



**CUBIX**  
Visualization and HPC Solutions

# HostEngine 5URP24 C612 Computer User Guide

## Front and Rear View



HostEngine 5URP24 (HE5URP24) computer features Intel® Xeon® E5-2600v4 (Broadwell) Series dual-processors with the Intel C612 chipset. HE5URP24 provides four PCI Express (PCIe) Gen 3.0 x16 expansion slots. Each slot accommodates a full-height, full-length, double-wide GPU or a half-height, half-length, single-wide controller such as the Cubix Host Interface Controller (HIC) that connects to Cubix Xpander Rackmount 8 with 1 or 2 x RAID controllers that connect to 24 x SAS hard disk drives (HDDs) or solid-state drives (SSDs). Each HIC connects to multiple slots within Xpander and each RAID controller connects to 24 x HDDs or SSDs within HE5URP24.

To support the 24 x Serial-Attached SCSI (SAS with 12Gbits / second or 12Gbps transfer rate) 2.5" or 3.5" hot-plug hard-disk drives (HDDs) requires 1 x 24-port or 2 x 12-port SAS (12Gbps) RAID controller(s) in one or two of the 8 x slots. Each RAID controller port connects to a 4-port SAS backplane with a 1.0meter cable from an SFF-8643 mini-SAS HD port to an SFF-8643 mini-SAS HD port, and in turn, each 4-port SAS backplane connects to 4 x SAS HDDs for a total of 24 x HDDs in each HE5URP24 and XPRM8G3-5URP24 chassis. The two chassis form a system with 48 x SAS HDDs. The total storage capacity is 48TBytes to 672TBytes, or 0.672PBytes, of direct-attached storage to use as a local data cache for fast reads / writes.

HE5URP24 also provides 4 x rear-panel USB ports – 2 x USB 3.0 and 2 x USB 2.0. In addition, it provides 2 x GbE network ports and 1 GbE port for both local and remote management using IPMI 2.0. It also provides a COM port and a VGA port. Each HE5URP24 and XPRM85URP24 chassis also features a power supply with 3 + 1 hot-plug, redundant power modules and 4 x hot-plug cooling fans. Each chassis is also rack-mountable with a tool-less access top cover.

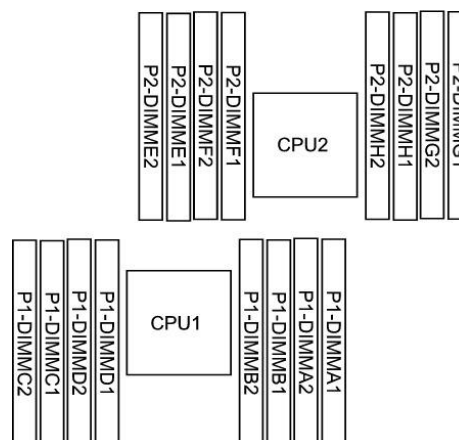
By connecting HostEngine 5URP24 to Xpander Rackmount 85URP24, you can add up to 8 x double-wide GPUs such as NVIDIA® Quadro P6000 to the HostEngine computer for running Autodesk® 3ds Max with NVIDIA iray or BlackMagic Design® DaVinci Resolve® for Linux or Windows.

## HostEngine 5URP24 C612 Technical Specifications

Central Processing Unit (CPU)	Intel® Xeon E5-2600v4 Series
Number CPUs	2 x R3 with identical revision, core voltage and bus (core) speed
Socket	2011-pin R3 LGA
Speeds / Cores / Threads	1.8 – 3.5GHz / up to 22 cores / up to 44 threads
Intel Smart Cache	Up to 55MByte
QuickPath Interconnect	Up to 9.6 GigaTransfers/second (GT/s) across 2 QPI links
Chipset	Intel C612
Front Side Bus Speed	2400MHz
System Memory Sizes	RDIMM: 32GByte, 16GByte, 8GByte or 4GByte LRDIMM: 128GByte, 64GByte or 32GByte
Type	Standard ECC Registered DIMMs (RDIMMs) Optional Load-Reduced DIMMs (LRDIMMs)
Configuration	DDR4-2400MHz, 2133MHz, 1866MHz, 1600MHz
Maximum Size	512GBytes using 16 x ECC Registered DIMMs (RDIMMs) 2TByte using 16 x Load-Reduced DIMMs (LRDIMMs)
PCI Express expansion slots	4x PCI-E 3.0 x16 2x PCI-E 3.0 x8 (1 in x16) 1x PCI-E 2.0 x4 (in x8)
System BIOS	AMI®
Ethernet ports (standard)	2 x Intel RJ-45 ports
Controller	Dual Intel i350 network controllers
Support	10BASE-T, 100BASE-TX, and 1000BASE-T
Ethernet port (management)	RJ-45 port for management only
Controller	Aspeed AST2400 BMC with dedicated IPMI
Support	10BASE-T, 100BASE-TX, and 1000BASE-T
Solid State Drive (SSD)	4TByte, 2TByte, 1TByte or 500GByte
Serial ATA (SATA)	10 x SATA 3 connectors
Drive Format	2.5-inch (63.5mm) solid-state drive (SSD)
Transfer Rate	6.0GByte / second (theoretical)
Number of drives / Capacity	1 standard or 2 optional
RAID configuration	0, 1, 5 or 10 software
Graphics Controller	Aspeed AST2400 BMC
Audio Controller	High-Definition (HD) 7.1 with SPDIF-input digital header
Serial port	COM1 (DB-9)
Universal Serial Bus (USB)	Version 3.0
Ports	4: 2 x USB 3.0 and 2 x USB 2.0
Cooling Fans	4
Standard	90 cubic feet / minute (cfm)
Opt, passively-cooled GPUs	134cfm
AC Power Supply	One single-phase, auto-ranging, 90-240VAC, 10-5Amps, 50/60Hz; total output power is not to exceed 1,500Watts
Operating Environment	0° to 30° Celsius (32° to 86° Fahrenheit) temperature 5% to 80% non-condensing humidity
Altitude	Maximum
Operating	10,000ft (3,050meters)
Storage	50,000ft (15,240meters)
Dimensions	7.00" H x 19.00" W x 25.50" D (17.78 cm H x 48.26 W x 64.77CM D)
Weight	49.00 lbs. (24.50kg)
Warranty / Period	Parts & labor return to manufacturer / 2 year
Ext. Warranty Period	Optional 3 <sup>rd</sup> year

## Memory Configuration

DIMM Configurations for CPU1 Only		
# DIMMs	Location	Memory Scheme
4	P1-DIMMA1 P1-DIMMB1 P1-DIMMC1 P1-DIMMD1	Interleaved DIMMs must be identical type and speed
8	P1-DIMMA1 P1-DIMMB1 P1-DIMMC1 P1-DIMMD1 P1-DIMMA2 P1-DIMMB2 P1-DIMMC2 P1-DIMMD2	
DIMM Configurations for CPU1 and CPU2		
16	P1-DIMMA1 P1-DIMMB1 P1-DIMMC1 P1-DIMMD1 P1-DIMMA2 P1-DIMMB2 P1-DIMMC2 P1-DIMMD2 P2-DIMME1 P2-DIMMF1 P2-DIMMG1 P2-DIMMH1 P2-DIMME2 P2-DIMMF2 P2-DIMMG2 P1-DIMMH2	Interleaved DIMMs must be identical type and speed



## PCIe Gen 3 Slots

When installing a HIC in HE5URP24, make sure you seat it in one of the PCIe Gen 3 x16 slots, which are numbered CPU1 Slot2, CPU1 Slot 4, CPU2 Slot 6 and CPU2 Slot 8. For double-wide accelerators like NVIDIA Quadro Series or AMD Firepro W Series, use these four slots as well. If you add a single-wide display controller like AMD Firepro W2100 / W4100 or NVIDIA Quadro K4200 for connecting one or more 4K / UHD displays, and the PCIe Gen 3 x16 slots are occupied, use CPU1 Slot 10.

HE5URP24 supports one to four 2.5-inch SATA 3 solid-state drives (SSDs) to boot the operating system (OS). HostEngine 5URP24 also accommodates PCIe flash / SSDs. Install PCIe flash or SSD cards in CPU1 Slot 10 and / or CPU2 Slot 11, if available. See page 4 for details.

## Access

### Remove / Replace HostEngine

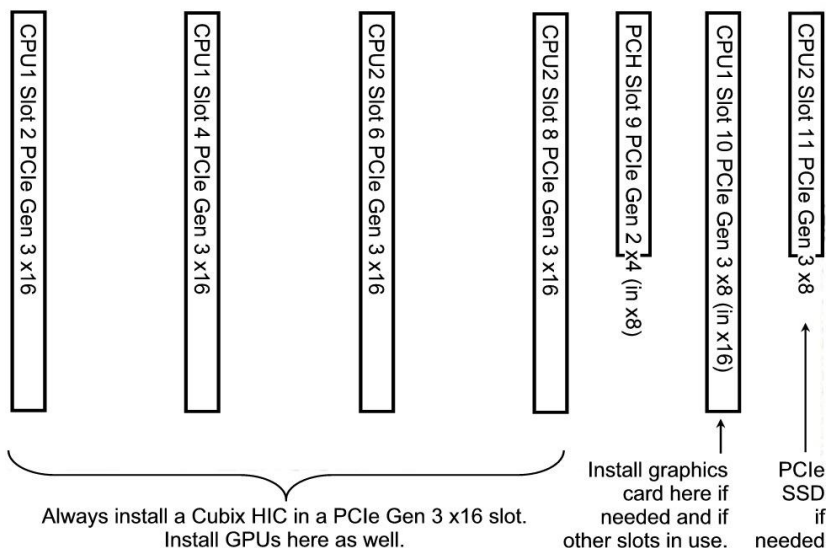
HostEngine can be removed and replaced from the front once you remove power.

- Power down gracefully using the OS or the front-panel on / off switch.
- Wait for the power to shut off.
- Disconnect power and all other cables from HostEngine.
- Loosen the two retention screws on the HostEngine front panel.
- Gently tug the HostEngine handles toward you.
- Extract the HostEngine while supporting its weight.
- Slide the replacement HostEngine into the rack mount slide mounts.
- Slide HostEngine into the cabinet and replace / tighten the retention screws.
- Connect power and all other cables to HostEngine.
- Power up HostEngine.

### Remove and replace PCIe devices

PCIe devices can be removed and replaced from the top once you power down HostEngine and remove the cop cover. See the image below for the PCIe devices to install in each slot.

- Power down gracefully using the OS and wait for the power to turn off
- Loosen the two retention screws on the HostEngine front panel.
- Gently tug the HostEngine handles toward you.
- Remove the screws holding the top cover and set it aside.
- Disconnect auxiliary power cables from the PCIe devices such as accelerators, if needed.
- Remove / replace the PCIe devices and re-connect the drive power and data cables.
- Replace the top cover and its retaining screws.
- Slide HostEngine into the cabinet and replace / tighten the retention screws.
- Power up HostEngine.



### Remove and replace a SATA drive

SATA drives are removable from the front panel once you power down HostEngine.

- Power down gracefully using the OS or the power on/off button on HostEngine front panel and wait for the power LED to turn off
- Loosen the retention screw on the HostEngine drive mounting bracket
- Gently tug the drive mounting bracket handle.
- Disconnect the drive power and data cables.
- Remove / replace the drive and re-connect the drive power and data cables.
- Slide in the drive mounting bracket and tighten the retention screw.

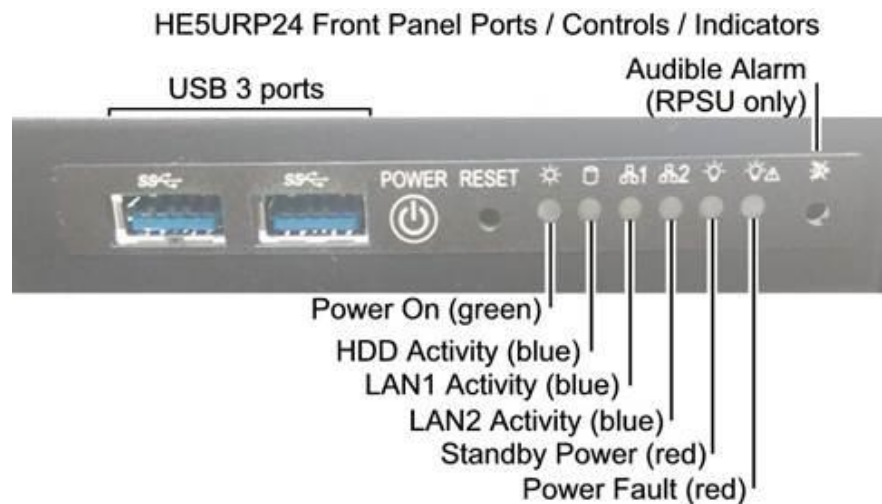
#### Note

Power down HostEngine before removing it or its hard disk drive.

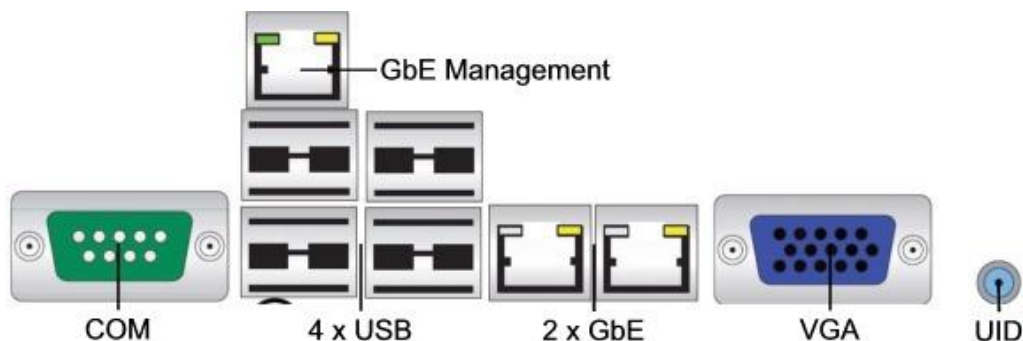
### Controls, Indicators and Connections

HE5URP24 front panel:

- 2 x USB 3 ports
- Press Power button to power up / down the OS – Windows or Linux.
- Press and hold Power button 4 seconds to force power down.
- Press Reset button (recessed) to recycle power or reset OS



On the rear panel, HostEngine provides four USB 2.0 ports, two GbE Ethernet ports, a COM port and an IPMI 2.0 GbE port. The AC power receptacle is also on the rear panel.



HostEngine also provides access for Cubix HICs that connect to an Xpander enclosure using external PCIe x16 cables, if needed. With these connections, you can mount HostEngine immediately above or below Xpander Rackmount 85URP. You can also install PCIe cards inside HostEngine. For example, install 4 x full-length, full-height, double-wide GPUs inside HostEngine.

### **Troubleshooting Procedure**

**Issue:** The Cubix HIC in HostEngine is linking at x8 or x4, or at Gen 2, with Cubix Xpander, and not linking at the specified PCIe Gen 3 x16 transfer rate.

**Resolution:** Confirm that the Cubix HIC is installed in HostEngine slot 2, 4, 6 or 8.

**Issue:** The Cubix HICs in HostEngine are installed in PCIe Gen 3 x16 slots 2, 4, 6 or 8, but not all 8 x GPUs in Xpander Rackmount 8 show up in the operating system (ls pci in Linux or Windows Device Manager > Display adapters).

**Resolution:** Confirm the following setting in HostEngine system BIOS > Advanced > PCI Plug-n-Play > Above 4G Decoding > Enabled.

**Issue:** How can I tell whether each GPU in Xpander connected to HostEngine is running at optimal bandwidth?

**Resolution:** Download Cubix GPU Manager for either Linux or Microsoft Windows (<http://www.cubix.com/gpumanager/>) and install it. Documentation is on-line [here](#).