

IBM z15 Model T01 Hardware Overview



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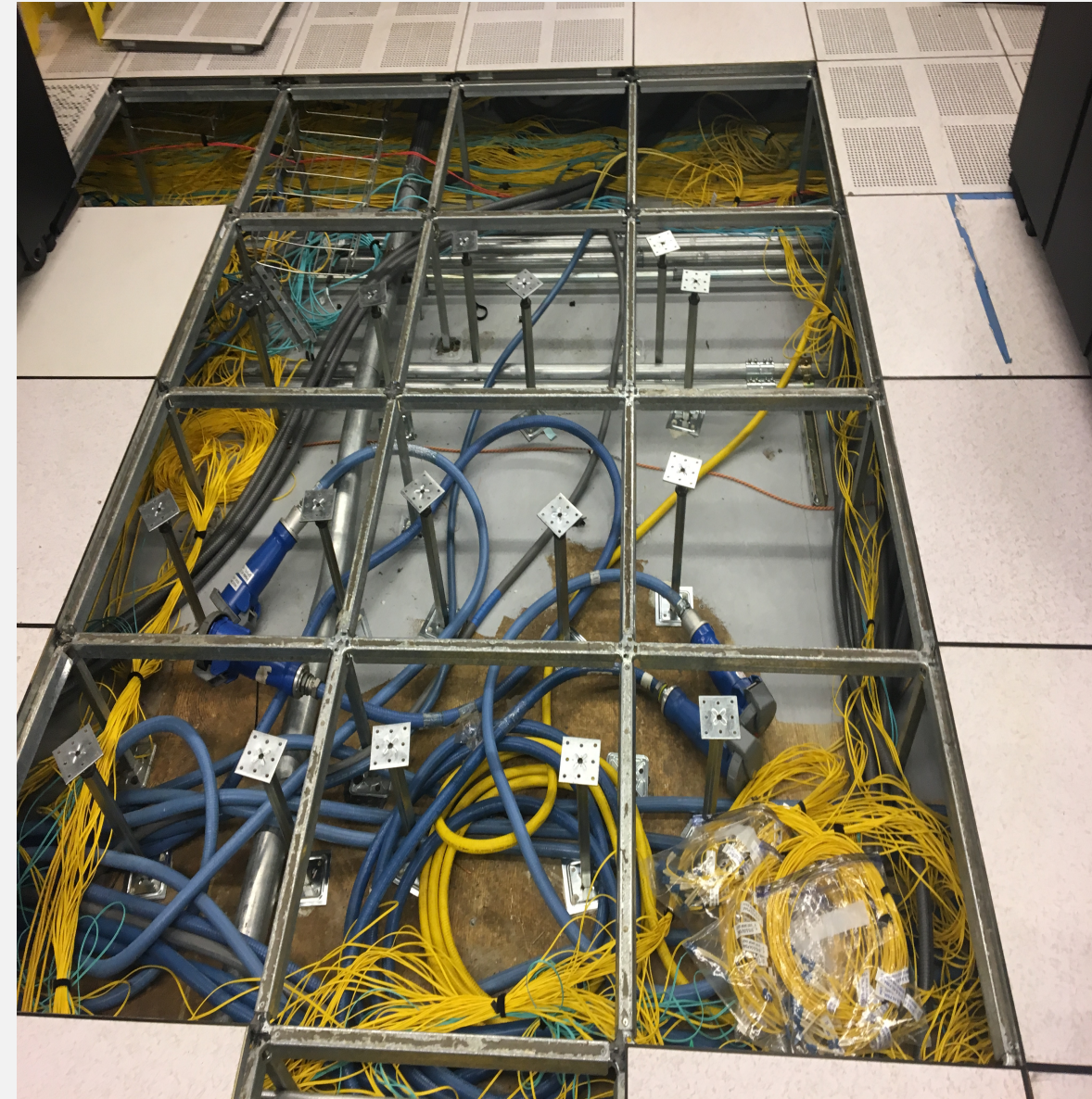
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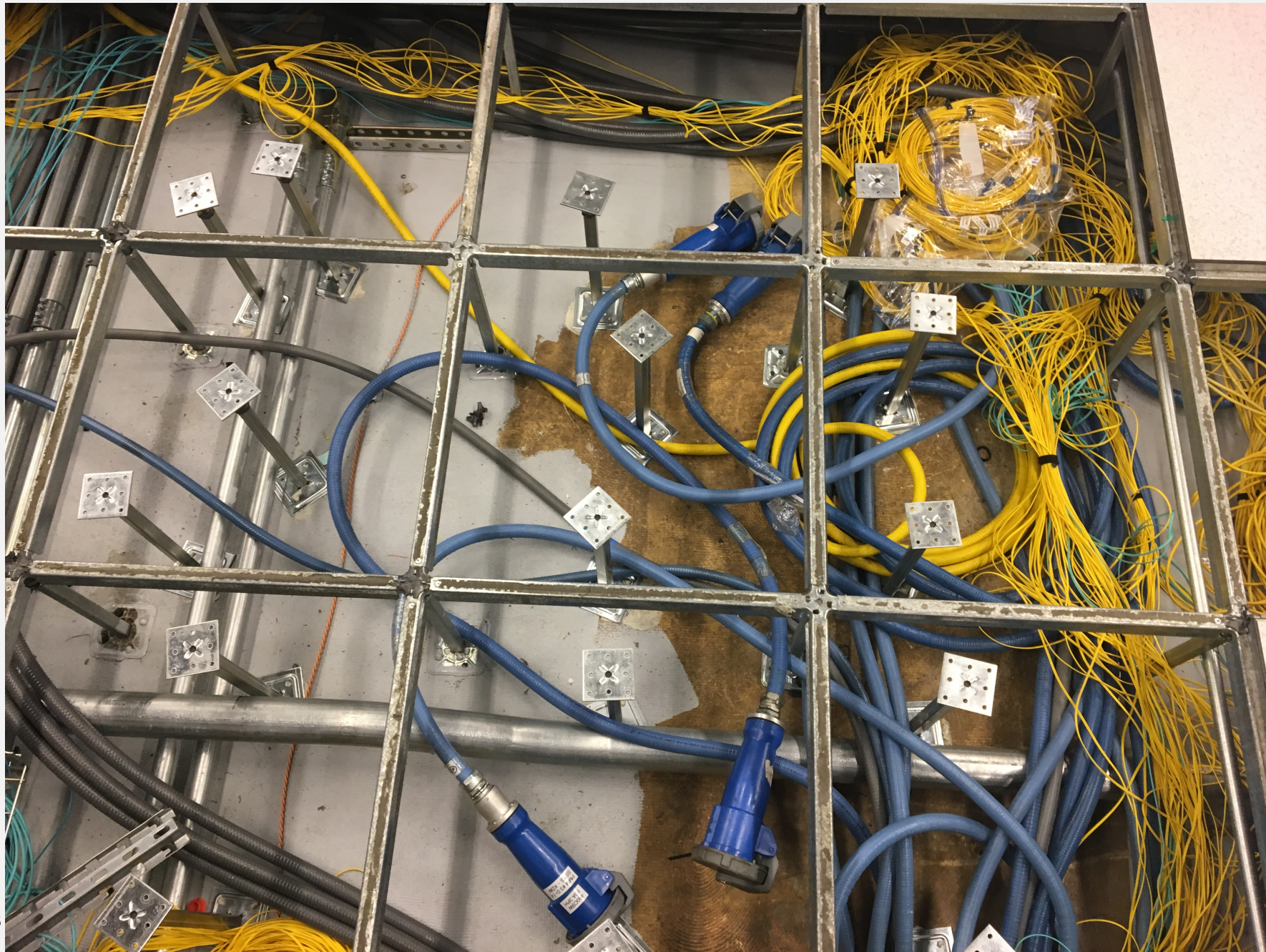
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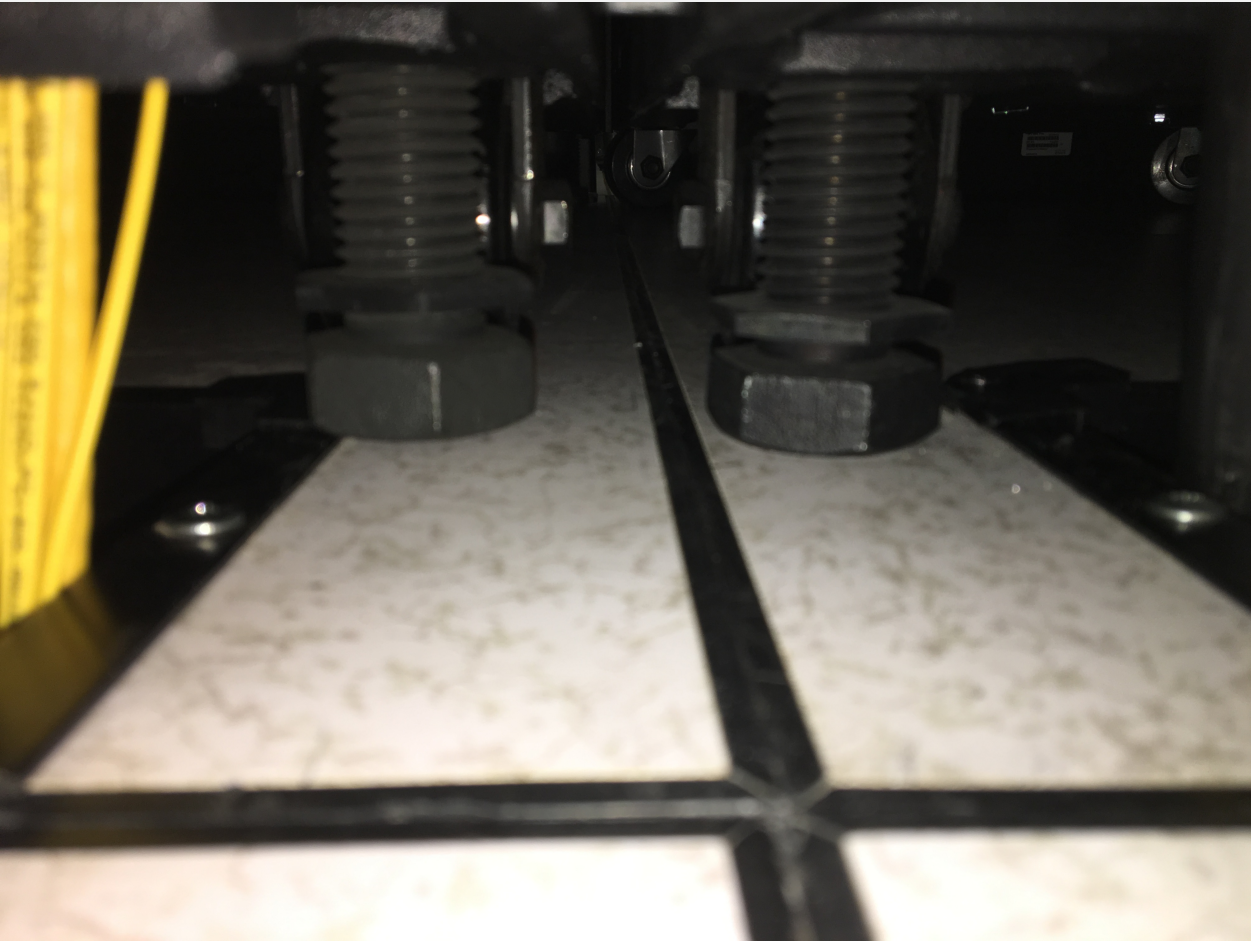
z15 WSC Installation

Background

- We were replacing a zEC12 with the new z15 T01
 - We order a T01 Max190 with one I/O expansion frame
 - Selected BPA Power
 - Left only 4 open I/O adapter slots
 - Added the HMA and external HMCs
- Pros
 - They had the same power requirements
 - This would not have been the case if we used a PDU
 - Took up the same width so it fit nicely into the slot
- Cons
 - We had to add additional floor stanchions
 - Had to move I/O cables
 - Had to get new floor cutouts







z15 Power and cooling

System Level Power and Choice

NEW -> Must choose one option: iPDU or Bulk system power (both are fully integrated into system)

NEW -> Higher AC voltage groups Must have neutral (5 wire). (no change for 200-240 VAC)



Intelligent PDU (iPDU) based system power:

- **Highest density:** Has potential of one less frame configurations
- **Higher electrical efficiency:**
 - On average saves ~1 kW for typical system, 2kW for large system
- **Larger maximum Config I/O slot count**
- Total number of line cords per system is **two minimum to eight maximum**



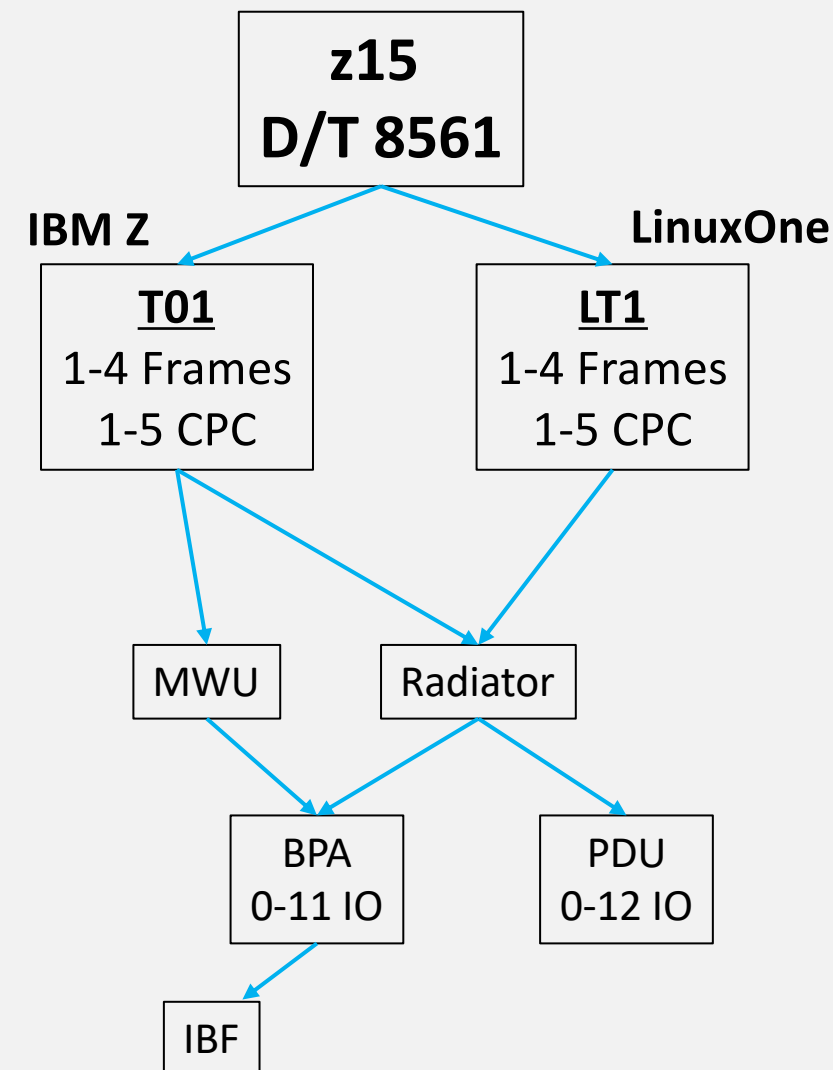
Bulk Power (BPA) based system power:

- **IBF (internal UPS) option**
- **Balanced 3 phase option**
- Client water cooling feature requires bulk power (and raised floor)
- Total number of line cords per system is **two minimum to four maximum line cords**

Note: No DC power on z15

Power options

Feature Description	BPA	iPDU
Number of line cords	2,4	2,4,6,8
3-Phase Line cords	Yes	Yes
200-240VAC (4wire, 60A Delta)	Yes	Yes
380-415VAC (5 wire Wye*, 30/32A Delta)	Yes	Yes
480VAC (5 wire Wye*)	Yes	No
PCIe+ I/O drawer max	11	12
Customer Water Cooling **	Yes	No
Radiator Cooling	Yes	Yes
Internal Battery Feature	Yes	No
Phase loss immunity	Yes	No
Balanced Power	Yes	No



No DC Power available

* Wye cords require 5 wires, 3 for power, 1 for neutral, 1 for ground

** Raised floor required. Not available on LinuxONE.

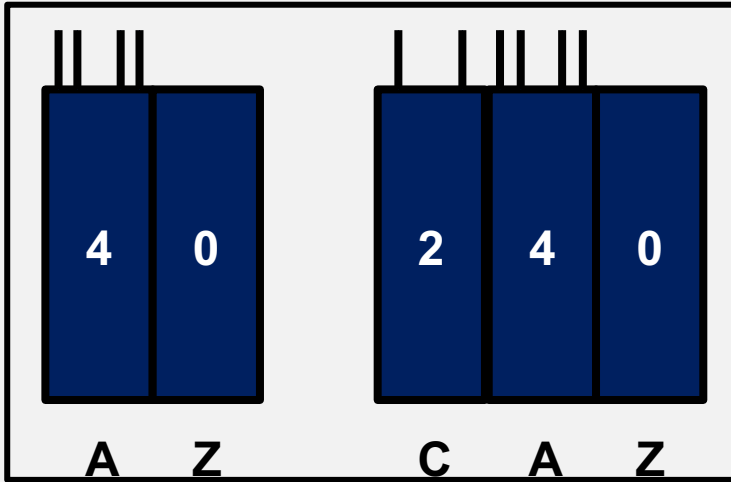
Summary of line cords Rear View

iPDU Based Power

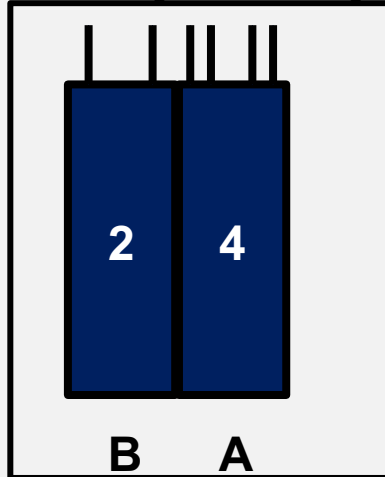


Frame **A**

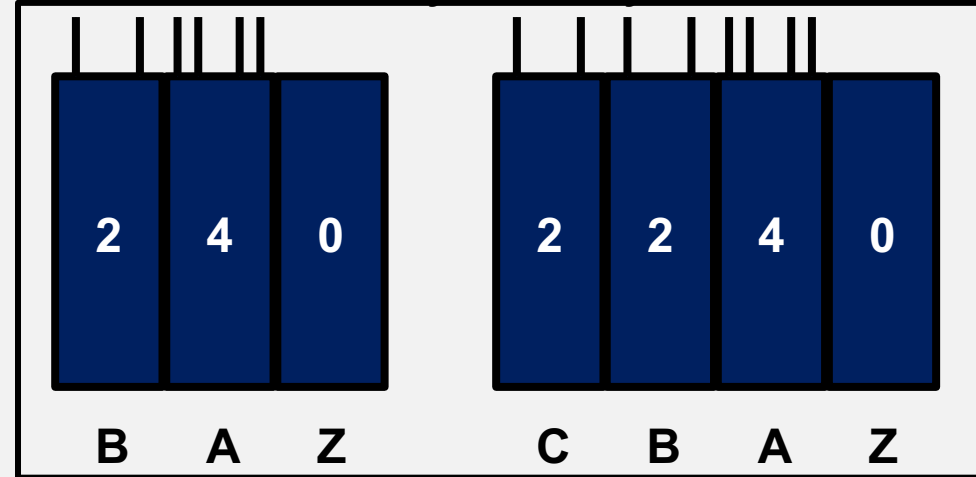
I/O Expansion



CP Expansion
Factory Build Only



CP and I/O Expansion
Factory Build Only



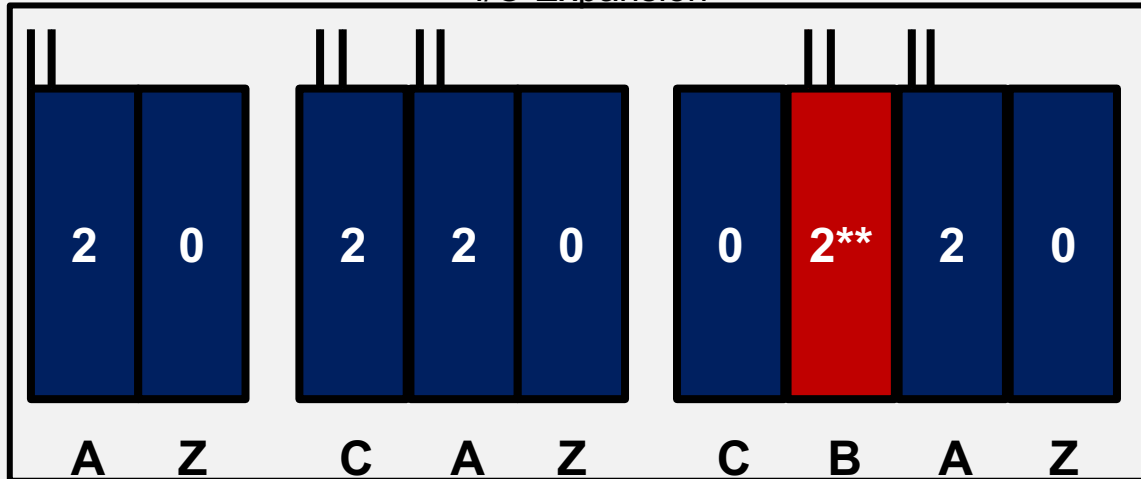
*4 line cords required in the A frame if more than 1 CPC drawer or 3 I/O drawers are present

BPA Based Power

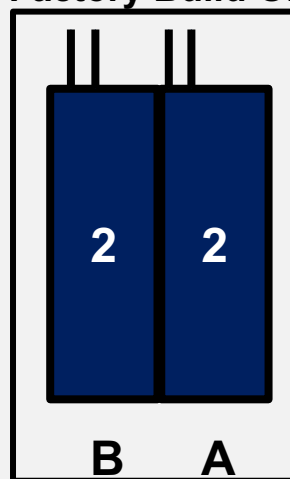


Frame **A**

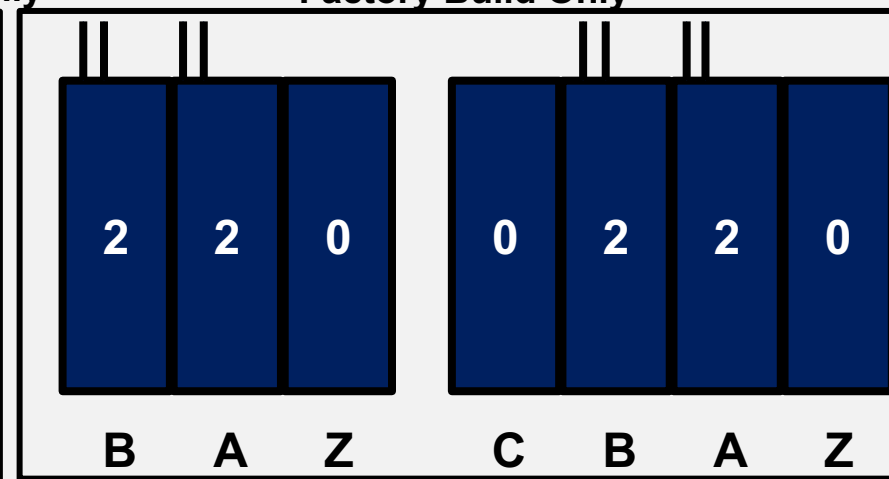
I/O Expansion



CP Expansion
Factory Build Only



CP and I/O Expansion
Factory Build Only

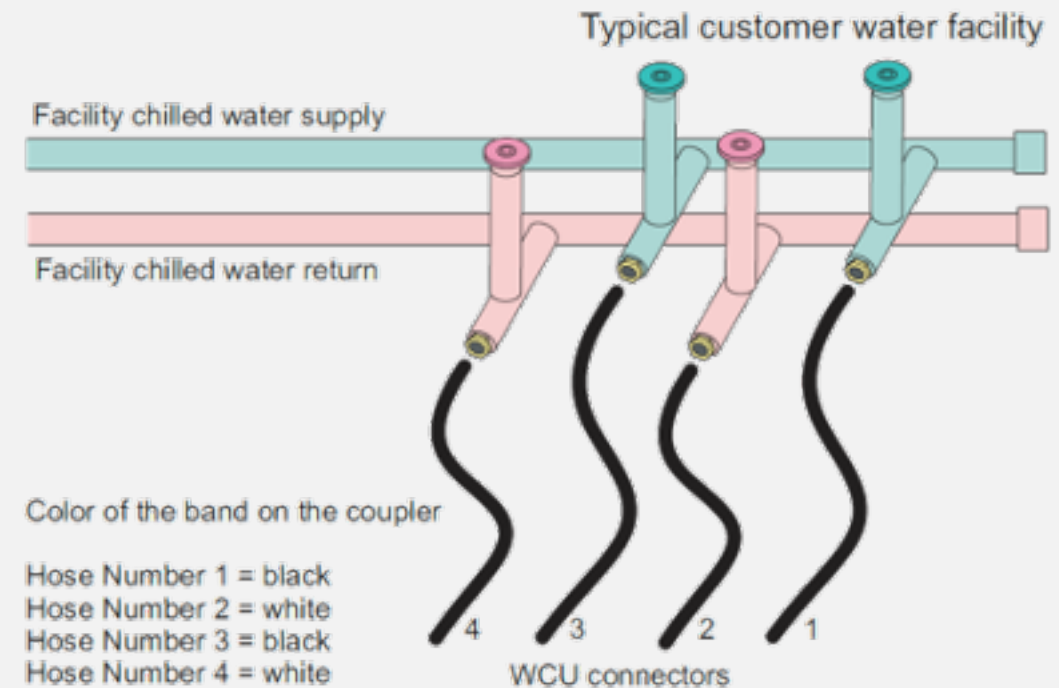


**Special BPA B-Frame plan ahead. B-Frame contains no CPC drawers or cooling

Water Cooling

Water-cooled machines

- Up to four fully redundant water control units (WCUs)
 - One to three CPC drawers require two feeds and two returns
 - Over three CPC drawers require an additional two feeds and two returns
- Water Supply must meet general conditions



*See IMPP for more information

z15 Physical Configuration

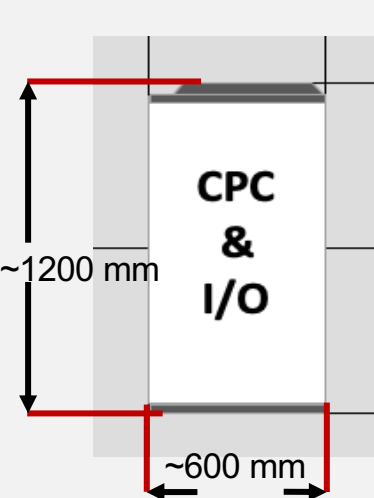
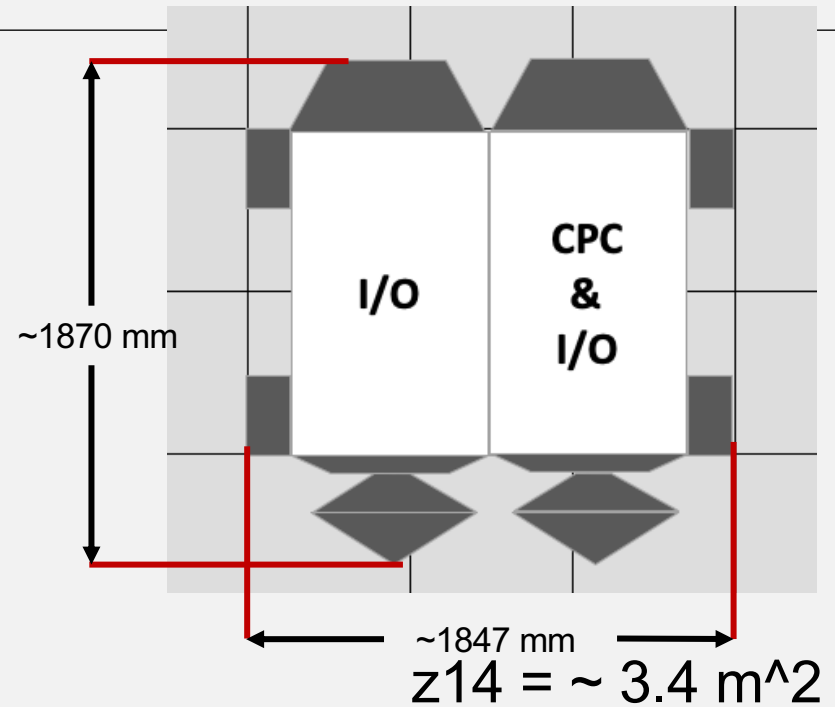
Space savings/New Layout

■ The Positives

- Most clients will see reduced floor space
- Frames fits on standard floor tile
- Height reduction available

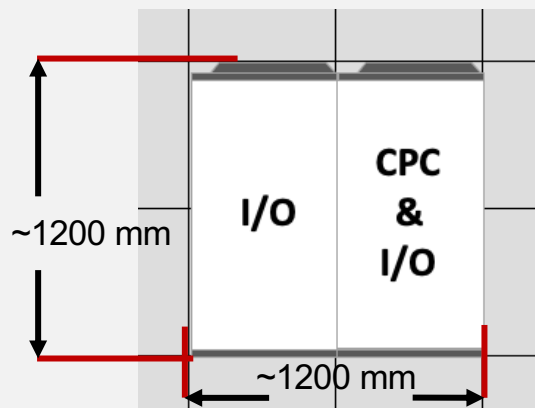
■ The Considerations

- May not fit into existing IBM Z space
- Clients may need to move floor stanchions
- New tile cut-outs may be needed



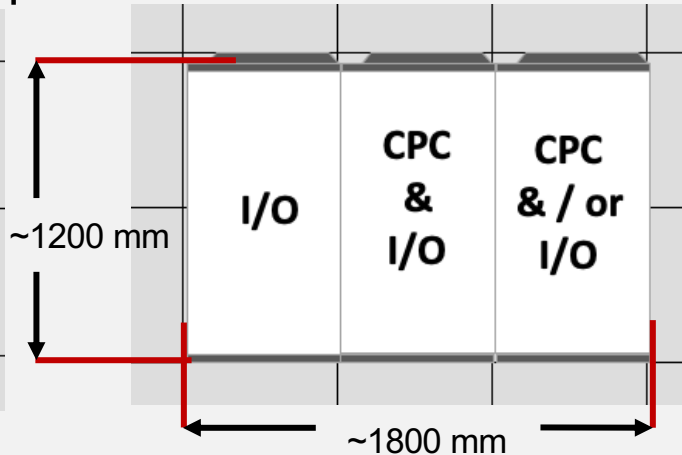
~ 1.44 m²

~50% Reduction in floor space



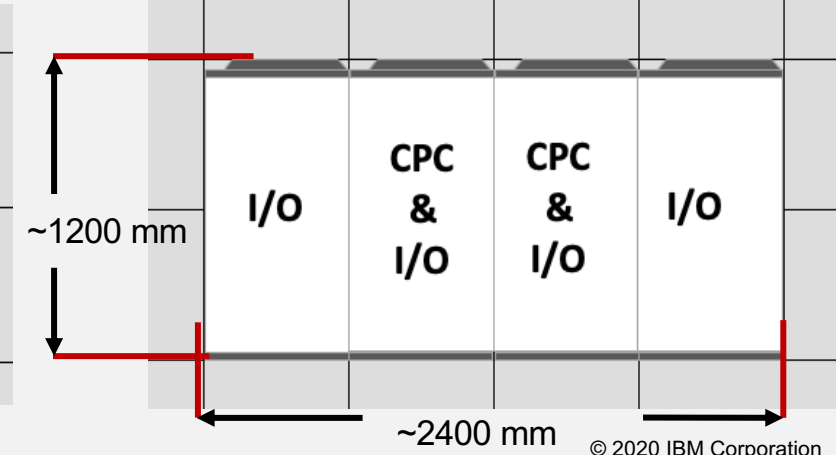
~ 2.2 m²

~25% Reduction in floor space



~ 2.9 m²

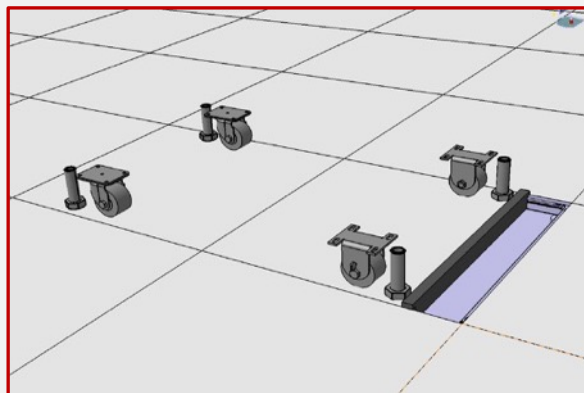
About equivalent to the z14



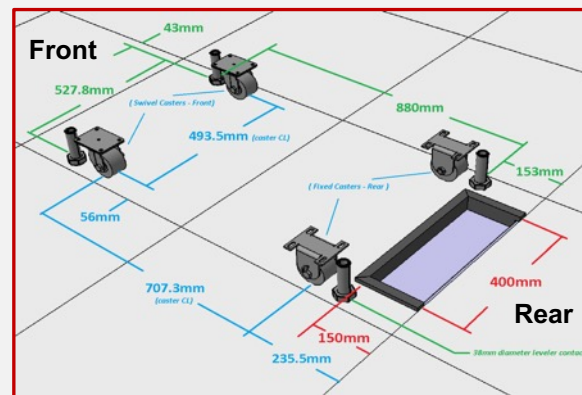
Guide For Raised Floor Preparation

Things to consider:

- Number of frames are configuration dependent and can change based of future MESs
 - Plan your z15 floor placement for future growth
- Rear exit I/O and power only, both for bottom and top exit cabling
- New floor cutouts may be necessary depending on placement
- Raised floor stanchions locations may need to be reevaluated
- As with previous system the z15 should be placed with adequate service clearance areas on both the front and back of the system.

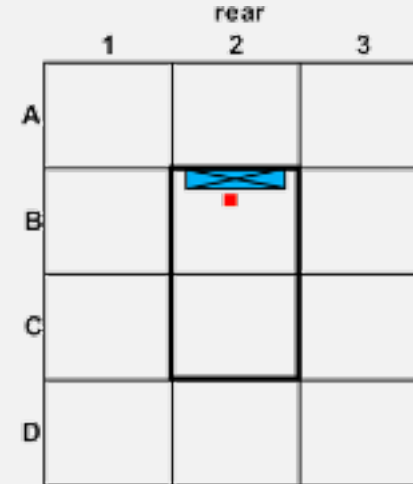


Max Floor Tile Cut-out

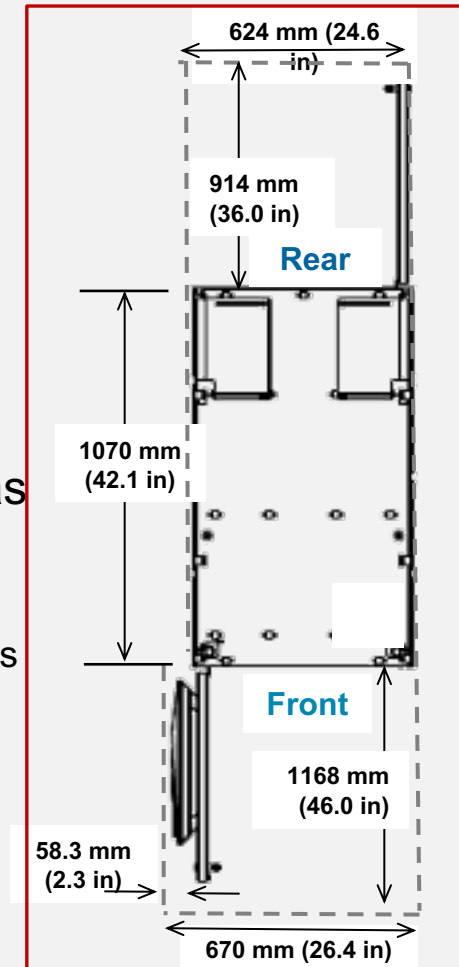


Typical Floor Tile Cut-out

Recommended Stanchion Locations



■ = added pedestal



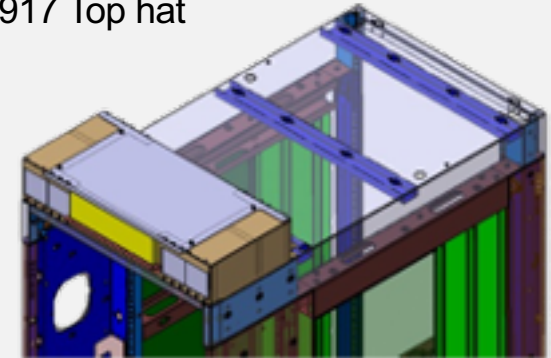
Service Clearance Area

Consult the z15 IMPP for additional information IMPP GC28-7002

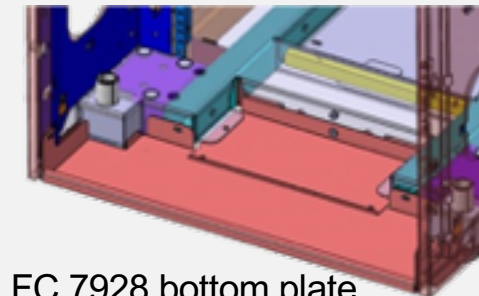
Cabling Design and Management

- **Top exit and bottom exit options (applicable to both power and I/O cabling)**
 - Three feature codes available for both power and I/O cable management
 - **FC 7919 Bottom Exit Cabling**
 - Necessary hardware to allow cable egress out the bottom *or* top of the frame
 - If only routing out the top hardware is included to cover bottom tailgate
 - **FC 7917 Top Exit Cabling**
 - Should only be ordered if using fiber trunking services and you want to exit out the top
 - Includes an additional top hat hardware to use the trunking cables
 - **FC 7928 Top Exit Cabling without Top Hat**
 - Should be order for non-raised floor or if client only wants top exit cabling
 - Comes with a cover to seal the bottom of the frame that limits access as well as a top plate on the top that will slide open for cables to egress.

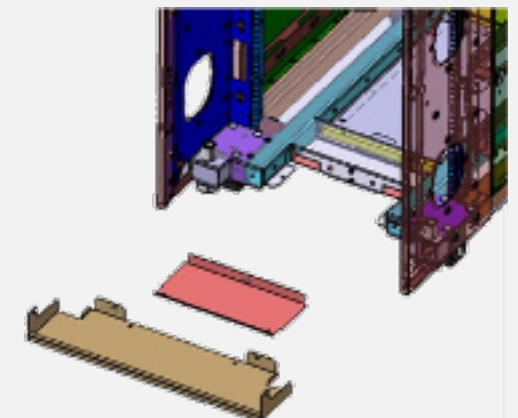
FC 7917 Top hat



FC 7928 top plate



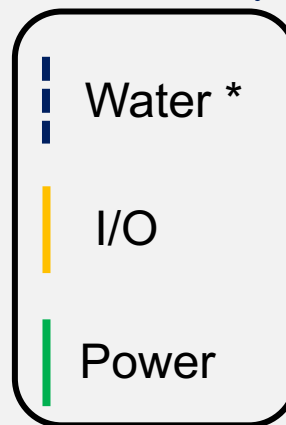
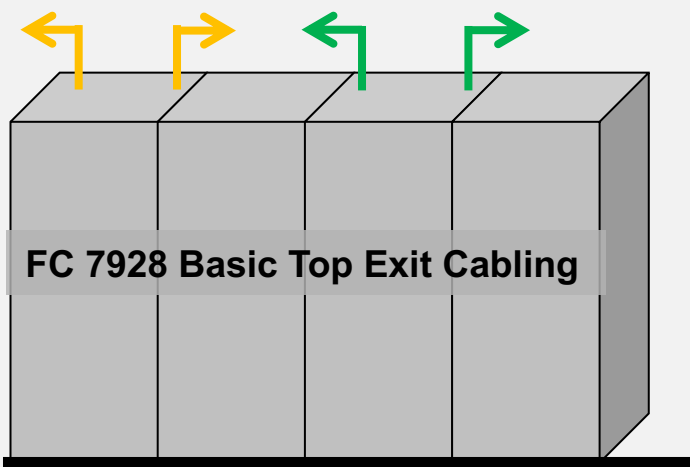
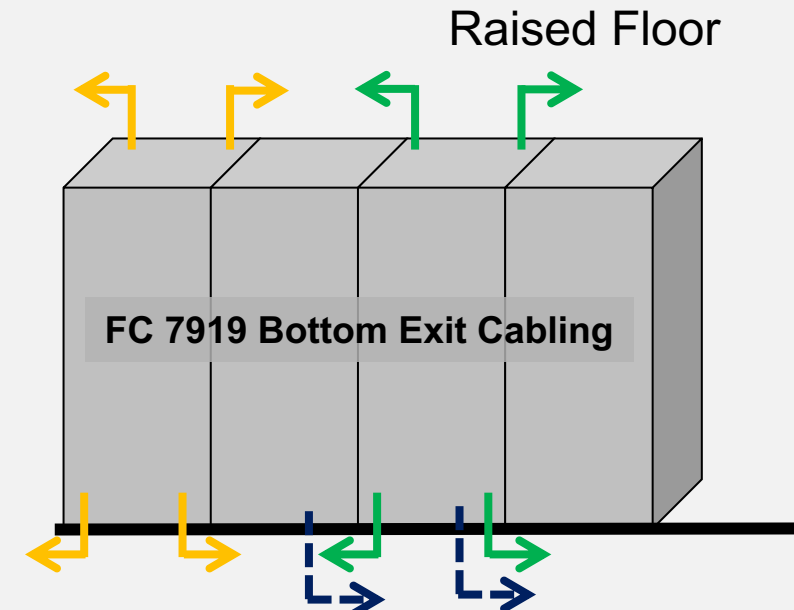
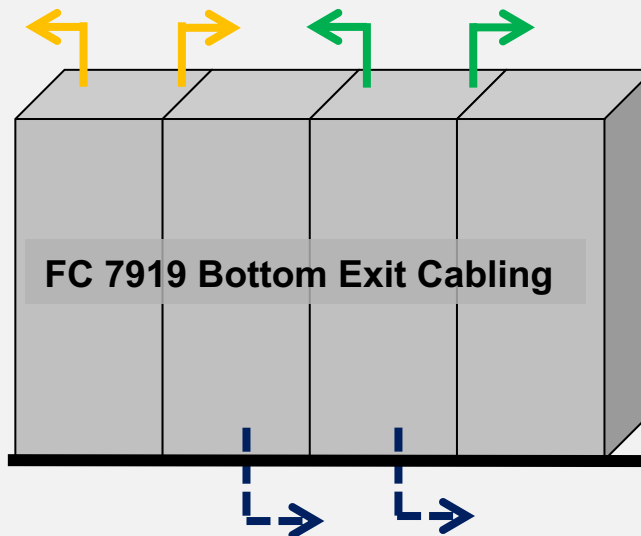
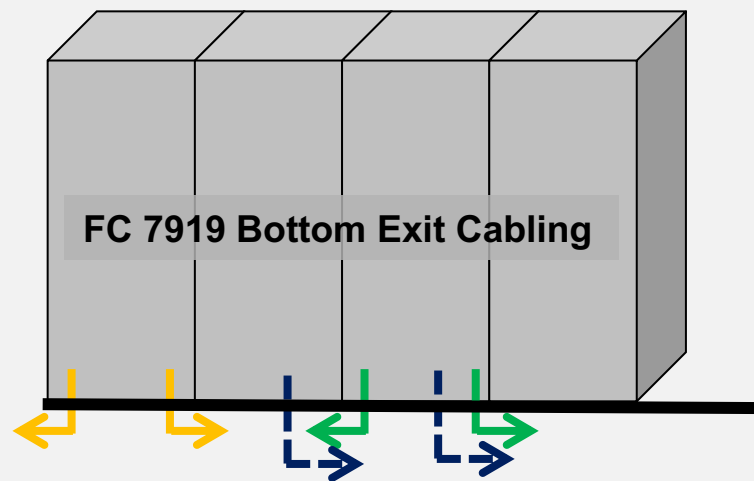
FC 7928 bottom plate



FC 7928 bottom plate

Cabling Exit Summary for Raised Floor

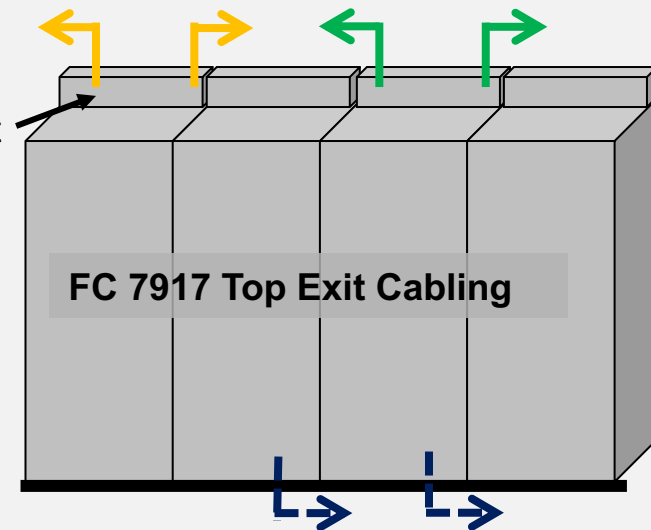
All cabling exits from the rear of the system



Number of frames and cable locations configuration dependent

Adds top hat

Only required for Fiber Transport Services/ Fiber Quick Connect

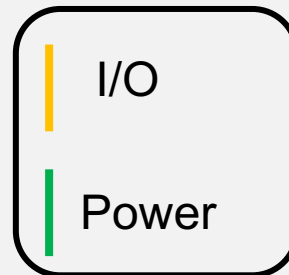
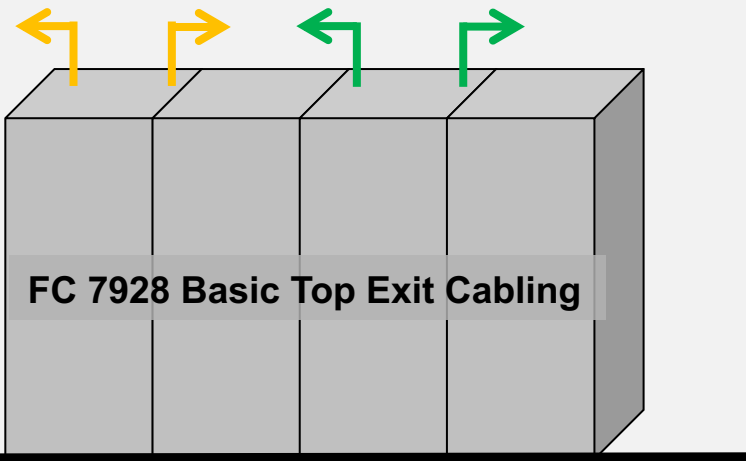
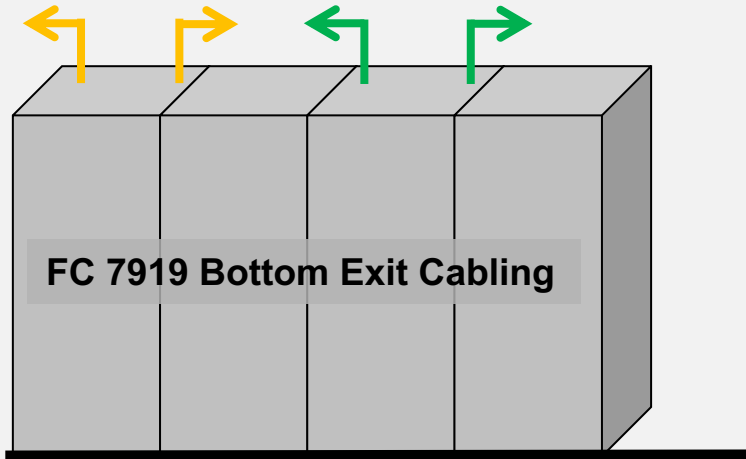


* Water cooling equipment always exit's through the bottom

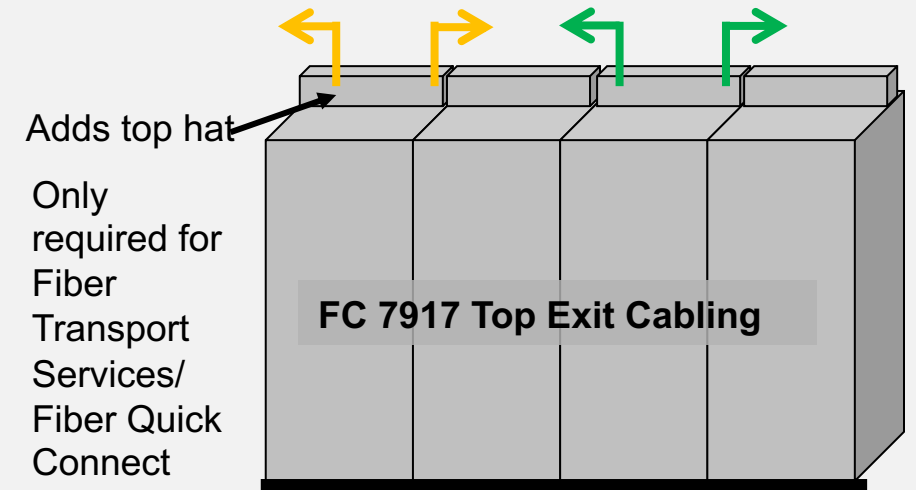
Cabling Exit Summary for Non Raised Floor

All cabling exits from the rear of the system

Non-Raised Floor



Number of frames and cable locations configuration dependent



Water cooling only available for raise floor

Package Shipping Specifications

▪ z15 shipment:

- Systems are shipped protected with an anti-static poly bag with desiccant inside. This is placed in a wooden container and mounted on pallets requiring commercial lift transportation. This packaging is used for all world-wide shipments.

▪ Packaged Shipping Specifications:

	Width mm (in)	Depth mm (in)	Height mm (in)	Max. Weight kg (lb)
Crated Frame w/o covers	940 mm (37.0 in)	1334 mm (52.5 in)	2286 mm (90.0 in)	958 kg (2110 lb)
Cover Set with Packaging	457 mm (18.0 in)	2134 mm (84.0 in)	1016 mm (40.0 in)	49.9 kg (110 lb)

▪ Height Reduction (FC 9975):

- If during transit to or entry to the final installation location contains openings less than 2032 mm (80.0 in) high, FC 9975 should be ordered.
- This feature reduces the frame height to 1898 mm (74.7 in), with the frame's top hat and side covers shipped in a separate carton.
- Note: FC 9976 shall be ordered for "ship to return" packaging

**Excludes front and rear doors (called covers here), but does include side covers*

z15 HMC

IBM z15 Hardware Management Console

You can order up to 10 HMCs total for a system

Available HMCs for z15

Feature Code	Description	CF/NB
0062	HMC Tower	NB
0063	HMC Rack Mount	NB
0082	HMC Tower	CF
0083	HMC Rack Mount	CF
0095	HMC Tower	CF
0096	HMC Rack Mount	CF
0100	HMA	NB



Available peripherals

- HMC Table top KMM FC 0148
- HMC Rack Mount KMM FC 0154

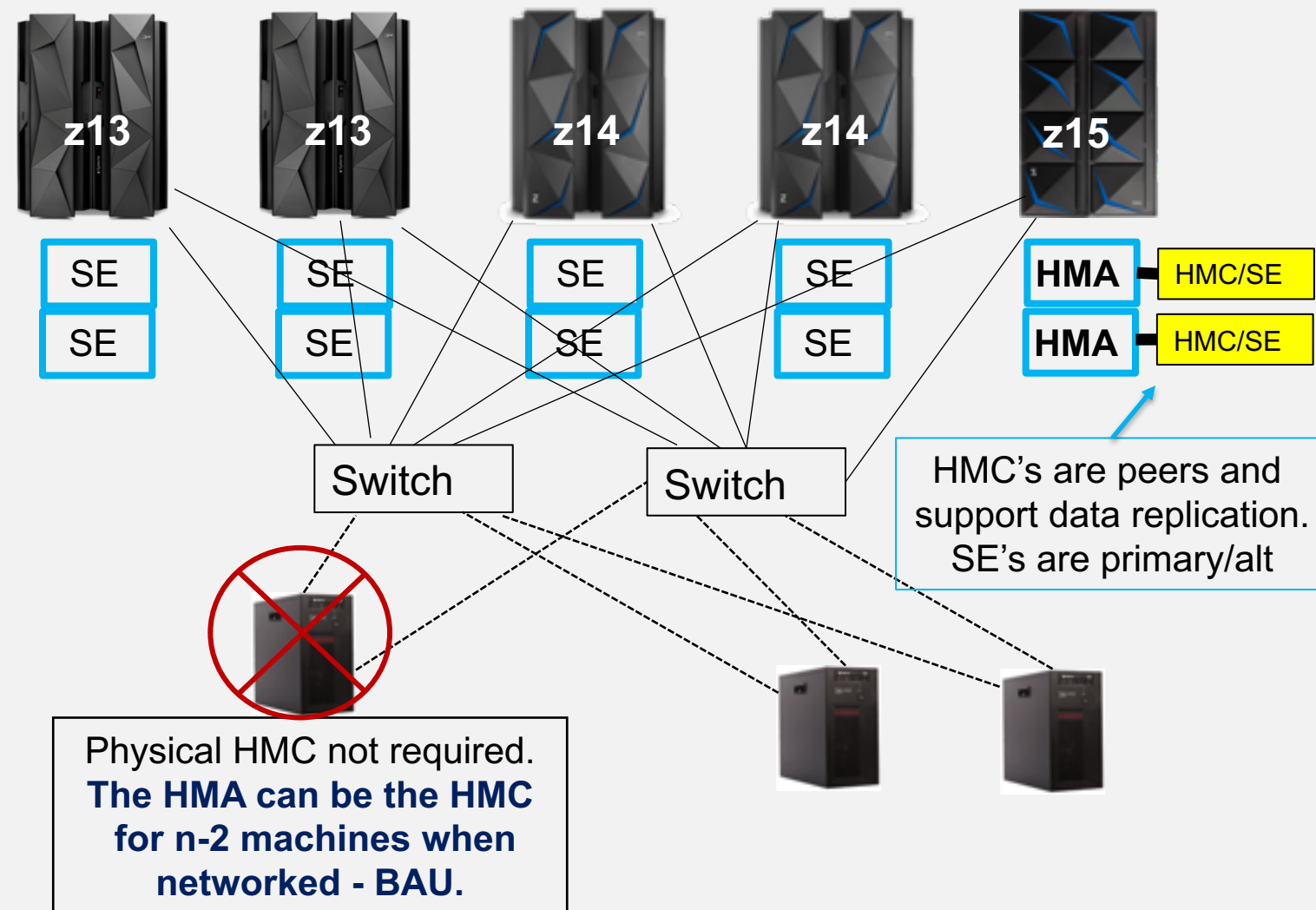
HMC Support

- Seamless hard drive encryption
- Will only support n-2 Systems
- DVD drives removed
- zBX & Ensemble Support Removed

Machine Family	Machine Type	Firmware Driver	SE Version
z15	8561	41	2.15.0
z14 M0x	3906	36	2.14.1
z14 ZR1	3907	36	2.14.1
z13	2964	27	2.13.1
z13s	2965	27	2.13.1

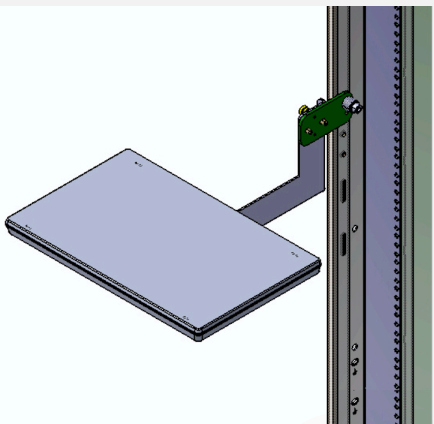
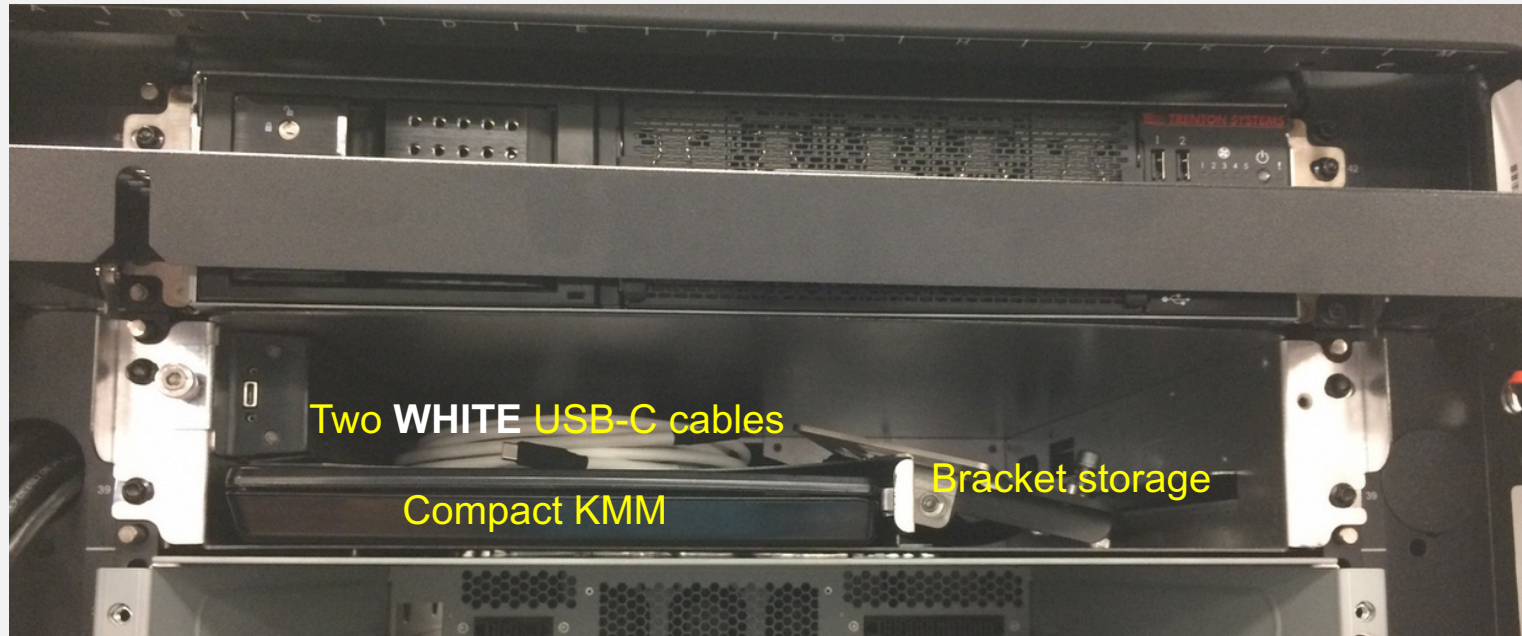
Hardware Management Appliance (HMA)

- The HMC code runs as an appliance on a higher performance model of the Support Element.
- Logon to HMC remotely from your browser.
- Same Driver 41 LIC as a physical HMC.
- Up to 10 physical HMCs plus the HMA can be ordered and used.
- Optional – FC0100
- PR/SM or DPM mode
- New Build Only – No MES



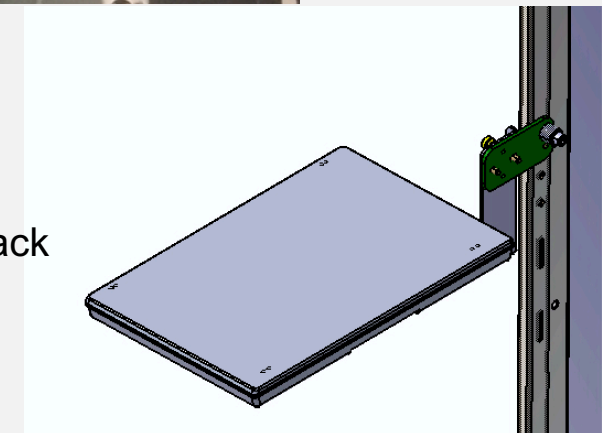
Mini KMM for SE

Open Cubby => KMM Stored



Mini KMM
Frame Mounting
Opens OUT of the
drawer space

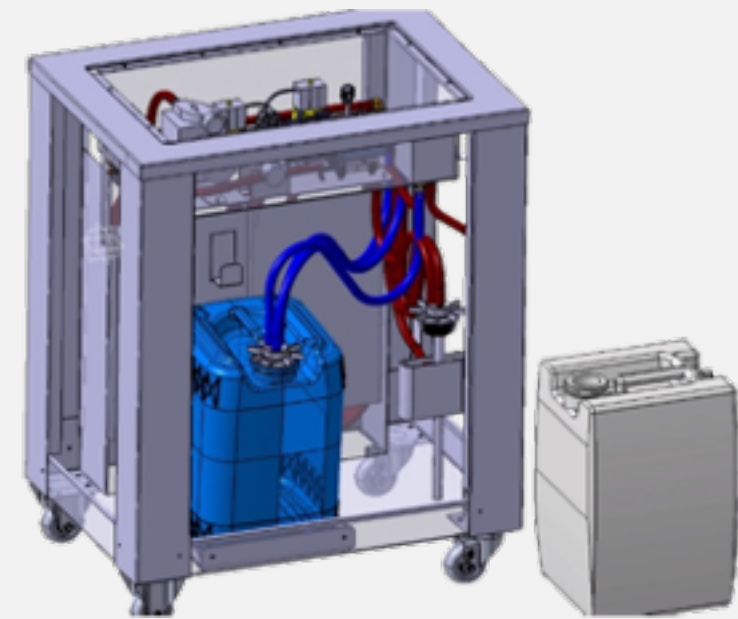
Mounts to either side,
left or right,
front or back
Can mount on an adjacent rack



z15 Site Tools

Fill and Drain Kit

- **New Fill and drain tool will be shipped with z15 and LinuxONE III FC 3393**
 - Previous tools will *not* be compatible
 - New tool designed to reduce the complexity of operation and improve its efficiency
 - Reduced the number of parts and streamlined its operation
 - Old tool could take up to 3 hours
- **Tool will include a 5 gal blue fill jug and a 6 gal drain jug that are interchangeable for operation**
 - Goal is to use one jug for fill or drain
- **Tool always connects to the system the same way**
- **Controlled by the SE once connected**



Lift Tool and Extension Ladder

- Lift Tool FC 3100
 - Same as the z14 ZR1
 - 5 separate components that attach to the front of the system
 - Each site requires at least one for all z15 systems
-
- Extension Ladder FC 3101
 - Same as the z14 ZR1
 - Each datacenter requires at least one for all z15 Systems



z15 System Configuration

Configuration Notes

- Initial configuration of the system was very similar to others
 - Chipid Mapping tool
 - HCD
 - HMC to define LPARS
 - With some tasks being moved to the HMC from the SE this did help speed defining Activation profiles
- Updated to the HMC
 - Help move tasks to the HMC from the SE
 - No need to SOO to the SE
 - New user and role interface helped cleaned up how to define objects
- Things to note
 - FCTC connections automatically use IBM Fibre Channel Endpoint Security
 - Other connection do not
 - The fibre switch will need to support this communication

z15 Statements of Direction

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Statements of General Direction

- **Prepaid OoCoD tokens:** Beginning with IBM z15, new prepaid OoCoD tokens purchased will not carry forward to future systems.
- **TLS 1.0 for OSA, HMC, and SE:** IBM z15 will be the last IBM Z server to support the use of the Transport Layer Security protocol version 1.0 (TLS 1.0) for establishing secure connections to the Support Element (SE), Hardware Management Console (HMC), and OSA-Integrated Console Controller (channel path type OSC).
- ~~**A new use of System Recovery Boost:** In the future, IBM plans to introduce a new use of System Recovery Boost that will focus on a limited number of short-duration boosts. These boosts are mediated by the operating system and designed to improve system resiliency during specific focused recovery actions.~~
- **Prepaid token expiration:** Beginning with IBM z15 Model T02, prepaid tokens for On/Off Capacity on Demand (On/Off CoD) will expire 5 years after LICCC expiration date.
- **Water Cooling:** IBM z15 is planned to be the last IBM Z server to offer customer water cooling .
- **Future HMC Hardware:** IBM z15 is planned to be the last server to offer the ability to order stand alone Hardware Management Console (HMC) hardware. For future systems, new HMC hardware can only be ordered in the form of the Hardware Management Appliance feature (#0100) which was introduced on IBM z15. The Hardware management Appliance feature provides redundant HMCs and Support Elements (SEs) that reside inside the Central Processor Complex (CPC) frame, and the ability to eliminate stand alone HMC hardware (tower or rack mounted) outside the CPC frame. Stand alone HMC hardware (tower or rack mounted) can still be ordered and used with IBM z15.

Statements of General Direction

- **Operational Data Generation and Analytics:** In the future IBM intends to deliver z/OS and Middleware interdependency data generation, and automated z/OS cross stack analytics to reduce skill requirements level and amount of time required to perform problem definition.
- ~~**z/VSE exploitation of System Recovery Boost:** In the future, IBM intends to deliver native z/VSE exploitation of System Recovery Boost, which is expected to enable restoration of service from, and catch up after, both planned and unplanned outages faster than on any prior Z machine.~~
- **The conditional-SSKE facility:** IBM z15 will be the last high end server to support the conditional-SSKE facility.
- ~~**Reserved space for DS8910F:** In the future, IBM plans to test a co-located DS8910F solution that can be utilized in the 16U Reserved space for single phase power z15 T02 model. Clients must consider leaving enough room for the reserved space and staying with the single phase power option, if they would like to consider configuring this option and co-locating their storage in the future.~~
- **Removal of IBF support:** IBM z15 is planned to be the last IBM Z server to offer an Integrated Battery Feature (IBF). As client data centers continue to improve power stability and uninterruptible power supply (UPS) coordination, IBM Z continues to innovate to help clients take advantage of common power efficiency and monitoring across their ecosystems. Additional support for data center power planning can be requested through your IBM Sales contact.
- **Capacity for Planned Events:** IBM z15 is planned to be the last IBM Z server to offer Capacity for Planned Events (CPE)

Thanks