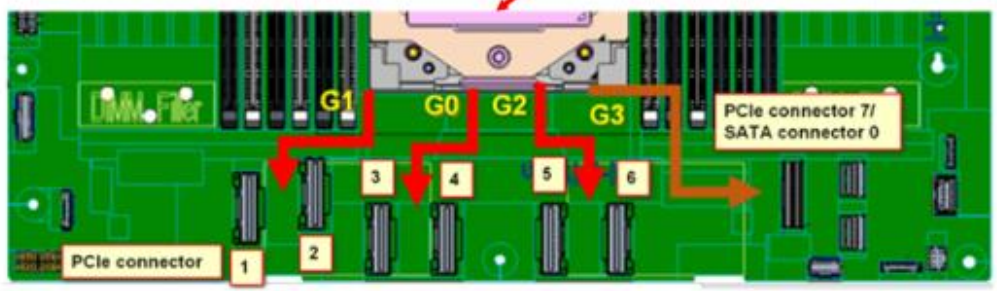
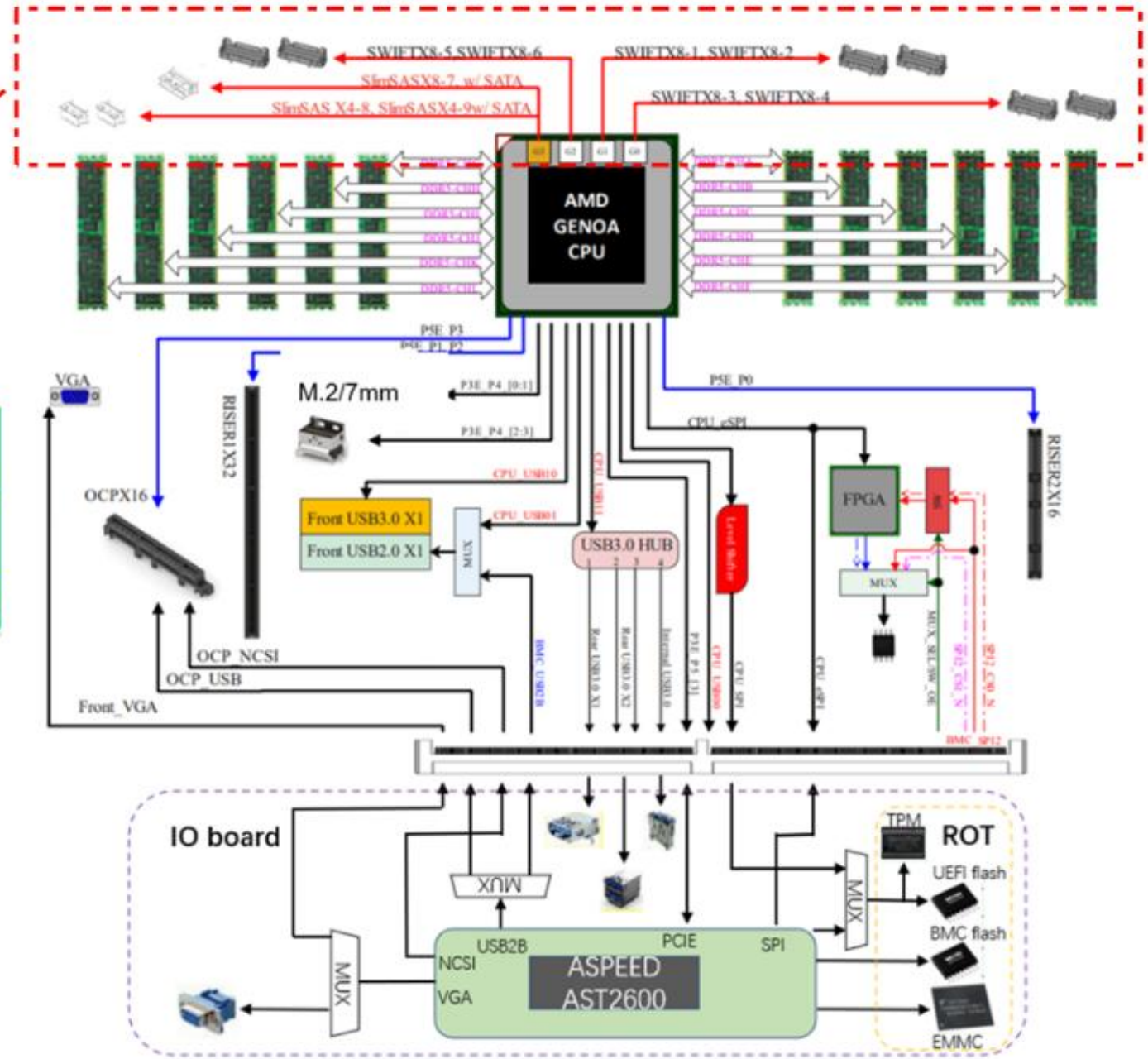
# System configurations and diagrams

System block diagram and hardware configurations

# Block diagram



# HDD backplane

The SR635 V3 supports the following backplanes:

Front drive bay (hot-swap)

- Four 2.5-inch SAS/SATA backplane (Gen4)
- Four 2.5-inch NVMe backplane (Gen4)
- Four 2.5-inch AnyBay backplane (Gen5)
- Eight 2.5-inch SAS/SATA backplane (Gen4)
- Six 2.5-inch SAS/SATA + four 2.5-inch AnyBay backplane (Gen4)
- 10 2.5-inch AnyBay backplane (Gen4 or Gen5)
- 16 EDSFF (E1.S 5.9 mm) backplane (Gen4)

Rear bay (hot-swap)

- Two 2.5-inch SAS/SATA rear backplane (Gen4)
- Two 2.5-inch NVMe rear backplane (Gen4)

# Front drive configurations

The SR635 V3 supports the following front drive configurations:


10 2.5-inch hot-swap drive bays


Eight 2.5-inch hot-swap drive bays with optional pull-out operator panel


Four 2.5-inch hot-swap drive bays

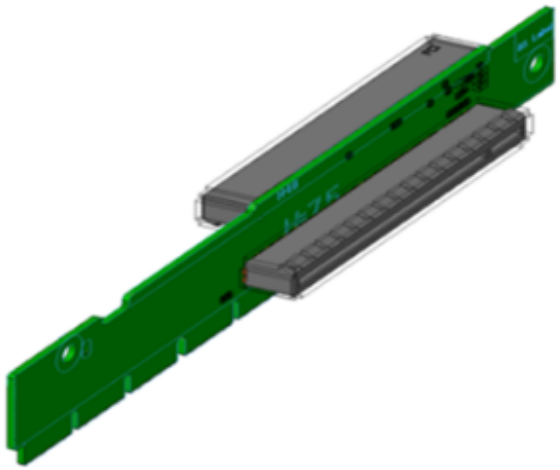

16 E1.S EDSFF NVMe hot-swap drive bays; support for M.2, so no support for the pull-out operator panel


16 E1.S EDSFF NVMe hot-swap drive bays; with the pull-out operator panel, so no support for M.2

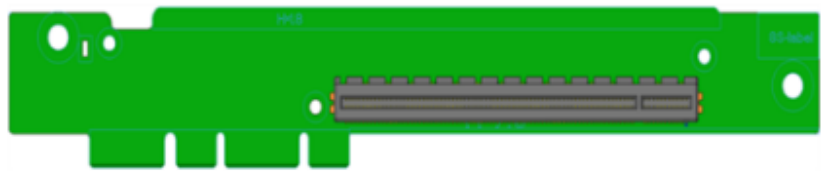
# PCIe riser 1 card and supported riser 1 bracket

The SR635 V3 supports the following PCIe riser cards for the riser 1 assembly:

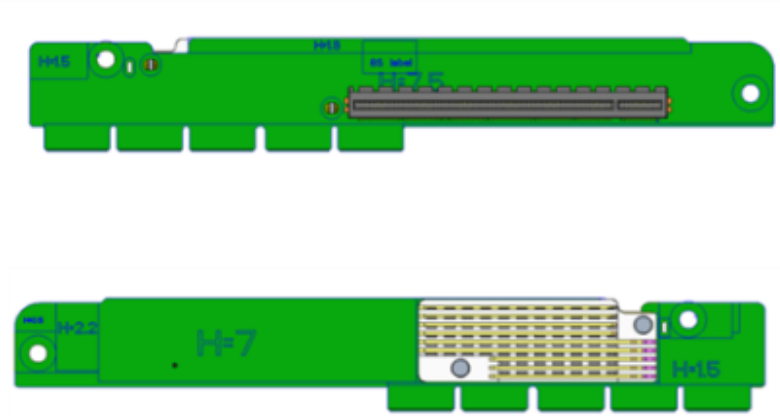
Riser 1 BF Gen4: two x16 slots



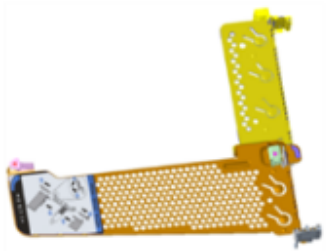
Riser 1 Gen4: one x16 slot (with a rear drive)



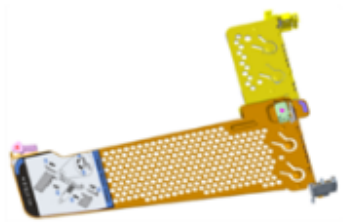
Riser 1 Gen5: one x16 slot (with a retimer)



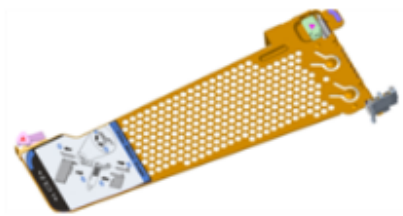

The SR635 V3 supports the following PCIe riser brackets for the riser 1 assembly:



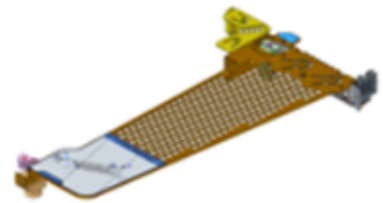
**LP+FH BF riser bracket**



**LP+LP BF riser bracket**



**LP riser bracket**



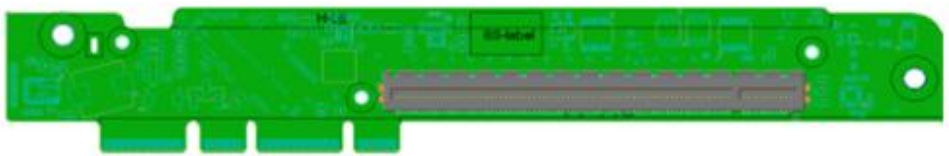
**LP+filler riser bracket**

# PCIe riser card – riser 2

The SR635 V3 supports the following PCIe riser cards for the riser 2 assembly:

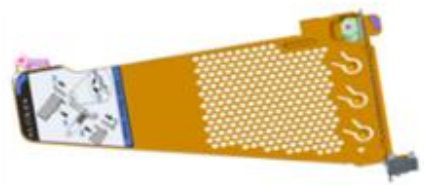
Riser 2 Gen4: one x16 slot

Riser 2 Gen5: one x16 slot (with a retimer)



The SR635 V3 supports the following PCIe riser brackets for the riser 2 assembly:

**LP riser bracket**



**FH riser bracket**

# Rear PCIe slot configurations

The SR635 V3 supports the following rear PCIe slot configurations. Click HERE to see the supported rear PCIe slot and riser card mapping table.

Figure A

Low Profile (LP) + Full Hight (FH)


Figure B

Three LP


Figure C

Two LP + two 7 mm SSD


Figure D

LP + two rear HDD (SAS/SATA)


Figure E

LP + FH

# Rear PCIe slot configurations

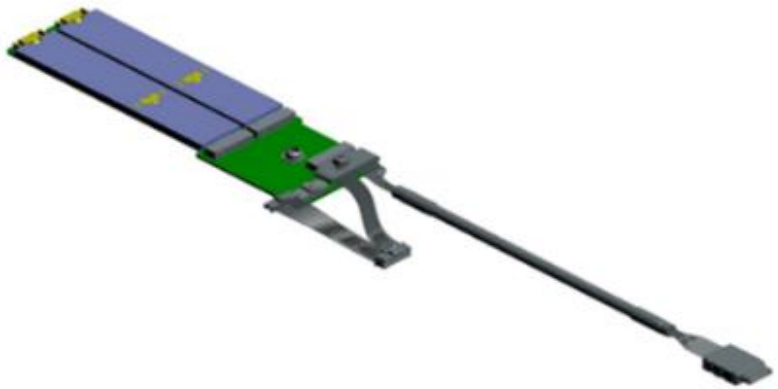
## Rear PCIe slot and riser card mapping table

| | Figure A | Figure B | Figure B | Figure E |
|---|---|---|---|---|
| Riser 1 | Riser 1 BF Gen4 | Riser 1 BF Gen4 | Riser 1 Gen5 | Riser 1 Gen5 |
| Riser 2 | None | Riser 2 Gen4 or Riser 2 Gen5 | Riser 2 Gen5 | Riser 2 Gen5 |
| Bracket for riser 1 | LP+FH BF riser bracket | LP+LP BF riser bracket | LP+LP BF riser bracket | LP+filler riser bracket |
| Bracket for riser 2 | None | LP riser bracket | LP riser bracket | FH riser bracket |
| Slot 1 | X16 LP (G4) | X16 LP (G4) | X16 LP (G5) | X16 LP (G5) |
| Slot 2 | X16 FH (G4) | X16 LP (G4) | Empty | Empty |
| Slot 3 | Empty | X16 LP (G4) or X16 LP (G5) | X16 LP (G5) | X16 FH (G5) |

# M.2 drive solution

The SR635 V3 supports one or two M.2 form-factor SATA or NVMe drives for use as an operating system boot solution or as additional storage. M.2 drives can be installed on either of the following M.2 adapters, which are then attached to the system board. If two M.2 drives are installed in the system, they should either both be SATA drives or both be NVMe drives.

M.2 SATA/NVMe drive PCIe 3.0 backplane

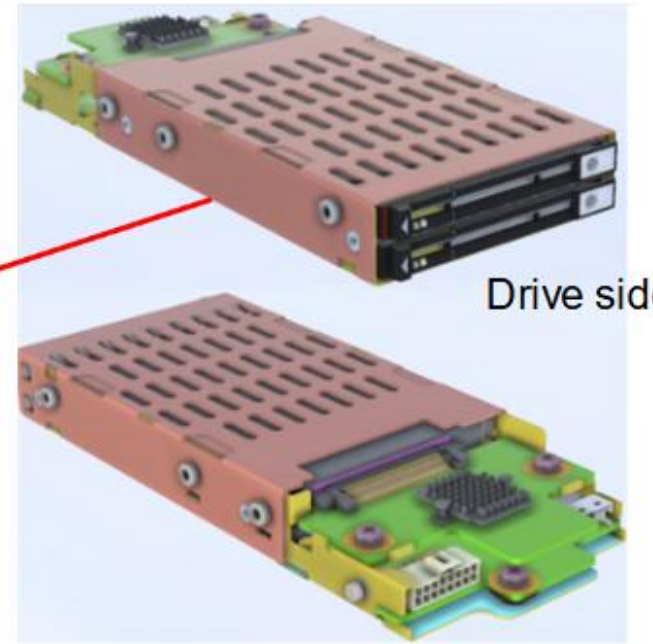


M.2 SATA/NVMe drive PCIe 4.0 backplane
(new for the ThinkSystem V3 series)


**Note:** Only the M.2 x4 SATA/NVMe adapter supports RAID.

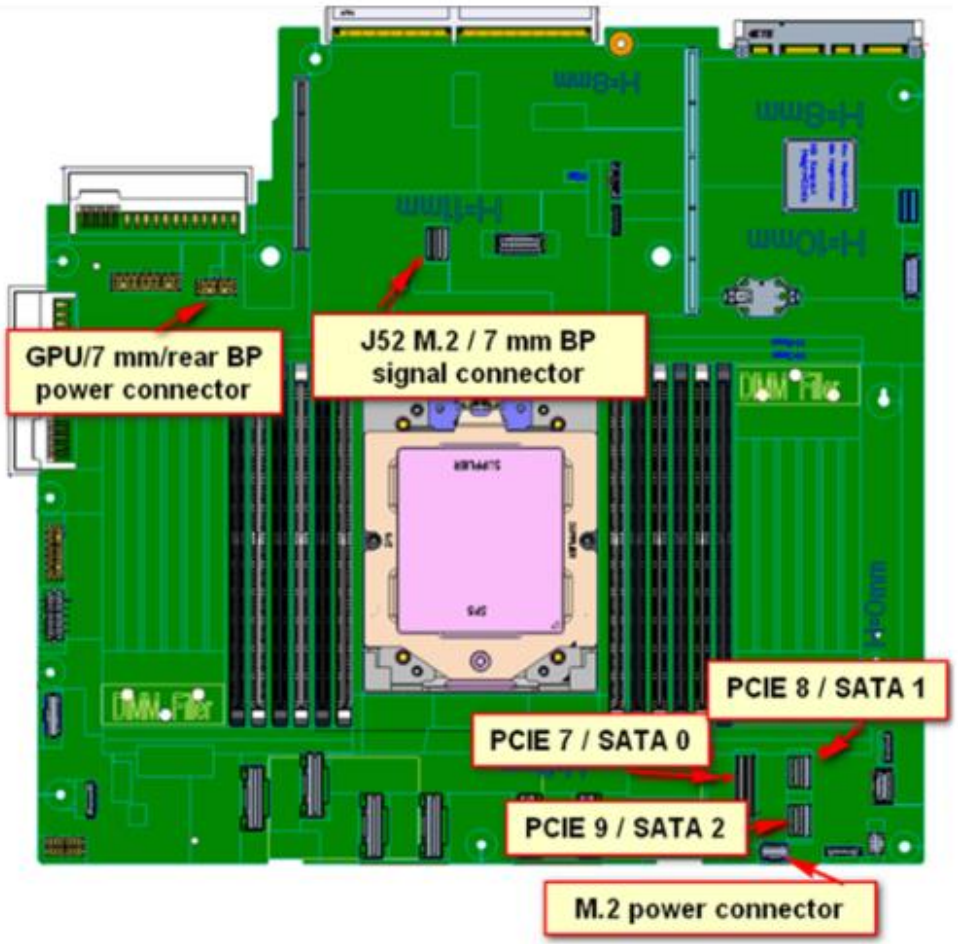
# 7 mm rear drive solution

The SR635 V3 supports the following 7 mm rear drive cage assembly for the installation of 7 mm SATA/NVMe drives in the system.

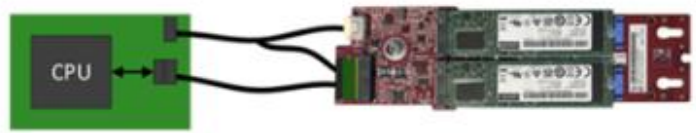



# M.2 and 7 mm drive non-RAID solutions

M.2 and 7 mm drives cannot support RAID while connected to the system board.




### M.2 PCIe 3.0 backplane




Non-RAID SATA drives:
- connects to the PCIe9/SATA2 and M.2 power connector on the system board

Non-RAID NVMe drives:
- connects to the J52 and M.2 power connector on the system board

### M.2 PCIe 4.0 backplane

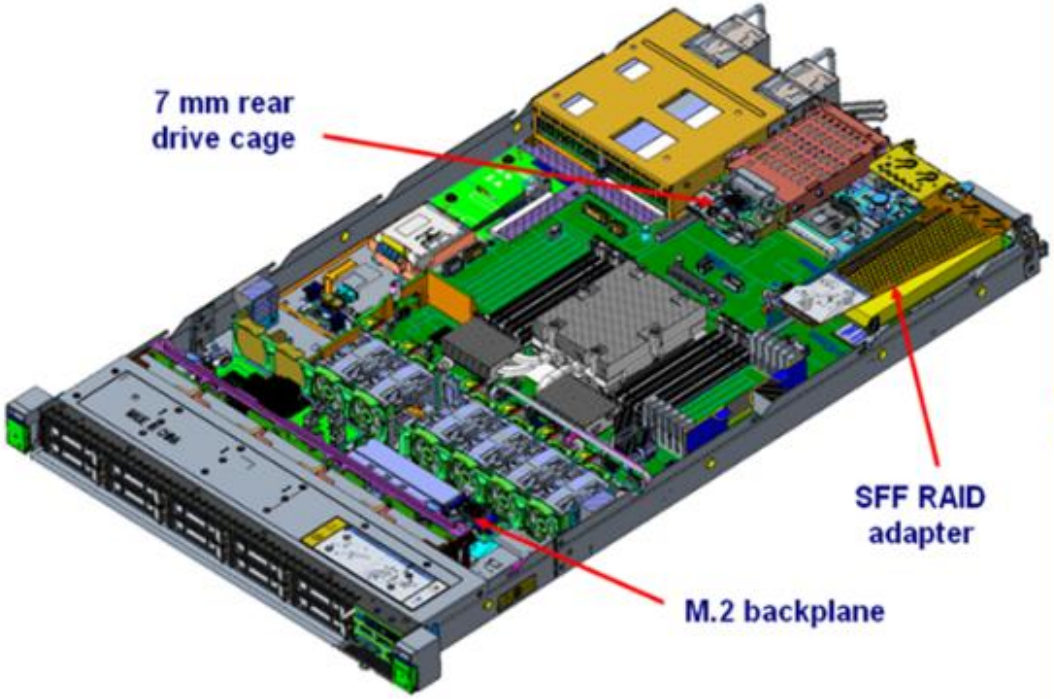

Non-RAID, all SATA or all NVME drives:
- connects to the PCIe8/SATA1, PCIe9/SATA2 connector and M.2 power connector on the system board

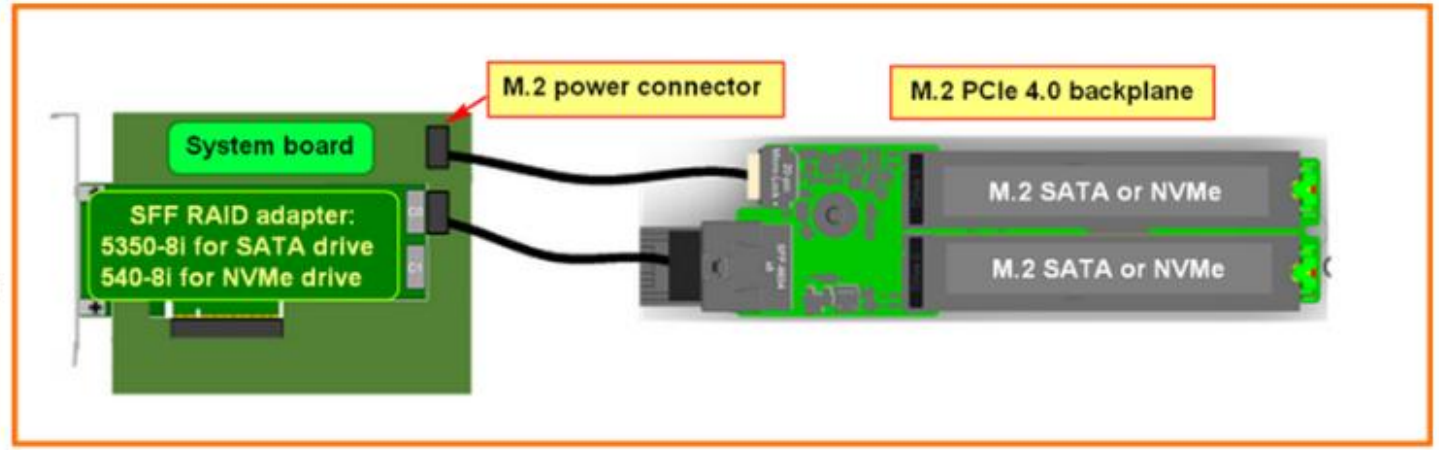
### 7 mm rear drive cage

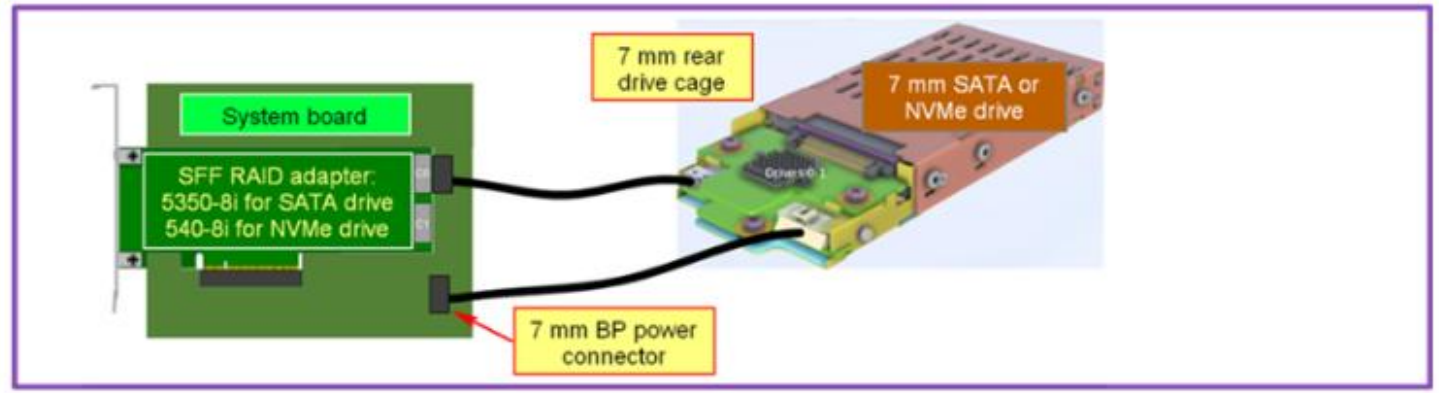

Non-RAID SATA drives:
- connects to the PCIe9/SATA2 and 7 mm BP power connector on the system board

Non-RAID NVMe drives:
- connects to the J52 and 7 mm BP power connector on the system board

# M.2 and 7 mm drive RAID solutions




**Note:** With the SR635 V3, M.2 drives can only support RAID when they are installed on the M.2 SATA/NVMe drive PCIe 4.0 backplane and then connected to the supported RAID adapter. M.2 drives installed on the M.2 SATA/NVMe drive PCIe 3.0 backplane cannot support RAID in the SR635 V3.

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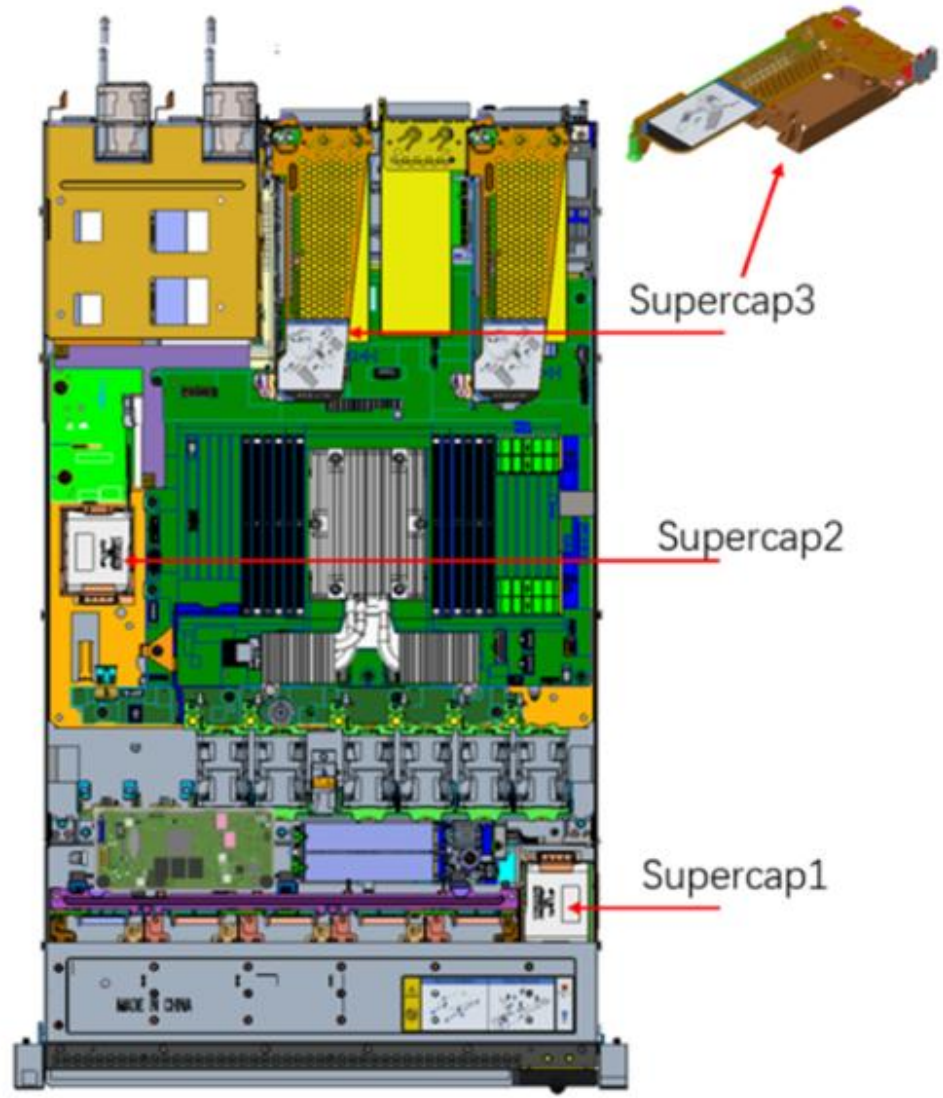
# Supercap placement locations

- Each 930/940 RAID card needs its own supercap
- The SR635 V3 supports up to three RAID adapters
- Installation priority: supercap1--> supercap2--> supercap3
- If an LACM is installed, it will occupy the supercap1 location
- Supercap3 will occupy one PCIe slot



# Memory module installation rules

The SR635 V3 has 12 memory slots and supports one DIMM per channel. The SR635 V3 supports 16, 32, or 64 GB TruDDR5 RDIMMs running at 4800 MT/s for a maximum memory capacity of 768 GB (twelve 64 GB RDIMMs).

Apply the following rules when installing DIMMs:

- Mixing DIMMs from different vendors is supported.
- Mixing x4 and x8 DIMMs is not supported.
  - –For example, mixing 16 GB (1Rx8) and 64 GB (2Rx4) is not supported.
- Only single rank and dual rank DIMM mixing is supported.
  - –For example, mixing 16 GB (1Rx8) and 32 GB (2Rx8) is supported.
- When installing DIMMs with different capacities, install the DIMM with the highest capacity first and follow the population sequence.
- For best performance, the population recommends identical memory capacity and rank across all 12 channels.

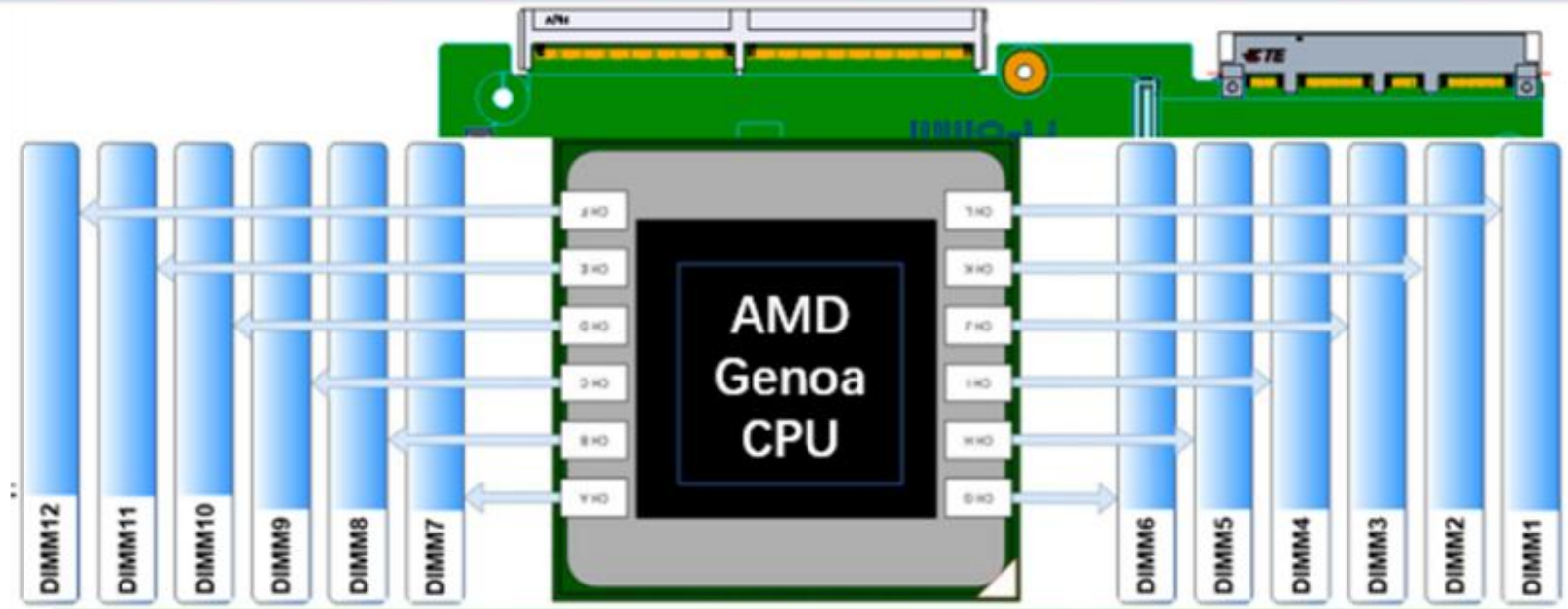
# SR635 V3 memory module installation order

| | UMC2 | UMC1 | UMC5 | UMC0 | UMC4 | UMC3 | | UMC9 | UMC10 | UMC6 | UMC11 | UMC7 | UMC8 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CH-F | CH-E | CH-D | CH-C | CH-B | CH-A | | CH-G | CH-H | CH-I | CH-J | CH-K | CH-L |
| DDR5 | DIMM12 | DIMM11 | DIMM10 | DIMM9 | DIMM8 | DIMM7 | | DIMM6 | DIMM5 | DIMM4 | DIMM3 | DIMM2 | DIMM1 |
| 1 | | | | | | DDR5 | | | | | | | |
| 2 | | | | | | DDR5 | CPU | DDR5 | | | | | |
| 4 | | | | DDR5 | | DDR5 | | DDR5 | | DDR5 | | | |
| 6 | | | | DDR5 | DDR5 | DDR5 | | DDR5 | DDR5 | DDR5 | | | |
| 8 | | DDR5 | | DDR5 | DDR5 | DDR5 | | DDR5 | DDR5 | DDR5 | | DDR5 | |
| 10 | | DDR5 | DDR5 | DDR5 | DDR5 | DDR5 | | DDR5 | DDR5 | DDR5 | DDR5 | DDR5 | |
| 12 | DDR5 | DDR5 | DDR5 | DDR5 | DDR5 | DDR5 | | DDR5 | DDR5 | DDR5 | DDR5 | DDR5 | DDR5 |

If one DIMM is to be installed, install it in the DIMM7 slot.

If two DIMMs are to be installed, install them in the DIMM7 and DIMM6 slots.

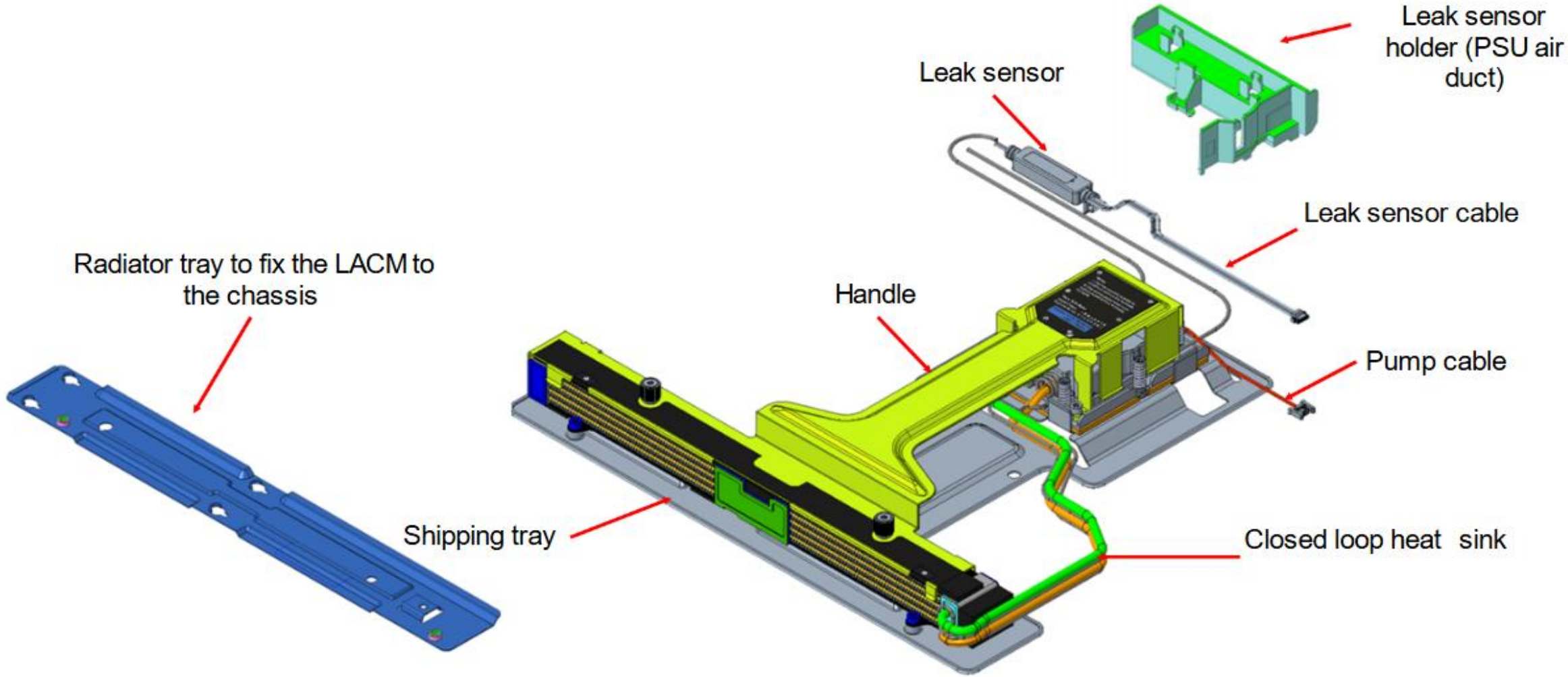
Follow this pattern to install more DIMMs.



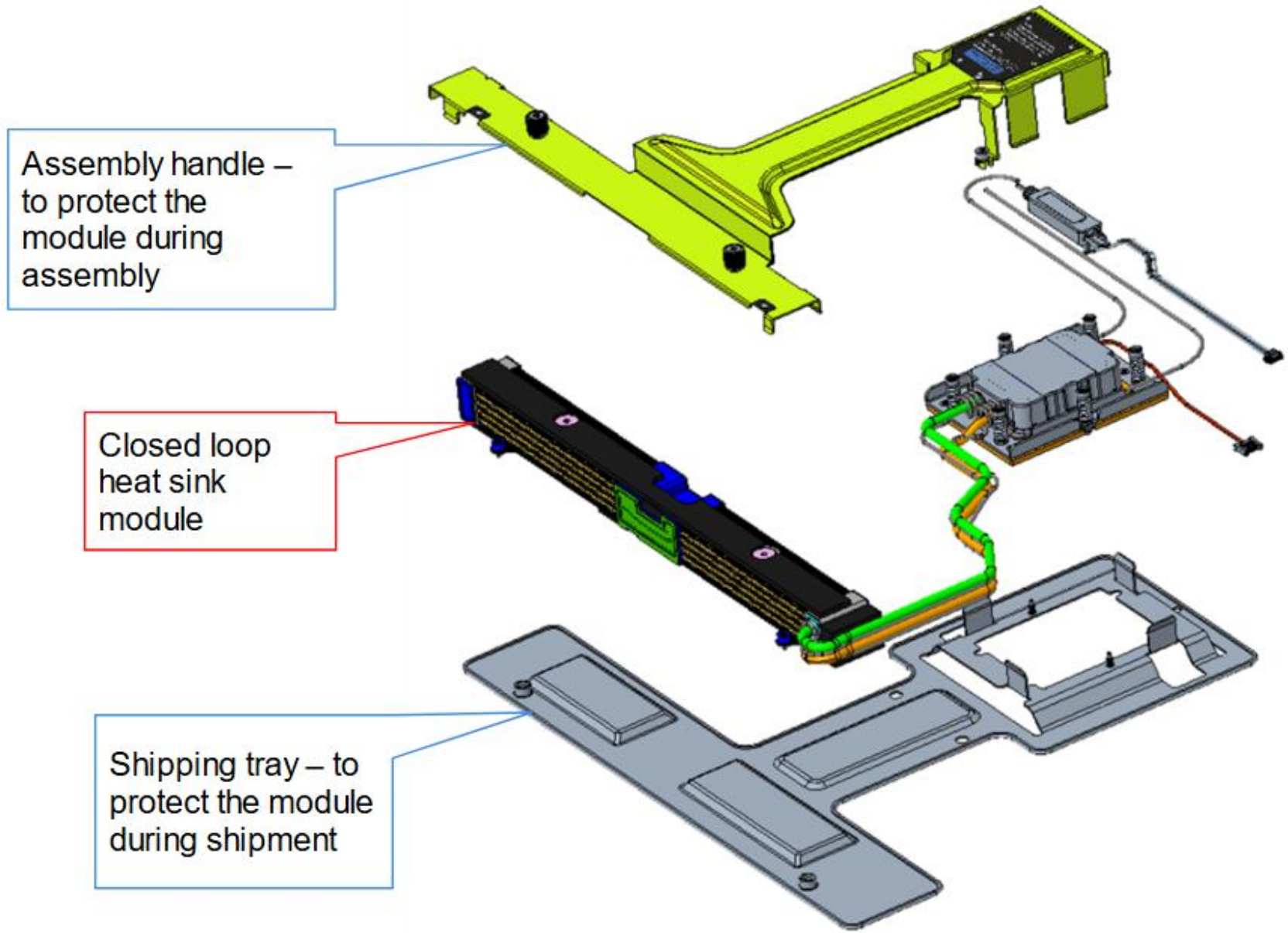

Server front

# Lenovo Neptune liquid assisted cooling module

The SR635 V3 supports the liquid assisted cooling module (LACM) when processors with a TDP of over 320 W are installed. The LACM consists of the following components:

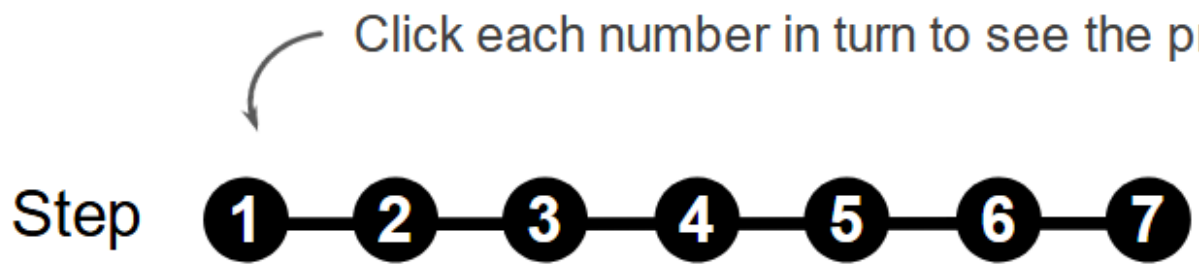


# LACM exploded view



# LACM assembly

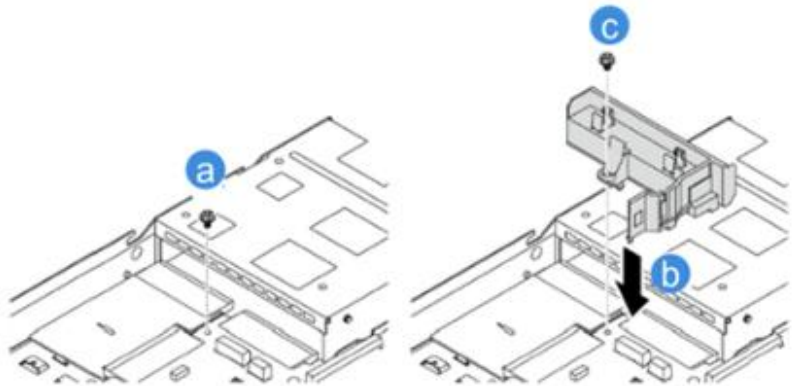
Work through the following procedure to learn how to assemble the LACM on the SR635 V3.

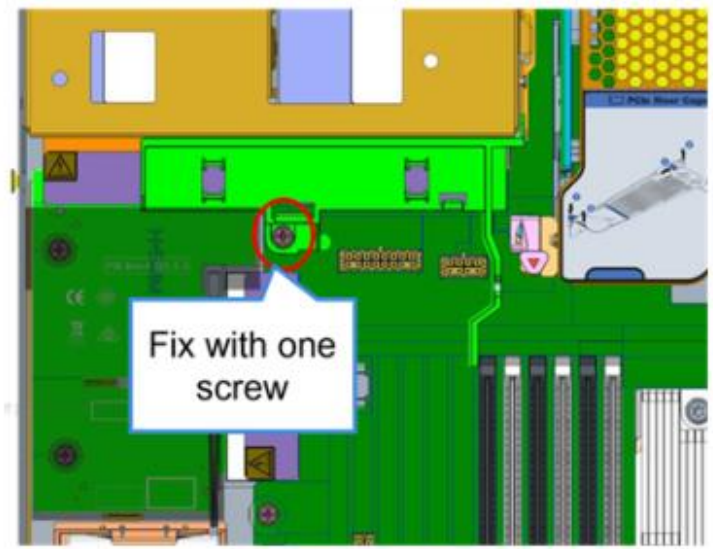


# LACM assembly

Install the power supply air duct (sensor holder) on the system board:

a. Remove the screw from the chassis.
b. Put the air duct down, making sure the screw holes on the air duct and the chassis are aligned.
c. Fasten the screw to secure the air duct in place.

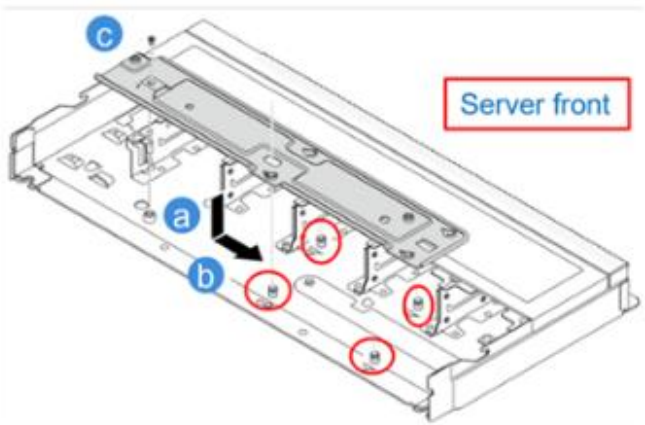


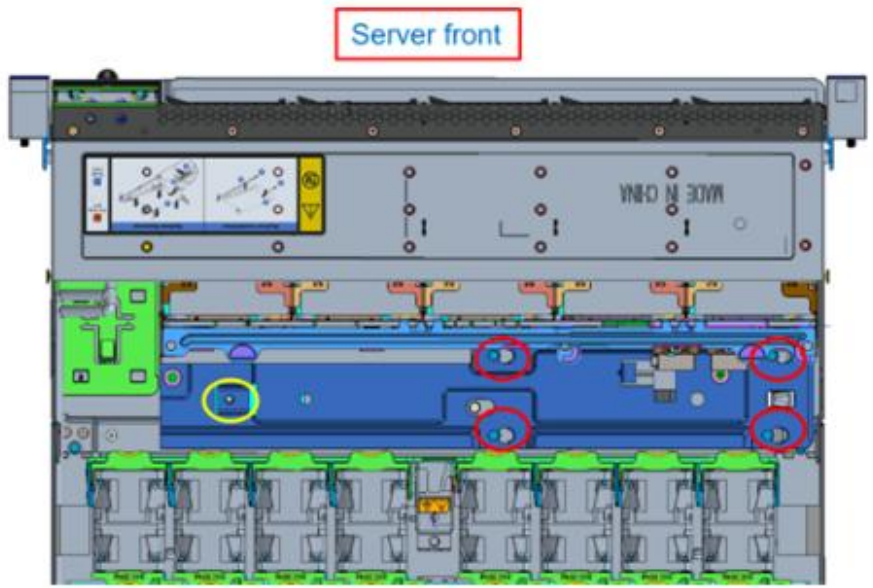



# LACM assembly

Install the radiator tray on the chassis:

a. Put the tray down on the chassis evenly, making sure the four T-pins on the chassis (shown in red circles) pass through the holes in the tray.
b. Move the tray to the right.
c. Tighten the screw (shown in a yellow circle).



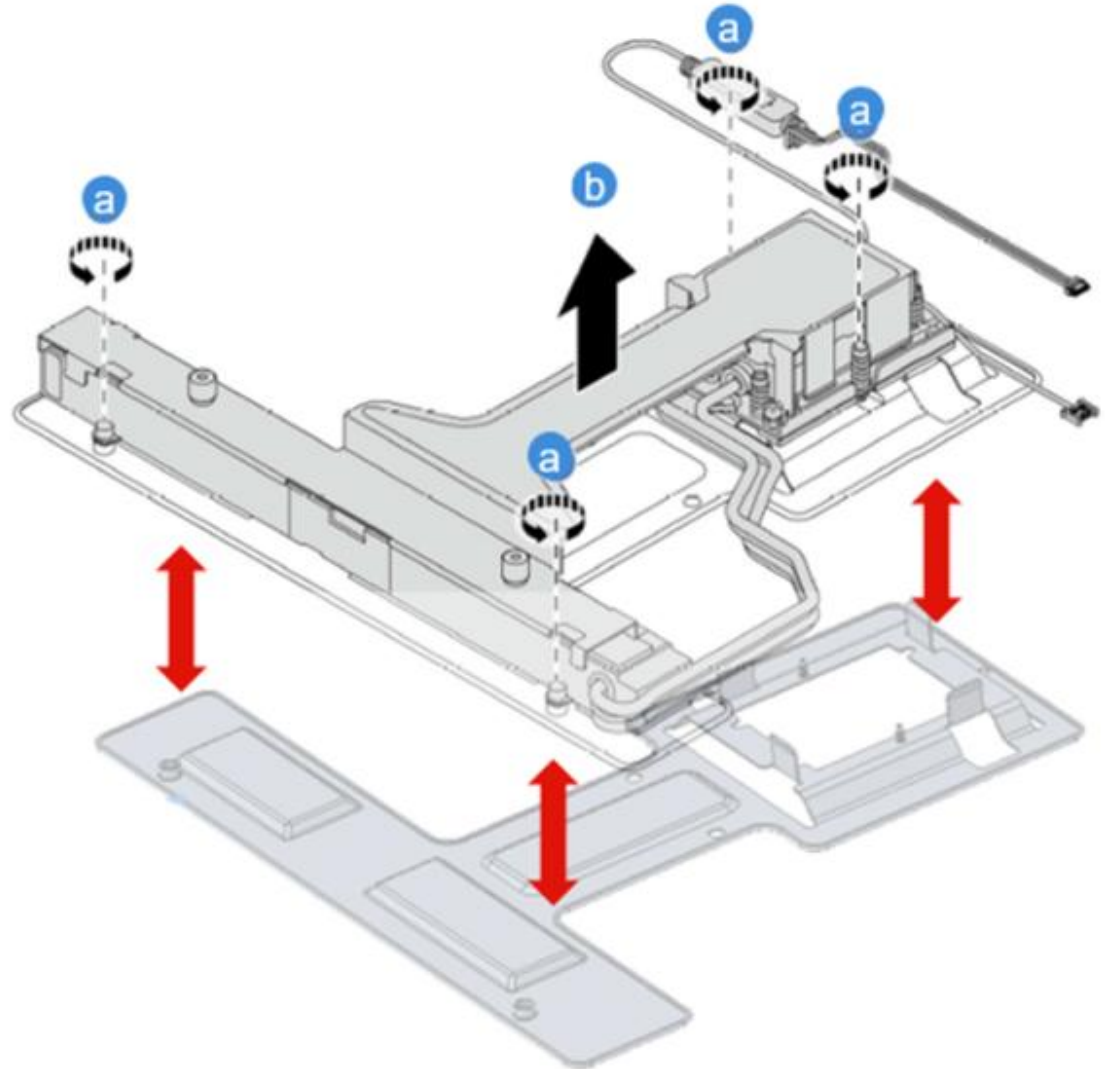




Step 1 2 3 4 5 6 7

# LACM assembly

Separate the LACM module from the shipping tray:

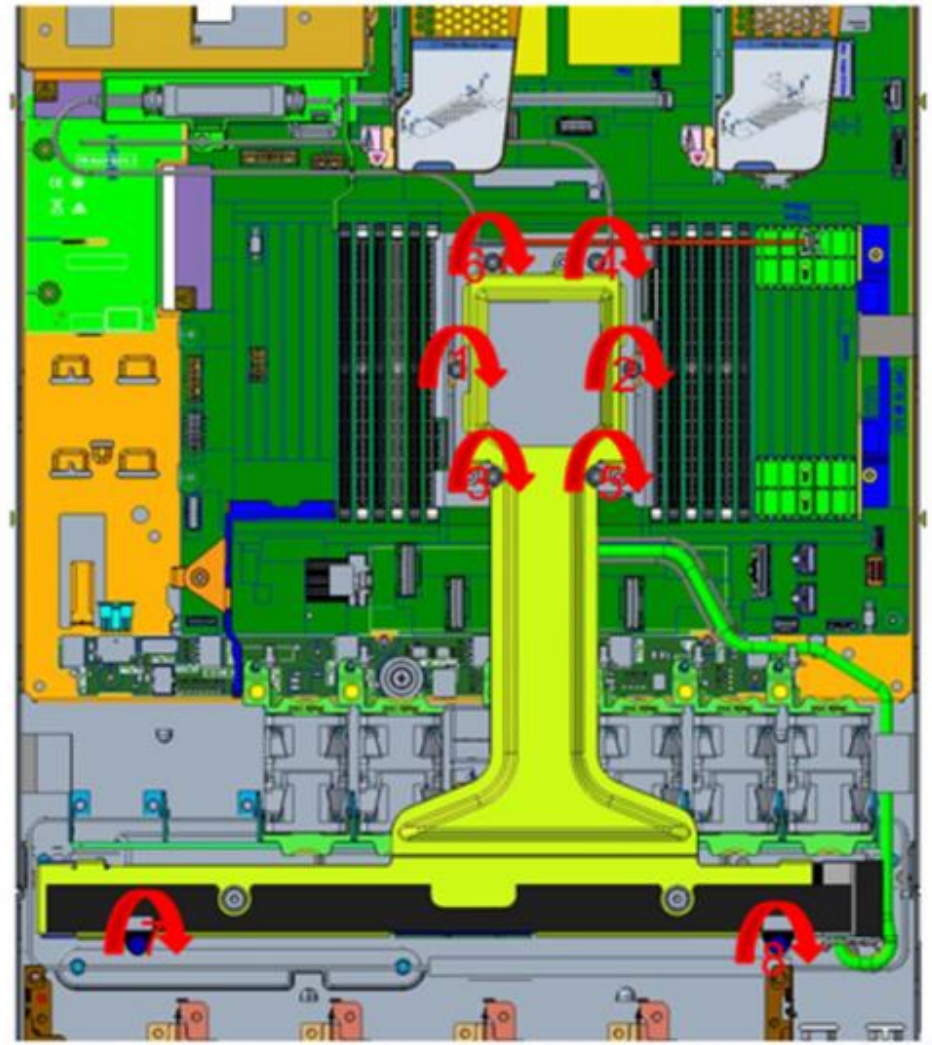
a. Unfasten the four screws on the LACM shipping tray.
b. Using the handle, lift the LACM to separate the module from the shipping tray.



# LACM assembly

Install the LACM on the system board assembly:

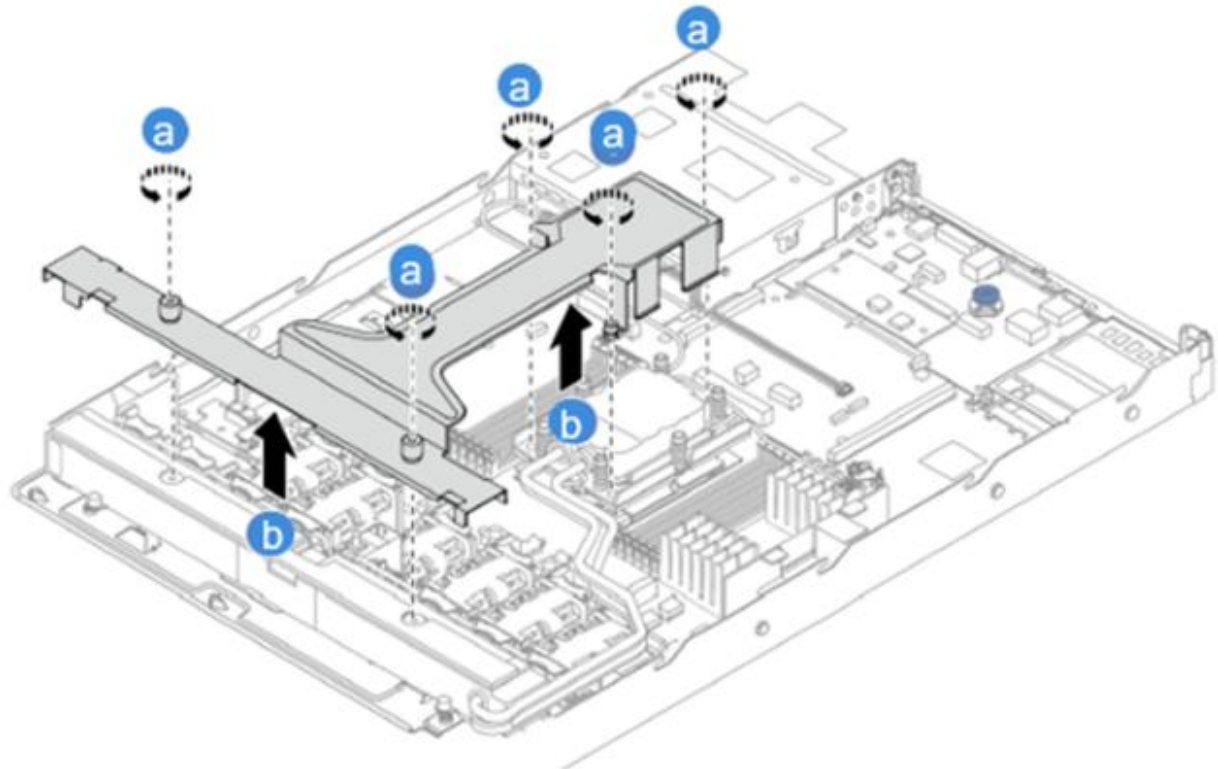
a. Align the triangular mark on the cold plate assembly label with the triangular mark on the processor carrier and processor.
b. Install the LACM on the processor-carrier. Press the carrier into place until the clips at all four corners engage.
c. Fasten all eight Torx T20 nuts following the sequence shown on the LACM label (1 to 8).



# LACM assembly

Separate the module handle from the module:

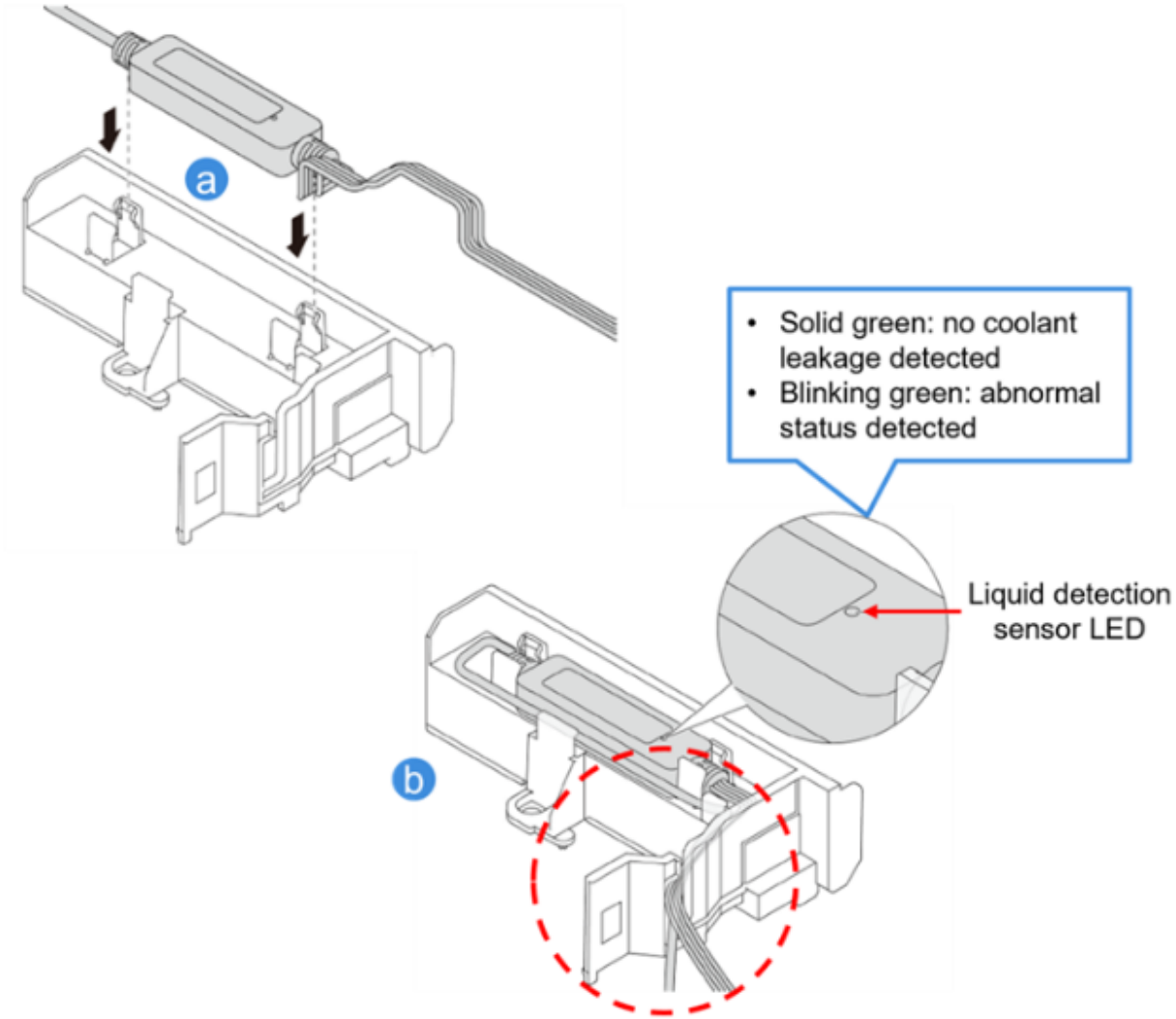
a. Unfasten the five screws on the module handle.
b. Lift the handle to separate it from the module.



# LACM assembly

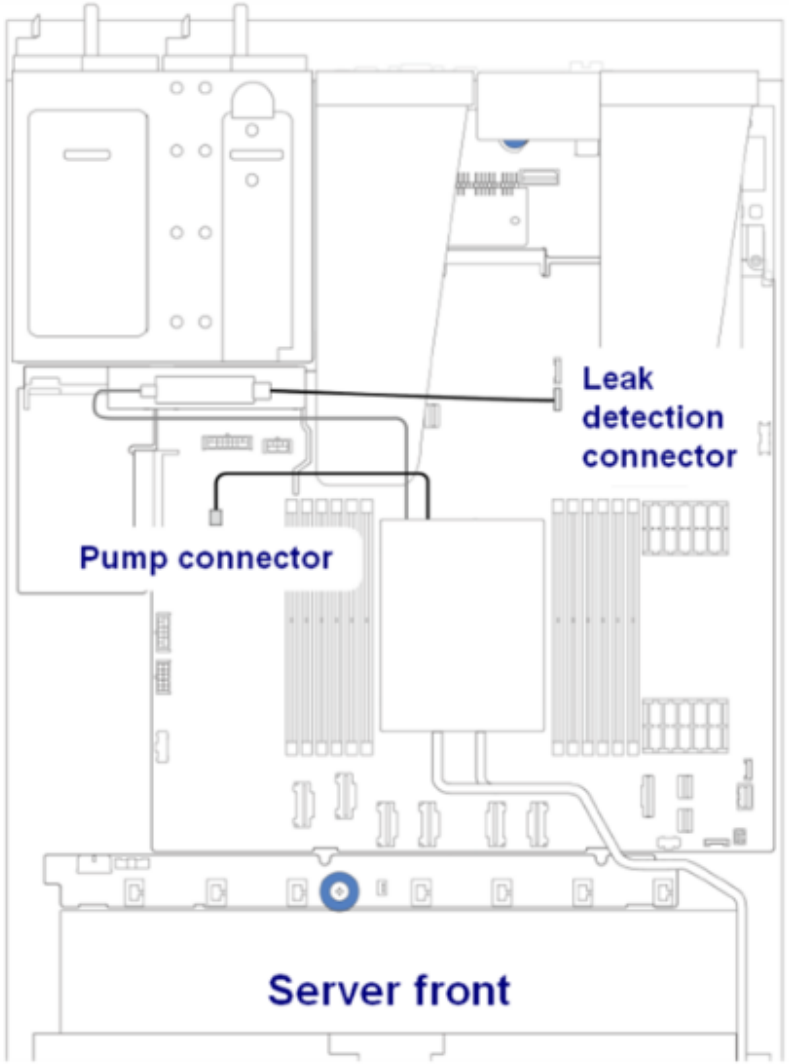
Install the leak detection module on the PSU air duct (sensor holder):

a. Install the leak detection sensor into the two clips on the PSU air duct. Ensure that the module is secured in place.
b. After the module is secured, route the cable through the cable clips to keep it tidy for later cable routing arrangements.



# LACM assembly

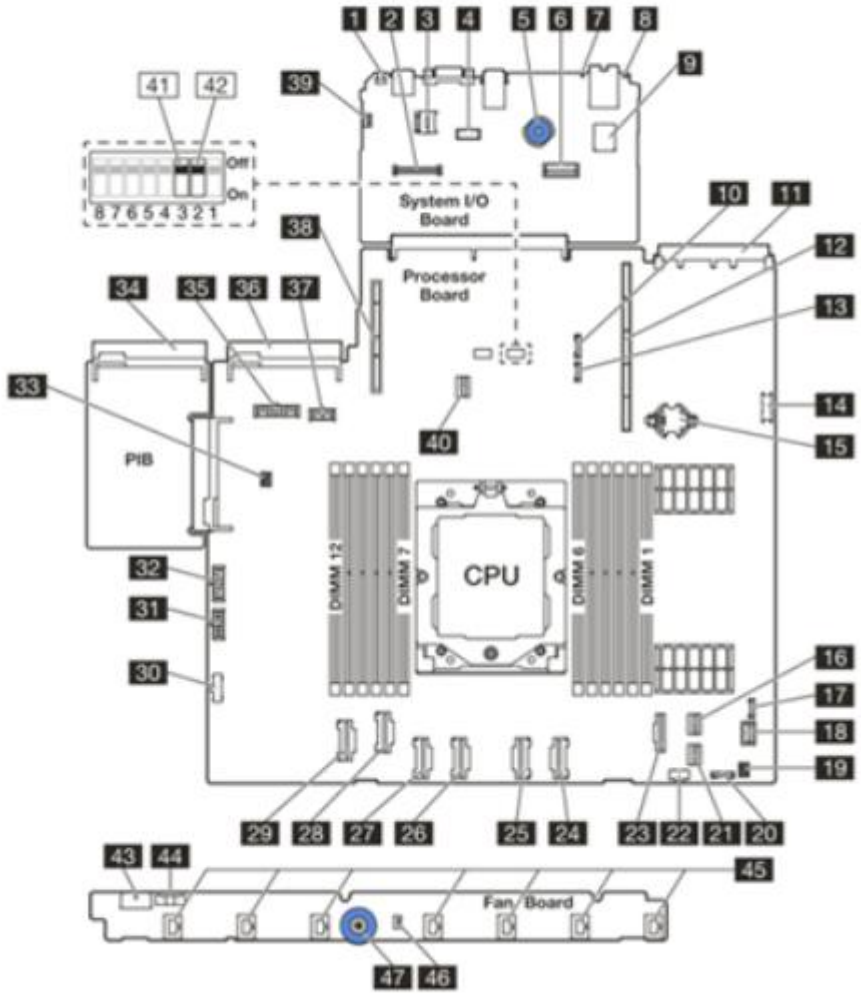
Connect the LACM pump cable and leak detection cable to the connectors on the system board assembly. For more information about the location of the connectors, refer to the ThinkSystem SR635 V3 processor board connectors page in this course.




Step 1 2 3 4 5 6 7

# Processor board connectors

1 NMI Button
2 RoT Connector
3 Micro SD Connector
4 Serial Port Connector
5 Lift Handle
6 Second MGMT Ethernet Connector
7 System Error LED
8 System ID LED
9 Internal USB Connector
10 7mm/Rear BP Sideband Connector
11 OCP 3.0 Network Card Connector
12 Riser 1 Slot
13 Leak Detection Connector
14 Front USB Connector
15 3V Battery (CR2032)
16 PCIe Connector 8 / SATA Connector 1
17 External LCD Connector
18 Front VGA Connector
19 Front Panel_Y Cable Connector
20 Front Panel Connector
21 PCIe Connector 9 / SATA Connector 2
22 M.2 Power Connector
23 PCIe Connector 7 / SATA Connector 0
24 PCIe Connector 6
25 PCIe Connector 5
26 PCIe Connector 4
27 PCIe Connector 3
28 PCIe Connector 2
29 PCIe Connector 1
30 Fan Board Sideband Connector
31 Fan Board Power Connector
32 Internal RAID Power Connector
33 Pump Connector
34 Power Supply 1 Connector
35 BP Power Connector
36 Power Supply 2 Connector
37 GPU/7mm/Rear BP Power Connector
38 Riser 2 Slot
39 Intrusion Switch Connector (Reserved)
40 M.2/7mm BP Signal Connector
41 Override Power-on Password Switch
Off: Default
On: Override Power-on Password
42 Clear CMOS Switch
Off: Default
On: Clear CMOS
43 Fan Board Power Connector
44 Fan Board Sideband Connector
45 Fan 1-7 Connectors
46 Intrusion Switch Connector
47 Lift Handle

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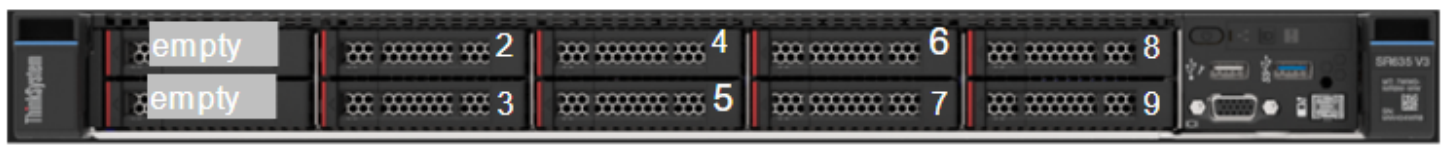
# SR635 V3 LACM configuration limitations

When equipped with the LACM, the SR635 V3 supports CPUs with a TDP of over 320 W. It also supports the following drive configurations:

- 10 2.5-inch SAS/SATA
- Six 2.5-inch SAS/SATA and four AnyBay
- Eight 2.5-inch SAS/SATA
- Four 2.5-inch NVMe
- Four 2.5-inch SAS/SATA
- 10 2.5-inch AnyBay Gen4
- Eight 2.5-inch AnyBay Gen5 (slots 2, 3, 4, 5, 6, 7, 8, 9)

When equipped with the LACM, the SR635 V3 cannot support the following drive configurations:

- 10 2.5-inch AnyBay Gen4 and 10 2.5-inch AnyBay Gen5
- 10 2.5-inch NVMe Gen5
- 16 EDSFF drives
- GPU
- 7 mm drive
- CFF raid adapter
- Rear drive
- M.2
- Supercap location1




Eight 2.5-inch NVMe Gen5

# SR635 V3 LACM configuration limitations table

| Backplane | Front drive support | Limitations |
|---|---|---|
| Six 2.5-inch SAS/SATA + four 2.5-inch AnyBay | Six SAS/SATA drive + four AnyBay | Supported – CPU ≤ 400 W TDP, ambient temp ≤ 30°C<br>Not supported – M.2, rear drive, GPU, CFF RAID adapter |
| | Six SAS/SATA drive + two AnyBay + two NVMe | |
| | 10 2.5-inch SAS/SATA | |
| Eight 2.5-inch SAS/SATA | Eight 2.5-inch SAS/SATA | |
| 10 2.5-inch AnyBay Gen4 | 10 2.5-inch NVMe Gen4 | |
| Eight 2.5-inch AnyBay Gen5 | Eight 2.5-inch NVMe Gen4 | |
| Four 2.5-inch backplane (SAS/SATA, NVMe, or AnyBay) | Four 2.5-inch SAS/SATA | Supported – CPU ≤ 400 W TDP, ambient temp ≤ 30°C<br>Not supported – M.2, rear drive, CFF RAID adapter |
| | Four NVMe Gen4 | |
| | Four AnyBay Gen5 | |

# SR635 V3 performance heat sink configuration limitations table

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| Backplane | Front drive support | Limitations |
|---|---|---|
| Four 2.5-inch backplane (SAS/SATA, NVMe, or AnyBay) | Four 2.5-inch SAS/SATA | Supported:<br>CPU ≤ 240 W TDP, ambient temp ≤ 35°C<br>CPU ≤ 300 W TDP, ambient temp ≤ 30°C<br>Supported with three 75 W LP GPUs:<br>CPU ≤ 300 W, ambient temp ≤ 30°C |
| | Four NVMe Gen4 | |
| | Four AnyBay Gen5 | |
| Six 2.5-inch SAS/SATA + four 2.5-inch AnyBay | Six SAS/SATA + four AnyBay | Supported with no rear drive:<br>CPU ≤ 240 W TDP, ambient temp ≤ 35°C<br>CPU ≤ 300 W TDP, ambient temp ≤ 30°C<br>Supported with a rear drive:<br>CPU ≤ 240 W TDP, ambient temp ≤ 30°C<br>Supported with three 75 W LP GPUs:<br>CPU ≤ 240 W TDP, ambient temp ≤ 30°C |
| | Six SAS/SATA + two AnyBay + two NVMe | |
| | 10 2.5-inch SAS/SATA | |
| Eight 2.5-inch SAS/SATA | Eight 2.5-inch SAS/SATA | |

# SR635 V3 performance heat sink configuration limitations table

Scroll down for more information

| Backplane | Front drive support | Limitations |
|---|---|---|
| | | |
| 10 2.5-inch AnyBay Gen4 | 10 2.5-inch AnyBay Gen4 | Not supported:<br>SAS/SATA rear driver<br>Supported with no rear drive:<br>CPU ≤ 300 W TDP, ambient temp ≤ 30°C<br>Supported with a rear NVMe:<br>CPU ≤ 240 W TDP, ambient temp ≤ 30°C<br>Supported with three 75 W LP GPUs:<br>CPU ≤ 240 W TDP, ambient temp ≤ 30°C |
| | 10 2.5-inch NVMe Gen4 | |
| | Eight 2.5-inch AnyBay Gen4 | |
| | Eight 2.5-inch NVMe Gen4 | |
| | Eight 2.5-inch U.3 | |
| 10 2.5-inch AnyBay Gen5 | 10 2.5-inch AnyBay Gen5 | |
| | 10 2.5-inch NVMe Gen5 | |
| 16 EDSFF Gen4 | 16 EDSFF E1.S 5.9 mm | Supported:<br>CPU ≤ 300 W TDP, ambient temp ≤ 30°C |