systems running bare metal on HPE systems and is not reference for virtualized environments.

Table 3 – HPE Protocol Support Matrix

	HP RGS	**Citrix XenDesktop HDX 3D Pro**	**Microsoft RDP**	**VMware Horizon PCoIP/Blast**
Windows 7	YES[1]	YES[2]	YES	NO[3]
Windows 8.1	YES[1]	YES[2]	YES	NO[3]
Windows 10	YES[1]	YES[2]	YES	YES[3]
RHEL Workstation	YES[1]	NO	NO	NO[3]

NOTE[1]: Requires RGS software and licenses, go to following link for more information:

NOTE[2]: Required use of XenDesktop and HDX 3D Pro

NOTE[3]: VMware Horizon support bare metal starting with Horizon 7.7 with Windows 10 only **https://www.hpe.com/us/en/product-catalog/detail/pip.7595461.html**

Configuration Information

Models

Mezzanine, Multi	HPE Synergy 480 Gen10 PCIe FIO Expansion Module	8726218-B21
MXM Expansion Module	HPE Synergy 480 Gen10 PCIe x4 Expansion Module	P14255-B21

Related Options

PCIe Expansion Module GPU Options for Synergy 480 Compute Module	HPE Synergy 480 NVIDIA Tesla P6 Multi MXM Option Kit	880709-B21
	HPE Synergy 480 Gen10 PCIe x4 Expander FIO Cable Kit	P17391-B21
	HPE Synergy 480 NVIDIA Tesla P6 GPU Mezzanine Graphics Card	880708-B21
	HPE NVIDIA Tesla T4 16GB Computational Accelerator	R0W29C
	HPE NVIDIA Tesla P40 24GB Computational Accelerator	Q0V80C
	HPE NVIDIA Quadro P6000 Graphics Accelerator	Q0V76A
	HPE NVIDIA Quadro RTX 6000 Graphics Accelerator	R0Z45C
	HPE NVIDIA Tesla V100 PCIe 32GB Computational Accelerator	Q9U36C

Summary of Changes

Date	Version History	Action	Description of Change
02-Dec-2019	Version 8	Changed	Configuration Information and Related Options sections were updated.
07-Oct-2019	Version 7	Changed	Overview, Standard Features, and Related Options sections were updated.
16-Sep-2019	Version 6	Changed	Overview, Standard Features, Configuration Information, Related Options and Service and Support sections were updated.
15-Abr-2019	Version 5	Changed	Standard Features and Service and Support sections were updated.
05-Mar-2018	Version 4	Changed	Overview, Standard Features, and Platform Information sections were updated
04-Dec-2017	Version 3	Changed	Overview, Standard Features, and Platform Information sections were updated.
		Added	SKUs added in Platform Information section: 880708-B21, 880709-B21.
		Removed	SKUs added in Platform Information section: M9R60A.
14-Aug-2017	Version 2	Changed	Quick Specs was updated.
11-Jul-2017	Version 1	Created	New Quick Specs

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