HPE Edgeline Converged Edge Systems and IoT gateways

Contents

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HPE Edgeline EL300, HPE Edgeline OT Link Platform Software, and HPE Edgeline Integrated System Manager (iSM)

Q. What did the HPE Edgeline BU announce at Discover Madrid 2018?
A. Hewlett Packard Enterprise announced new hardware, software, solutions, and services for its flagship HPE Edgeline Converged Edge Systems portfolio that improve customer's experiences for connecting, computing, and controlling processes and things at the edge. The announcement consisted of four major items:

1. HPE Edgeline OT Link IoT Platform Software for fast and simple configuration and orchestration of HPE Edgeline Converged Edge Systems and third-party industry-standard x86 systems. This includes OT Link-certified hardware modules for physical integration of control systems, data acquisition systems, and industrial networks, along with the OT Link ecosystem with open SDK/APIs and OT Link services for third-party custom software and hardware development.
2. HPE Edgeline iSM and Infrastructure Manager (EIM) hardware and software, which introduce our new edge-optimized management capabilities.
3. HPE Edgeline EL300 Converged Edge System in an ultra-compact, rugged system design, showcasing the advanced management, and OT Link capabilities.
4. HPE Edgeline Engineering Workstation (EWS) solution for agile product design and simulation.

Q. Which markets/industries is HPE targeting with these announcements?
A. HPE Edgeline Converged Edge Systems are targeted at the edge, along with a variety of applications and use cases that run outside traditional data centers. Edge environments can be an oil rig at sea, a factory floor, a petrochemical company, or an energy utility. The systems need to interoperate with operational technologies (OT) such as PLCs or SCADA systems that already exist at the edge. It also delivers sufficient performance to run analytics locally and incorporates the security, systems management, and ruggedization suitable for remote and hostile operating environments.

Q. How does the new HPE Edgeline announcement stack up to competitive offerings?
A. HPE invented a new product category called HPE Edgeline Converged Edge Systems and is the leading vendor in the industry that delivers on all the key customer criteria for converged OT+IT at the edge. HPE delivers:

1. No compromise enterprise IT at the edge
2. Edge-optimized remote systems management
3. Physical OT convergence
4. Software-defined intelligence for fast, simple, and secure deployment at the edge
5. Rugged small form factor (SFF) certified for industrial environments

Q. Who are some of the key customers using or in beta with these new offerings?
A. At Discover Madrid 2018, HPE featured several customers and partners who are achieving success and instrumental in completing HPE Edgeline solutions. CenterPoint Energy, Tesla, and Seagate Technologies, in addition to Enagas and Airbus are customers were featured in demonstrations and speaking sessions in Madrid. OEM customer Keysight Technologies was also featured as a new OEM customer bringing expertise in converged OT and emerging 5G technologies.

Q. What is HPE Edgeline OT Link?
A. HPE Edgeline OT Link is software-defined intelligent software and hardware for the Edgeline portfolio that dramatically simplifies deployment and management of OT as they are converged with IT in a secure and reliable way. HPE Edgeline OT Link is **fast**, as it can deploy Edgeline Converged Edge Systems with one-touch provisioning. HPE Edgeline OT Link is **simple**, as it can orchestrate OT+IT applications in just of few clicks. And HPE Edgeline OT Link is **secure**, as it helps protect converged edge systems with integrated security and enterprise-class reliability. OT Link is delivered through a combination of OT Link-certified hardware modules supported on HPE Edgeline, plus OT Link Platform and Workload Orchestration software for software-defined configuration and application orchestration.

Q. What is HPE Edgeline iSM?
A. HPE Edgeline iSM hardware and software, built into the EL300, is an edge-optimized management technology that provides secure and reliable remote monitoring, alerting, and management of individual HPE Edgeline EL300. It supports standard HPE system management and security capabilities and adds edge-critical features such as management over Wi-Fi or LTE connections, along with an ability to securely erase or disable compromised systems.

Q. What is HPE EIM?
A. HPE EIM software allows an IT administrator to inventory, update, and manage (proxy) thousands of HPE Edgeline EL300, EL1000, and EL4000 at an edge site using a single-pane-of-glass. EIM supports industry-standard interfaces such as Redfish for integration with industry standard systems management software offerings.

Q. What is the HPE Edgeline EL300 Converged Edge System?
A. HPE Edgeline EL300 and its compact rugged form factor make it suitable for embedded platform use cases. HPE EL300 includes edge-optimized systems management and security, broad I/O options, and HPE Edgeline OT Link—for fast, simple, and secure integration of OT+IT in a single ruggedized system. The passive design and IP50 rating make it ideal for rugged environments such as factory floors or building closets and its wide temperature ranges (–30°C to +70°C) bring analytics to the most remote locations.

Q. What is HPE Edgeline EWS?
A. The most demanding CAD professional users can now have the benefits of a VDI experience at the edge, far away from the traditional data center. This solution consists of an HPE Edgeline EL4000 Converged Edge System configured with up to 4 AMD Radeon Pro WX 4100 Graphics Cards. It can tackle the most demanding professional workflows ranging from product design and simulation to video post-production and visual effects. The HPE Edgeline EL4000 is an enterprise-class, fully managed, 1U rack mounted, ruggedized system, suitable for deployment into design, test, manufacturing, and quality assurance environments.

Q. What is HPE Edgeline VPU Module for Myriad X?
A. The HPE Edgeline VPU Module for Myriad X accelerates vision processing applications where power efficiency, compactness, and ruggedization are valued. Based on an HPE Edgeline implementation of Intel® Movidius Myriad X VPU technology in a PCIe M.2 form factor, this HPE option card delivers efficient AI inference for image and video analytics workloads. This HPE Edgeline VPU module will be shipping in H1 2019 and is supported on HPE Edgeline EL300, EL1000, and EL4000.

Q. What is HPE Edge Center 6?
A. HPE Edge Center is a SFF enclosure that secures and protects edge infrastructure solutions that support OT or IoT workloads. It is a wall hanging ruggedized and integrated 6 RU remote-edge platform for rackmount-based servers and networking. It provides the IT hardware-protected power and an environment with an enterprise remote management solution.

Q. What HPE Pointnext offerings are available in support of these new Edgeline announcements?
A. New HPE Pointnext Edgeline Field Application Engineering (FAE) Services help customers plan, design, build, and run IoT, edge, and cyber-physical systems to accelerate deployment, as well as ensure reliable and secure operation. This includes identification of use cases, proof of value, solution deployment, and management of ongoing operation. As part of HPE GreenLake, the entire solution can be delivered based on a pay-as-you-go pricing model. Moreover, HPE Pointnext assists customers in developing their own data acquisition, industrial network, and control components for HPE Edgeline OT Link to create proprietary intellectual property and competitive advantage.

Q. What about availability and pricing?
A.

- HPE Edgeline EL300 Converged Edge System is available now and configurations begin at $2,500.
- HPE Edgeline iSM is available now and is included standard with every HPE Edgeline EL300. Customers can upgrade to iSM Advanced with licenses starting at $499.
- HPE Edgeline OT Link Certified hardware modules are available now, with prices starting at $189.
- HPE EIM, HPE Edgeline OT Link Platform software, and HPE Edgeline Workload Orchestrator are available in H1 2019.

Q. On November 12, Siemens and Aruba announced a strategic partnership for integrated OT and IT networks. How does this announcement relate to HPE Edgeline OT Link and HPE Edgeline EL300 Converged Edge System?
A. The announcements are not directly related to each other but the technologies are complementary and can be mutually reinforcing. The partnership between Siemens and Aruba is focused on bridging the OT and IT worlds by offering integrated communication networks. OT Link and EL300, can use such integrated OT/IT networks to feed OT data into business and IoT applications running on enterprise-grade IT at the edge to drive intelligent and autonomous decision-making.

- From a networking perspective, HPE Edgeline Systems supports and connects to many IT and industrial networks. Architecturally, they are nodes that connect too many vendors' access points and switches.
- Consistent with HPE Edgeline Systems' first-mover advantages, the newly announced OT Link hardware modules, include a time sensitive network (TSN) NIC connection, built on the new deterministic Ethernet standard. This allows HPE Edgeline to connect into any TSN compliant switch in the industry.

Note
At this time, Aruba has no TSN switch, hence Edgeline will connect into other vendor's TSN switches. This is an HPE Edgeline differentiator.

Q. Do you plan to deploy virtual PLCs on OT Link and HPE Edgeline?
A. This is an option being considered for the future OT Link road map, as HPE works with PLC vendors in the OT Link ecosystem.

Q. Considering you want to make OT Link an open platform will you offer it as a cloud service?
A. As we build the ecosystem around OT Link, we will assess offering cloud-based services to provide customers with the broad range of capabilities.

Q. You say you bring enterprise-grade security to the edge but enterprise-grade security in the IT world still means that you'll be hacked. That can be disastrous with an OT system. How do you deal with that?
A. Hewlett Packard Enterprise is leveraging multiple security technologies to secure both the hardware and software running at the edge. The new HPE EL300 incorporates critical security features. It includes intrusion detection, silicon root of trust protecting the management software and the mission software, the ability to remotely disable any system that has been compromised, and includes a trusted platform module (TPM) to protect important data.

Edge-to-cloud solution and HPE Edgeline Extended Storage Adapter

Q. What did HPE announce on 20 June 2018?
A. HPE launched the edge-to-cloud family of solutions. The edge-to-cloud solutions operate unmodified enterprise software from partners Citrix®, Microsoft®, PTC, SAP®, and SparkCognition, both on HPE Edgeline Converged Edge Systems—rugged, compact systems delivering immediate insight and control from data at the edge—and on data center and cloud platforms.

HPE also announced the **HPE Edgeline Extended Storage Adapter option kit,** adding up to 48 terabytes of software-defined storage to HPE Edgeline Converged Edge Systems. This enhancement enables storage-intensive use cases such as artificial intelligence, video analytics, or databases at the edge while leveraging industry-standard storage management tools such as Microsoft Storage Spaces, HPE StoreVirtual VSA, and VMware vSAN™.

Q. Why was this announcement important?
A. By running applications with enterprise-class performance, manageability, and security from the edge-to-cloud, customers can achieve real business benefits.

1. Drive business innovation with real-time processes at the edge
2. Expedite action and control across the enterprise and supply chain
3. Simplify hybrid cloud

In addition, software partners gain value when customers can run existing unmodified software at the edge, typically where customers don't have or don't want a cloud connection to their enterprise processes. In these cases, software vendors gain new opportunity to support customers with unmodified enterprise software running on HPE Edgeline.

HPE Edgeline EL1000 and EL4000 Converged Edge Systems

Q. What is the HPE Edgeline EL1000 system?
A. HPE Edgeline EL1000 system supports one HPE ProLiant server blade (HPE m710x or HPE m510) and up to two full-height half-length (FHHL) PCI Express or PXI/PXIe modules (hybrid slot). Optionally, a board supporting two Mini PCIe adapters with associated SIM carriers and antennas (for example, 3G, Wi-Fi). It also accommodates two small form factor (SFF) SATA drives and is available with 1GbE or 10GbE network options.

Enterprise
- 853995-B21: HPE EL1000 system with Dual 1GbE Pass Through Network
- 880271-B21: HPE EL1000 v2 systems with Dual 1GbE Pass Through Network
- 866585-B21: HPE EL1000 system with Dual 10GbE Pass Through Network
- 880273-B21: HPE EL1000 v2 systems with Dual 10GbE Pass Through Network

Data capture and control
- 847555-B21: HPE Edgeline EL1000 Converged Edge system with PXIe

Q. What is the difference between HPE Edgeline EL1000 system and HPE Edgeline EL1000 v2 systems?
A. HPE Edgeline EL1000 v2 system has been designed and certified to support higher watt PCIe graphics cards (two per system, up to 75W with Active Fan Control). HPE EL1000 is designed to support 37W industry-standard PCIe cards. HPE EL1000 v2 has been designed to support Wi-Fi options.

Q. What is HPE Edgeline EL4000 system?
A. HPE EL4000 system supports one to four HPE ProLiant server blades (HPE m710x or HPE m510) and up to four FHHL PCI Express or PXIe cards. It is available with 1GbE or 10GbE network options (either switched or pass-through).

Enterprise
- 847535-B21: HPE Edgeline EL4000 1U System Dual 10Gb Aggregated Uplinks
- 879808-B21: HPE Edgeline EL4000 v2 1U System Dual 10Gb Aggregated Uplinks System

Telco
- 847534-B21: HPE EL4000 1U System with Dual 4x10Gb Pass Through Network
- 879799-B21: HPE EL4000 v2 1U System with Dual 4x10Gb Pass Through Network
- 843992-B21: HPE EL4000 1U System with Reverse Airflow and Dual 4x10Gb Pass Through Network (private SKU)

Data capture and control
- 847536-B21: HPE Edgeline EL4000 1U Converged Edge System with PXIe (OEM/private SKU)

Q. What is the difference between HPE Edgeline EL4000 system and HPE Edgeline EL4000-v2 systems?
A. HPE Edgeline EL4000 v2 system has been designed and certified to support higher watt PCIe graphics cards (four per system, up to 75W with Active Fan Control). HPE EL4000 v1 is designed to support up to 37W industry-standard PCIe cards.

Q. What is HPE Edgeline EL4000 reverse airflow SKU?
A. HPE Edgeline EL4000 reverse airflow SKU comes pre-configured with fans that drive back-to-front airflow (versus normal front-to-back airflow on servers). This makes it suitable for usage in some telco environments.

Note that normal airflow may meet the needs of many telco customers, so the reverse airflow SKU is currently planned only as a private offering. Contact HPE if you have specific customer requirements.

Q. What are the available mounting kit options?
A. A variety of mounting kit options will be available to open up a multitude of placement possibilities, when floor space options are limited:

HPE Edgeline EL1000
- Standard server rack mount
- ETSI rack mount
- Wall mount
- Table-top operation
- Integrated into customer equipment (custom design)

HPE Edgeline EL4000
- Standard server rack mount
- Wall mount
- Table-top operation
- Integrated into customer equipment (custom design)

Q. Are the servers hot pluggable?
A. Yes. HPE ProLiant server blades can be serviced without turning off power to HPE Edgeline system. Take note that the OS must be shut down before the service operation to reduce the risk of data corruption.

- HPE Edgeline EL1000: Service from the front (one server)
- HPE Edgeline EL4000: Service from the left (two servers) and right sides (two servers)

Q. Does HPE Edgeline EL1000 support internal drives?
A. Yes. Two 2.5" SFF drive bays are supported in the base SKU.

Q. Can I connect an HPE Smart Array controller to the internal SFF drives on HPE Edgeline EL1000?
A. Yes, one HPE Smart Array controller is supported on HPE Edgeline EL1000.

Order the following option when configuring the system and any internal cables needed will also be provided.

726907-B21: HPE H240 12Gb 2-ports Int Smart Host Bus Adapter

Note that the HPE Smart Array controller cannot be connected to the M.2 SSDs on HPE ProLiant server blade.

Note
If the customer is upgrading an existing HPE EL1000, which has been deployed, an additional cable is needed for connecting the HPE Smart Array controller to the Drive Bay Backplane (885017-B21).

Q. Can I connect an HPE Smart Array controller to the internal SFF drives on HPE Edgeline EL4000?
A. No, HPE Smart Array controller is not supported on HPE Edgeline EL4000.

Q. What are the network options provided?
A. A variety of 1GbE and 10GbE options are available depending on the SKU ordered. See the description of HPE Edgeline EL1000. HPE EL4000 supports 10GbE options.

Q. Why does the HPE Edgeline EL4000 Converged Edge System SKU have network ports on the front instead of the rear?
A. This is due to a lack of space at the rear when all the instrumentation cards and cabling are installed.

Q. Do HPE Edgeline EL1000 and EL4000 network ports support Power over Ethernet (PoE)?
A. No. However, PoE-capable NIC cards can be installed on the add-in PCIe I/O slots.

Q. Does the HPE Edgeline EL1000 and EL4000 have user replaceable network switches?
A. No. HPE Edgeline EL1000 does not use any switch and directly connects the server to network ports.

HPE Edgeline EL4000 uses either an unmanaged switch or a pass-through ASIC that's integrated on board and connects all four server blades in the chassis to network ports. Once ordered, it is not possible to change the type of network in HPE Edgeline EL4000 system. This is different from the modular and replaceable switches in HPE Moonshot 1500 chassis, which are larger and more complex due to a need to support many more servers (up to 180 nodes).

Q. Can the QSFP+ pass-through port on HPE EL4000 be aggregated to form a 40GbE link?
A. No. The four lanes of each QSFP+ connector are connected to four different servers and must be treated as four independent 10GbE ports when connecting to external infrastructure. A QSFP+ connector is used since the chassis lacks space for 4 x SFP+ connectors.

Therefore, connectivity options are:

- 40GbE QSFP+ to 4x10GbE SFP+ splitter cable connecting to four different external 10GbE ports

  (Or)

- 40GbE QSFP+ optical transceiver carrying 4x10GbE internal links, connecting to a 40GbE QSFP+ port on an external switch, which has that port configured as 4x10GbE ports.

Q. Does the HPE Edgeline EL1000 and EL4000 network ports support optical interconnects?
A. Yes. If direct-attached copper (DAC) cables are not desired, standard optical transceivers can be plugged into the SFP+ and QSFP+ ports for a fiber uplink.

Q. What are the I/O options provided?
A. HPE Converged Edge system SKU provides the ability to add PXIe cards. HPE Edgeline EL1000 supports both PXI and PXIe cards, as it implements hybrid slots. It also provides an orderable option that adds support for Mini PCIe cards, which can then be connected to one or more of the three prewired chassis antennas.

HPE EL4000 supports PXIe cards only and it supports mapping of the PCIe bus to allow assignment of the PXIe cards to one or more HPE ProLiant server blades:

- HPE ProLiant server blades can own all four PXIe cards (1:4 mapping).

All other SKUs support standard PCIe I/O cards (limit of 50W per card; x8 electrical connections in an x16 physical slot). See the description of HPE Edgeline EL1000 and EL4000 systems mentioned previously for details.

Q. Are the antennas on HPE Edgeline EL1000 replaceable?
A. Yes. Antennas can be easily unscrewed and changed to match the type of wireless card installed in the system (for example, Wi-Fi, 3G WAN). Remember to connect the correct internal antenna wire to the correct I/O card before replacing the system cover.

Q. Can I install any antenna of my choice in HPE Edgeline EL1000?
A. No. Wireless I/O option cards ordered from HPE will be shipped with specific antennas optimized for best performance. See the documentation supplied with third-party wireless I/O options for their recommendation.

Note that installing unapproved antennas may result in poor wireless operation and could violate radio frequency laws in the respective country.

Q. Can I install HPE wireless options in an HPE Edgeline EL4000?
A. There is no HPE wireless option certified for HPE EL4000. You can either use a standard PCIe I/O card with wireless capabilities and its own integrated antennas, or you can use an appropriate USB wireless dongle.

Q. Can I use a high-powered card like NVIDIA® GRID K2 or Intel® Xeon® Phi card in an HPE Edgeline EL1000 or EL4000 system?
A. No. The physical (full-height but half-length) and power limit (75W per card) of the I/O slots will prevent usage of these cards. SFF cards such as NVIDIA Tesla P4 is supported in HPE EL1000 v2 and HPE EL4000 v2.

Note that the slots are electrically PCIe Gen3 x8 although they can physically accommodate x16 sized cards. This limits the maximum available system bandwidth to the slot.

Q. Do HPE Edgeline EL1000 and EL4000 support Fibre Channel (FC) SAN?
A. Yes, if a suitable FC add-in I/O card is installed, both HPE Edgeline EL1000 and EL4000 can be directly connected to SAN arrays. This is an enhancement over HPE Moonshot 1500 chassis where only iSCSI is supported for remote storage.

Q. Do HPE Edgeline EL1000 and EL4000 support InfiniBand?
A. Yes, but only with a suitable InfiniBand PCIe I/O card installed.

Q. Are HPE Edgeline EL4000 and EL1000 NEBS certified?
A. Yes. The certification was completed on April 30, 2018. And it is a customer selectable configuration option.

Q. What is the operating temperature range of HPE Edgeline EL1000 and EL4000?
A. Both HPE Edgeline EL1000 and EL4000 base systems are designed to operate in the extended inlet ambient temperature range (0°C to either 40°C, 45°C, or 55°C depending on configuration). This allows them to operate in a significantly hotter environment than the 0°C to 35°C range of a typical HPE ProLiant server.

Note that some add-in options (for example, specific I/O cards or HDD types) may constrain the operating temperature range to a lower limit than what the base system itself can tolerate. As a typical rule, telco-configured SKUs support the widest range while the denser converged edge and enterprise-configured SKUs may have limitations depending on the options selected.

Additionally, the failure of a fan rotor will reduce cooling airflow. This may cause servers to throttle their performance in an attempt to stay within thermal limits. In extreme cases (for example, multiple rotor failures, inlet ambient temperature beyond spec, and such), the system may gracefully shutdown to protect the hardware.

Q. Can these systems be certified to other standards (for example, rolling stock)?
A. HPE engineering evaluates any additional certifications on a case-by-case basis. Contact HPE with the customer requests.

Q. What is the power consumption and what power supplies do HPE Edgeline EL1000 and EL4000 support?
A. Both HPE Edgeline EL1000 and EL4000 support standard Gen9 server Flex Slot power supplies.

- HPE Edgeline EL1000
  - Power consumption:
    - Typical: 100W to 150W
    - Maximum: 250W
  - One Gen9 Flex Slot power supply
    - 95 VAC to 265 VAC input, 500W
    - –48 VDC input, 800W
- HPE Edgeline EL4000
  - Power consumption:
    - Typical: 400W to 600W
    - Maximum: 800W
  - Two Gen9 Flex Slot power supplies (redundant and hot swappable)
    - 95 VAC to 265 VAC input, 800W
    - –48 VDC input, 800W

Q. Are the fans in HPE Edgeline EL1000 and EL4000 redundant?
A.

- HPE Edgeline EL1000
  - Three fan modules—One rotor per fan module
  - Failure of any one rotor may impact performance (at high ambient temperature)
- HPE Edgeline EL4000
  - Six fan modules—Two rotors per fan module
  - One rotor failure up to 40°C inlet temperature does not impact performance
  - One rotor failure between 40°C to 55°C inlet temperature may impact performance
  - Two rotor failures may trigger a graceful system shutdown

Note that the fans are not hot swappable since it is difficult to ensure sufficient airflow across all components in such a dense chassis when the top cover is removed.

Q. Does HPE Edgeline EL1000 and EL4000 have an HPE iLO Chassis Manager?
A. No. HPE Edgeline System implements a lightweight chassis controller to monitor and control the common chassis elements (power supplies, fans, and more). HPE iLO 4 on each server blades communicates with the chassis controller to gather and report status information on the chassis itself. Users can connect directly to HPE iLO 4 of each server blades to manage the respective server.

Q. Can legacy HPE ProLiant server blades (for example, HPE m710p) work on HPE Edgeline EL1000 and EL4000?
A. Not at this time. HPE Edgeline EL1000 and EL4000 systems are designed to provide a user-friendly HPE iLO based management experience consistent with other HPE ProLiant servers. Such functionality requires an HPE iLO 4 management processor to be embedded on each server, which has been done for the new HPE m710x and HPE m510 designs. Unfortunately, since legacy blades (for example, HPE m710p and HPE m700) do not have an embedded HPE iLO 4 processor they are unable to deliver an equivalent user experience. If there are specific customer requirements for use of legacy servers with these new HPE Edgeline systems, contact HPE.

Q. Can HPE Edgeline EL1000 and EL4000 be operated in dusty environments?
A. Yes, HPE EL1000 and EL4000 have optional dust filters in product development. They are available as a private offering.

Q. Can HPE Edgeline EL1000 and EL4000 be submerged?
A. No. These are not waterproofed or splash-proofed systems.

Q. What is the noise level of an HPE Edgeline EL1000 and EL4000?
A. HPE Edgeline EL1000 and EL4000 are declared.

- A-weighted sound power levels (L Wad) and declared average bystander position
- A-weighted sound pressure levels (L pAm) when the product is operating in a 23°C ambient environment

Noise emissions were measured in accordance with ISO 7779 (ECMA-74) and declared in accordance with ISO 9296 (ECMA-109).

HPE Edgeline Converged Edge Systems option I/O cards
HPE Edgeline EL1000 also supports similar Mini PCIe options, and the list of options is as follows

869557-B21: HPE Intel AC 7260 Wi-Fi Kit

870054-B21: HPE Wide Temperature WAN 3G #OD1 Kit

870056-B21: HPE Wide Temperature Wi-Fi #OD1 Kit

866847-B21: HPE WWAN LTE Wide Temp AMS/EU Opt Kit

866850-B21: HPE WWAN LTE Wide Temp APJ Opt Kit

Q. What are the supported standard PCIe option I/O card types on HPE Edgeline Converged Edge Systems?
A. HPE Edgeline EL4000 does not provide any Mini PCIe slots. Support for HPE Wireless Options will be through standard PCIe cards or USB dongles.

Both HPE Edgeline EL1000 and EL4000 support FHHL or half-height half-length (HHHL) PCIe cards, with a power limit of 50W per card. HPE EL1000 supports one to two cards (one or two per server) and the EL4000 supports one to four cards (one per server).

Table 1. Supported PCIe I/O cards

Function	Options	Product number
HPE storage	HPE H241 12Gb 2-ports Ext Smart Host Bus Adapter	726911-B21
HPE networking	HPE Ethernet 25Gb 2P 640SFP28	817753-B21
	HPE Ethernet 100Gb 2P 841QSFP IB	872726-B21
	HPE Ethernet 10Gb 2P 560SFP+ Adapter	665249-B21
	HPE Ethernet 10Gb 2P 561T Adapter	716591-B21
	HPE Ethernet 10G 2-port 546SFP+ Adapter	779793-B21
	HPE Ethernet 1Gb 4-port 366T Adapter	811546-B21
HPE InfiniBand	HPE IB FDR/EN 40Gb 2P 544+ QSFP Adapter	764284-B21

Examples of other options available from standard HPE ProLiant or third-party catalog are provided as follows (not comprehensive; option choice may reduce allowable operating temperature of the product):

- Storage controllers: RAID (for example, HPE Smart Array) or HBA cards
- Networking: 1 Gb RJ-45, 10 Gb SFP+, 40 Gb QSFP+, 100 Gb Omni-Path
- InfiniBand: FDR/QDR/EDR (for example, Mellanox ConnectX), Combo IB/Ethernet
- Fibre Channel: HBA (for example, HPE StoreFabric)
- GPU: Graphics cards, GPGPU (for example, Tesla M4)
- Workload accelerators

Q. What is PXI/PXIe?
A. PCI eXtensions for Instrumentation/Express (PXI/PXIe) is an open industry standard launched in 1998 and is used as the basis for building electronic test equipment, automation systems, and modular laboratory instruments. PXI is promoted and maintained by the 70+ member PXI Systems Alliance (PXISA), whose sponsor members include National Instruments (who invented the standard), Keysight Technologies, Teradyne, and others.[1]

PXI is both a high-performance and low-cost deployment platform for applications such as manufacturing test, military and aerospace, machine monitoring, automotive, and industrial test. PXI combines PCI electrical-bus features with the modular, Eurocard packaging of CompactPCI and then adds specialized synchronization buses and key software features.[2]

Over 1500 different PXI peripheral modules are available that enable instrumentation, data acquisition, control, interfacing to buses, and others.

Q. What are the differences between PXI and PXIe?
A. PXI uses PCI as the physical layer, whereas PXIe uses PCI Express. This allows a substantial increase in bandwidth from 132 MB/s up to 24 GB/s. PXIe also has enhanced synchronization capabilities with a 100 MHz differential clock and differential triggering (versus 10 MHz for PXI).

HPE Edgeline EL1000 and EL4000 support hybrid slots that can accept both PXI and PXIe modules for best backward compatibility.

[1] en.wikipedia.org/wiki/PCI_eXtensions_for_Instrumentation.
[2] ni.com/pxi/whatis

Q. What are the types of PXI/PXIe modules available?
A. A wide range of PXI modules is available from vendors such as National Instruments.[3] Examples:

- Data acquisition (DAQ) and control
- Multifunction I/O
- FPGA
  - PXIe cards (FlexRIO)
  - High-performance hardware in the loop simulation, high-speed signal preprocessing, and hardware-based control
- Digital I/O
- Analog I/O
- Vision and motion
- Counter, timer, and clock
- Sensor measurements
- Reconfigurable I/O
- Signal conditioning

Instruments
- Oscilloscopes
- High-speed digital I/O
- Digital multimeters
- Signal generators
- Switching
- RF analyzers and generators
  - Including GHz frequencies
  - Support for 4G and 5G telco radio development and testing
- Power supplies
- Dynamic signal analyzers
- Source measurement units

Interfaces
- GPIB, USB, LAN
- RS-232, RS-485
- CAN, LIN, FlexRay
- Avionics buses
- I²C, SPI
- Boundary Scan, JTAG
- DeviceNet, PROFIBUS
- SCSI, Ethernet
- VXI-VME

[3] ni.com/

HPE Edgeline sensors

Q. How can I connect sensors to an HPE Edgeline system?
A. HPE Edgeline systems offer a wide variety of wireless and wired interconnects to interface with sensors in almost any edge use case.

Wireless
- Wi-Fi
- 3G WAN
- Bluetooth® (BT) and Bluetooth Low Energy (BTLE)
- LTE (4G) WAN (upcoming)
- Zigbee (third-party option)
- 6LoWPAN (third-party option)
- LoRaWAN (third-party option)
- Sigfox (third-party option)

Wired
- Ethernet (including PoE)
- USB
- RS-232, RS-422, RS-485
- Audio (MIC, IN, OUT)
- Digital I/O

PXI connected[4]
- High-speed and high-precision analog or digital I/O
- RF analyzers
  - Including GHz frequencies
  - Support for 4G and 5G telco radio development and testing
- GPIB, CAN, LIN
- Avionics buses

[4] Fits HPE EL1000 and EL4000 only. See the National Instruments PXI module catalog: sine.ni.com/np/app/main/p/ap/global/lang/en/pg/1/sn/n25:device,n24:PXI-FSLASH-CompactPCI/.

HPE Edgeline control systems

Q. How can I control "things" connected to HPE Edgeline system?
A. HPE Edgeline systems offer a wide variety of control mechanisms for the things at the edge. The ability to immediately act upon IoT insights at the edge itself is a key HPE Edgeline differentiator.

Wireless
- Wi-Fi
- BT and BTLE
- Zigbee (third-party option)
- 6LoWPAN (third-party option) and other local area wireless protocols through third-party options

Wired
- Ethernet
- USB
- RS-232, RS-422, RS-485
- Digital I/O

PXI connected[5]
- High-speed and high-precision analog or digital I/O
- GPIB, CAN, LIN
- Signal generators
- Switching
- RF generators
- Including GHz frequencies
- Support for 4G and 5G telco radio development and testing
- Power supplies and many more

HPE ProLiant m710x Server Blade

Q. What is HPE ProLiant m710x Server Blade?
A. These server blades use the latest Intel Xeon E3 Skylake SoC and next-generation integrated GT4e graphics.

Specifications
- Intel Xeon E3-1585L v5 Skylake-H (4-core, 3.0 GHz base/3.4 GHz all-core turbo)
  - 128 MB shared L4 cache (eDRAM)
- Intel Iris Pro P580 GT4e GPU with 72 execution units (504 threads)
- 4 DDR4 ECC SODIMMs (can run at 2133 or 2400 MHz; 1.2V) (8 GB, 16 GB)
  - Maximum configuration: 64 GB (4 x 16 GB) dual channel
  - Maximum speed in system: 2133 MHz (CPU limit)
- Mellanox ConnectX-3 Pro, Dual-port 10GbE NIC with RoCE
- Five M.2 modules, ~ 4 TB NVMe capacity
  - 1 SATA-3 M.2 (2242): 64 GB, 120 GB, 240 GB
  - 4 x4 Gen3 NVMe M.2 (2280/22110): 256 GB, 512 GB, 1024 GB

[5] Fits HPE EL1000 and EL4000 only. See the National Instruments PXI module catalog: sine.ni.com/np/app/main/p/ap/global/lang/en/pg/1/sn/n25:device,n24:PXI-FSLASH-CompactPCI/.

- HPE iLO 4 (Remote Console with vKVM and vMedia)
- HPE TPM embedded
- Typical power: 70W; maximum power: 85W

Q. What operating systems will be supported?
A. HPE m710x supports all major server and client OSs, along with a variety of virtualization software stacks. For more information on OS support, visit: hpe.com/us/en/servers/server-operating-systems.html.

Q. Can I use Citrix XenServer 6.5?
A. Minimum recommended version is Citrix XenServer 7.0 since NVMe drive support (and general performance) in this version has been significantly improved compared to XenServer 6.5.

Q. What workloads are suitable for HPE m710x?
A. Examples of workloads suitable for HPE m710x are

- Graphics-intensive application publishing (Citrix XenApp)
- Trader and engineering workstations (Citrix XenDesktop®)
- Video transcoding using Intel Quick Sync HW acceleration
- Big Data analytics and visualization (for example, Tableau)
- Industrial deep data capture, analytics, and control

Since HPE m710x is an industry standard x86 server, other workloads may also be feasible. When HPE m710x is installed in an HPE Edgeline system, these workloads can also be run outside the data center, for example, in a factory, branch office, retail outlet, or a remotely accessed site.

Q. What is the full list of CPU frequencies (base and turbo)?
A. The full list of frequencies is as follows:

Intel Xeon E3-1585L v5 (4-core, 45W)	
Base	3.0 GHz
1 core active	3.7 GHz max.
2 cores active	3.7 GHz max.
3 cores active	3.6 GHz max.
4 cores active	3.4 GHz max.

Q. Will HPE m710x have options for other CPU SKUs?
A. HPE m710x will only support the Intel Xeon E3-1585L v5 (4-core, 45W) CPU SKU. The CPU SoC is fixed (soldered) on the board and cannot be replaced. More Intel E3 specs can be found here ark.intel.com/products/93741/Intel-Xeon-Processor-E3-1585L-v5-8M-Cache-3_00-GHz.

Q. What is the HPE m710x GPU frequency?
A. On the HPE m710x, the Intel Iris Pro P580 GPU operates between the following frequencies:

Base	0.35 GHz
Max.	1.15 GHz

Q. What is the maximum usable graphics memory?
A. The main system memory is shared between the CPU and GPU cores. This is a key difference between Intel-integrated GPUs and discrete GPUs (for example, NVIDIA Quadro). Graphics memory is dynamically allocated out of main system memory based on demand and has limitations depending on the OS used:

- Windows® 7 x64: Up to 1.8 GB video memory
- Windows 8.1: Up to 3.75 GB video memory
  intel.com/content/www/us/en/support/graphics-drivers/000005539.html
- Windows 10: Up to half of the main system memory for video (for example, 32 GB out of 64 GB main memory)
  intel.com/content/www/us/en/support/graphics-drivers/000020962.html

Q. Can the Intel Iris Pro GPU be virtualized?
A. Yes. Starting with Intel Xeon E3-1500 v5 (Skylake) platforms Intel supports the following GPU modes depending on the virtualization software used:

- Bare metal
  - Not virtualized; native GPU driver
- GPU pass-through
  - Intel: GVT-d; VMware®: vDGA
  - Supported on: Citrix XenServer, VMware ESXi™
  - Native GPU driver
- GPU virtualization
  - Intel: GVT-g; VMware: vGPU
  - Supported on: Citrix XenServer
- GPU API forwarding
  - Intel: GVT-s; VMware: vSGA
  - Supported on: Microsoft RemoteFX (Hyper-V)

Q. What are the supported DIMM types?
A. HPE m710x supports four DDR4 ECC small outline DIMM (SODIMMs). Capacities are either 8 GB or 16 GB per DIMM for a maximum of 64 GB per server (up from 32 GB in HPE m710p). These DIMMs can operate at either 2133 MHz or 2400 MHz, but the CPU on HPE m710x only supports 2133 MHz.

Choose 1–4 of the following DIMMs per server (follow loading rules):

- 863951-B21: HPE 8GB 2Rx8 PC4-2400 CAS-15-15-15 Unbuffered SO-DIMM Field Upgradable Kit
- 863953-B21: HPE 16GB 2Rx8 PC4-2400 CAS-15-15-15 Unbuffered SO-DIMM Field Upgradable Kit

Q. Are the DIMMs factory configurable?
A. HPE m710x introduces full DIMM configurability. Customers can choose a memory footprint ranging from 8 GB to 64 GB either at the time of ordering or as an option kit after purchase. All DIMMs are customer self-serviceable and configuration rules are available as follows. This is a user-friendly enhancement over the previous HPE m710p, which only supports a fixed 32 GB configuration.

Recommended DIMM loading rules (based on HPE validation not ability to function):

- Put identical DIMMs (same size, same vendor) on the same channel
- Follow the loading order specified as follows:

Table 2. Recommended DIMM loading

Total memory	DIMM 1 (GB)	DIMM 2 (GB)	DIMM 3 (GB)	DIMM 4 (GB)
8 GB	N/A	8	N/A	N/A
16 GB	N/A	8	N/A	8
24 GB	N/A	16	N/A	8
32 GB	N/A	16	N/A	16
40 GB	16	16	N/A	8
48 GB	16	16	8	8
64 GB	16	16	16	16

Figure 1. HPE ProLiant m710x server blades DIMM load slots

Q. Can I use existing HPE ProLiant Gen9 server DIMMs?
A. No. HPE m710x uses SODIMM form factor memory while HPE ProLiant Gen9 servers use Registered DIMMs (RDIMMs). SODIMMs are more compact than RDIMMs and allow a high-memory density to be supported within the small size of each blade. Similar to HPE ProLiant Gen9 RDIMMs, the SODIMMs used on HPE m710x has ECC capability for high availability.

Q. Can I reuse DIMMs from HPE m710p?
A. No. HPE m710p uses older DDR3 SODIMMs while HPE m710x uses the latest DDR4 SODIMMs.

Q. What are the supported SSD types?
A.

HPE m710x supports a maximum of five SSDs for ~ 8 TB of maximum capacity:

- 1 SATA-3 M.2 (2242): 120 GB, 240 GB
- 4 x4 Gen3 NVMe M.2 (2280/22110): 256 GB, 512 GB, 1 TB
- 4 x4 Gen3 NVMe M.2 Extended Temp (2280/22110): 256 GB, 512 GB, 1 TB, 2 TB

Choose 0–1 of the following SATA SSDs per server:

- 866842-B21: HPE DRV, 120GB 2242 SSD IndsGrd Kit
- 866844-B21: HPE DRV, 240GB 2242 SSD IndsGrd Kit

Choose 0–4 of the following NVMe SSDs per server (mixing allowed):

- 862159-B21: HPE DRV, 256GB PCIe M.2 2280 SSD KIT
- 862161-B21: HPE DRV, 512GB PCIe M.2 2280 SSD KIT
- 862163-B21: HPE DRV, 1.024TB PCIe M.2 2280 SSD KIT
- 880262-B21: HPE DRV, 256GB PCIe M.2 2280 SSD KIT XTemp
- 880264-B21: HPE DRV, 512GB PCIe M.2 2280 SSD KIT XTemp
- 880266-B21: HPE DRV, 1.024TB PCIe M.2 2280 SSD KIT XTemp
- P00375-B21: HPE DRV, 2.048TB PCIe M.2 2280 SSD KIT XTemp

Recommended SSD loading rules:

- SATA SSD can only be loaded in 1 slot (2242).
- NVMe SSD should be loaded in the order shown as follows for optimized cooling and performance (Note: M.2 SSD slots #1–3 are PCIe G3 x4, slot #4 is PCIe G3 x2).

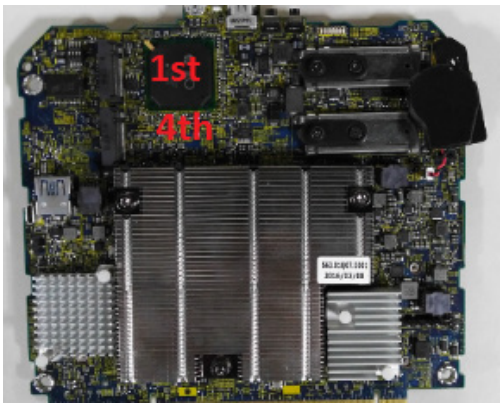

Figure 2. Recommended SSD loading rules on HPE ProLiant m510 server blades (front)

Figure 3. Recommended SSD loading rules on HPE ProLiant m510 server blades (back)

Q. What is the performance and endurance of the supported SSDs?

A. SATA SSDs—The SSD vendor (ADATA) quotes the following indicative[6] performance numbers.

Table 3. SSD performance numbers

Reads/writes	120 GB	240 GB
Sequential read (max.) MB/s	450	480
Sequential write (max.) MB/s	130	260
4K random read (max.) IOPS	12,000	46,000
4K random write (max.) IOPS	87,000	88,000

Endurance: 0.3 drive writes per day (DWPD)[7]

NVMe SSDs: The SSD vendor (Toshiba) quotes the following indicative[8] performance numbers.

Table 4. NVMe performance numbers

Read/writes	256 GB	512 GB	1024 GB	2048 GB
Sequential read (max.) MB/s	2861	2861	2861	3000
Sequential write (max.) MB/s	1159	1425	1413	2200
4K random read (max.) IOPS	210,000	190,000	210,000	320,000
4K random write (max.) IOPS	140,000	120,000	130,000	265,000

Endurance: 0.5 DWPD[9]

Q. Do you plan to add support for higher endurance SSDs?

A. HPE SSDs are available in three broad categories based on their typical target workloads.

- Read intensive: <= 1 DWPD
- Mixed use: > 1 and < 10 DWPD
- Write intensive: >= 10 DWPD

Currently, most commercially available SSDs in the M.2 form-factor fall in the read-intensive category, which offers the best cost per IOPS/GB. However, qualification of higher endurance SSDs in the M.2 form factor can be considered based on customer demand. Contact HPE with your requirements.

[6, 8] Note that real-life performance (that is, outside a vendor's special test bed) may vary and should be benchmarked with the customer's desired workload.
[7, 9] DWPD is the maximum number of 4K host writes to the entire drive capacity of the SSD per day over a 5-year period.

Q. Are the SSDs factory configurable?
A. The SSDs are fully configurable. Customers can select zero (diskless) to five SSDs either at ordering time or by getting an option kit after purchase. All SSDs are customer self-serviceable and configuration rules are available in the documentation.

Q. Can the SSDs be aggregated into a single contiguous storage volume?
A. The SSDs can be configured by the user into RAID arrays using OS software tools, such as Storage Spaces (Windows) or mdadm (Linux®). There is no hardware HPE Smart Array controller on HPE m710x itself, but it is possible to add one in an I/O slot of HPE Edgeline EL1000 for the chassis supported SFF drives. HPE EL4000 does not support 2.5" SFF drives.

Q. Is HPE m710x compatible with HPE Moonshot 1500 chassis?
A. Yes. HPE m710x can be installed in an existing HPE Moonshot 1500 chassis alongside other server blades. Firmware components, especially HPE iLO Chassis Manager, will need to be updated to versions recommended in the latest HPE Moonshot Component Pack (MCP) found at HPE Support Center.

Q. Are there any chassis configuration restrictions with HPE m710x?
A. Permitted configurations are listed as follows:

- HPE Moonshot 1500
  - 1–45 m710x
  - No restrictions on mixing with other servers
  - Supported switches must be installed
- HPE EL4000
  - 1–4 m710x
  - Mixing with other supported servers is permitted
- HPE EL1000
  - 1 m710x

Q. Does HPE m710x support HPE Moonshot Remote Console Administrator (mRCA)?
A. No. HPE m710x has an embedded HPE iLO 4 management processor with full Remote Console and Virtual Media capabilities. HPE mRCA is only needed for previous generation server blades such as HPE m710p, which do not have embedded HPE iLO 4.

Q. What is the BIOS type on this server?
A. HPE m710x uses the same UEFI BIOS as HPE ProLiant Gen9 servers. Note that it does support Legacy Boot option in the latest BIOS.

Q. How can I connect a physical monitor, keyboard, and mouse to HPE m710x?
A. Users may sometimes find it necessary to connect a physical monitor, keyboard, and mouse to HPE m710x. This can be achieved by using the Mini DisplayPort and Micro USB connectors located on the top bezel of the server (near the power button).

The following kit may be purchased to get common adapters:

- 867893-B21: HPE m710x to EL1000 CBL Kit
- Adapters included: 1 Mini DP to DP, 1 Mini DP to HDMI, and 1 Micro USB to USB Type A Female

Alternatively, the user can also purchase the necessary adapters and cables off the shelf. Connect the adapters or cables to the bezel of HPE m710x using the instructions as follows:

- Monitor: Plug in a Mini DisplayPort (DP) adapter or cable and connect directly to a compliant monitor.
- Keyboard/mouse: Plug in a Micro USB adapter (or a USB on-the-go adapter) and connect it to a USB hub. Connect the keyboard and mouse to the USB hub. Note that use of any high power USB devices such as HDDs may require a powered USB hub.

Q. Do I need a monitor capable of supporting DP?
A. No. HPE cable kit (refer to earlier question) or off-the-shelf adapters that convert Mini DisplayPort to a variety of other input types (for example, standard DisplayPort, HDMI, DVI) can be used as needed.

Q. HPE m710x plugged into an HPE Edgeline EL1000 system looks like a typical deskside workstation.
A. Yes, it does although this was not the primary goal. Assuming that fan noise levels are acceptable, the high-performance Intel Xeon E3 CPU, integrated Iris Pro GPU, and large memory or storage footprint of HPE m710x allow this configuration to function like a typical deskside workstation for mainstream 2D/3D graphics users. Connect HPE m710x directly to a physical monitor, keyboard, and mouse. HPE Edgeline EL1000 system also exposes the network/USB ports and can accommodate two SFF HDDs and two PCIe I/O cards.

In addition to server-grade reliability and the ruggedized EL form factor, this deskside workstation can also be managed exactly like any HPE iLO 4 based HPE ProLiant server in a data center.

Q. Where can I get the Windows OS drivers for HPE m710x?
A. For more information on the HPE Certified and Supported HPE ProLiant servers for OS and virtualization software and latest listing of software drivers available for the server, visit our OS support site at hpe.com/info/ossupport and our driver download page, which can be found from the HPE Support Center: hpe.com/support/hpesc.

Q. How can I install the GPU drivers for Linux?
A. Intel Iris Pro GPU drivers for Linux are bundled with the Intel Media Server Studio installation package. Download and install the free community edition of Intel MSS from software.intel.com/sites/default/files/managed/52/a7/media_server_studio_getting_started_guide.pdf (page 4 to 6).

Q. What is the recommended version of Citrix XenDesktop?
A. Intel and Citrix have tested and optimized the HDX 3D Pro protocol in XenDesktop 7.14 (or later) for Iris Pro GPUs. This is the recommended version for use on HPE m710x.

Q. Can I use HPE RGS on the HPE m710x?
A. HPE RGS 7 sender and receiver functions normally when run on HPE m710x (fully supported on server and client OS for Windows 7 and higher).

Q. Since VMware ESXi is now supported, are we recommending that customers virtualize HPE Moonshot servers?
A. HPE ProLiant servers in HPE Moonshot blade form factor provide the perfect rightsized hardware for targeted solutions, and running OS/applications on bare metal still delivers exceptional performance.[10]

However, the greatly increased capability (CPU core count, GPU performance, memory/storage footprint, and more) of the new HPE ProLiant server blades does permit them to be successfully virtualized. The inclusion of popular virtualization software such as VMware ESXi is made to give customers an option in scenarios such as:

- Migration from legacy virtual desktop infrastructure (VDI) solutions
- Using the virtualization layer as a common target for application development and testing across different server platforms
- Needing strong software enforced segregation between the applications
- Running a few VMs, for which the size of a traditional HPE ProLiant DL/BL server may be overkill

Q. Is there a plan to support VMware Horizon® View™ Foundation on VSPP™?
A. HPE has extensively collaborated with Citrix engineering to optimize and test XenApp, XenDesktop, and XenServer on our HPE ProLiant servers. Citrix remains the preferred solution for application and desktop delivery. Therefore, while VMware Horizon View will run on HPE m710x, formal qualification of such a solution is still TBD. Contact HPE to discuss any customer needs.

HPE ProLiant m510 Server Blade

Q. What are the supported DIMM types?
A. HPE m510 supports four DDR4 ECC RDIMMs (similar in type to HPE ProLiant Gen9 servers). Capacities are either 8 GB, 16 GB, or 32 GB per DIMM for a maximum of 128 GB per server. These DIMMs can operate at either 2133 MHz or 2400 MHz.

Choose 1–4 of the following DIMMs per server (follow loading rules):

- 854592-B21: HPE 8GB 1Rx8 PC4-2400T-R Kit
- 854594-B21: HPE 16GB 1Rx4 PC4-2400T-R Kit
- 854596-B21: HPE 32GB 2Rx4 PC4-2400T-R Kit

[10] hpe.com/us/en/product-catalog/servers/proliant-servers/pip.hpe-proliant-m710x-server-cartridge.1009011712.html

Q. Are the DIMMs factory configurable?

A. HPE m510 introduces full DIMM configurability. Customers can choose a memory footprint ranging from 8 GB to 128 GB at the time of ordering. DIMMs are not customer self-serviceable due to the complexity of removing the heatsink, which overhangs two of the DIMMs. Servicing done by an authorized HPE customer engineer will still be possible.

Recommended DIMM loading rules provided for reference only. Follow the loading order specified as follows.

Table 5. Recommended DIMM load on HPE ProLiant m510 server Blade

Total memory	DIMM 1 (GB)	DIMM 2 (GB)	DIMM 3 (GB)	DIMM 4 (GB)
8 GB	8	N/A	N/A	N/A
16 GB	16	N/A	N/A	N/A
16 GB	8	N/A	8	N/A
24 GB	16	N/A	8	N/A
24 GB	8	8	8	N/A
32 GB	32	N/A	N/A	N/A
32 GB	16	N/A	16	N/A
32 GB	16	8	8	N/A
32 GB	8	8	8	8
40 GB	32	N/A	8	N/A
40 GB	16	8	16	N/A
40 GB	16	8	8	8
48 GB	32	N/A	16	N/A
48 GB	32	8	8	N/A
48 GB	16	16	16	N/A
48 GB	16	8	16	8
56 GB	32	8	16	N/A
56 GB	32	8	8	8
56 GB	16	16	16	8
64 GB	32	N/A	32	N/A
64 GB	32	16	16	N/A
64 GB	32	8	16	8
64 GB	16	16	16	16
72 GB	32	8	32	N/A
72 GB	32	16	16	8
80 GB	32	16	32	N/A
80 GB	32	8	32	8
80 GB	32	16	16	16
88 GB	32	16	32	8
96 GB	32	32	32	N/A
96 GB	32	16	32	16
104 GB	32	32	32	8
112 GB	32	32	32	16
128 GB	32	32	32	32

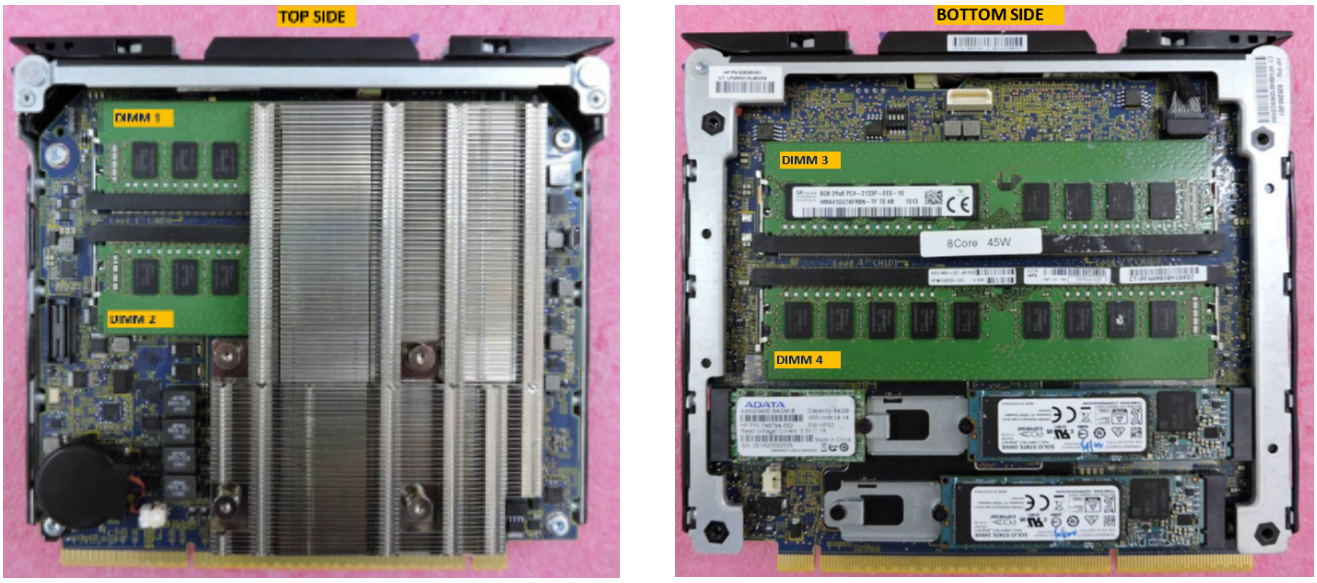

Figure 4. Available DIMM slots on HPE ProLiant m510 server blade

Q. Can I use existing HPE ProLiant Gen9 server DIMMs?
A. Although such DIMMs may work on HPE m510, it is not recommended to do so. HPE m510 server is configured with a curated subset of HPE ProLiant Gen9 server RDIMMs, which have been specially tested and qualified to operate in harsh edge environments across a wider temperature range than typical HPE ProLiant servers. We cannot guarantee data reliability if other RDIMMs are used.

Q. What are the supported SSD types?
A. HPE m510 supports a maximum of three SSDs for ~ 4 TB of maximum capacity:

- 1 SATA-3 M.2 (2242): 120 GB, 240 GB
- 2 x4 Gen3 NVMe M.2 (2280/22110): 256 GB, 512 GB, 1024 GB, 2048 GB

Choose 0–1 of the following SATA SSDs per server:

- 866842-B21: HPE DRV, 120GB 2242 SSD IndsGrd Kit
- 866844-B21: HPE DRV, 240GB 2242 SSD IndsGrd Kit

Choose 0–3 of the following NVMe SSDs per server (mixing allowed):

- 862159-B21: HPE DRV, 256GB PCIe M.2 2280 SSD KIT
- 862161-B21: HPE DRV, 512GB PCIe M.2 2280 SSD KIT
- 862163-B21: HPE DRV, 1.024TB PCIe M.2 2280 SSD KIT
- 880262-B21: HPE DRV, 256GB PCIe M.2 2280 SSD KIT XTemp
- 880264-B21: HPE DRV, 512GB PCIe M.2 2280 SSD KIT XTemp
- 880266-B21: HPE DRV, 1.024TB PCIe M.2 2280 SSD KIT XTemp
- P00375-B21: HPE DRV, 2.048TB PCIe M.2 2280 SSD KIT XTemp

Recommended SSD loading rules:

- SATA SSD can only be loaded in one slot (2242).
- NVMe SSD should be loaded in the following order:
  - Load NVMe Drive 1 followed by NVMe Drive 2

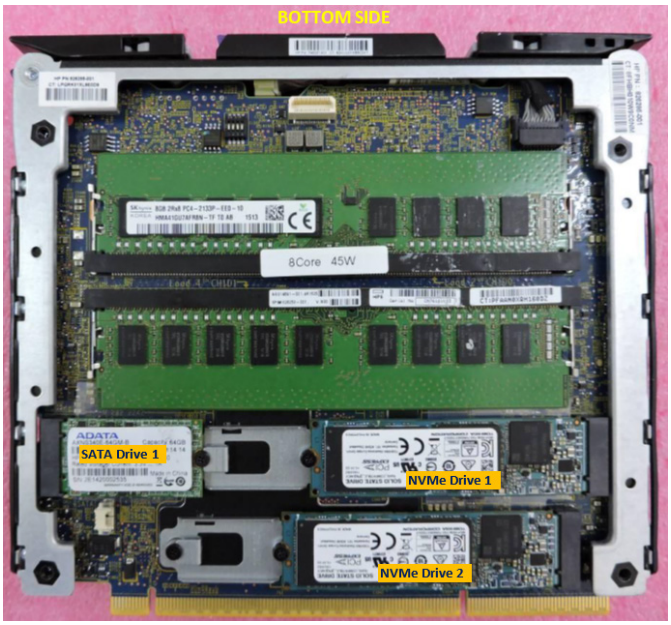

Figure 5. Available SATA slots

Q. What is the performance and endurance of the supported SSDs?

A. SATA SSDs—The SSD vendor (ADATA) quotes the following indicative[11] performance numbers.

Table 6. SATA performance

Reads/writes	120 GB	240 GB
Sequential read (max.) MB/s	450	480
Sequential write (max.) MB/s	130	260
4K random read (max.) IOPS	12,000	46,000
4K random write (max.) IOPS	87,000	88,000

Endurance: 0.3 DWPD[12]

NVMe SSDs: The SSD vendor (Toshiba) quotes the following indicative[13] performance numbers.

Table 7. NVMe performance

Reads/writes	256 GB	512 GB	1024 GB	2048 GB
Sequential read (max.) MB/s	2861	2861	2861	N/A
Sequential write (max.) MB/s	1159	1425	1413	N/A
4K Random read (max.) IOPS	210,000	190,000	210,000	N/A
4K Random write (max.) IOPS	140,000	120,000	130,000	N/A

Endurance: 0.5 DWPD[14]

[11, 13] Note that real-life performance (that is, outside a vendor's special test bed) may vary and should be benchmarked with the customer's desired workload.
[12, 14] DWPD is the maximum number of 4K host writes to the entire drive capacity of the SSD per day over a 5-year period.

Q. Do you plan to add support for higher endurance SSDs?
A. HPE SSDs are available in three broad categories based on their typical target workloads.

- Read intensive: <= 1 DWPD
- Mixed use: > 1 and < 10 DWPD
- Write intensive: >= 10 DWPD

Currently, most commercially available SSDs in the M.2 form-factor fall in the read-intensive category, which offers the best cost per IOPS/GB. However, qualification of higher endurance SSDs in the M.2 form factor can be considered based on customer demand. Contact HPE with your requirements.

Q. Are the SSDs factory configurable?
A. The SSDs are fully configurable. Customers can select zero (diskless) to three SSDs either at ordering time or by getting an option kit after purchase. All SSDs are customer self-serviceable and configuration rules are available in the documentation.

Q. Can the SSDs be configured into RAID volumes?
A. The SSDs can be configured by the user into RAID arrays using OS SW tools such as Storage Spaces or mdadm. There is no hardware HPE Smart Array controller on HPE m510 itself, but it is possible to add one in an I/O slot of HPE EL1000 or EL4000 for the chassis supported SFF drives.

Q. Is HPE m510 compatible with HPE Moonshot 1500 Chassis?
A. Yes. HPE m510 can be installed in an existing HPE Moonshot 1500 Chassis alongside other server blades. Firmware components, especially HPE iLO Chassis Manager will need to be updated to versions recommended in the latest HPE MCP found at HPE Support Center.

Q. Are there any chassis configuration restrictions with HPE m510?
A. Permitted configurations are listed here. Note the special rules for HPE m510 16-core SKUs.

- HPE Moonshot 1500
  - 1–45 m510 (8-core) or 1–30 m510 (16-core)
  - HPE m510 (8-core) has no restrictions on mixing with other servers
  - HPE m510 (16-core) must follow documented configuration rules when mixing with other servers including HPE m510 (8-core)
  - Supported switches must be installed
- HPE Edgeline EL4000
  - 1–4 HPE m510 (8- or 16-core)
  - Mixing with other supported servers is permitted
- HPE Edgeline EL1000
  - 1 HPE m510 (8- or 16-core)

Q. Why are there limitations in the maximum configuration of HPE m510 (16-core SKU only) in an HPE Moonshot 1500 chassis?
A. HPE m510 (16-core) SKU uses a higher performance processor (65W versus 45W in base SKU). In order to meet the thermal requirements of this SoC across the server operating range, the maximum chassis configuration must be constrained.

Q. Does HPE m510 support HPE mRCA?
A. No. HPE m510 has an embedded HPE iLO 4 management processor with full Remote Console and Virtual Media capabilities. HPE mRCA is only needed for previous generation server blades such as HPE m710p, which do not have embedded HPE iLO 4.

Q. What is the BIOS type on this server?
A. HPE m510 uses the same UEFI BIOS as HPE ProLiant Gen9 servers. Note that it does not support Legacy Boot compatibility mode at this time. Contact HPE with your requirements.

Q. Where can I get the Windows OS drivers for HPE m510?
A. All necessary Windows OS drivers can be found in HPE Moonshot Windows Deployment Pack (MWDP) from HPE Support Center.

Q. Why does the HPE m510 have a 3-3-3 warranty when all other server blades have a 3-0-0 warranty?
A. The top two DIMMs on HPE m510 cannot be serviced without removing the heatsink. Since this is a delicate operation, it is not recommended that a customer perform it on their own. Hence, the HPE m510 server has a 3-year parts, 3-year labor, and 3-year on-site support warranty.

HPE Integrated Lights Out 4 (iLO 4) on HPE ProLiant server blades

Q. Is the HPE iLO 4 used on HPE m710x and HPE m510 identical to that on other HPE ProLiant servers (for example, HPE DL380 Gen9)?
A. Yes. It is the same ASIC (silicon chip) and hardware design.

Q. What features does HPE iLO 4 provide on HPE Moonshot servers?
A. The features supported by HPE iLO 4 on HPE ProLiant server blades will depend on the chassis that it is installed in:

- HPE Moonshot 1500
  - Access to server HPE iLO 4 will be through HPE iLO CM IP (note the https)
  - Format: https://<iLO CM IP>:<735+cart#>
  - For example, connection to IRC on blade #10 via HPE iLO CM IP of 192.168.1.100 => https:// 192.168.1.100:745
  - Blade-specific messages can be seen in HPE iLO CM logs
  - Supports only Remote Console and Virtual Media; no HPE iLO Advanced Pack licenses are needed
- HPE Edgeline EL1000/EL4000
  - Access to HPE iLO 4 is by direct connection to HPE iLO 4 IP (HPE EL1000/EL4000 does not have HPE iLO CM)
  - Blade-specific messages can be seen in the respective HPE iLO 4 IML
  - Supports all HPE iLO 4 standard features available on typical HPE ProLiant servers (for example, HPE DL380 Gen9)
  - HPE iLO Advanced Pack licenses need to be ordered to unlock additional features, including Remote Console and Virtual Media

Q. Does HPE iLO 4 on HPE ProLiant server blades require an HPE iLO Advanced Pack license?
A. It depends on the chassis that the server is installed in:

- HPE Moonshot 1500
  - HPE iLO 4 supports only Remote Console and Virtual Media; no HPE iLO Advanced Pack licenses are needed
- HPE Edgeline EL1000/EL4000
  - HPE iLO Advanced Pack licenses are needed to unlock features beyond those provided by standard HPE iLO 4, including Remote Console and Virtual Media; this is similar to other HPE ProLiant servers

HPE GL10 and HPE GL20 IoT gateways

Q. What is HPE GL10?
A. HPE GL10 is an entry-tier IoT gateway targeted for edge deployments.

Specifications
- Intel Atom E3826
  - 2 cores/2 threads
  - 1.46 GHz base
- Integrated Intel HD Graphics
  - 533 MHz Base/667 MHz burst
- 1 DDR3L non-ECC SODIMM (1066 MHz) (4 GB default, 2 GB/8 GB possible)
  - Maximum configuration: 8 GB (1 x 8 GB); dual channel (only 1 used)
  - Maximum speed in system: 1066 MHz
- 2 1GbE NIC ports
  - 1 Intel I210-AT 1GbE NIC
  - 1 Realtek RTL8111G 1GbE NIC
- 2 Mini PCIe expansion slots
  - 1 full-size Mini PCIe
  - 1 half-size Mini PCIe
- Storage
  - 1 2.5 inch SATA-2 bay: 32 GB SSD
  - Optional mSATA support via full-size Mini PCIe slot
- Peripherals
  - 1 standard USB 2.0 port, 1 Micro USB 2.0 port, 1 standard USB 3.0 port
  - 1 RS-232 or RS-422/485 serial port (internal cable movement required)
  - 1 microphone port (MIC, OUT)
  - 1 VGA port and 1 micro-HDMI port
- Typical power: 5.88W; maximum power: 10.56W

Q. What is HPE GL20?
A. HPE GL20 is a performance IoT gateway targeted for edge deployments.

Specifications
- Intel® Core™ i5-4300U
  - 2 cores/4 threads
  - 1.9 GHz base/2.9 GHz boost
- Integrated Intel HD 4400 GT2 GPU
  - 200 MHz Base/1.1 GHz boost
  - 2 GB vRAM
- 1 DDR3L non-ECC SODIMM (1600/1333 MHz) (8 GB default, 2 GB/4 GB possible)
  - Maximum configuration: 8 GB (1 x 8 GB); dual channel (only 1 used)
  - Maximum speed in system: 1600 MHz

- 2 1GbE NIC ports
  - 1 Intel I210-IT 1GbE NIC (with WoL support)
  - 1 Intel I218 1GbE NIC (with WoL support)
- 4 100 Mbps NIC ports with PoE capability
  - 4 10/100 Mbps
- 4 Mini PCIe expansion slots
  - 3 full-size Mini PCIe
  - 1 half-size Mini PCIe
- Storage
  - 1 2.5 inch SATA bay: 64 GB SSD
  - Optional mSATA support via full-size Mini PCIe slot #1
- Peripherals
  - 8-bit digital I/O port (6 inputs, 2 outputs)
  - 2 standard USB 2.0 ports, 1 standard USB 3.0 port
  - 2 RS-232 or RS-422/485 serial ports (BIOS selectable)
  - 1 microphone port (MIC, IN, OUT)
  - 1 VGA port and 1 HDMI port
- Typical power: 15W; maximum power: 35W
  - 9 VDC to 36 VDC input

Q. Do HPE GL10 and HPE GL20 use HPE ProLiant server blades?
A. No. Due to the compact form factor of HPE GL10 and HPE GL20, all the necessary compute hardware is fully integrated into the system itself. HPE Edgeline EL1000 and EL4000 Converged Edge Systems will use HPE ProLiant server blades.

Q. Which operating systems will be supported?
A. For more information on the HPE Certified and Supported Edgeline servers for OS and virtualization software and latest listing of software drivers available for your gateway, visit our OS support site at hpe.com/us/en/server-operating-systems.html.

Q. What workloads are suitable for HPE GL10 and HPE GL20?
A. Examples of workloads suitable for HPE GL10 and GL20 are:

- Data aggregation and forwarding
- Complex event processing
- Common video analytics (for example, ANPR) and more

Q. Do HPE GL10 and HPE GL20 use HPE ProLiant BIOS?
A. No. HPE GL10 and HPE GL20 are much simpler systems than a typical HPE ProLiant server and use commercially available UEFI BIOS (AMI).

Q. Can HPE GL20 IoT Gateway be directly connected to digital I/O devices?
A. Yes. HPE GL20 has an 8-bit digital I/O port (six inputs and two outputs) in the form of a 10-pin screw terminal block. The signals can tolerate the following electrical load:

- Input voltage: 0 VDC to 30 VDC (25 Hz)
- Output voltage: 24 VDC nominal in on state (open collector to 30 VDC)
- Output current: Max. 500 mA per channel
- Isolated up to 3 kV

Figure 6. Digital I/O connector

Q. How can the customer access the digital I/O ports on HPE GL20?
A. The digital I/O ports are accessed through the system's LPC bus. Contact HPE for further information.

Q. Can HPE GL20 IoT Gateway support Power over Ethernet (PoE)?
A. Yes. HPE GL20 supports four PoE ports capable of 10/100 Mbps speeds and the following power loads per port:

- 7W: 4 ports, full-load, IEEE802.3af class 2
- 15W: 2 ports full-load, IEEE802.3af class 3

Q. Do HPE GL10 and HPE GL20 have fans?
A. No. Both HPE GL10 and GL20 are designed to be passively cooled without the need for fans. Instead, the top cover on both systems acts as a heat radiator. This allows HPE GL10 and HPE GL20 to be deployed to sites where there's a risk of dust or dirt infiltration or where adequate airflow clearance around the product cannot be guaranteed.

Q. Are the HPE GL10 and GL20 ruggedized?
A. Yes. They are ruggedized to the following specifications:

- Extended temperature qualified: –20°C to 60°C. Note that certain I/O options or drive choices may reduce the operational range.
- IP40 certified: > 1 mm object ingress protection, no liquid ingress protection.
- Shock tested: 30G, IEC 60068-2-27, half sine, 11 ms duration.
- Vibration tested: 3 Grms, IEC 60068-2-64, random, 5 ~ 500 Hz, 1 hour/axis.

Q. Can these systems be certified to other standards (for example, rolling stock)?
A. HPE engineering evaluates any additional certifications on a case-by-case basis. Contact HPE with the customer requests.

Q. What mounting options do HPE GL10 and HPE GL20 support?
A. Both HPE GL10 and HPE GL20 support several mounting options:

- VESA mount
  - 848461-B21: HPE GL10 VESA Mount Bracket Kit
  - Bundled with HPE GL20 base unit
- Wall mount
  - Bundled with HPE GL10 and HPE GL20 base units
- DIN rail
  - Bundled with HPE GL10 and HPE GL20 base units
- Desk mount
  - Placed on desk. No special kit needed.

Q. What power supply options do HPE GL10 and HPE GL20 support?
A. HPE GL10 and HPE GL20 support the following power options:

- HPE GL10 IoT gateway
  - AC: 36W 12V 3A AC/DC power adapter
- HPE GL20 IoT gateway
- AC: 12V AC/DC power adapter
- DC: 3-pin DC +9-36 VDC input, isolated to 1.5 kV (Recommend >10.9 VDC input voltage to supply full power to the system)

Q. How are HPE GL10 and GL20 power input connectors secured?
A. HPE GL10: Insert and secure with standard friction lock

HPE GL20: Insert and secure with finger nut

Q. Can HPE GL20 IoT Gateway power digital devices such as external sensors?
A. PoE can be used to supply external devices such as CCTV cameras.

Q. How can I configure the serial port type on HPE GL10 and HPE GL20?
A. To select serial port type as RS-232 (default) or RS-422/485 on

- **HPE GL10 IoT Gateway:** Open the lid and move the following ribbon cable from COM1 (RS-232/default) to COM2 (RS-422/485). The side panel can be removed for easier access.
- **HPE GL20 IoT Gateway:** Use BIOS options to select the serial port type.

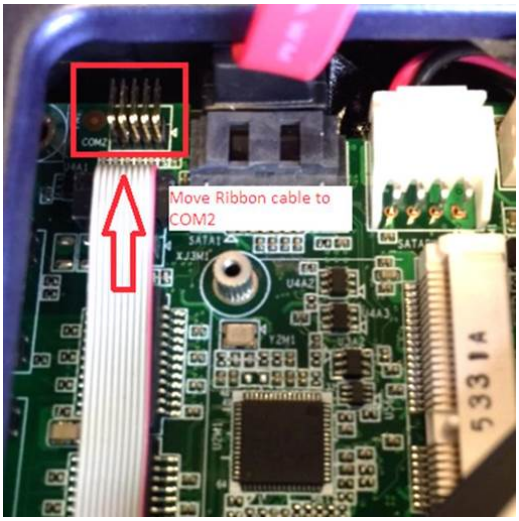

Figure 7. Serial port configuration

Q. Do HPE GL10 and GL20 provide support for HPE iLO?
A. No. There is no embedded HPE iLO or out-of-band management on either product. Instead, these systems are intended to be managed on-site or in-band.

Q. Are the antennas on HPE GL10 and GL20 replaceable?
A. Yes. Antennas can be easily unscrewed and changed to match the type of wireless card installed in the system (for example, Wi-Fi, 3G WAN, and such). Remember to connect the correct internal antenna wire to the correct I/O card before replacing the system cover.

Q. Can I install any antenna of my choice in HPE GL10 and GL20?
A. No. Wireless I/O option cards ordered from HPE will be shipped with specific antennas optimized for exceptional performance. See documentation supplied with third-party wireless I/O options for their recommendation.

Note that installing unapproved antennas may result in poor wireless operation and could violate radio frequency laws in your country.

Q. What are the supported DIMM types?
A. Both HPE GL10 and HPE GL20 only support one SODIMM with a capacity of either 2 GB, 4 GB, or 8 GB. At this time, HPE GL10 is only orderable with 1 x 4 GB SODIMM and HPE GL20 with 1 x 8 GB SODIMM. Contact HPE if you need other memory sizes.

Q. Can I service the DIMMs?
A. This is not recommended and may have warranty implications since the entire system will have to be removed from the chassis, as the DIMMs are located at the bottom. Care must also be taken not to damage the thermal grease.

Q. What are the supported HDD/SSD types?
A. At this time, HPE only provides 1 32 GB SSD with both HPE GL10 and HPE GL20. Other third-party 2.5" SFF HDDs and SSDs may work, but they have not been validated by HPE.

You can also choose to install a third-party mSATA SSD in a full-size Mini PCIe slot (slot #1 on HPE GL20).

Q. Is the 2.5" SFF drive on the front of HPE GL20 IoT Gateway hot swappable?
A. Yes, but all operations to the drive must be first stopped to prevent data corruption.

Q. Are HPE GL10 and HPE GL20 Division 1/Zone 1 devices?
A. Both HPE GL10 and HPE GL20 are not qualified as Div. 1/Zone 1 [15] devices. However, a customized enclosure is available from a partner that is explosion protected.

HPE IoT gateway option I/O cards

Q. What are the supported Mini PCIe option I/O card types on HPE Edgeline?
A. HPE GL10 and HPE GL20 support the following Mini PCIe I/O card options.

- 845788-B21: HPE Telit 3G uPCIe Assy Kit

  Based on Telit HE910
  - Full-size Mini PCIe card (FMC) and 3G antennas
  - USB 2.0 interface to system
  - SIM slot at the bottom
  - 21.0 Mbps DL/5.76 Mbps UL speeds
  - Compatible with HSPA+ (3.75G) networks
  - Rx Diversity (two antennas) for improved quality and reliability
  - Optional high-sensitivity GPA/A-GPS receiver
- Supported frequencies
  - GSM, GPRS, Edge: 850, 900, 1800, and 1900 MHz
  - UMTS, HSPA. 800/850,[16] 900, AWS 1700, 1900, and 2100 MHz
- 845779-B21: HPE Atheros AR9592 802.11

  Based on Atheros AR9592-AR1B
  - FMC and Wi-Fi (2.4/5G) antennas
  - PCIe interface to system
  - Wi-Fi speeds up to 300 Mbps
  - Supports 2T2R (2x2) MIMO using 2 antennas
  - IEEE 802.11a/b/g/n
- 845776-B21: HPE Wi-Fi/BT Std Temp HMC Option Kit (under test)

  WNC based on Atheros silicon
- Half-size Mini PCIe card (HMC) and Wi-Fi (2.4/5G) 2x2 antennas

[15] en.wikipedia.org/wiki/Electrical_equipment_in_hazardous_areas
[16] Bands B6 and B19 (800 MHz) are a subset of B5 (850 MHz) and supported as well

Q. Where is the SIM slot on Telit 3G WAN I/O card?
A. The SIM slot is located at the bottom of the card. You do not need to use the SIM slot embedded in HPE GL10 or HPE GL20 for this option.

Q. Are you planning to support LTE (4G) WAN I/O cards?
A. Yes. The following LTE WAN option kits are under testing planned for introduction in the near future. They will be based on either Sierra Wireless MC7430/7455 or Telit LE910 v2 LTE silicon. Further details will be provided nearer to the release date.

866847-B21: HPE WAN LTE Wide Temp FMC AMS/EU Opt Kit

866850-B21: HPE WAN LTE Wide Temp FMC APJ Opt Kit

Q. Are you planning to introduce supports for other wireless protocols?
A. Qualification and addition of new I/O options to the HPE catalog is an exhaustive process and will depend on customer demand.

Usually there are numerous third-party Mini PCIe and USB-based wireless connectivity options available in the market that should be compatible with HPE Edgeline systems. HPE has not tested the following examples, but given the low cost to purchase such kits, you can (and should) conduct your own evaluation.

Zigbee (802.15.4)
- redpinesignals.com/Modules/Internet_of_Things/nLink_Family/RS9113_Wireless_Mini_PCI_Express_Card.php
- whitebream.com/xbee

6LoWPAN
- downloadt.advantech.com/ProductFile/PIS/WISE-1301/Product%20-%20Datasheet/WISE-1301_DS(09.04.14)20140924110754.pdf

LoRaWAN
- lora-alliance.org/
- liyatech.com/hardware.php

Sigfox
- partners.sigfox.com/products/live-gray-usb

Q. What are the supported standard PCIe option I/O card types on IoT gateway systems?
A. HPE GL10 IoT and HPE GL20 do not support standard PCIe cards—only Mini PCIe cards.

Additional resources

The following resources are a good source of information about HPE Moonshot and HPE Edgeline. They form the basis for this FAQ. The more you ask and contribute, the better the quality of information that can be published.

HPE external

HPE GL10 webpage	hpe.com/us/en/product-catalog/servers/edgeline-systems/pip.hpe-edgeline-el10-intelligent-gateway.1008670386.html
HPE GL10 QuickSpecs	h20195.www2.hpe.com/v2/GetPDF.aspx/c04884747.pdf
HPE GL20 webpage	hpe.com/us/en/product-catalog/servers/edgeline-systems/pip.hpe-edgeline-el20-intelligent-gateway.1008670391.html
HPE GL20 QuickSpecs	h20195.www2.hpe.com/v2/GetDocument.aspx?docname=c04884769
HPE EL300 webpage	hpe.com/us/en/product-catalog/servers/edgeline-systems/pip.hpe-edgeline-el300-converged-edge-system.1011127891.html
HPE EL300 QuickSpecs	h20195.www2.hpe.com/v2/GetDocument.aspx?docname=a00056114enw
HPE EL1000 webpage	hpe.com/us/en/product-catalog/servers/edgeline-systems/pip.hpe-edgeline-el1000-converged-iot-system.1008670396.html
HPE EL1000 QuickSpecs	h20195.www2.hpe.com/v2/GetDocument.aspx?docname=c05211199
HPE EL4000 webpage	hpe.com/us/en/product-catalog/servers/edgeline-systems/pip.hpe-edgeline-el4000-converged-iot-system.1008670180.html
HPE EL4000 QuickSpecs	h20195.www2.hpe.com/v2/GetDocument.aspx?docname=c05211200
HPE m710x webpage	hpe.com/us/en/product-catalog/servers/proliant-servers/pip.hpe-proliant-m710x-server-cartridge.1009011712.html
HPE m710x QuickSpecs	h20195.www2.hpe.com/v2/GetDocument.aspx?docname=c05069173
HPE m510 webpage	hpe.com/us/en/product-catalog/servers/proliant-servers/pip.hpe-proliant-m510-server-cartridge.1009019439.html
HPE m510 QuickSpecs	h20195.www2.hpe.com/v2/GetDocument.aspx?docname=c05069171&doctype=quickspecs&doclang=EN_US&searchquery=&cc=us&lc=en

Frequently asked questions
For HPE internal and channel partner use only.

HPE internal

HPE Moonshot Yammer group (HPE internal and partners)	yammer.com/hpmoonshot/
Seismic sales briefcase	hpe.seismic.com/Link/Content/NCP6yClWQOBEaTWeKpyFn2KA

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