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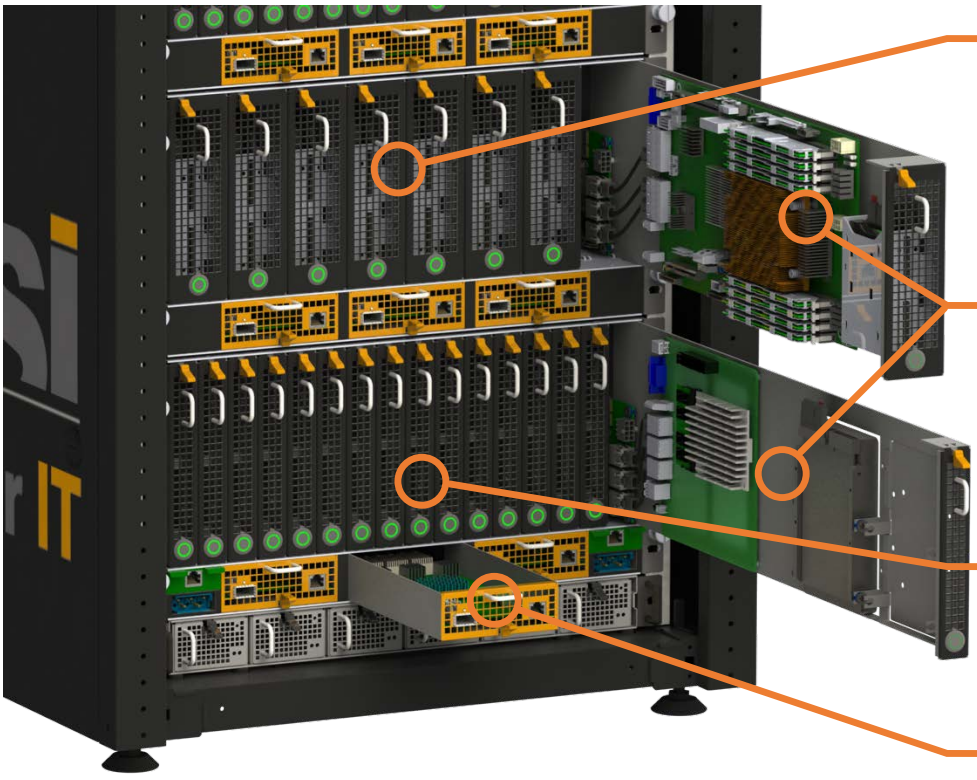
Rack Systems

OpenBlade™

High-Density, Full-Rack Solution Optimized for CAPEX & OPEX

OpenBlade lets you experience maximum flexibility in building and extending your cloud. The first hardware-agnostic blade server, OpenBlade gives you the freedom to evolve at your speed, within your budget, and based on your needs. Maintenance-friendly OpenBlade allows all access from the hot corridor, saving time, hassle, and security risks—and streamlined cabling reduces the number of cables by up to 90% for more accessible maintenance. Thanks to OpenBlade's centralized power distribution, this solution even uses up to 50% less power.



Complete front-side maintenance

Up to 11 blades to chose from or BYOB

Each enclosure has 16 OpenU slots

Easy access to networking equipment

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Key Features

Features

- 11 different blades available, designed for compute, networking, storage, GP/GPU, IoT, hosting, etc.
- BYOB: Bring Your Own Blade.
- Embedded network.
- All networking elements are interchangeable.
- Cooling done by bigger, slower fans reducing vibration and noise.
- Water cooling ready.
- Immersion cooling ready.

Specifications

Rack System	44U, 600 mm x 1000 mm x 2075.7 mm (W x D x H)
Enclosure	5U, 447 mm x 800 mm x 242.5 mm (W x D x H)
Management Modules	2x remote management controller modules to manage each enclosure
Switch Modules	Up to 3 switches: 16x 1 Gb/s down - 4x 10 Gb/s up (QSFP+) or 16x 10 Gb/s down - 2x 100 Gb/s up (QSFP28)
Power	1U-height power supply, 14.4 kW 5+1 redundant power supply modules Three pairs of power bars installed for the rack system

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Detailed Technical Specifications

Rack System

Features		Description
System	Form Factor	44U high-density rack server
	Dimensions (W x D x H)	600 mm x 1000 mm x 2075.7 mm
	Gross Weight	TBF
Connectivity	TOR Switch	2x TOR switches, each switch can support: 48x 10 GbE SFP+ ports 4x 40 GbE QSFP+ ports
	Management Switch	2x mid-U switches, each can support: 8x 1 GbE ports 2x 10 GbE ports
Server	System Enclosure	Each rack supports up to 8 OpenBlade server enclosures
Cooling System	Fan Enclosure	16x system fan enclosures in the rear side of rack with 172 mm x 51mm system fans
Power Supply	Power Shelf	1U-height power shelf, 2 options: Option #1: 14400 W (3+3) Option #2: 8700 W (5+1)
	Redundancy	5+1 (option #1) or 3+3 (option #2)
	Power Bars	Each rack system includes 3 pairs of power bars installed
Environment	Operating temperature	10°C ~ 35°C
	Non-operating Temperature	-40°C ~ 70°C

System Enclosure

Features		Description
Enclosure	Dimensions (W x D x H)	5U, 447 mm x 800 mm x 242.5 mm
	Gross Weight	63 kg
Computability	Processor Blade	Supports 4x 4 MUDs, 8x 2 MUDs, up to 16x 1 MUDs for each enclosure
Manageability	Remote Management Controller	2x remote management controllers for each enclosure
	Switch Modules	3x switch modules for each enclosure

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Features		Description
Backplane	Power Backplane (PB)	Distributes power to blades
	Data Backplane (DB)	Distributes the network interface and the management system to the blades
	Switch Board (SB)	Network card that plugs into the data backplane (DB)
	Midplane (MP)	3x RJ45 connectors 1x Mini-Fit® power connector Connection between the Mini-ITX motherboard, the data backplane, and the power backplane
Connection card	Management Card (MC)	Connection between data backplane (DB) and external management connector card (EMCC)
	External Management Connector Card (EMCC)	1x RJ45 connector Connection between the management card (MC) and the external management connector card (EMCC) for network data and LEDs
	External Connector Card (ECC)	1x QSFP+ connector Connection between the switch board (SB) and the top-of-rack (TOR) switch
Cooling	Fan Enclosure (FE)	2x 172 mm x 51mm system fans (rear) Enclosure support for 2 system fans 172 mm x51mm
Front Panel	Front Power Button (FPWB)	1x front power switch with power LED The front power switch for manual start blade and front LED power-on indicator
Power Connection	Power Connectors	2 inputs/3-phases, line-to-line input AC 400/480 V or 208 V

Processor Blade

	OpenBlade 1MUD-1900	OpenBlade 2MUD-1540	OpenBlade 2MUD-1200	OpenBlade 2MUD-2600
MUD				
Form Factor	1 OpenU	2 OpenU	2 OpenU	2 OpenU
Motherboard				
Form Factor	Mini-ITX, 6.7” x 6.7”	Mini-ITX, 6.7” x 6.7”	Mini-ITX, 6.7” x 6.7”	Mini-ITX, 6.7” x 6.7”

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	OpenBlade 1MUD-1900	OpenBlade 2MUD-1540	OpenBlade 2MUD-1200	OpenBlade 2MUD-2600
CPU				
Reference	Intel® Bay Trail-D1900 D1540	Intel Xeon® D1540	Intel Xeon E3-1200V5	2x Intel Xeon E5-2600V3/V4
Power (TDP)	10 W	65 W	95 W	145 W
Memory				
Type	DDR3/DDR3L ECC SO-DIMM	DDR4 ECC RDIMM	DDR4 ECC UDIMM	DDR4 ECC SO-DIMM
Size	2 DIMMs, 8 GB (max)	4 DIMMs, 128 GB (max)	2 DIMMs, 64 GB (max)	4 DIMMs, 128 GB (max)
Speed	1333 MHz	2133/1866 MHz	2133/1866 MHz	2133/1866 MHz
Voltage	1.5 V/1.35 V	1.2 V	1.2 V	1.2 V
Network				
Controller	2x Intel I210 1 Gb/s controllers	2x Intel I210 1 Gb/s controllers 1x Intel X557-AT2 10 Gb/s controller	Dual 1 Gb/s controllers	2x Intel I210 1 Gb/s controllers 1x Intel I217
Port	2x 1 GbE RJ45 ports 1x RJ45 port (for IPMI)	2x 1 GbE RJ45 ports 2x 10 GbE base-T ports	2x 1 GbE RJ45 ports	2x 1 GbE RJ45 ports 1x RJ45 port (for IPMI)
Storage				
Internal Disks	2x 3.5" internal disk brackets	4x 3.5" internal disk brackets		
Controller	Intel SOC	Intel SOC	Intel C232	Intel C612
RAID	NA	Intel RSTe RAID 01/1/10/5	Intel RSTe RAID 01/1/10/5	Intel RSTe RAID 01/1/10/5
Interface	SATA 3.0 Gb/s	SATA 6.0 Gb/s	SATA 6.0 Gb/s	SATA 6.0 Gb/s
Manageability				
Controller	ASPEED AST2300	ASPEED AST2400	ASPEED AST2400	ASPEED AST2400
Midplane (MP)				
RJ45	3x 1 Gb/s RJ45 ports Connection between the Mini-ITX MB, the data backplane, and the power backplane			
Power Connector	1x Mini-Fit® power connector			
HE10 Connector	1x management port to control Mini-ITX MB (power button, reset button, and power backplane)			
OS Support				
Windows	Windows® Server 2012 R2/2012			
Linux	RedHat® Enterprise, CentOS			

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Remote Management Controller

Features		Description
Redundancy		2x remote management controllers for each system enclosure Supports redundant management between system enclosure and top-of-rack switch
Manageability	Management Card (MC)	1x dual-core ARM 800 MHz Connection between data backplane (DB) and external management connector card (EMCC)
	External Management Connector Card (EMCC)	1x RJ45 connector Connection between the management card (MC) and the switch (TOR)
	Ribbon Cable (RC-SB2EMCC)	Connection between the management card (MC) and the external management card (EMCC) for network data and LEDs
	Auto Node Discovery	Yes

Switch Module

Features		Description
Network	External	1x QSFP+ port, supports up to 4 x 10 Gb/s
	Internal	Supports up to 16 multilayer GbE ports
Processor	CPU	Dual-core ARM V7 CPU
Memory	Flash	4 GB NAND and 16 MB NOR
	SDRAM	DDR3 4 GB SDRAM
Manageability	Management	Flexible L2 and L3 tunneling capabilities
	Packet Buffer	1.5 MB
	MAC Addresses	16 K entries
	Port-Extender Capability	802.1Br-Compliant bridge port extension capability
	Integrated PHYs	SFP+ (10 G)/QSFP+ -based uplink/stacking port support

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Features		Description
	20 G Stacking/Cascading Ports	Provides up to 2x 20 G stacking ports or 40 G cascading bandwidth
Connection Boards	Switch Board (SB)	1x switch board (SB) for each switch module Network card plugs into the data backplane (DB)
	External Connector Card (ECC)	1x QSFP+ connector Connection between the switch and the top-of-rack (TOR) switch
	CS2S Cable	1x SFF-8643 to SFF-8643 cable Connection between the switch board (SB) and the external connector card (ECC)
	Ribbon Cable (RC-SB2ECC)	Connection between the switch board (SB) and the external connector card (ECC) for power, LEDs, and I2C

Power Shelf

Features		Description
Power Shelf	Input	3-phase, AC 400/480 V line-to-line input with neutral 3-phase, AC 208 V line-to-line input without neutral
	AC Inlet Configuration	6 power modules powered from one AC inlet
	Redundant Configuration	1U-height power shelf, 2 options Option 1: 8700 W Option 2: 14400 W
	Option 1	8700 W (3+3 redundant power supply module)
	Option 2	14400 W (5+1 redundant power supply module)
	Output Connection	Set of 3 output blades for DC +12 V output
	Auxiliary Output	50 W (Standby output 12 V/4 A)
	Management	I2C PMBus™, optional Ethernet capability
Power Supply Module	Type	Front-end
	Number of outputs	1
	Voltage–Input	180–300 VAC
	Voltage Output	12 V
	Current Output (max)	244 A

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Features		Description
	Power (Watts)	3000 W
	Operating Temperature	0°C-55°C (with derating)
	Dimensions (W x D x H)	inch: 1.65” x 22.98” x 2.72” mm: 42.0 mm x 583.7 mm x 69.0 mm

Order Information

Base System

Reference	Specifics	Notes
TBD	TBD	

Parts

Reference	Specifics	Notes
TBD	**Power Backplane (PB)** Distributes power to the blades.	
TBD	**Data Backplane (DB)** Distribute de network interfaces and the Management system to the blades.	
TBD	**Switch Board (SB)** Network card that plugs into the Data Backplane (DB).	
TBD	**Cable SFF8643 to SFF8643 (CS2S)** Connection between the Switch Board (SB) and the External Connector Card (ECC).	
TBD	**Ribbon Cable (RC-SB2ECC)** Connection between the Switch Board (SB) and the External Connector Card (ECC), for power, LEDs, and I2C.	
TBD	**External Connector Card (ECC) with QSFP+** Connection between the switch and the top-of-rack (TOR) switch, exposing one QSFP+ connector.	

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Reference	Specifics	Notes
TBD	**External Connector Card (ECC) with 4x RJ45** Connection between the switch and the top-of-rack (TOR) switch, exposing four RJ45 connectors, 10GbE per connector.	1
TBD	**External Connector Card (ECC) with 4x SFP+** Connection between the switch and the top-of-rack (TOR) switch, exposing four SFP+ connectors, 10GbE per connector.	2
TBD	**External Connector Card (ECC) with 4x QSFP+** Connection between the switch and the top-of-rack (TOR) switch, exposing four QSFP+ connectors, 40GbE per connector.	3
TBD	**External Connector Card (ECC) with 2x QSFP28** Connection between the switch and the top-of-rack (TOR) switch, exposing two QSFP28 connectors, 100GbE per connector.	4
TBD	**Management Card (MC)** Management card, which plugs into Data Backplane (DB).	
TBD	**Ribbon Cable (RC-SB2EMCC)** Connection between the Management Card (MC) and the External Management Connector Card (EMCC), for network data and LEDs.	
TBD	**External Management Connector Card (EMCC) with 1x RJ45** Connection between the Management Card (MC) and the top-of-rack (TOR) switch, exposing one RJ45 connector.	
TBD	**Mid Plane (MP) with 3x RJ45, 1x Power, and management** Connection between the Mini-ITX motherboard and the Data Backplane (DB) and Power Backplane (PB) with 3 RJ45 connectors, 1 MiniFit Power connector and HE10 for manage the motherboard (Power Button, Reset Button and ID Switch).	
TBD	**Mid Plane (MP) with 1x SFP+** Connection between the Mini-ITX motherboard and the Data Backplane (DB), with 1 SFP+ connector.	5

[1] Available in Q3 2016
[2] Available in Q3 2016
[3] Available in Q3 2016
[4] Available in Q3 2016
[5] Available in Q3 2016

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Reference	Specifics	Notes
TBD	**Mid Plane (MP)** Connection between the Mini-ITX motherboard and the switch, with 3x RJ45 connectors.	6
TBD	**Enclosure (E)** 5U enclosure.	
TBD	**1MU Drawer (1MUD)** 1-Mini-Unit Drawer to slide in the enclosure.	
TBD	**2MU Drawer (2MUD)** 2-Mini-Unit Drawer to slide in the enclosure.	
TBD	**4MU Drawer (4MUD)** 4-Mini-Unit Drawer to slide in the enclosure.	
TBD	Cable (CblRJ45) Connection between the RJ45 Connector Card of the Mid Plane (MP) and the RJ45 Connector Card of the Mini-ITX for network data.	
TBD	Front Power Button (FPWB) with power LED The Front power Switch for manual start Blade and Front Power LED to see the blade started	
TBD	HDD Brackets (HB) Brackets support for HDD 3,5”	
TBD	FAN enclosure support (FE) Enclosure support for FAN 172x51	
TBD	FAN (FAN) FAN 172x51	
TBD	FAN Rear cable (FRC) Connection between the Data backplane (DB) and the two rear FAN (FAN).	
TBD	**FAN Front cable (FFC)** Connection between the Data backplane (DB) and the two front FAN (FAN).	
TBD	**Backplane Power Cable (BPC)** Power Connection between the Data backplane (DB) and the Power backplane (PB).	

[6] Available in Q3 2016

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Reference	Specifics	Notes
TBD	**BIG Power Extension Cord (BPEC)** Extension cord, allowing the front layout of the main AC power connector	
TBD	**Data SATA Cable (DSC)** Connection between the motherboard and the data HDD connector.	
TBD	**Power SATA Cable (DSC)** Connection between the motherboard and the Power HDD connector.	

Options

TBD

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