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Product Description

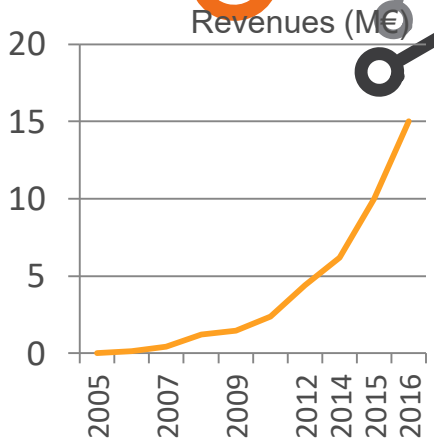
OpenBlade™

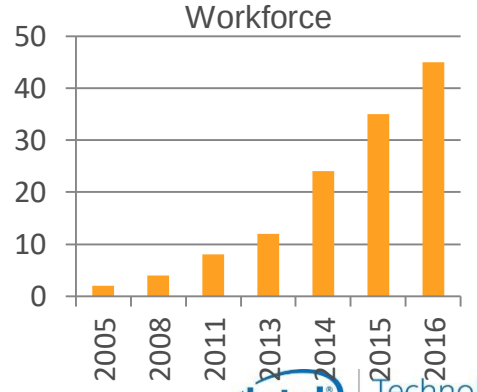
Hyperconverged Solution

Figures intro

Financial info 2015	• Revenue : 10M € • Revenue : +71% compared to 2014 • Won $32M contract

Other information	• Workforce: 44 employees
	• Customers : more than 500
	• Delivered servers in 2015 : 2500
	• Worlwide settlement : France, USA, UAE
	• Participation to multiple international exhibitions: 7 in 2015
	• Awards:
	  ○ Export trophee 2015
	  ○ Deloitte Fast50 2015
	  ○ Innovation Award 2014 (HexaPHI)





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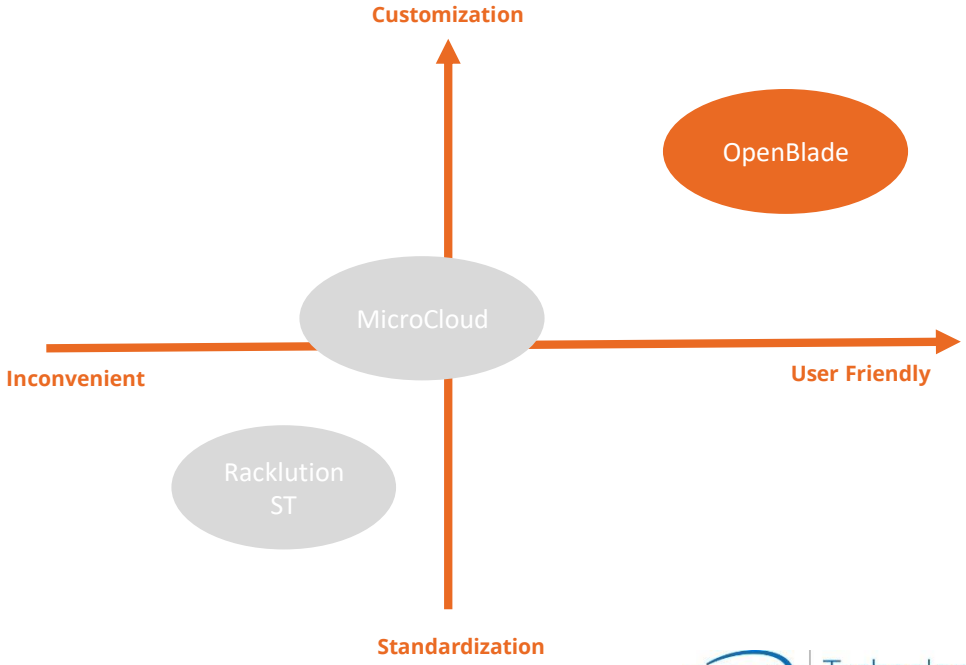
Modular Blade Market Positioning

Nowadays, the blade servers market **major concerns** are critical regarding **Space**, **Power & Cooling**, **Switching** and **I/O Requirements**. Solutions provided by other manufacturers remains **inefficient** though.

Proprietary hardware
- Expensive
- Not adjusted

Not responsive
- Hardly adaptable
- Sparsely scalable

High power consumption
- Up to 50% of the hosting costs per year



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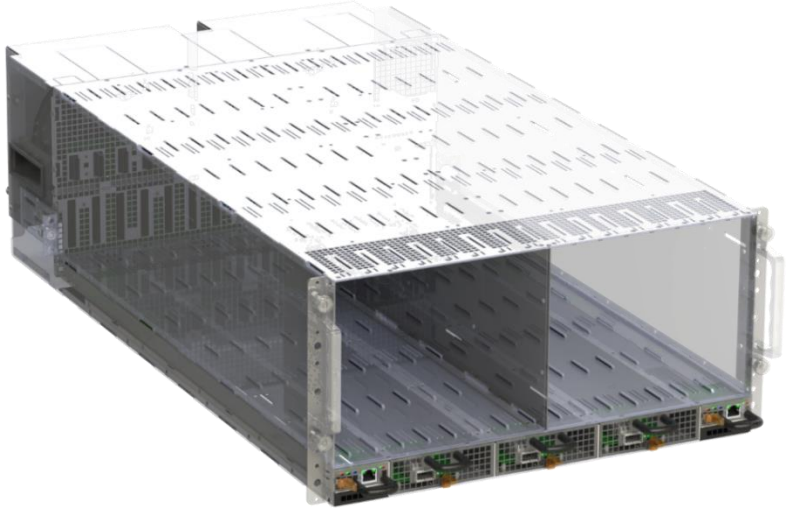
OpenBlade - HARDWARE-AGNOSTIC BLADE SERVER

OpenBlade solution is a **smart** designed chassis, perfect for **modular**, **scalable** and **hyperconverged needs**.

The 5U height chassis,19 inches width is **adapted to every types of rack**, it **includes network**, **management**, and up to 16x “Open-1u" blades (up to 48 nodes).

Cheaper to operate
- Less power consumption
- Standard hardware

Easy to maintain
- Centralized maintenance
- Less cables
- Standard hardware
- Complete front maintenance



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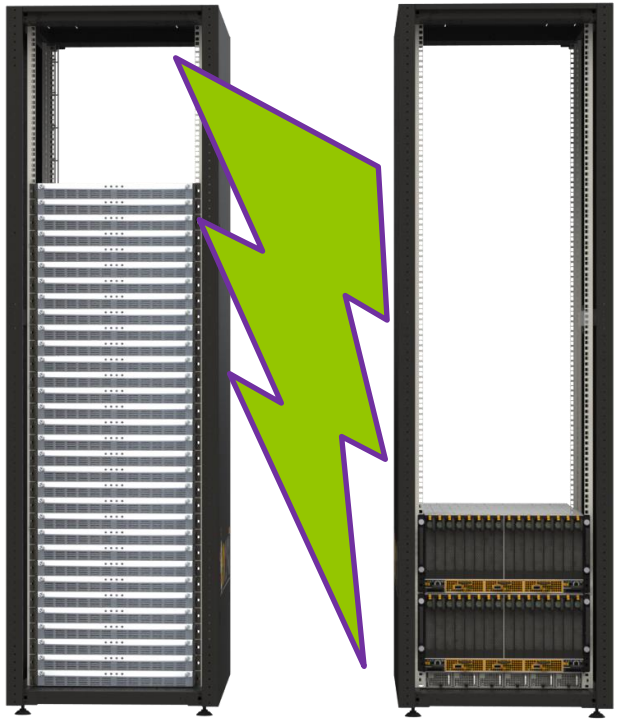
Standard servers VS OpenBlade™

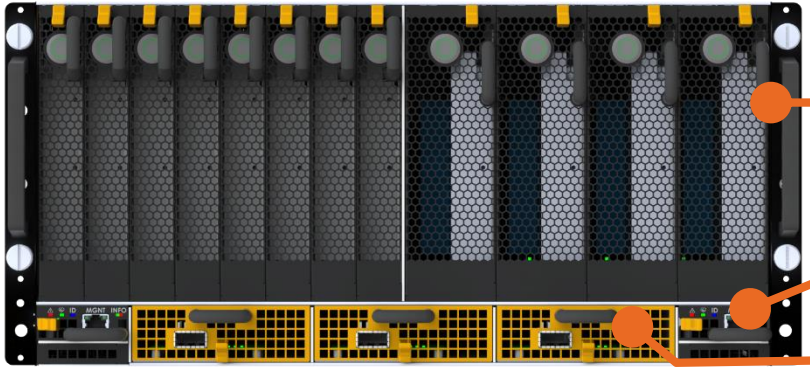


- **32 nodes in a rack**
- **Save more than 50% space**

Saving space in your data center has multiple benefits:

- Reducing space saves money.
- When you reduce the amount of space used, you also reduce the amount of power, water, lighting and cooling needed – which cuts spending.
- When you control space consumption, you also ensure that you have room to accommodate future growth and expansion.

OpenBlade™ enclosure :



- Up to 16x Open-u™ blade
- Up to 2 management boards
- Up to 3 x L2/L3 switches

Form Factor	19” – Standard Rackmount Chassis 5U height
Dimensions	220 mm (H) x 447 mm (W) x 875mm (D)
Management	Up to 2 remote management modules per enclosure
Switching	Up to 3 switches (L2/L3 layers) with: • 16x GbE down - 4x 10GbE up (QSFP+ or 4x SFP+) • 16x 10GbE down – 4 x 40GbE or 2x 100GbE up *(coming soon)*
Cooling	Redundant rear axial fans Ø172x51mm - 40W – 600m³/h

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OpenBlade™ : complete rack integration example

Dimensions (W x D x H)	600mm x 1000mm x 2075mm
System Enclosure	up to 8 OpenBlade™ => up to 384 nodes in one 42U rack
Top-Of-Rack switch	Downlink 24x 10GbE ports Uplink 6x 40GbE or 3 x 100GbE
Power bank	1U full redundant power supply : • up 6 modules 3KW / 12VDC - 14,4KW maximum total output • dual 3-phase input, with (400/480VAC) or w/o Neutral (208VAC)
DC Power distribution	At least one pair of copper bars to power OpenBlade™ Up to 3 pairs of copper bar for high wattage needs
Operating Temperature	5°C ~ 35°C

Scalability

Data Center

Low Consumption

Turn-key Solution

Green IT

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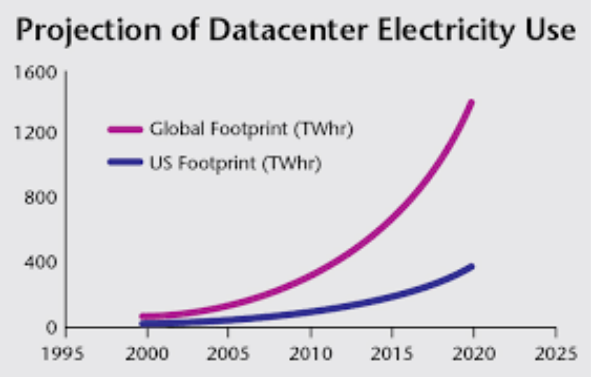
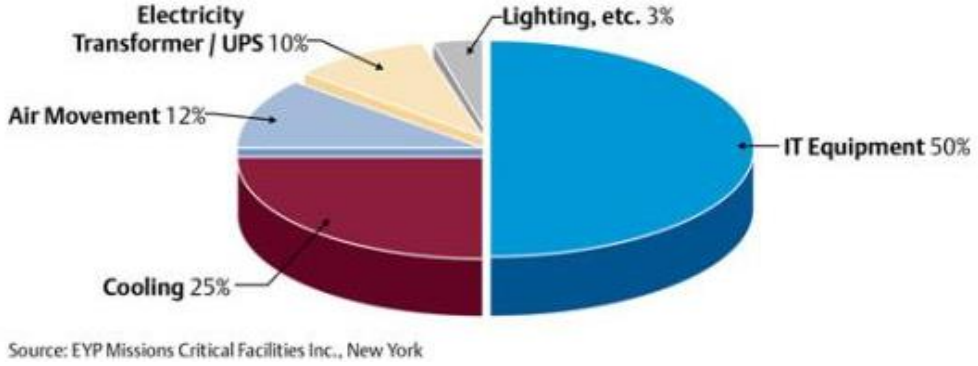
Data Center Power Consumption Global Issue

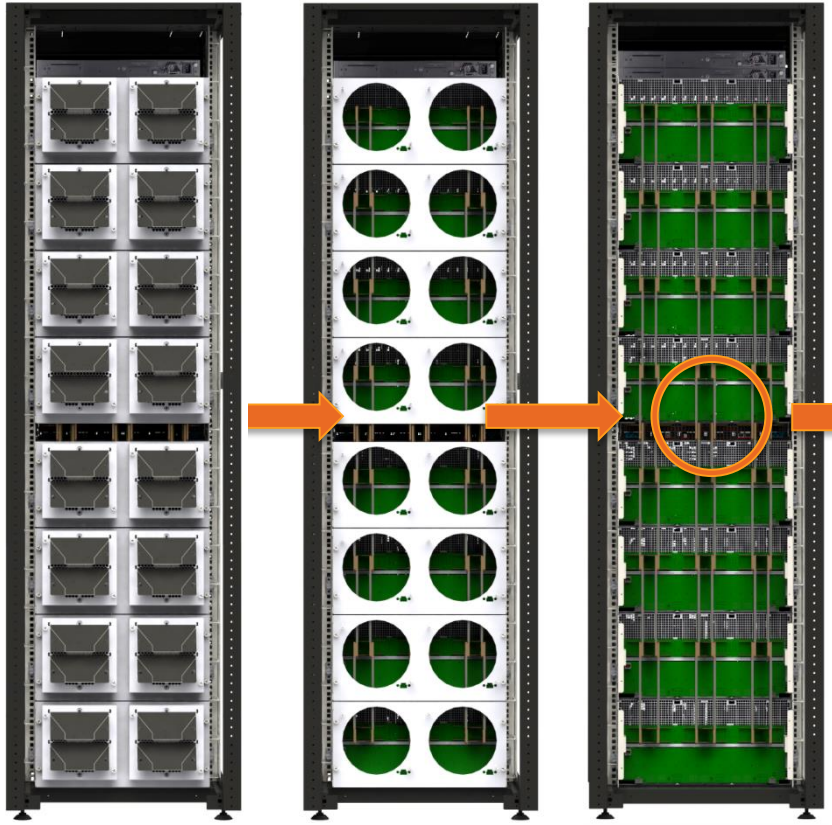
According to Lux Research, the "1,520 data centers in the U.S. consume **91 billion kilowatt-hours** of electricity per year, and the National Resource Defense Council (NRDC) projects they're on track to reach **140 billion kilowatt-hours** by 2020."

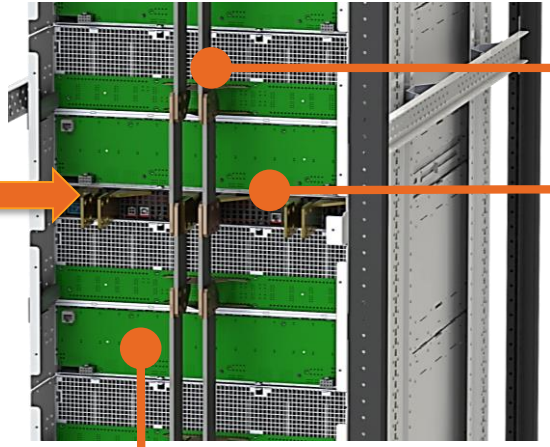




Obviously it's time to look for new efficiencies within the data center to help stave off the power limitations, cooling issues, and the high cost of adding new space

Back Integrated and Protected Power Distribution





Power Distribution through Power bars

1U Power bank

OpenBlade backplane connected to Power bars

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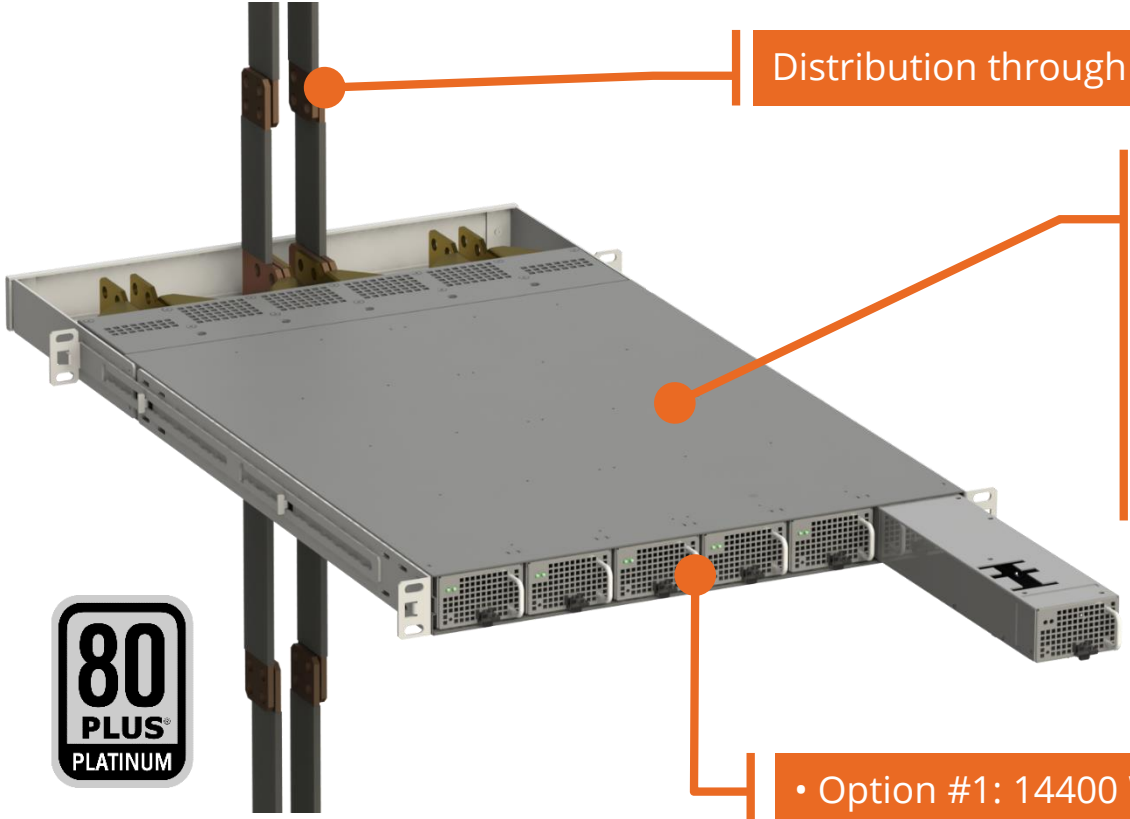
Power System: 1U power bank



Distribution through power bars 12V DC

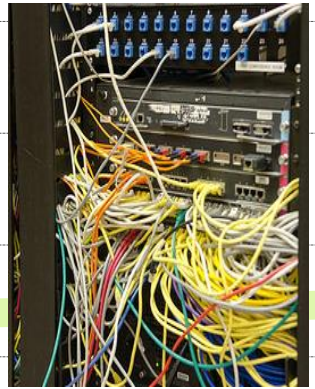
Redundant 1U power bank:
- Up to 6 modules
- 3-phase, 400/480 VAC line to line input with Neutral line
- 3-phase, 208 VAC line to line input without Neutral line

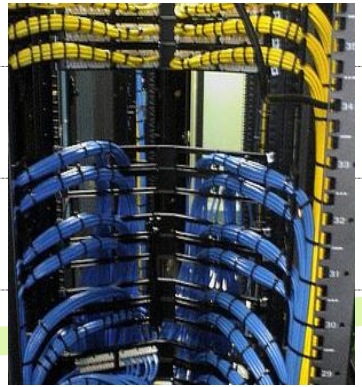
Efficiency : 80+ Platinum

- Option #1: 14400 W (5+1)
- Option #2: 8700 W (3+3)

Cabling Innovative Evolution

Priority is given to cable and cord management, by simplifying integration, cabling accessibility and modularity.

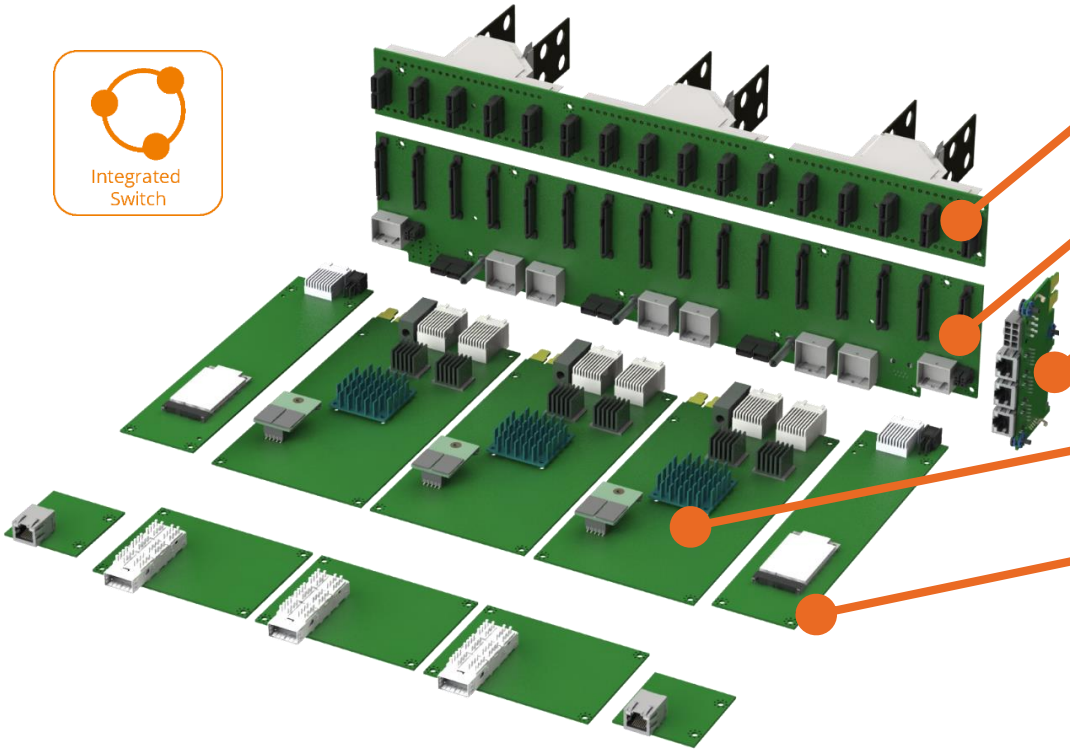




90% less cables !

Ethernet Switch & Management Modules

Integrated Switch



- 1x passive power backplane
- 1x passive signal backplane
- Up to 16x midplanes
- Up to 3 x switches 16 x GbE to 4 x 10GbE
- Up to 2x management modules

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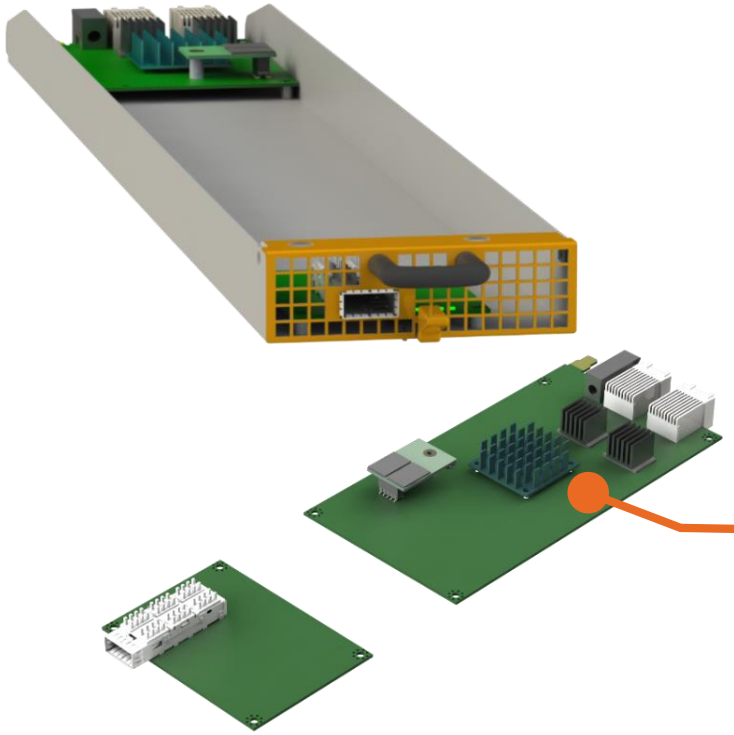
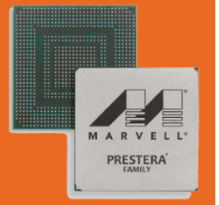
Ethernet Switching



Based on **Marvell AlleyCat 3**
ARM CPU : Linux & CPSS
L2 (Switching)
L3 (Routing)



- 16x 1 Gb/s down - 4x 10 Gb/s up (QSFP+)
- 16x 10 Gb/s down 2x 100 Gb/s up (QSFP28) *coming soon*

Ethernet switch board

2CRSI switch modules are specifically designed to meet the rigors of nodes application infrastructure. Thereby, the modules do not deliver any oversubscription.

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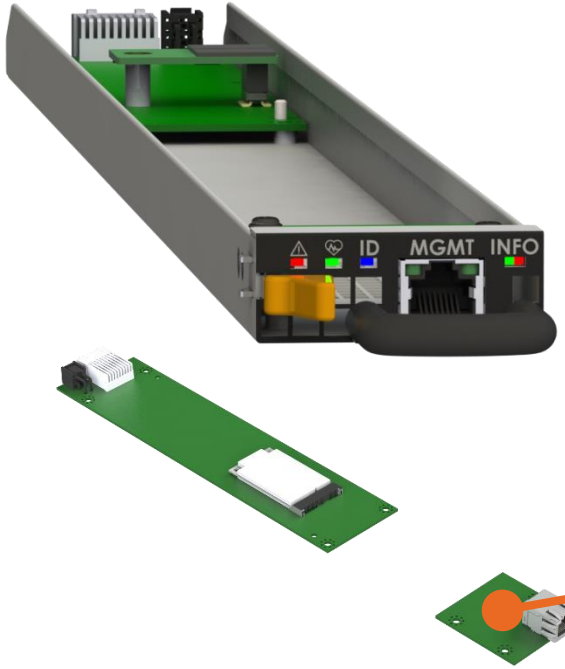
Management Board



Based on **Marvell AlleyCat 3**
ARM CPU : Linux & CPSS

- Power On/Off
- Reset
- id
- Voltage Ctrl (V)
- Current Ctrl (A)
- Fan Ctrl
- Temp Ctrl
- IPMI / API

Management board

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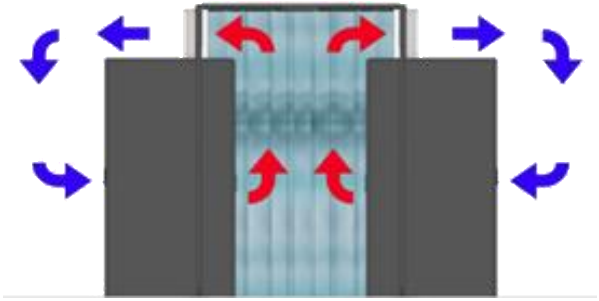
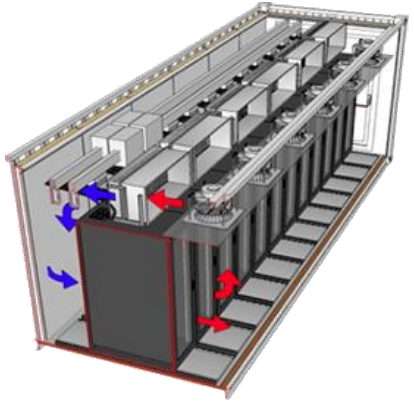
To Prevent Access to the Hot Corridor





Front I/O ports

- Lower **CAPEX** than with Indirect and Direct Free Cooling modules
- **Reduce up to 60%** energy savings over other cooling designs
- Scalability
- Add modular cooling capacity "as needed"
- Particularly suitable to modular data centers.

Compact Solution that saves valuable IT space

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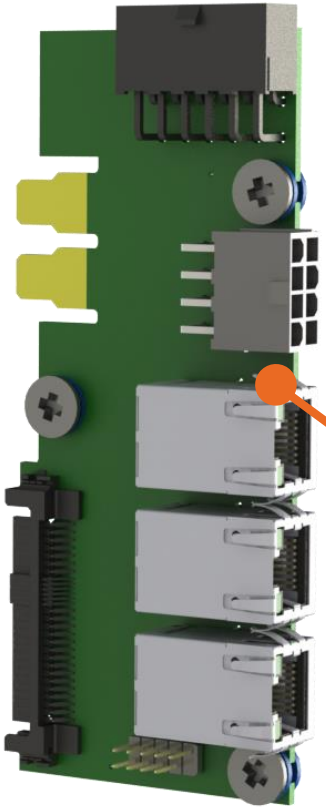
OpenBlade Midplane

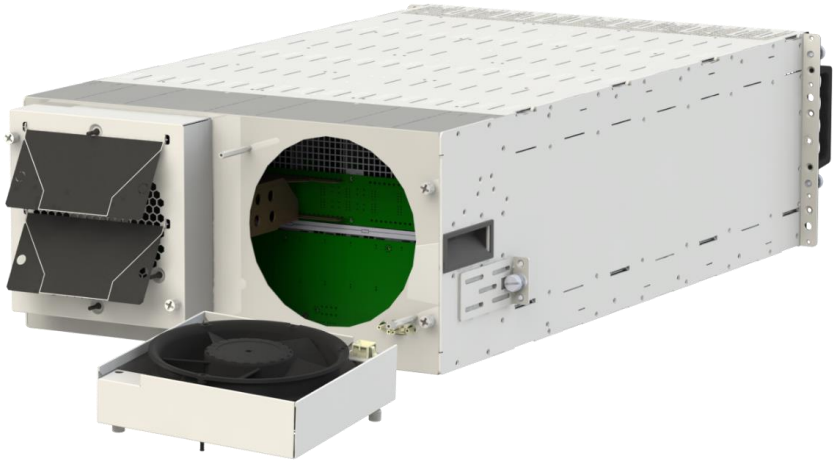


Midplane included on every blades

- Full Hot swap
- Manageable (Temp. control, current power control, 4x I2C I/O, etc…)
- 12V up to 540W (control and protect electronically)
- 5V up to 100W (control and protect electronically)
- 3x 1 Gb/s

Midplane

Redundant Air Cooling System



Redundant axial fans Ø172x51mm

- **Very rigid compression** curve for high air flow at high back pressure
- **Low operating noise level** at high back pressure
- Standard with PWM control input and speed signal
- Silent block mounting, **anti-vibration system**
- Max 600m3/h - 353 CFM per fan
- 12VDC/40W
- Weight: 910 g.

ebmpapst

2x Redundant Hot Swap Fans

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Blades powered by Intel® Technologies

Intel® blades designed for **specific needs** such as **Computing**, **Networking**, **Broadcasting**, **GPGPU**, **IoT Gateway Management**, **Hosting**, **Big Data**, etc.

Data Center

Cloud

High-performance Computing

Big Data

Broadcast

2crsi

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Open-1u Blade – 3 Nodes with Intel® Core i7 NUC

3x nodes Intel® i7 NUC board
6 x 2.5” SSD + 3 x M.2 flash
Up to 48 Nodes per OpenBlade™

- Broadcast
- Big Data
- Content Delivery
- Cloud

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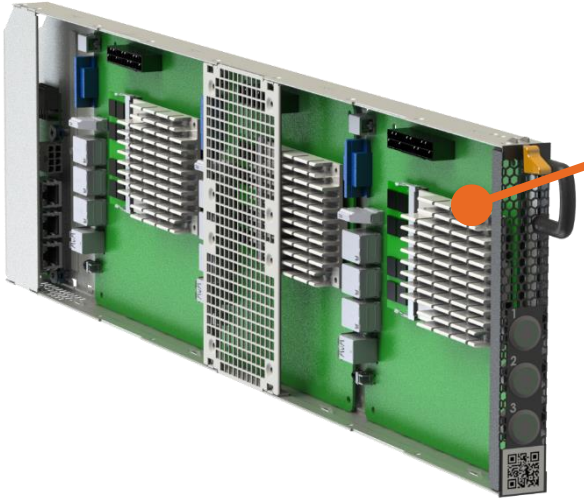
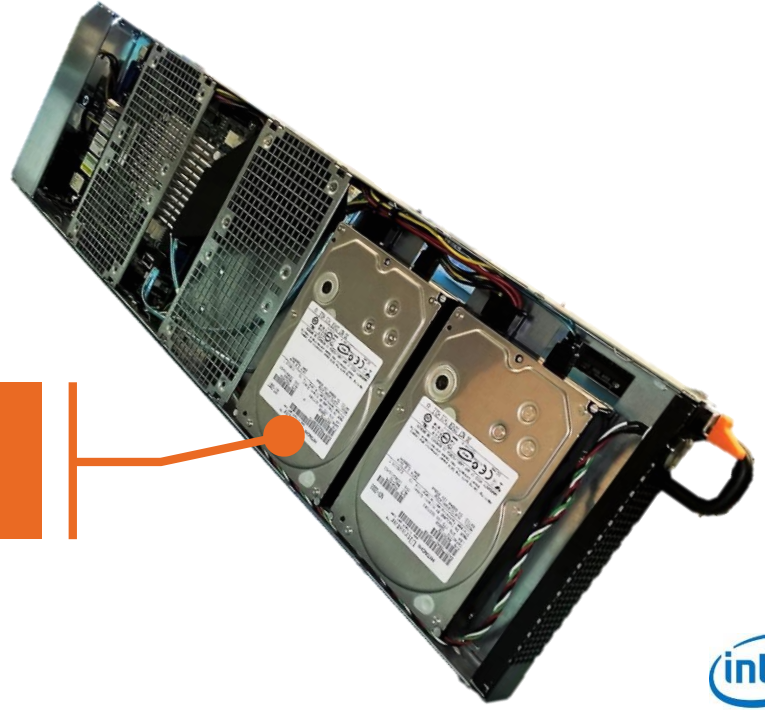
Open-1u Blade - Intel® J1900 CPU



3x Nodes in J1900 Mini-ITX board mSATA drive
Up to 48 Nodes per OpenBlade™



1x Node in J1900 Mini-ITX board
2x 3,5'' HDD (Up to 2x10TB) or 4x 2,5'' SSD
Up to 16 Nodes per OpenBlade™

Cloud

Massive Storage

Big Data

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Open-2u Blade - Intel® Xeon D15xx / E3-15xx

3x Nodes Intel® Xeon D15xx / E3-15xx
NVMe M.2 storage
Up to 24 Nodes per OpenBlade™

1x Node Intel® Xeon D15xx / E3-15xx
Up to 6x 3.5” HDD (Up to 10TB per drive)
Full front I/O

Broadcast

Cloud

Massive Storage

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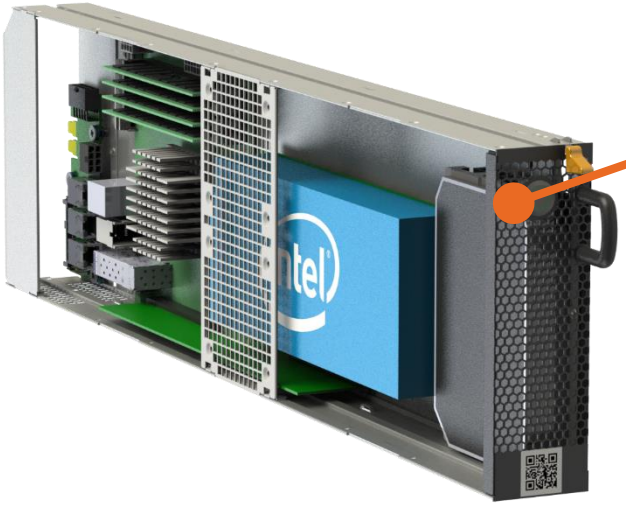
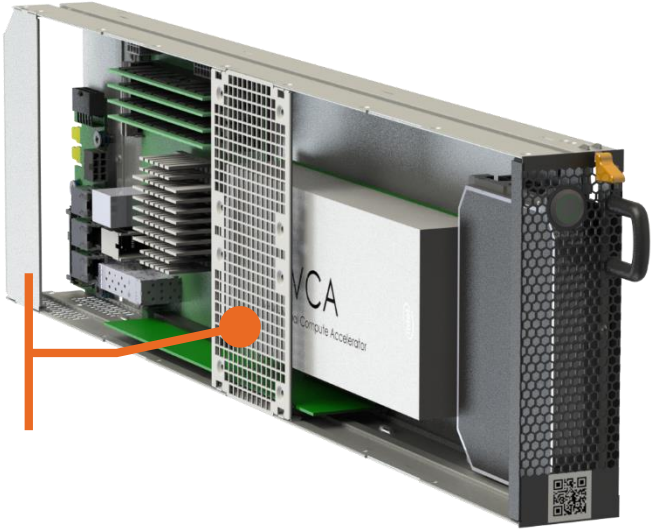
Open-2u Blade - Intel® Xeon® E3 / E5



1x Node Intel® Xeon® E3 / E5
2x 3.5” drive or 4 x 2.5” drive
1x Intel® Xeon Phi™ PCIe 16x



1x Node Intel® Xeon® E3 board
2x 3.5” drive or 4 x 2.5” drive
1x Intel® VCA PCIe 16x

Broadcast

Cloud

Big Data

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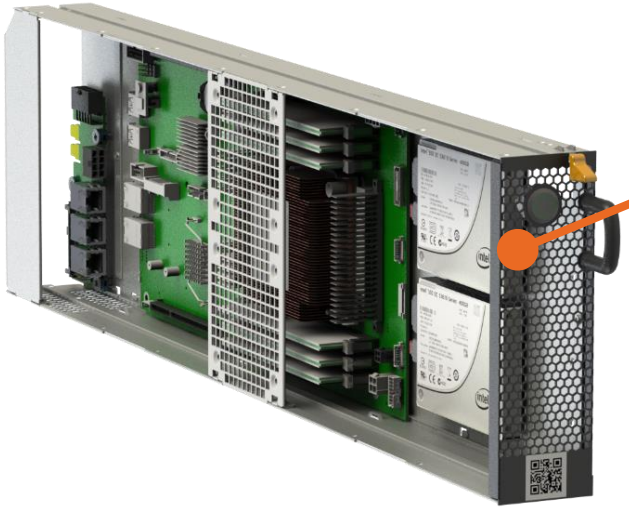
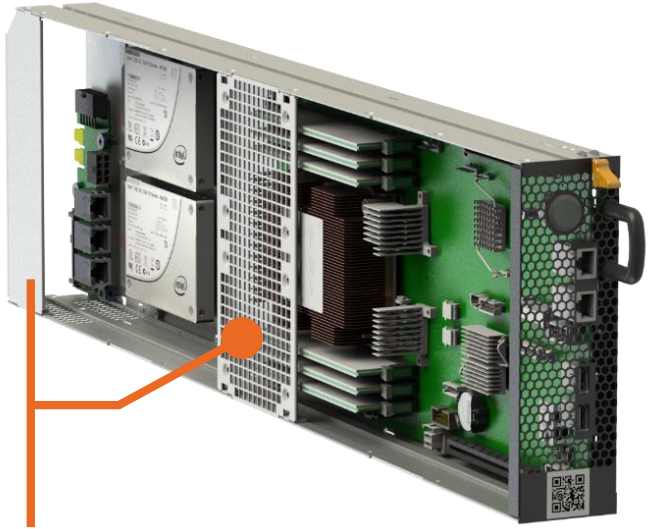
Open-2u Blade - Intel® Adam Pass – Intel® Xeon Phi™



1x Node with Intel® Xeon Phi™ board 2x 2.5” SSD drive
1x Intel® Xeon Phi™ KNL CPU
8 Nodes per OpenBlade



1x Node with Intel® Xeon Phi™ board
2x 2.5” SSD drive
1x Intel® Xeon Phi™ KNL CPU
Front I/O / Omni-Path Link
8 Nodes per OpenBlade

Broadcast

Cloud

High-performance Computing

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Open-2u Blade - Intel® Adam Pass – Intel® Xeon Phi™

Node with Intel® Xeon Phi™
2x 2.5” SSD drive
1x Intel® Xeon Phi™ KNL CPU
Front I/O with 1 x low profile PCIe slot
8 nodes per OpenBlade

Cloud

Broadcast

High-performance Computing

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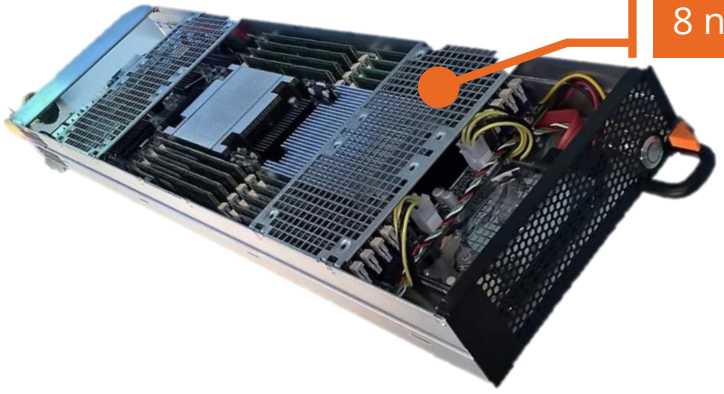
Open-2u Blade for Intel® S2600KP/TP
2x Intel® Xeon® E5-2600v4

Node with 2 Intel® Xeon® E5-2600v4
4x 2.5” SSD drive
8 nodes per OpenBlade™



Node with 2x Intel® Xeon® E5-2600v4
4x 2.5” SSD drive
Front I/O with 1 x low profile PCIe 16x slot
8 nodes per OpenBlade™

Broadcast

Cloud

High-performance Computing

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Open-4u Blade for Intel® S2600KP/TP
2x Intel® Xeon® E5-2600v4 + 2x Intel® VCA / Intel® Xeon Phi™

1x Node with 2x Intel® Xeon® E5-2600v4
2 x 2.5” SSD drive
2x Intel® VCA / Intel® Xeon Phi™ KNL
1x PCIe Card
4 nodes per OpenBlade™

Cloud

Broadcast

High-performance Computing

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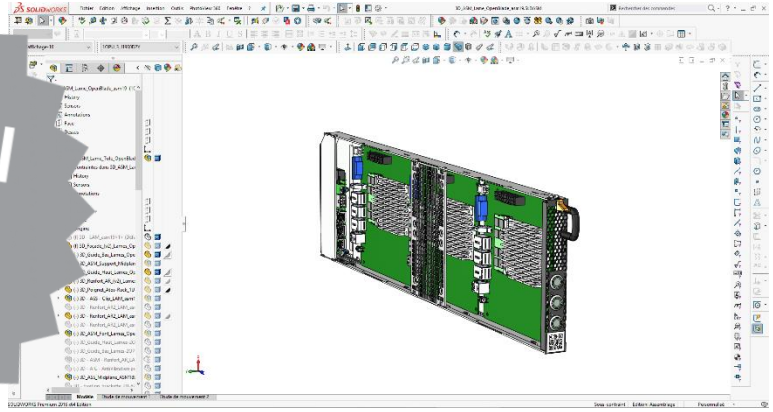
OpenBlade™ integration examples

DESIGN YOUR OWN!



Cloud

Broadcast

High-performance Computing

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Strategic Alliance with Tech Leaders

Markets	Tech Alliances
Operating System	Microsoft, Linux
Memory	crucial, SAMSUNG
MB	ASRock Rack, intel, ASUS
RAID card	AVAGO TECHNOLOGIES
HDD / SSD	HGST, SAMSUNG, intel
CPU	intel
PSU	bel
Cooling	ebmpapst

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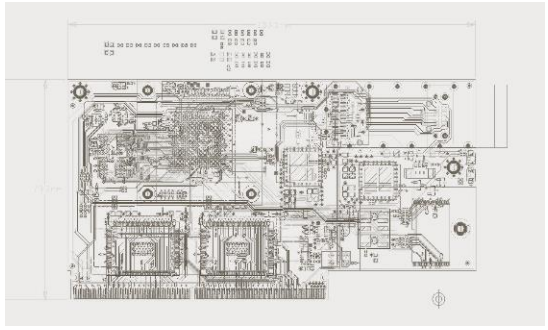
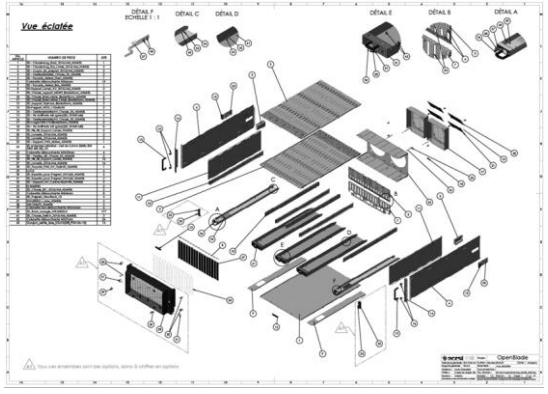
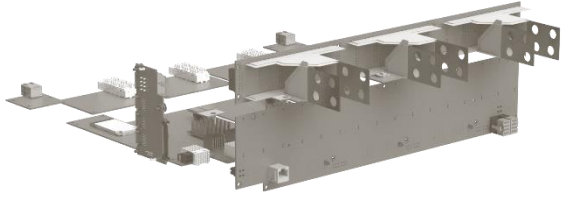
Quality Sourcing

Made In France

- Electronic engineering
- Electronic production
- Mechanical engineering
- Mechanical production
- Power engineering
- Cooling engineering
- Tests
- Software design







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OpenBlade™ is more than what you expected

Scalable & Modular

Scalability

Power Efficient

Green IT

Complete & Adaptable

Integrated Switch

Exclusive 2CRSI

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Open Compute

- Use of electric power in 480v to reduce energy losses
- Removal of anything that does not contribute to efficiency in the server
- Reuse of hot air produced by the server, optimization of cooling rooms Machine *(work in progress)*
- Get rid of non-redundant power supply needs

Intel® and 2CRSI

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HPC Data Center Specialist

2CRSI is a certified Intel® Technology Provider Platinum, proof of 2CRSI expertise in the efficient exploitation of Intel® cutting-edge technologies.

2CRSI is about to be certified Intel® HPC Data Center Specialist.

Furthermore, 2CRSI is an Intel® Strategic OEM partner.

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F.A.Q

- **Is there any network bottleneck?**

No. Each switch has 16x 1Gb/s downstream and 2x 20 Gb/s upstream. Besides, OpenBlade™ does not have bottleneck because of the 2 links for redundancy.

- **Is OpenBlade™ fully hardware agnostic?**

It is. OpenBlade gives you the freedom to evolve at your speed, within your budget, and based on your needs.

- **Is the upstream restricted by the internal switching?**

No it is not, thanks to MARVELL ALLEYCAT 3 QSFP interface which allows up to 4x 10Gb/s.

- **How can I design my own blade?**

You can design & create your own blade by reaching out 2CRSI OpenBlade™ team.

- **Do I have to purchase additional things to make it work properly?**

No, OpenBlade™ is a full turn key solution.

About 2CRSI

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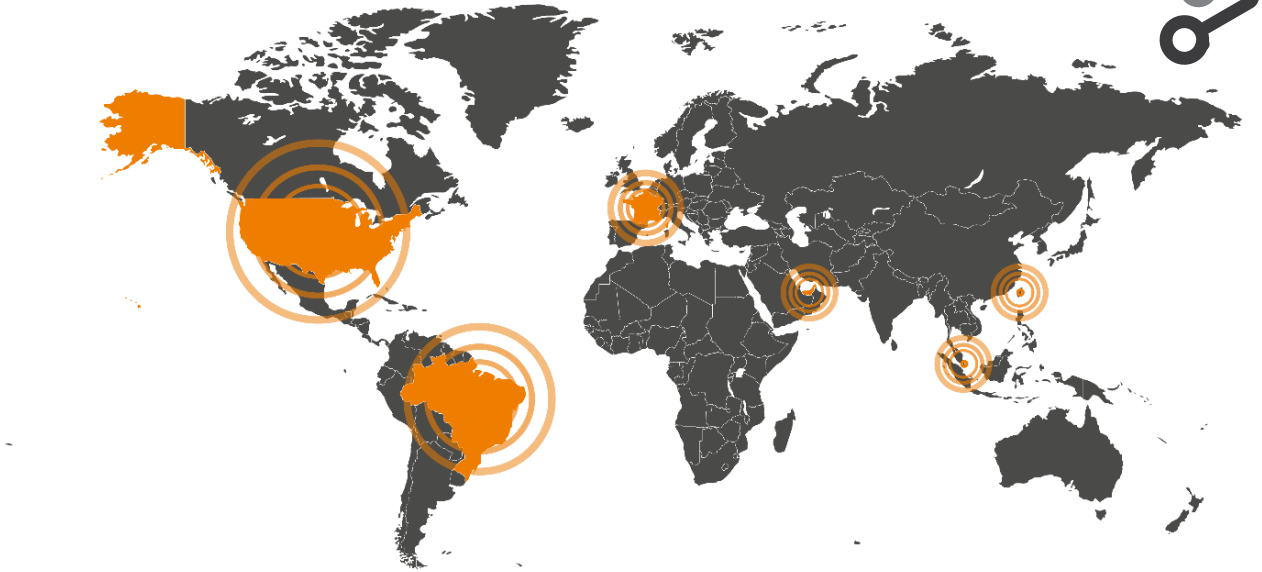

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Vocabulary

OpenU

OpenBlade can accommodate 3 types of blades with different widths.

1OpenU = **27mm**

2OpenU = **54mm**

4OpenU = **108mm**

PWM

Pulse Width Modulation

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