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Optimize Your Datacenter

Rackgo X

Leading the Way to Open Compute

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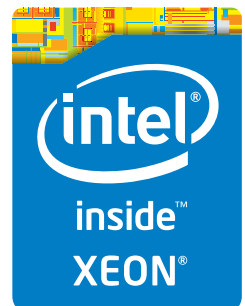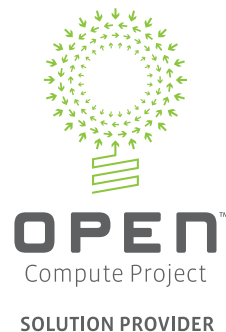
Rackgo X, An Innovative Rack Solution Inspired by OCP

The cloud is changing at the speed of light. Chief Technology Officers working on datacenter build-out, say data growth, lack of space, and power and cooling issues are their biggest challenges. Conventional datacenter hardware cannot keep up with the growing density and large capacity requirements of datacenters that demand more efficient and simplified hardware design. QCT's pioneering ideas and engineering excellence help meet their needs.

QCT's Rackgo X is a rack solution inspired by the Open Compute Project (OCP, www.opencompute.org) standard. Designed for low CAPEX and OPEX with simplicity, energy and cooling efficiency, high density, serviceability, scalability, and manageability, Rackgo X is ideally suited for cloud service providers or large enterprise datacenters looking for the highest level of efficiency.

Rackgo X

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Increased Efficiency with Unique Rack Design

The Rackgo X is a rack solution that integrates QCT's server, storage and top-of-rack switch. Meant to optimize capital efficiency, its simple, vanity-free design eliminates excessive features that do not contribute to overall performance.

The Rackgo X features a wider rack width of 21 inches. Compared to conventional 19-inch rack solutions, it provides higher compute density, greater storage capacity, and increased airflow, which improves cooling efficiency.

The Rackgo X equips centralized power supplies (PSU) on the rack. All nodes share the centralized power supplies, providing lower capital cost and high energy efficiency.

Serviceability and Easy Maintenance

Designed for easy cold aisle operation, most service parts are tool-less and can be replaced in the front aisle. The Rackgo X boasts serviceability.

Compared to conventional design where each node equips its own power supply unit (PSU), the Rackgo X's centralized PSUs in the rack greatly reduce total PSUs. Its vanity-free design eliminates excessive components and reduces the total component number, resulting in minimized maintenance efforts and a better mean time between failures (MTBF).

Manageability

The Quanta Rackgo X allows datacenter operators to monitor the hardware status through a single point of contact with its best-in-class easy-to-use management tool.

Like the LEGO concept, Rackgo X provides modular units to be built on each other. The Quanta Rackgo X includes two server options, one microserver, one JBOD storage and QuantaMesh network switches as the basic building blocks. Customers can choose components to fit the specific needs of their datacenter applications.

Highly Efficient Servers for the Scalable Datacenter Environment

The Rackgo X server solution offers two compute systems with different density levels – model F03A at four nodes in a 2 open unit (OU) space and model F03C at three nodes in a 2 OU space – to fit varying workloads, such as Web 2.0, hosting, or high-performance computing applications.

F03A

High density 2U4N design for maximum performance

The Rackgo X F03A is designed for the highest compute density with four nodes in a 2 OU space. Each node can install up to two SATADOMs for the operating system and up to four extra hot-swappable SSD/HDDs for cache or data storage. Its RAID-ready configuration preserves data integrity and avoids data corruption.

Vanity-free design for better MTBF

By centralizing power supplies in the rack and removing unnecessary components from the system, the F03A enhances system MTBF by 58 percent compared to other conventional 2U4N systems in the market. This will avoid system downtime caused by component failure and minimize maintenance efforts.

VGA-redirection for on-site troubleshooting

The F03A offers an optional dual-port 10Gbps SFP+ mezzanine card with an ASPEED 2300 chip, providing VGA-redirection for datacenters requiring on-site troubleshooting.

Form Factor	2 OU Rackmount, 4 Nodes
MB Size (W x L)	6.5" x 20"
Processor	(2) Intel® Xeon® processor E5-2600/E5-2600 v2 product family per node, up to 130W
Chipset	Intel® C602 chipset
SAS Controller	Intel® C602 upgrade ROM #1 (optional)
	Intel® C602 upgrade ROM #2 (optional)
Memory	(16) DDR3 800/1066/1333/1600/1866 MHz ECC UDIMM/RDIMM/LRDIMM slots per node
Drive Bay	SKU 1: (2) 2.5" SATA/SAS hot-plug HDD trays per node
	SKU 2: (4) 2.5" SATA/SAS hot-plug HDD trays per node
Onboard Storage Device	(3) Mini-SAS connectors signal from Intel® C602
	(2) SATA connectors signal from Intel® C602
HDD Backplane	1 to 1
PCIe Expansion Slot	SKU 1: (2) PCIe x8 G3 riser slots for low-profile card per node
	SKU 2: (1) PCIe x8 G3 riser slots for low-profile card per node
	Both SKU 1 and 2 have (1) PCIe x8 G3 dedicated OCP network mezzanine card slot per node
SW RAID Options	Intel® C602 upgrade ROM #1 RAID 0/1/10 for SCU (optional)
	Intel® C602 upgrade ROM #2 SAS RAID 0/1/10/5 for SCU (optional)
Management Network	(1) Dedicated Intel® 82574 GbE RJ45 port for onboard management
Integrated Graphics	AST2300 (optional with 10G SFP+ mezzanine card)
Front I/O	(1) USB port per node
	(1) OCP debug header per port
	(1) Dedicated RJ45 management port
	(1) Power button
	(1) Reset button

F03C

2U3N design for maximum flexible input/output

Compared to the 2U4N design, the F03C's 2U3N design provides more room for various PCIe expansion cards such as the PCIe flash accelerator card or Infiniband network adaptor, turning the F03C into a multi-purpose server that can run various workloads by supporting different configurations with a single design. The F03C is ideal for a wide range of workloads from Web 2.0 to complicated computing and anything in between.

Form Factor	2 OU Rackmount, 3 Nodes
MB Size (W x L)	6.5" x 20"
Processor	(2) Intel® Xeon® processor E5-2600/E5-2600 v2 product family per node, up to 130W
Chipset	Intel® C602 chipset
SAS Controller	Intel® C602 upgrade ROM #1 (optional)
	Intel® C602 upgrade ROM #2 (optional)
Memory	(16) DDR3 800/1066/1333/1600/1866 MHz ECC UDIMM/RDIMM/LRDIMM slots per node
Drive Bay	(1) 3.5" SATA/SAS fixed HDD tray per node
Onboard Storage Device	(3) Mini-SAS connectors signal from Intel® C602
	(2) SATA connectors signal from Intel® C602
HDD Backplane	NA
PCIe Expansion Slot	(2) PCIe x8 G3 riser slot for low-profile card per node
	(1) PCIe x8 G3 dedicated OCP network mezzanine card per node
SW RAID Options	Intel® C602 upgrade ROM #1 RAID 0/1/10 for SCU (optional)
	Intel® C602 upgrade ROM #2 SAS RAID 0/1/10/5 for SCU (optional)
Management Network	(1) Dedicated Intel® 82574 GbE RJ45 port for onboard management
Integrated Graphics	NA
Front I/O	(1) USB port per node
	(1) OCP debug header per port
	(1) Dedicated RJ45 management port
	(1) Power button
	(1) Reset button

Unprecedented 42-Node Microserver

▌ S1M

World's Densest 42-Node Microserver in a 2 OU Chassis

The S1M is based on QCT's patented "hidden-shelf" chassis design to fit 42x independent hot-swappable microserver nodes in a 2 OU space.

Redundant Hot-Swappable 40Gb/s Integrated Ethernet Switches

S1M has an integrated Intel® FM5224 switch that aggregates all the inbound and outbound network traffic. It significantly reducing cabling complexity in the rack that enhances manageability and reduces CAPEX by eliminating extra Top-of-Rack switch.

Form Factor	2 OU Rackmount, 42 nodes
MB Size (WxL)	2.87" x 7.48"
Processor	(1) Intel® Atom™ processor C2000 product family for microservers per node
Memory	(4) DDR3 1067/1333 MHz ECC SODIMM slots per node, up to 8GB
Storage	(1) mSATA per node
Onboard Storage Device	(1) SATA connector signals from C2000 SoC
Network	(1) Intel® 2.5GbE connection per node to back plane board
Management Port	(1) Dedicated 10/100 Mbps connection per node to back plane board
BMC	TI mini-BMC snowflake
Front I/O	N/A
System Management	IPMI v2.0 compliant

Storage with High Capacity, Density, and Serviceability

▌ JBR

High Density 28 hot-swappable HDD

The JBR is based on QCT's patented " hidden-shelf " chassis design to fit 28x 3.5 inch hard disks in a 2 OU space.

Lock-in Mini-SAS module for better cable management

Serviceability is a key objective for the JBR. With its unique hidden-shelf design and lock-in Mini-SAS module design, datacenter operators can swap failed disks without adjusting the cables.

Screw-less tray, easy-to-service

Our engineers have overcome the toughest RVI (Rotational Vibration Interference) challenge to bring datacenter operators the all new screw-less hard disk tray design, making failed drive replacement a less time-consuming task.

Form Factor	2 OU Rackmount
Controller Module	(2) SAS Interface Modules (SIM)
External I/O Ports	(2) 6Gb/s mini-SAS port per SIM
Storage	(28) 3.5" and 2.5" SAS/SATA hot-pluggable HDDs
Management port	(1) OCP debug management port
Expansion Support	Scalable up to (84) hard drives in cascading (2) more JBRs
Cooling Fans	(3) Hot-swappable dual rotor fan modules per system
Firmware Management	SCSI Enclosure Service (SES-2)
LED Indicators	HDD status LED
	System status LED
	HDD Active and fault LED
	SAS Interface Module Status LED

▌ Rack Specification

Quanta Rackgo X offers two unique rack specifications for different power budgets at 25 kilowatt and 12.5 kilowatt.

- Rack Dimension: 24" W x 86.6" H x 42" D
- Based on OCP Open Rack 1.0 spec
- 42 OU (Open Unit) height for Open Rack compliant systems (1 OU=1.89")
  — 3 OU reserved for each power shelf
  — 2 OU reserved for switches
- Support of up to two standard network switches
- Integrated rack management controller for easy management
- Cold aisle access service design
- Up to two centralized redundant power shelves
  — Each power shelf contains 5+1 redundant PSUs
  — Each power shelf provides total 12.5KW with 2500W PSUs
  — Support 208V or 230V 3 phase 50A power

Optimized Rack Configurations

QCT provides a full line of services for datacenter customers, from testing systems, to delivering fully configured racks, to deploying racks on the customer's site. To help customers get started with the Rackgo X rack solution, QCT offers three rack architectures to suit different types of workloads. Each architecture has been fully tested and validated for optimized and balanced performance. Datacenter customers can choose from the three rack configurations or build their own racks. Quanta Rackgo X helps datacenters achieve " best performance per watt, per dollar. "

JBR
F03A
T3048-LY2
Power Shelf

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Rackgo X Solution	X300	X500	X700
Quantity of F03A Node	64	14	24
Quantity of JBR JBOD storage	0	14	12
Quantity of T3048-LY2 switch	4	2	2
Quantity of CPU socket	128	28	48
Quantity of JBOD HDD	0	392	336
Weight	1052KG	1108KG	1086KG
Power Requirement	25KW with 2 power shelves	12.5KW with 1 power shelf	12.5KW with 1 power shelf
Targeted Applications	Compute-intensive workloads	OpenStack, storage and bandwidth-intensive workloads	Virtualization, object storage application, Hadoop and more balanced workloads

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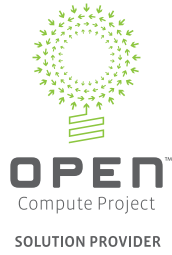
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