CXL Memory Pooling Solution

H3 Platform
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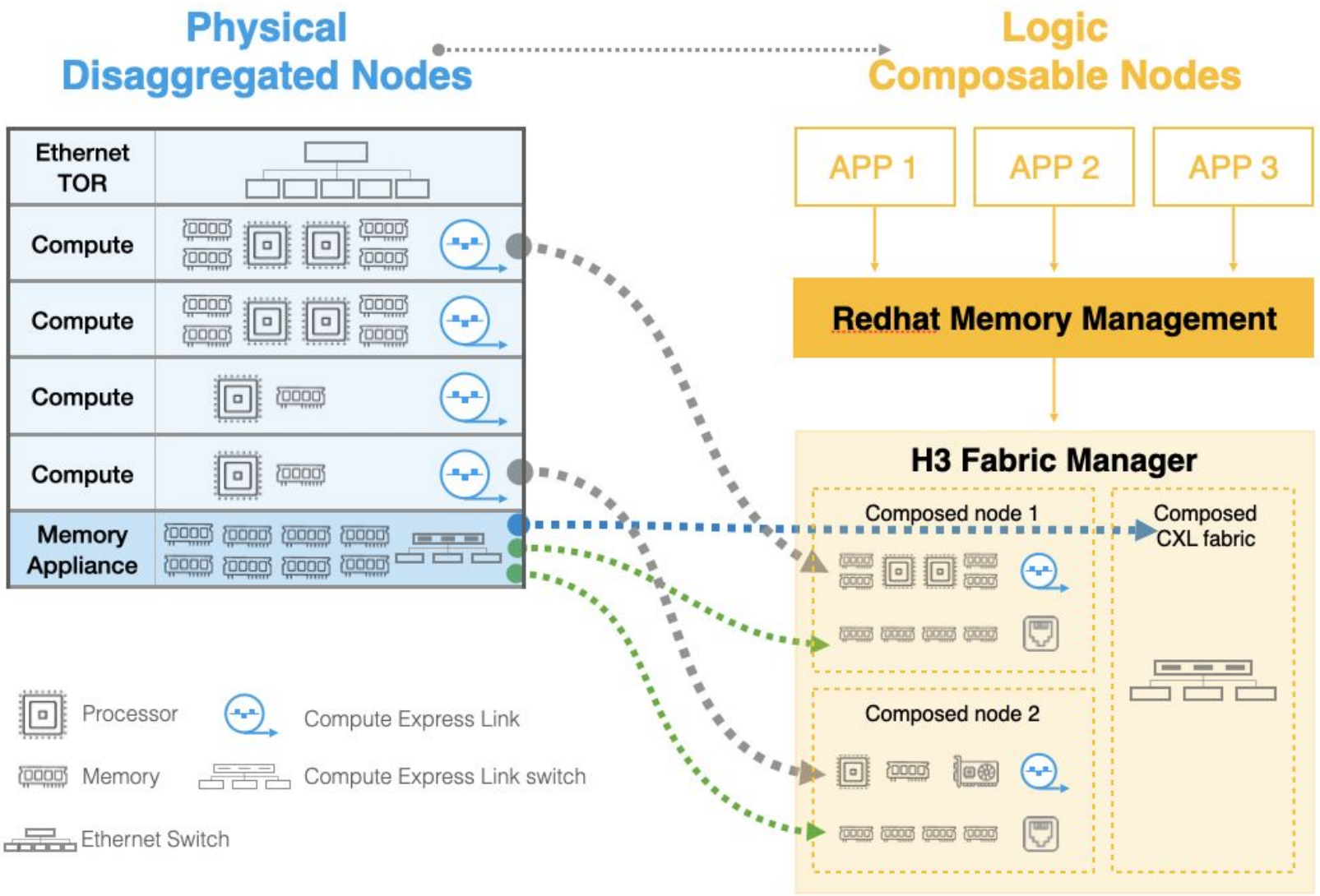
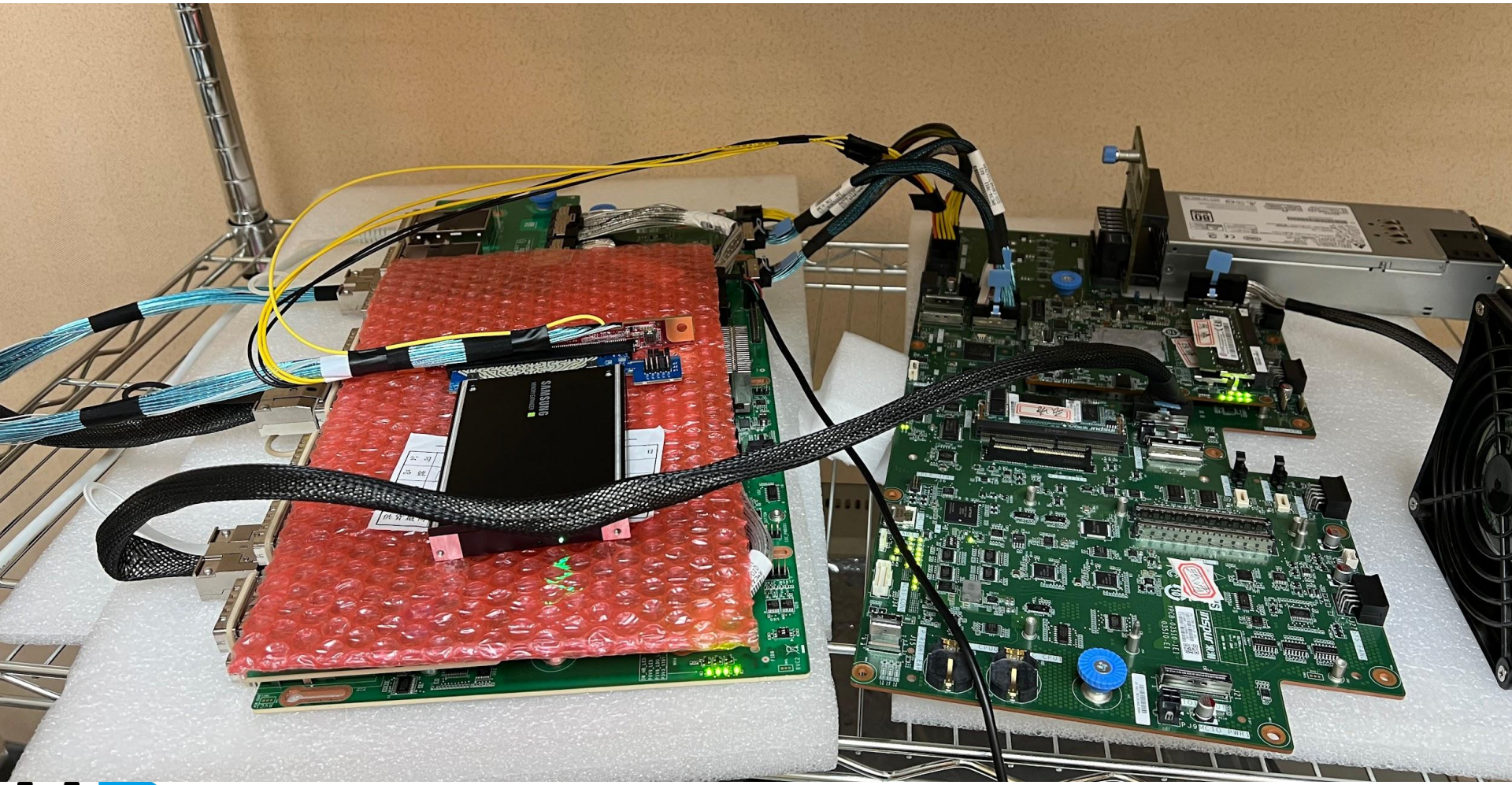
Purpose

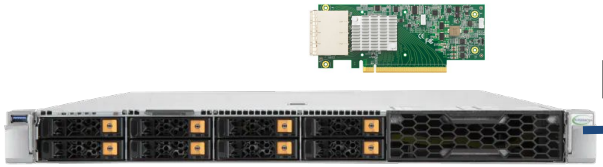
- **Integrate with OFMF**
  - Understand what to provide for the integration
  - Discuss the procedures of the integration
- **Understand the system architecture and requirements**
  - Explain H3 CXL architecture
  - Know how to integrate the OFMF

Architecture-- CXL 2.0 Memory Pooling and Sharing





Architecture-- Host, Fabric Box and GPU Chassis



PCIe Gen5 x16

PCIe Gen5 x16

Host adapter

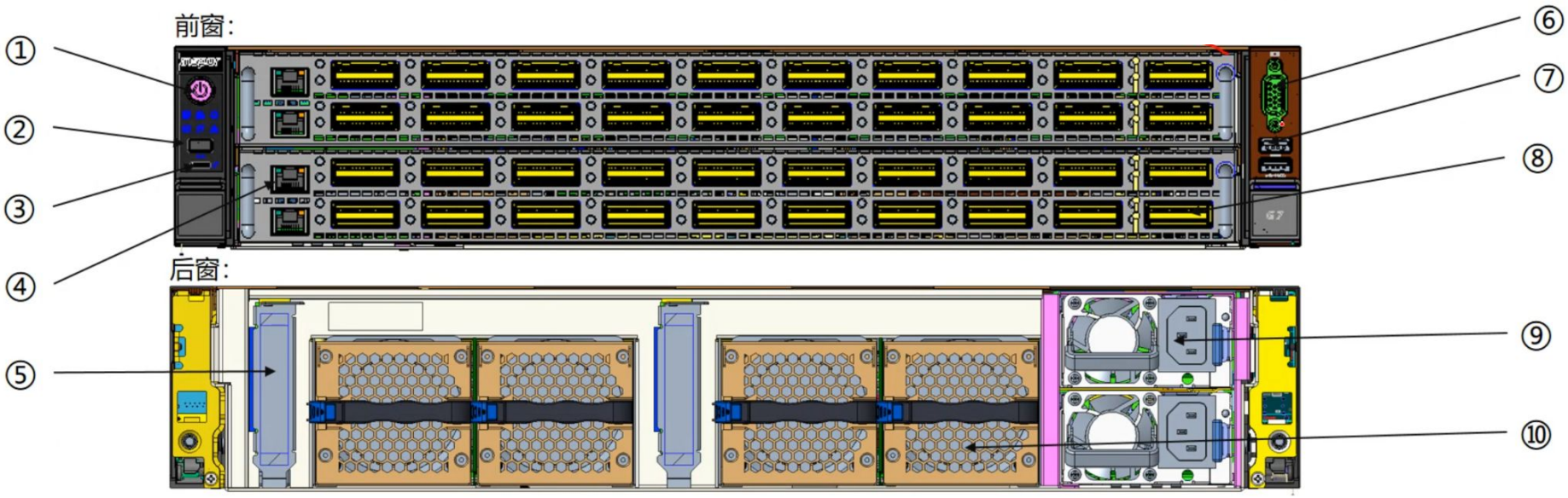
1m CDFP cable

CXL 2.0 fabric box

Memory Chassis

CXL Fabric Switch Solution

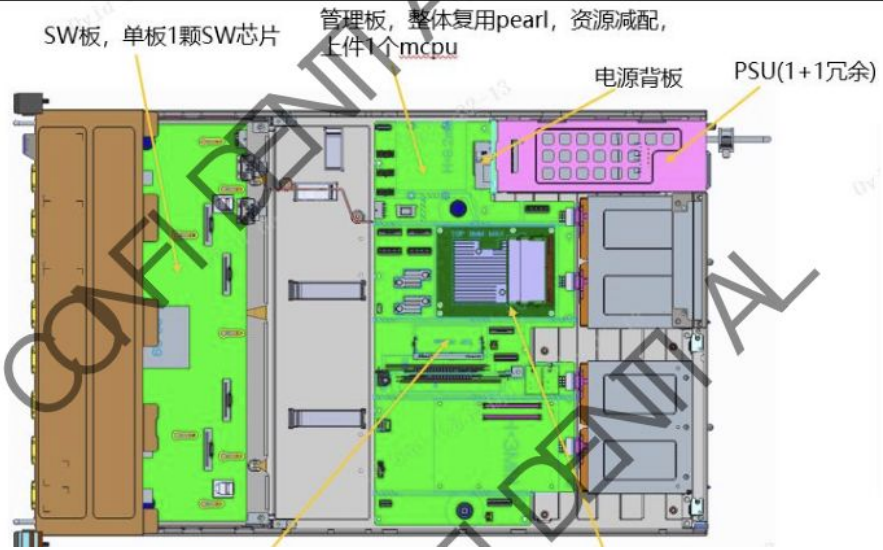
- 2U高度，19 inch，支持前/后上架；
- 整机尺寸：高度---87mm，宽度---447mm，深度---700mm；
- 每两层Switch板做一托盘，可前向抽拉。



1. 电源按键&指示灯　2. UID　3. Type-c （Debug）　4. RJ45　5. AIC卡
6. VGA　7. USB3.0&2.0　8. CDFP连接器（x16）　9. PSU　10. 6056风扇（后拔插）

CXL Fabric Switch Solution

关键规格
• 19寸2U标准机箱，深度：700mm；宽度：435mm；高度：87mm，支持L型托轨上架
• 单颗CXL Switch 256 lane, 16 X16 port，可配置上下行，整机可支持2颗CXL Switch，可配置为16路上行，16路下行
• 整机可出32个CDFP x16 port，支持CXL 2.0
• 使用COMe模块进行带内管理，RunBMC进行系统管理
• 支持2个CRPS电源，1+1冗余；
• 风扇支持N+2转子冗余，支持热插拔，支持功耗监控；
• 外部线缆：CDFP DAC线缆互联；



Hardware Specification 1 of Fabric Switch

Model Name	Falcon F5016
mCPU	Intel ATOM C3000 3758R
CXL Switch	X-conn Apollo Switch (A1 version)
No. of Host	• Flexible host ports from **1 to 7** CDFP connectors for host
No. of Devices	• Flexible device ports from **8 to 14** CXL device slots

Hardware Specification 2 of Fabric Switch

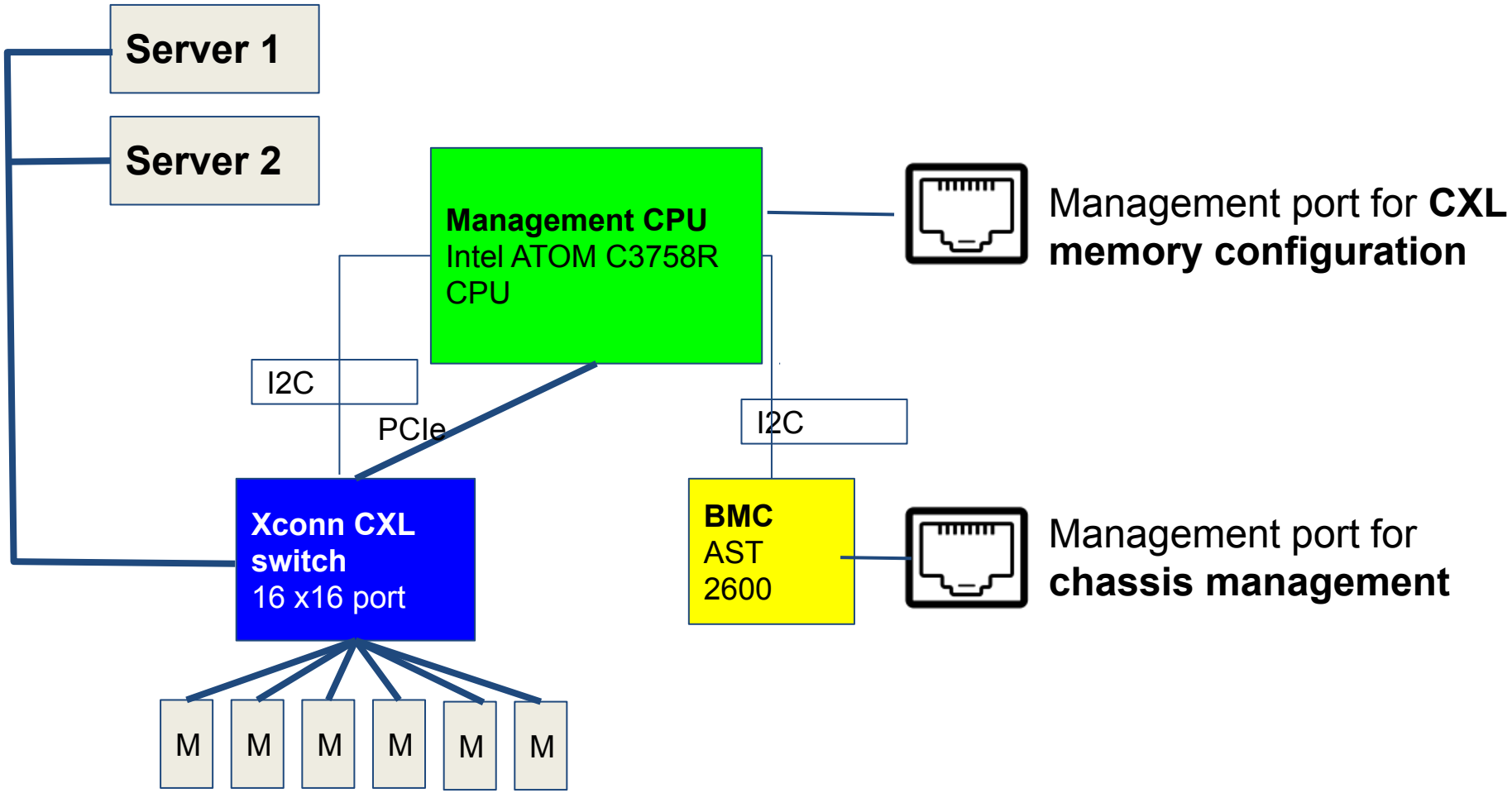
Ethernet Ports	• RJ45 of mCPU for memory management • RJ45 of BMC for chassis management
Connection Cables	• 1m CDFP copper cable

CXL Memory Chassis

DIMM内存资源池 关键规格
• 19寸2U标准机箱，深度：700mm；宽度：435mm；高度：87mm，支持L型托轨上架
• 支持64个DDR5 RDIMM（4800MT/s）扩展，256GB/DIMM，单port支持1TB内存扩展，单机最大扩展内存容量16 TB；
• 整机可出16个CDFP x16 port，支持CXL 1.1 32GT/速率，支持Pin to Pin升级支持CXL 2.0
• 支持2个CRPS电源，1+1冗余；
• 风扇支持N+1转子冗余，支持热插拔，支持功耗监控；
• 外部线缆：CDFP DAC线缆互联；

E3.S CXL内存资源池 关键规格
• 19寸2U标准机箱，深度：850mm；宽度：435mm；高度：87mm，支持L型托轨上架
• 支持24个E3.S CXL内存模组扩展，单模组容量最高512GB，单port支持1TB内存扩展，单机最大扩展内存容量12TB；
• 支持12*CDFP，支持CXL/PCIe Gen5，单port带宽x16
• 支持2个CRPS电源，1+1冗余；
• 风扇支持N+1转子冗余，支持热插拔，支持功耗监控；
• 外部线缆：CDFP DAC线缆互联；

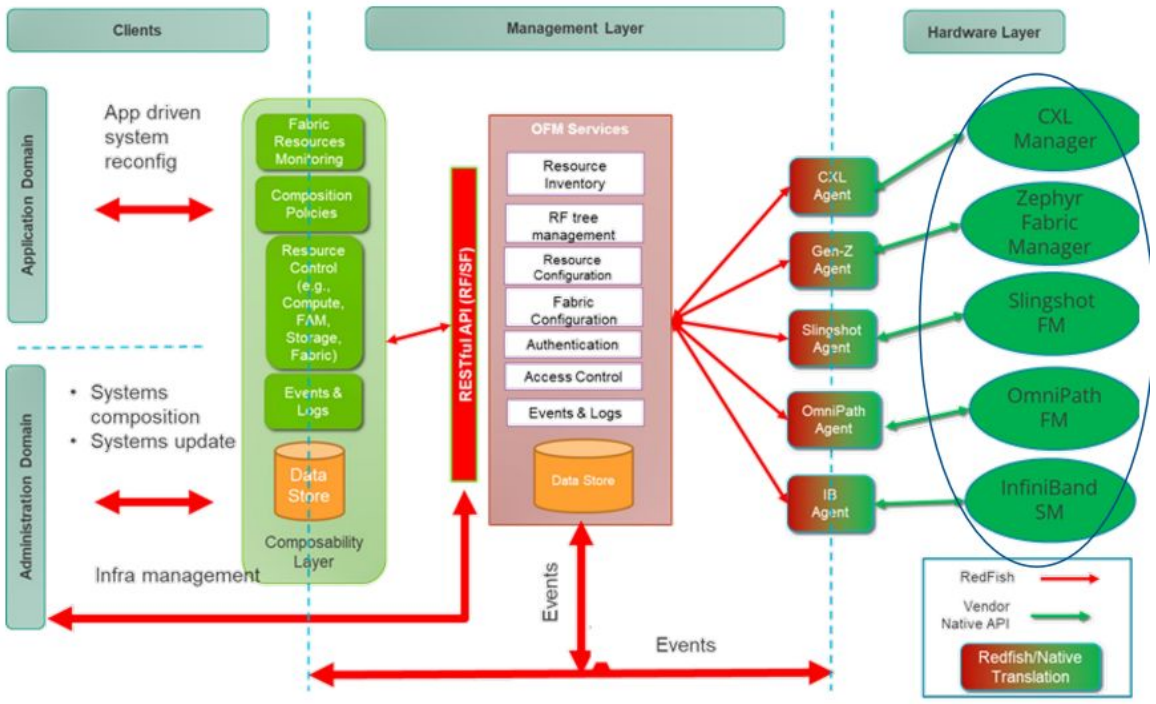
Block Diagram-- Key Components



H3 Hardware Fabric Manager (Native Transaction)

Hardware Fabric Managers

- Entities with:
  - physical access to the control space of fabric resources
  - the authority to modify those settings
- Responsible for:
  - Performing a fabric crawl
  - Taking inventory of fabric resources
  - Configuration of such resources



H3 Platform API

3 List of Available APIs

Method	URI	Note	Avl
GET	*/h3api/v1/CXLDevices*		✓
GET	*/h3api/v1/CXLDevices/<Device_ID>*		✓
GET	*/h3api/v1/CXLDevices/<Device_ID>/MDs*		✓
PATCH	*/h3api/v1/CXLDevices/<Device_ID>/MDs/<MD_id>*	*Attach MD to specific port (pooling)*	✓
GET	*/h3api/v1/Ports*		✓
GET	*/h3api/v1/Ports/<Port_Id>*		✓
POST	*/h3api/v1/Ports*		✓
PATCH	*/h3api/v1/Ports/<Port_Id>*	*Port configuration*	✓

H3 Platform API

GET	/h3api/v1/Firmwares		✓
POST	/h3api/v1/FirmwareUpdate/SystemFirmware	Update firmware	✓
POST	/h3api/v1/FirmwareUpdate/SwitchFirmware/<switch_Id>	Update switch firmware	
GET	/h3api/v1/FirmwareUpdate/SwitchFirmware/UpdateProgress		
GET	/h3api/v1/User		✓
POST	/h3api/v1/User	create account	✓
GET	/h3api/v1/User/<User_Id>		✓
PATCH	/h3api/v1/User/<User_Id>		✓
DELETE	/h3api/v1/User/<User_Id>		✓
POST	/h3api/v1/Login	Login	✓
POST	/h3api/v1/Logout	Logout	✓

Current Development Status

- Working on the redfish API
  - Will have the redfish API soon and need to discuss the expectation of the redfish API
- Questions
  - Who will provide the OFMF server
  - What is the fabric configuration
  - How to integrate the the OFMF with existing CXL memory pooling solution

OFMF Service

OFMF Services

- Resource Inventory
- Resource Configuration
- Fabric Configuration
- Access Control
- Performance Monitoring
- Events and Logs