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The UfiSpace Distributed Disaggregated Chassis Routing System

Incubation Committee Meeting

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What is Distributed Disaggregated Chassis (DDC)?

The DDC architecture are the building blocks for carrier-class routers that scale from standalone to large, core clusters.

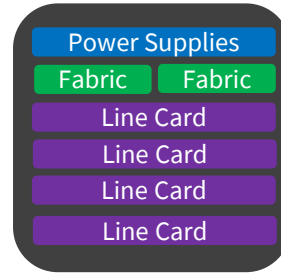


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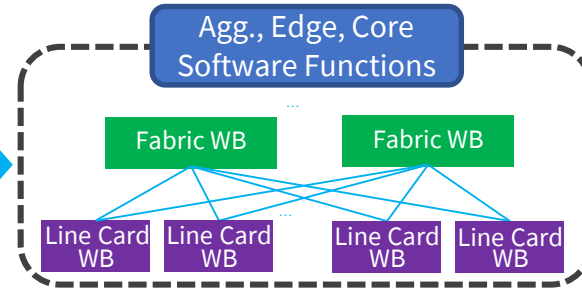
Key Principles of DDC:

1. White box (WB) hardware built on merchant silicon
2. Disaggregation of hardware and software
3. Unified system design operating as a single logic L2/L3 router that can scale from small to large clusters

Traditional Chassis



Distributed Disaggregated Chassis



Benefits of Distributed Disaggregated Chassis

Architectural Benefits

- Foster HW and SW innovations
- Flexibility in CO installation
- Simplify service and capacity upgrades
- Uniform WB components used in aggregation, edge and core networks
- Flexible horizontal scalability by adding on WB when needed

Business Benefits

Minimize CAPEX

- Merchant silicon
- Bulk purchasing of White Box HW
- Scale up without purchasing redundant chassis space

Minimize OPEX

- Common hardware across entire network



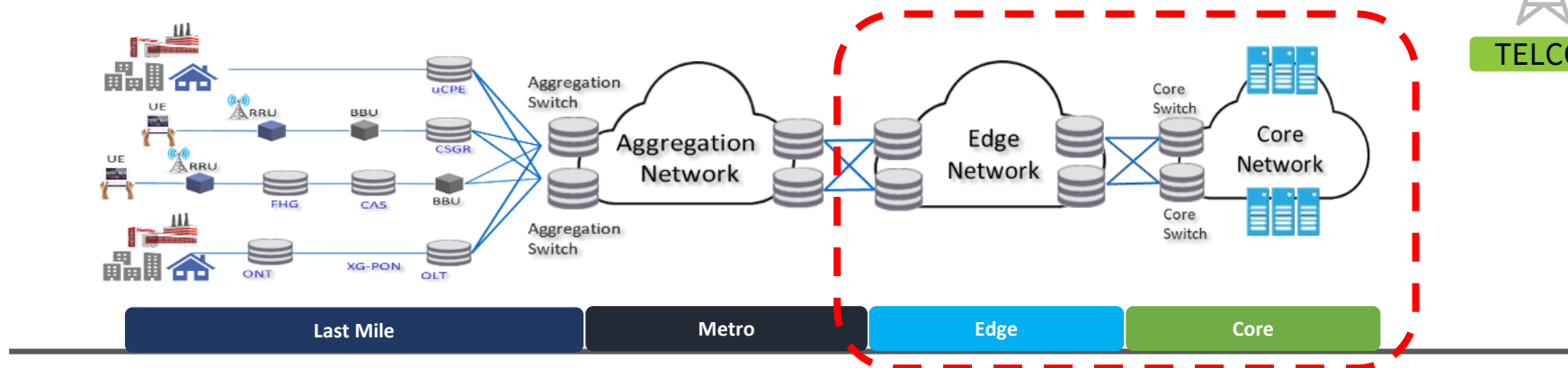
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DDC Topology for Next Gen Routing System



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S9705-48D (400GE NCF) : Up to 13



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400GE Fiber



100GE Ports

100GE Ports

.....



400GE Ports

400GE Ports

S9700-53DX (100GE NCP) : Up to 48

S9700-23D (400GE NCP) : Up to 48



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DDC Topology for Next Gen Routing System



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S9705-48D (400GE NCF)



+

S9700-53DX (100GE NCP)



or

S9700-23D (400GE NCP)



Standalone
(4 Tbps)

0

1 x 40x100GE
(40x100GE)

1 x 10x400GE
(10x400GE)

Small Cluster
(16 Tbps)

1

4 x 40x100GE
(160x100GE)

4 x 10x400GE
(40x400GE)

Medium Cluster
(96 Tbps)

7
(6+1 redundant)

24 x 40x100GE
(960x100GE)

24 x 10x400GE
(240x400GE)

Large Cluster
(192 Tbps*)

13
(12+1 redundant)

48 x 40x100GE
(1920x100GE)

48 x 10x400GE
(480x400GE)

*192 Tbps = 40ports x 100GE x 48pcs / 1000Gbps

1 NCP req. 12 fabrics for non-blocking routing, therefore 1 NCF support up to 4 NCP



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DDC Routing System Compliances



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S9700-53DX

40 x 100GE QSFP28 Service
13 x 400GE QSFP-DD Fabric



S9700-23D

10 x 400GE QSFP-DD Service
13 x 400GE QSFP-DD Fabric



S9705-48D

48 x 400GE QSFP-DD Fabric

Compliances:

- Compliant with the AT&T DDC Specification.
- TP-76200 & TP-76450 compliance for Central Office/Telco environment, NEBS Level 3.
- Standalone or coupled with fabric router in small/medium/large clusters enabling 4Tb (standalone) to 192Tb (large cluster) switching capacity.
- Operating temperature range 32°F to 113°F (0°C to 45°C).
- IEEE 1588v2 and Synchronous Ethernet, support G.8273.3 T-TC (Class C), and G.8262.
- 2RU height and 30" chassis depth especially designed for existing 19" cabinet rack-mount installation.
- Field replaceable dual -48VDC or AC hot swappable power supply options with 1+1 redundancy and field replaceable hot swappable FAN with 3+1 redundancy.



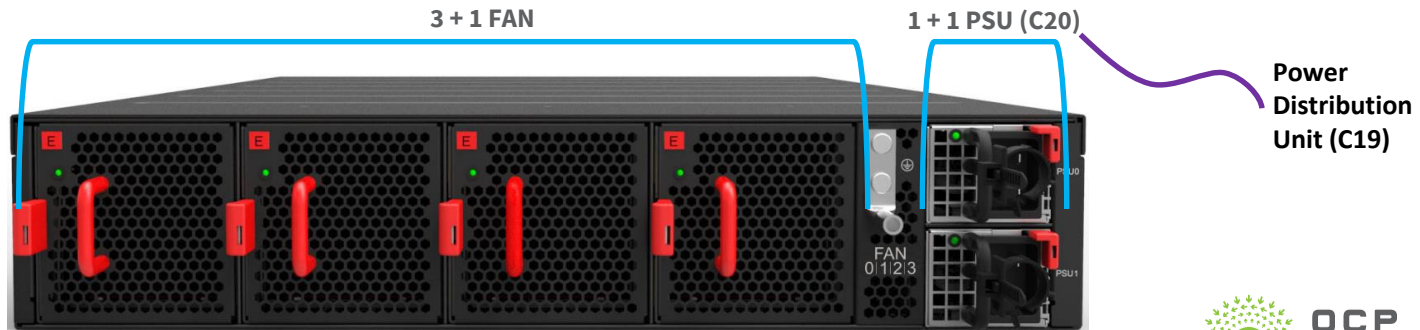
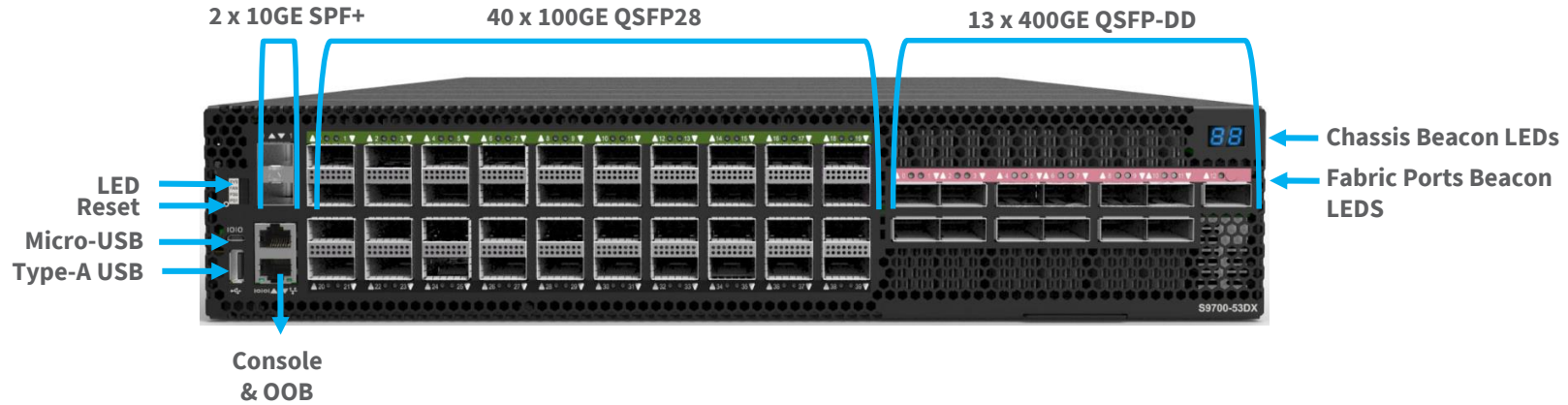
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S9700-53DX DDC Routing System



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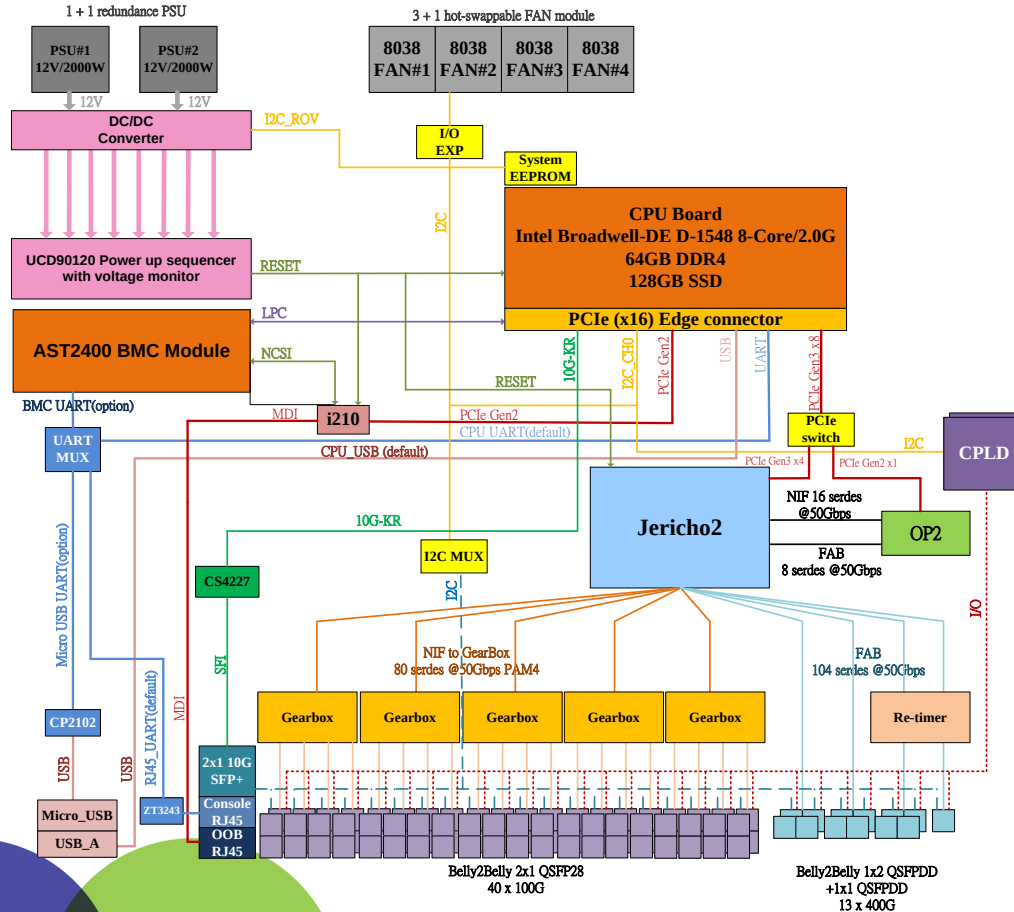
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S9700-53DX System Block Diagram



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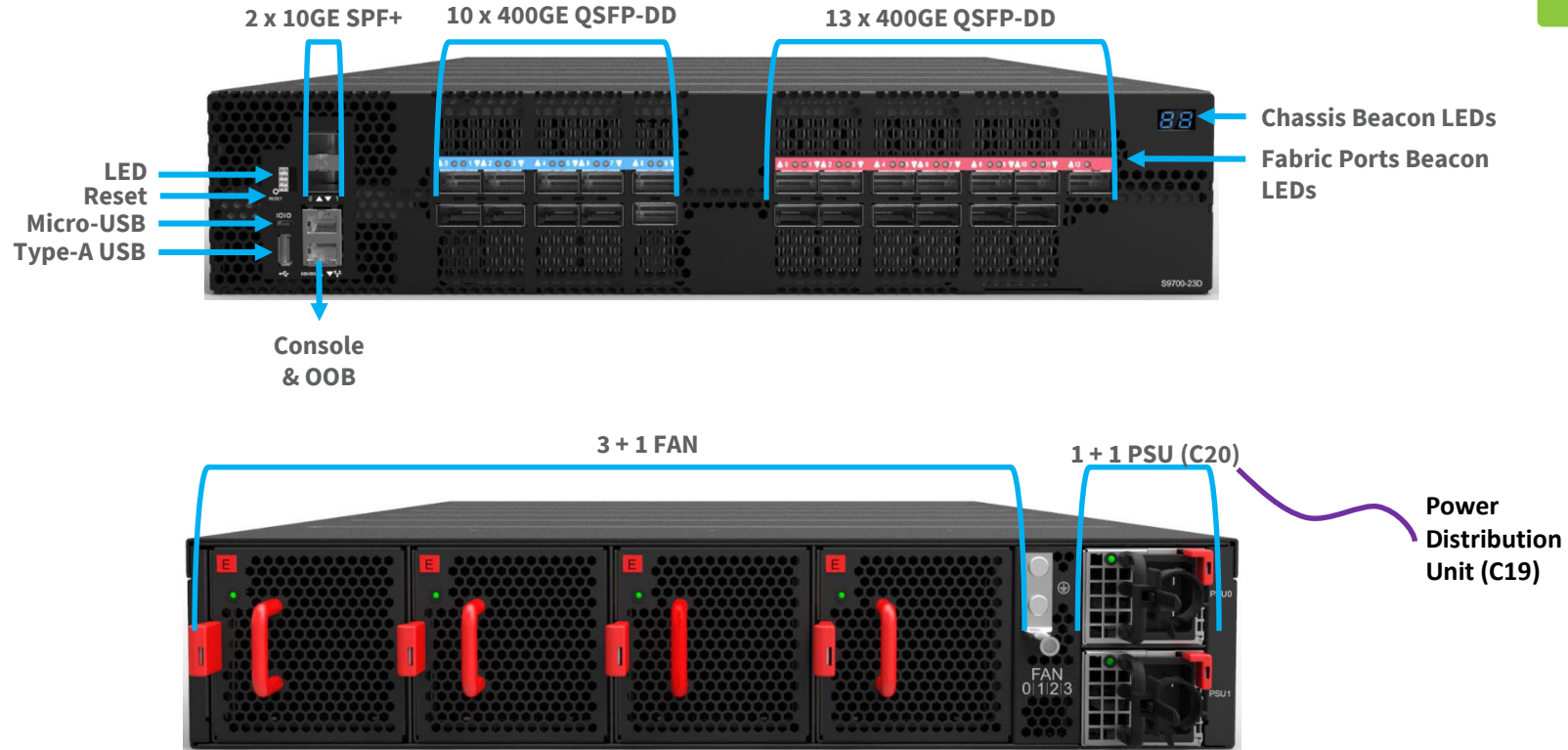
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S9700-23D DDC Routing System



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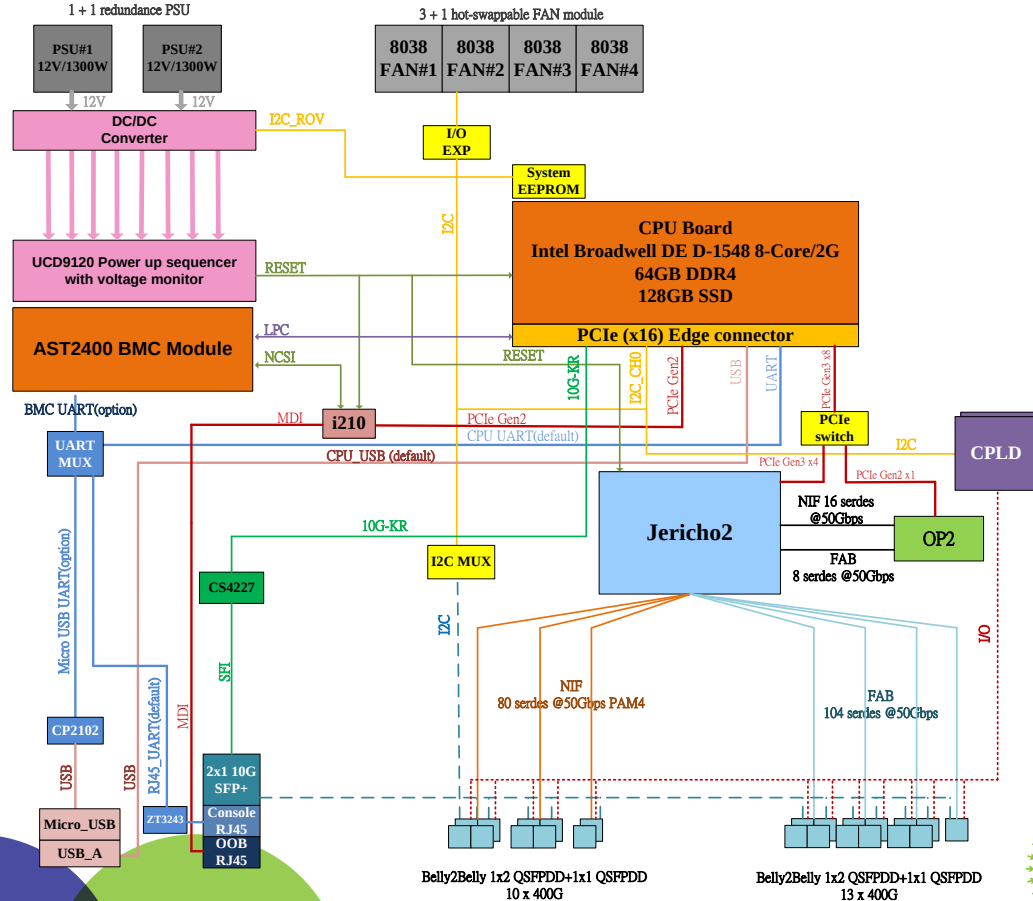
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S9700-23D System Block Diagram



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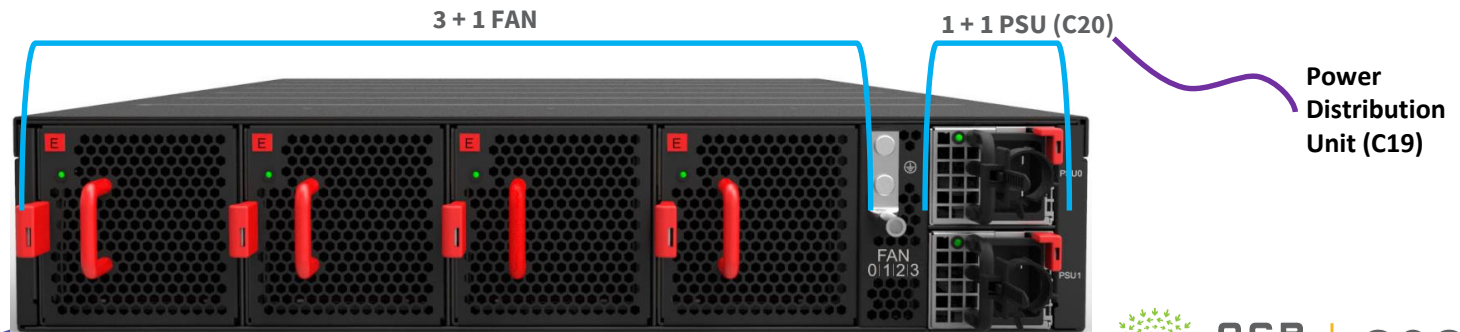
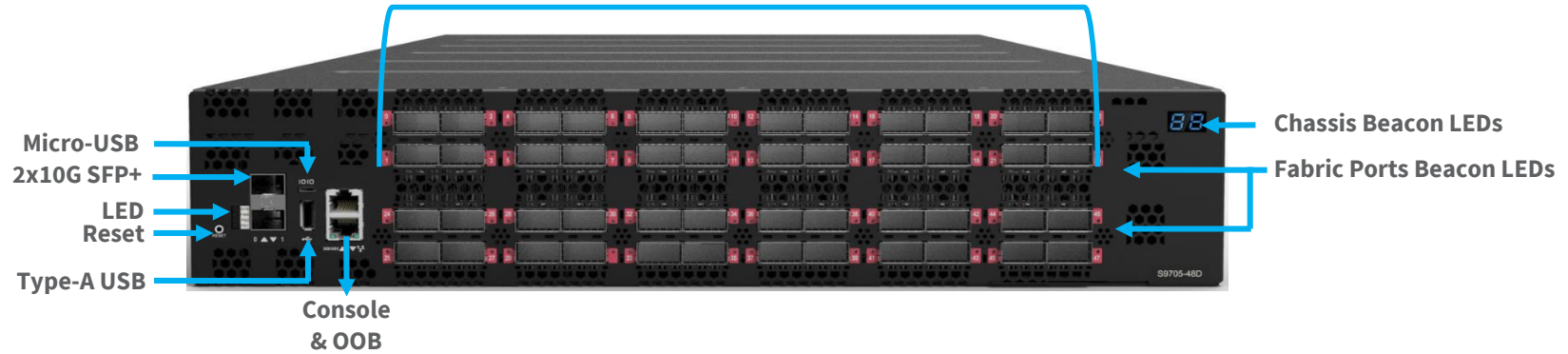
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S9705-48D DDC Routing System



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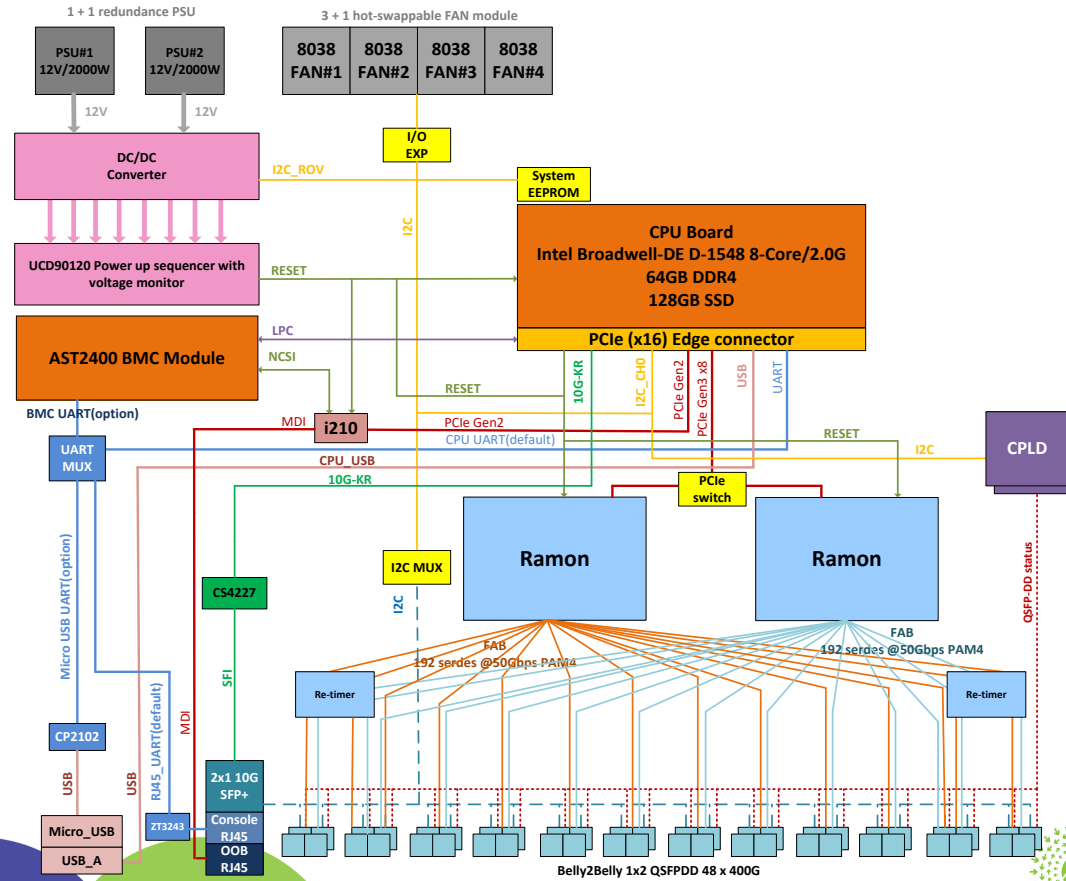
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S9705-48D System Block Diagram



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DDC OCP Tenets Compliances



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● EFFICIENCY

- ✓ The UfiSpace DDC routing system breaks apart the traditional chassis routing system by disaggregating the line and fabric cards into easy to manage, standalone disaggregated white boxes. Each component is equipped with their own hot swappable, fans and power supplies (with redundancy) for easy maintenance and servicing. No longer will forklifts be needed when installing the routing system because the DDC are compact, just 2RU in height and width and depth suitable for a standard 19" data center rack. UfiSpace's DDC is designed for a routing system that is easier to install, manage, and maintain, while meeting all the technical requirements of a carrier-grade core and edge routing system.

● SCALABILITY

- ✓ The UfiSpace DDC routing system can be easily scaled up horizontally when needed by connecting additional S9700-53DXs and S9700-23Ds to the S9705-48Ds (fabric white box routers) into small (16Tb), medium (96Tb), large clusters (192Tb), or anything in between. The connection between the S9700-53DX/S9700-23D and the S9705-48D is through standard optical cables. The scalability of the routing system will no longer be limited by the physical dimensions of a chassis or the electrical conductance of a backplane. Furthermore, the DDC system capacity can be scaled not only economically and rapidly, but also lowering the total cost of ownership.

● OPENNESS

- ✓ The complete S9700-53DX and S9700-23D hardware design packages and the specifications of S9705-48D are in the process of being contributed to the Open Compute. The DDC routing system also supports ONL and ONIE as well as being compliant to the Open Compute Project (OCP) Distributed Disaggregated Chassis (DDC) specifications.

● IMPACT

- ✓ The UfiSpace DDC routing system utilizes an open design for enabling carrier and service providers to adopt SDN/NFV applications using disaggregated white boxes within their central office/telco environments. It opens the path for building an infrastructure suitable for the high capacity demands of 5G, providing flexibility to core router needs in the industry, integral to Ethernet switching performance and intelligence to networks while minimizing the network's complexity.



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