Lenovo Neptune Processor Direct Water Cooling Module

Introducing the DWCM

Lenovo

Major components

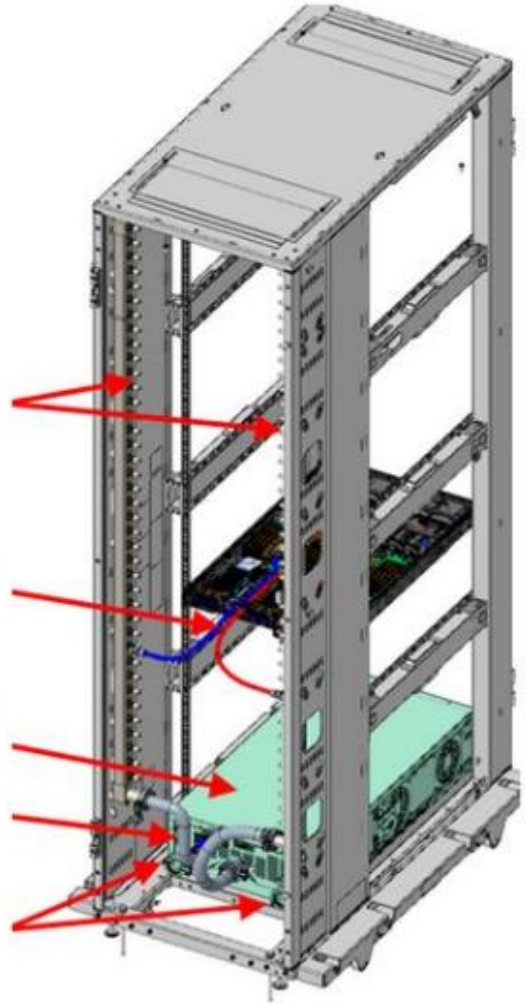
ThinkSystem Neptune DWC 38 Port Rack Manifold (inlet, outlet)

Neptune Processor DWC Module

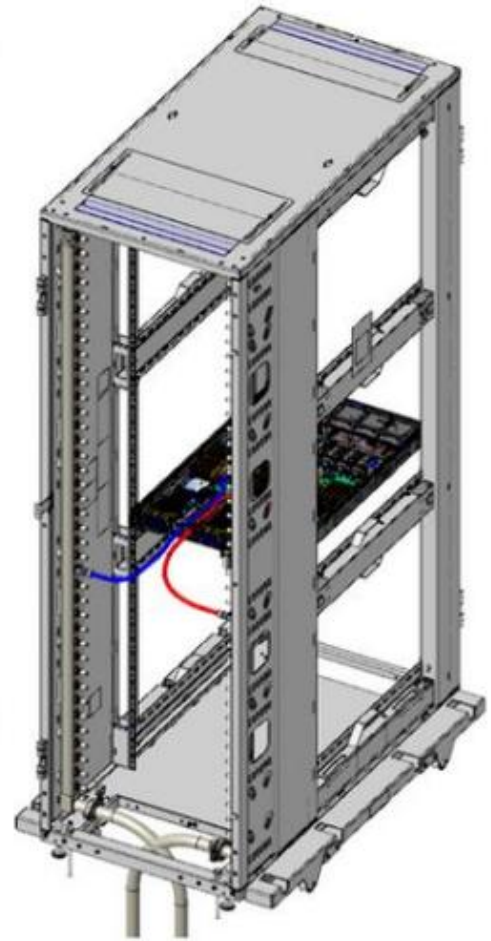
RM100 in-rack Coolant Distribution Unit (CDU)

CDU hoses

Building water supply/return



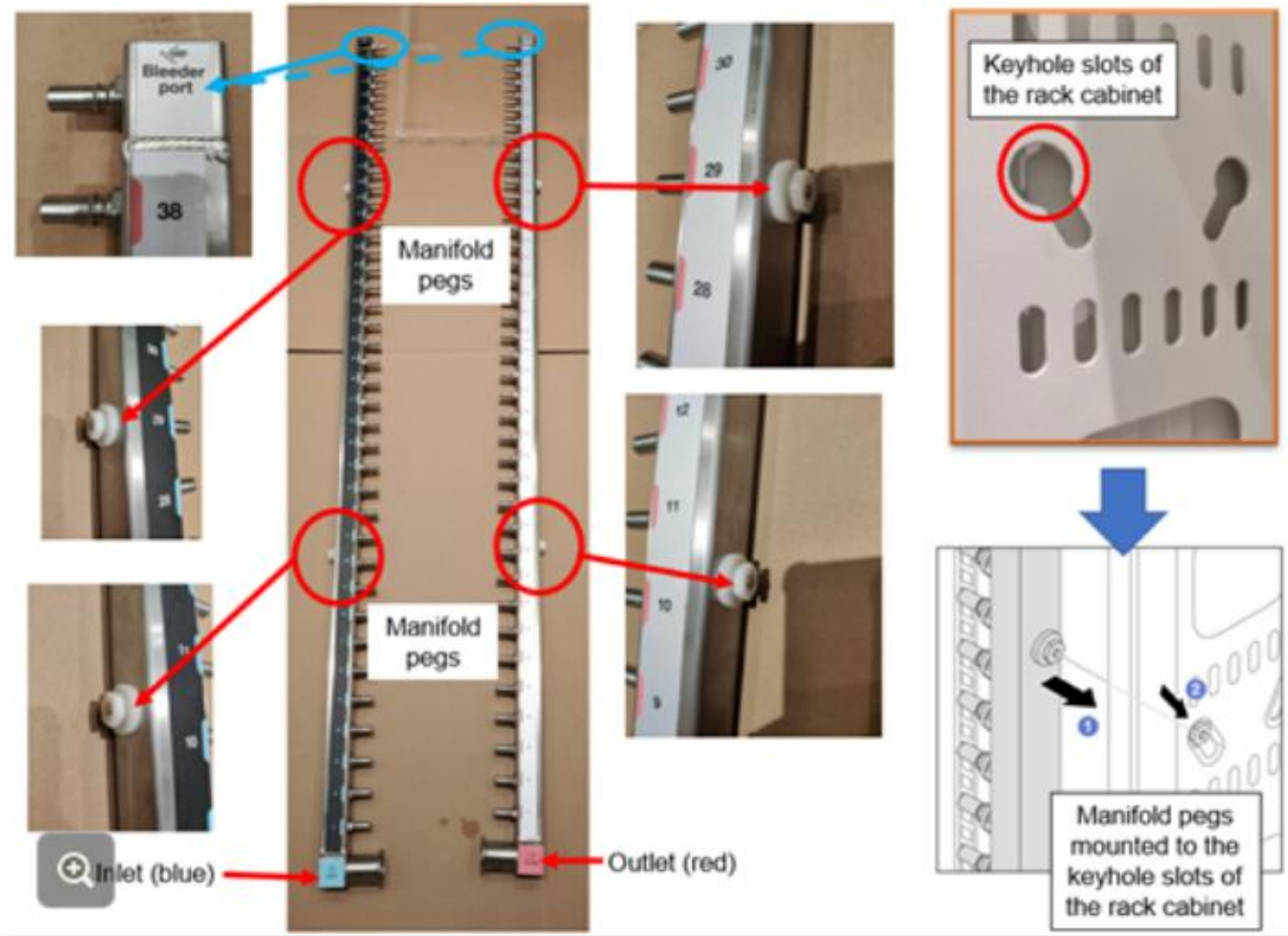
In-rack CDU solution (48U rack shown)



In-row CDU solution (42U rack shown)

ThinkSystem Neptune DWC 38 Port Rack Manifold

The ThinkSystem Neptune DWC 38 Port Rack Manifold is mounted vertically at the rear of the 42U or 48U Heavy Duty Rack Cabinet.
The inlet manifold provides cold coolant, and the outlet manifold receives the heated coolant.
The manifolds have quick-disconnect couplings for each server in the rack.
At the top of each manifold is a bleeder port, which can be connected to a bleeder kit to drain the coolant or push air out of the manifold.



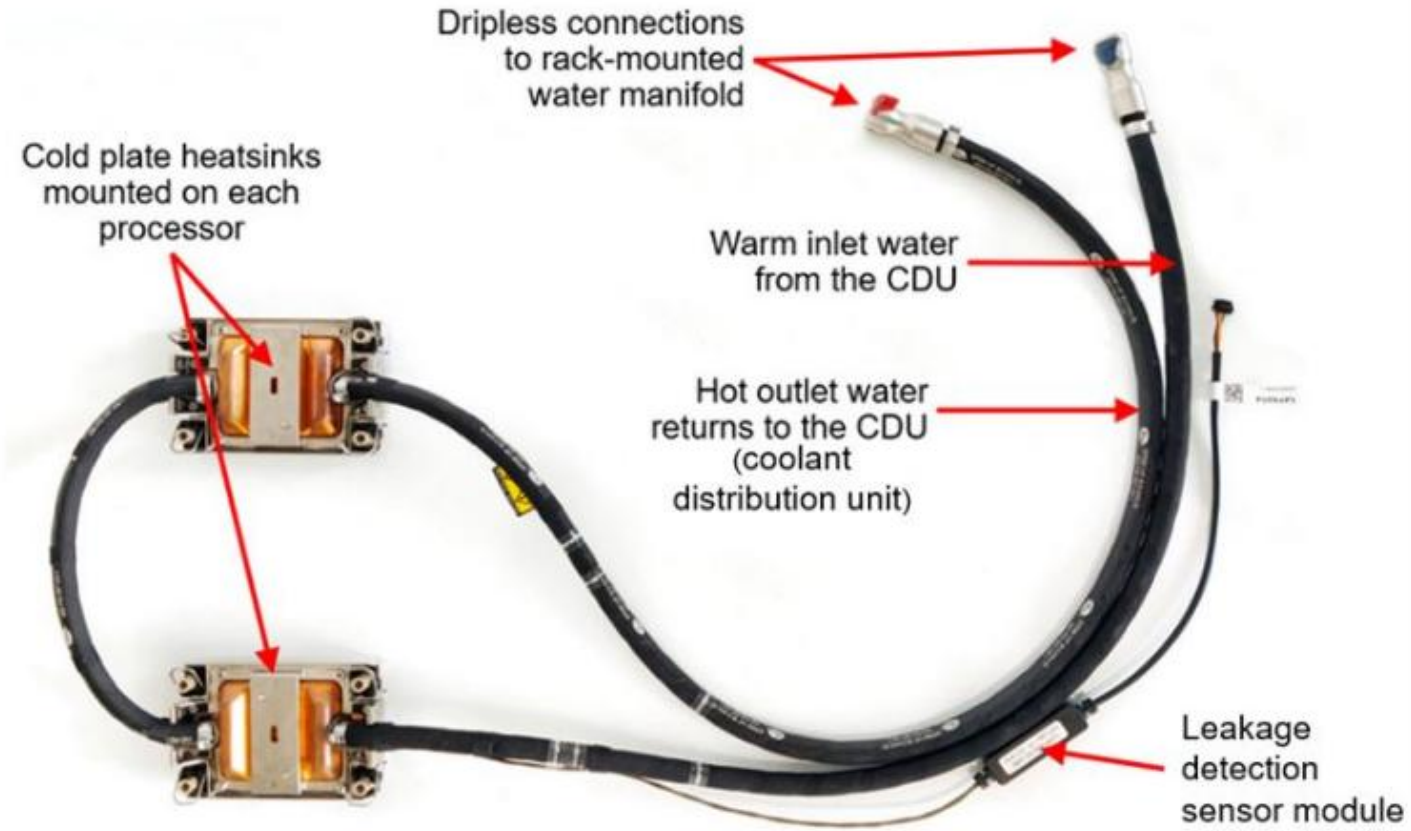
Note: With a rack full of SR650 V3 servers, only up to 19 of the manifold ports will be used.

RM100 in-rack Coolant Distribution Unit

The RM100 in-rack Coolant Distribution Unit (CDU) can provide 100 kW of cooling capacity within the rack cabinet. It is designed as a 4U device to be installed at the bottom of the 42U and 48U Heavy Duty Rack Cabinets. The CDU can be ordered using the CTO process in the configurators using machine type 7DBLCTOLWW and feature code BRL4. Refer to the in-rack CDU Operation and Maintenance Guide for details and exact CDU specifications.

The Direct Water Cooling Module

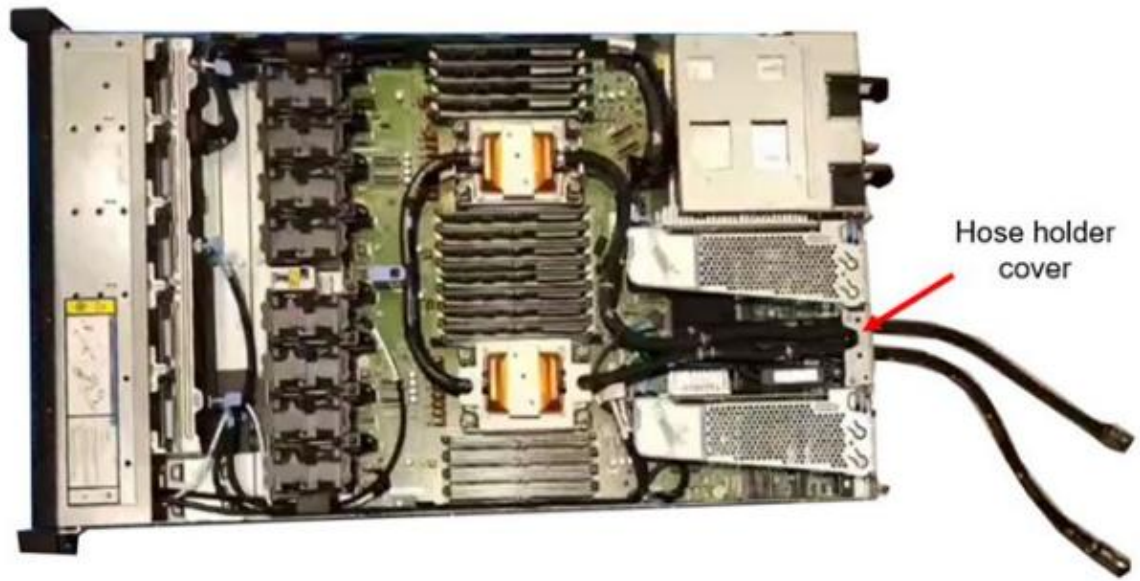
With the DWCM, all heat generated by the processors is removed from the server using water. This means that the server fans and data center air conditioning units only need to remove the heat generated by the other components. This results in lower air conditioning costs and enables the use of slower fans, which means lower overall power consumption.



The DWCM on the SR650 V3 and SR630 V3

The replacement procedures for the DWCM are almost identical on the SR630 V3 and SR650 V3. The only exception is that on the SR650 V3, the DWCM riser cage has to be removed before the module is installed or replaced; on the SR630 V3, the hose holder cover has to be removed.

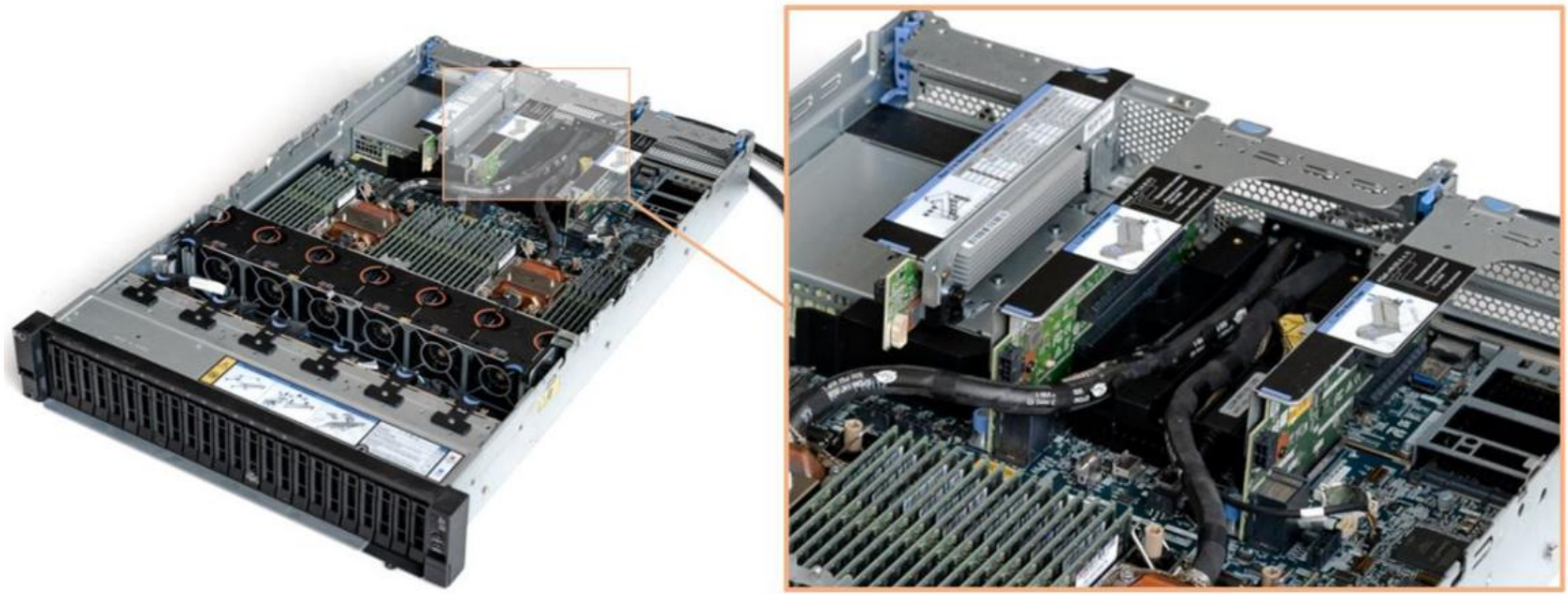
The SR650 V3 with a DWCM



The SR630 V3 with a DWCM

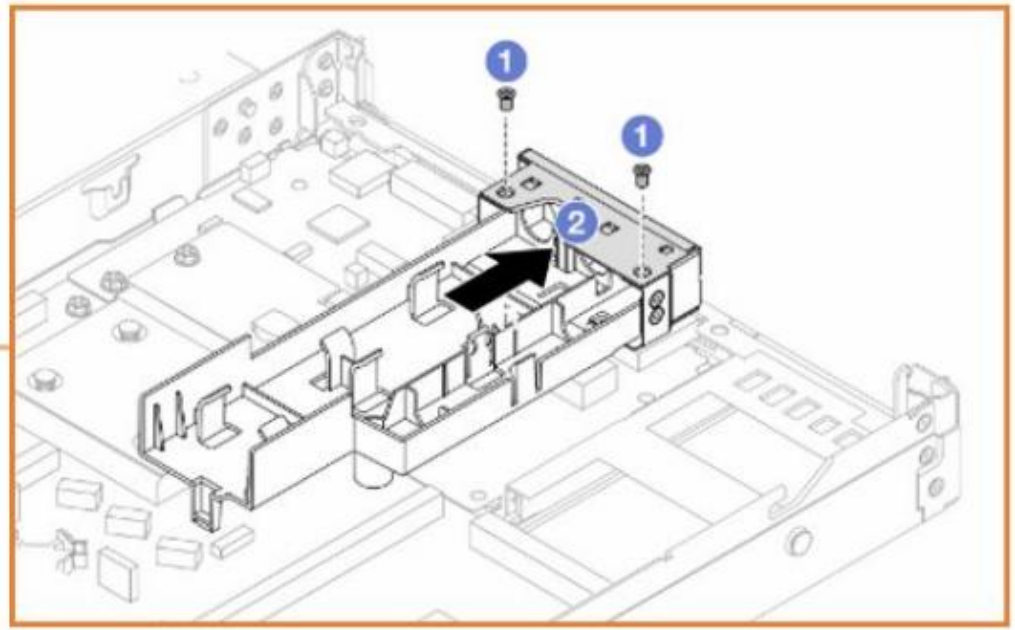
Removing a DWCM riser cage from the SR650 V3

The DWCM riser cage has to be removed from the SR650 V3 before a module is installed or replaced.



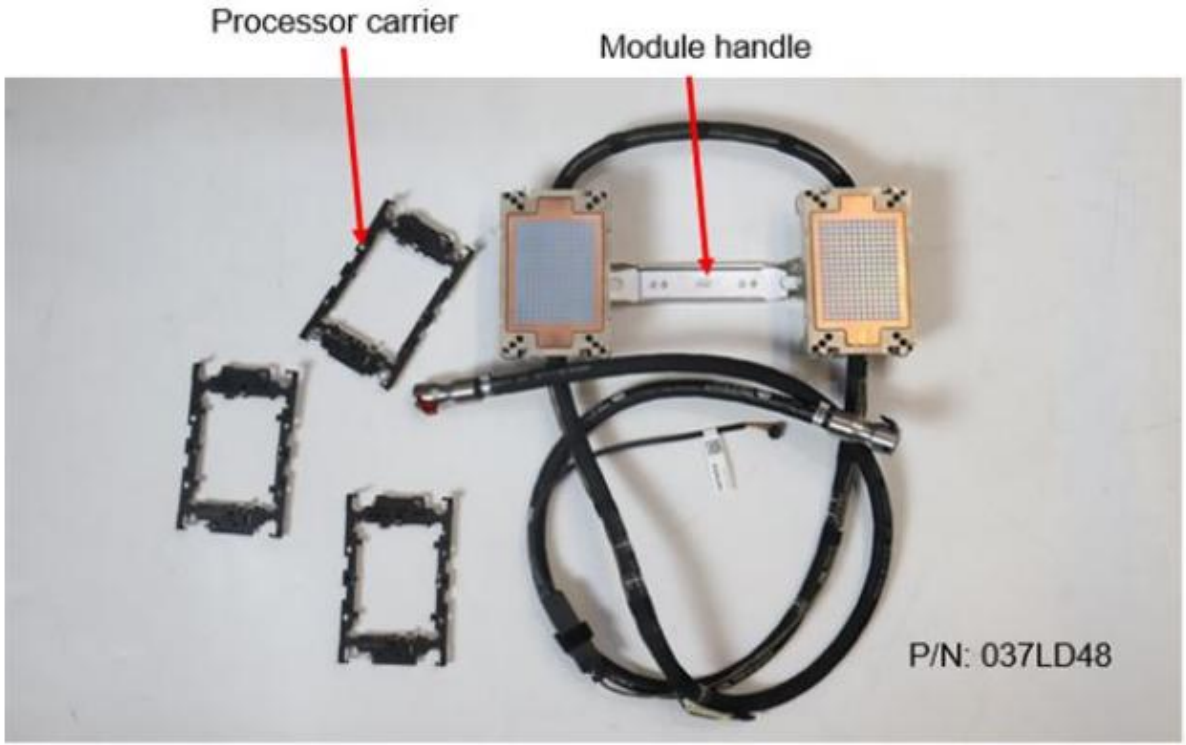
Removing a hose holder cover from the SR630 V3

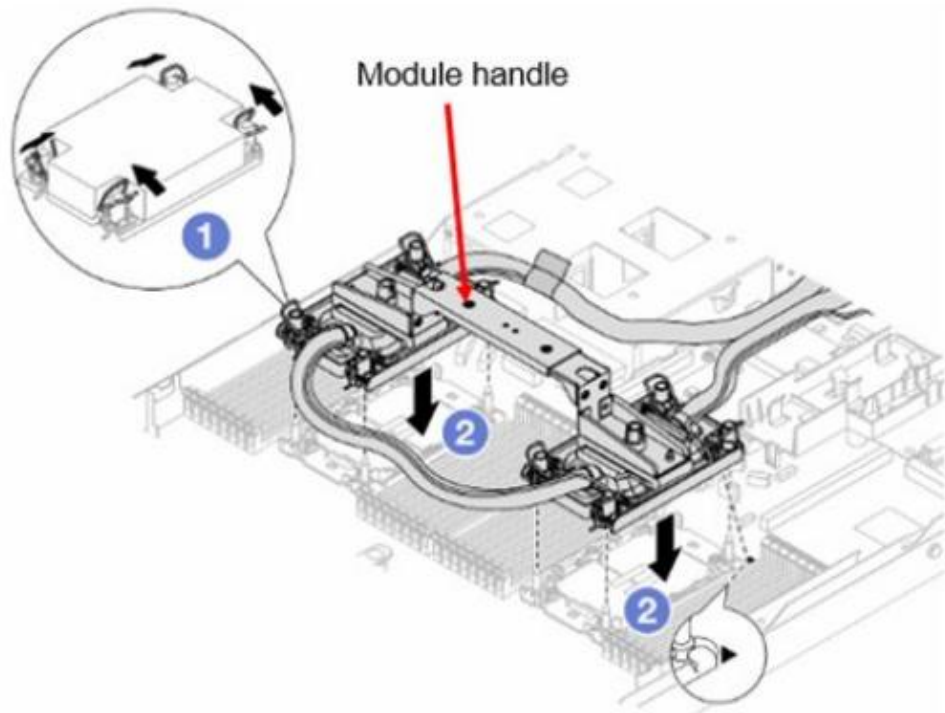
The hose holder cover has to be removed from the SR630 V3 before a module is installed or replaced.



Replacing a DWCM with installed processors

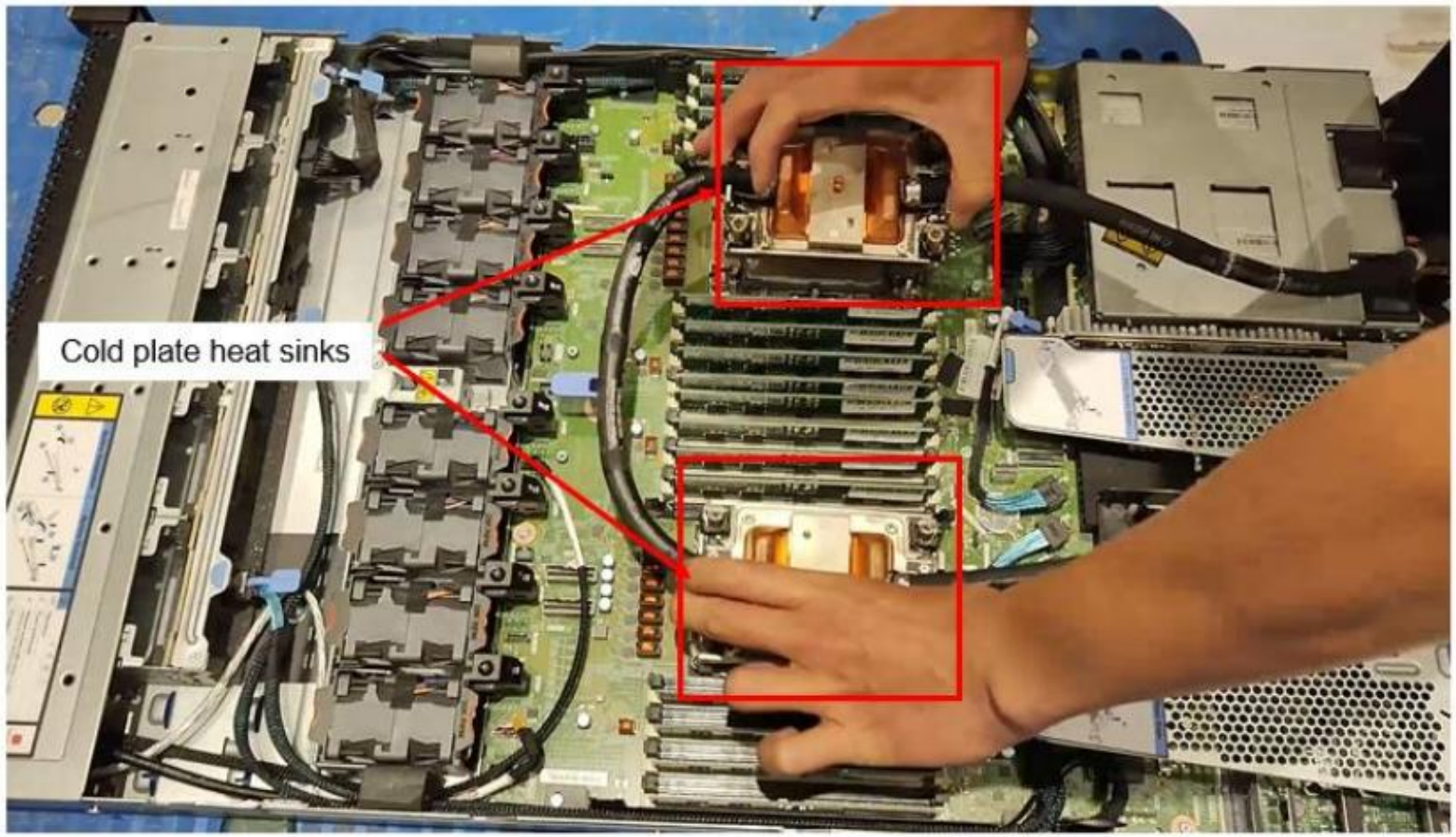
To replace a DWCM, install the existing processors on the new DWCM, and then use the module handle shipped with the new component to move the new DWCM to the processor sockets. Then, fully fasten the Torx T30 nuts on the heat sinks. The torque required to fully tighten the fasteners 0.9 to 1.3 newton-meters or 8 to 12 inch-pounds.





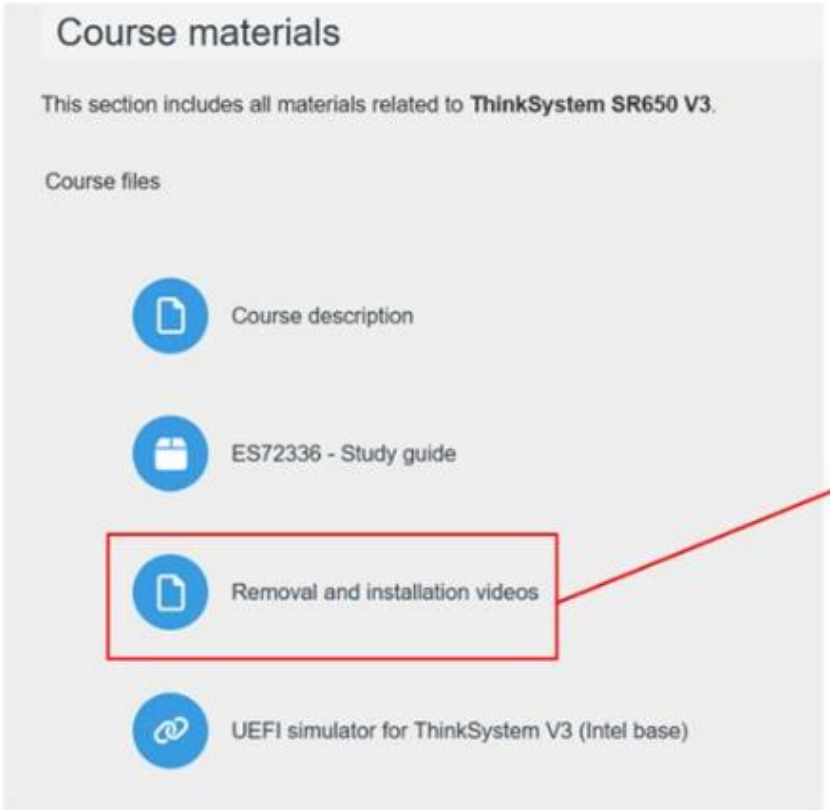
Replacing a processor connected to a DWCM

Install the new processor on the existing DWCM, and then use both hands to hold the cold plate heat sinks and install the DWCM onto the processor socket. Then, fully fasten the Torx T30 nuts on the heat sinks. The torque required to fully tighten the fasteners 0.9 to 1.3 newton-meters or 8 to 12 inch-pounds.



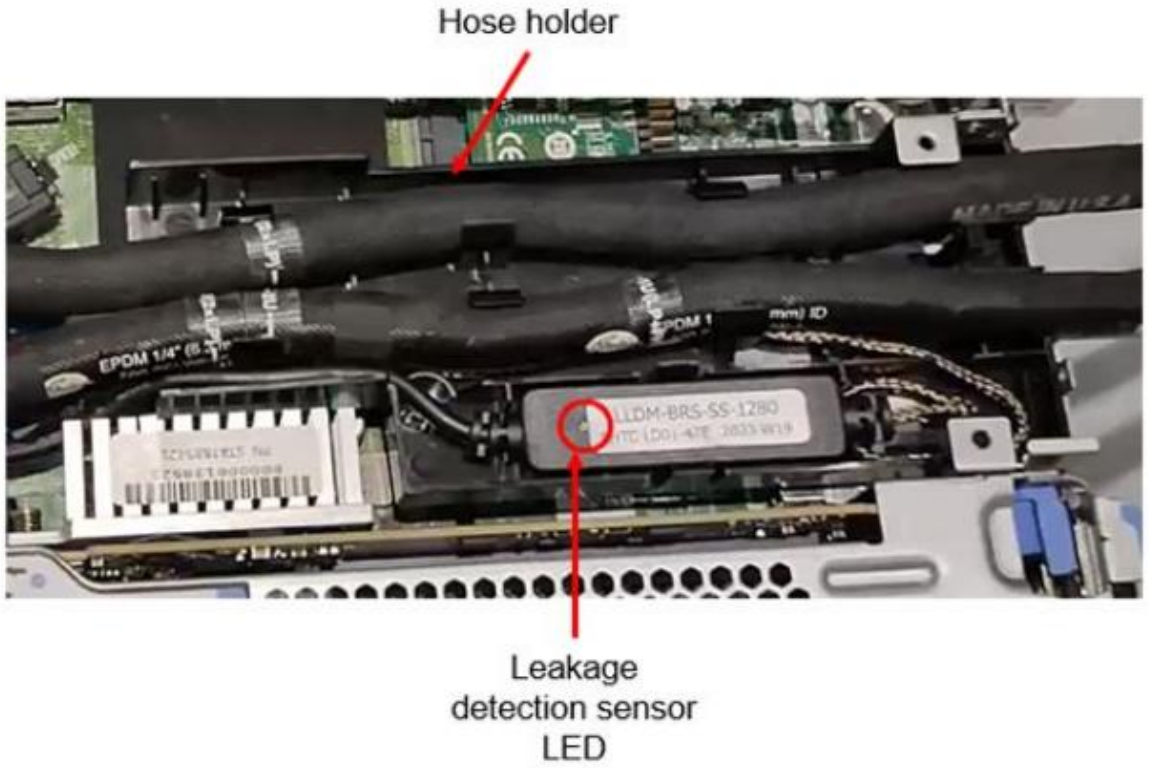
Manifold and DWCM replacement

Refer to the SR650 V3 User guide or the **Removal and installation videos** section on the course landing page for detailed instructions of how to replace the manifold and DWCM.



Leakage detection sensor module

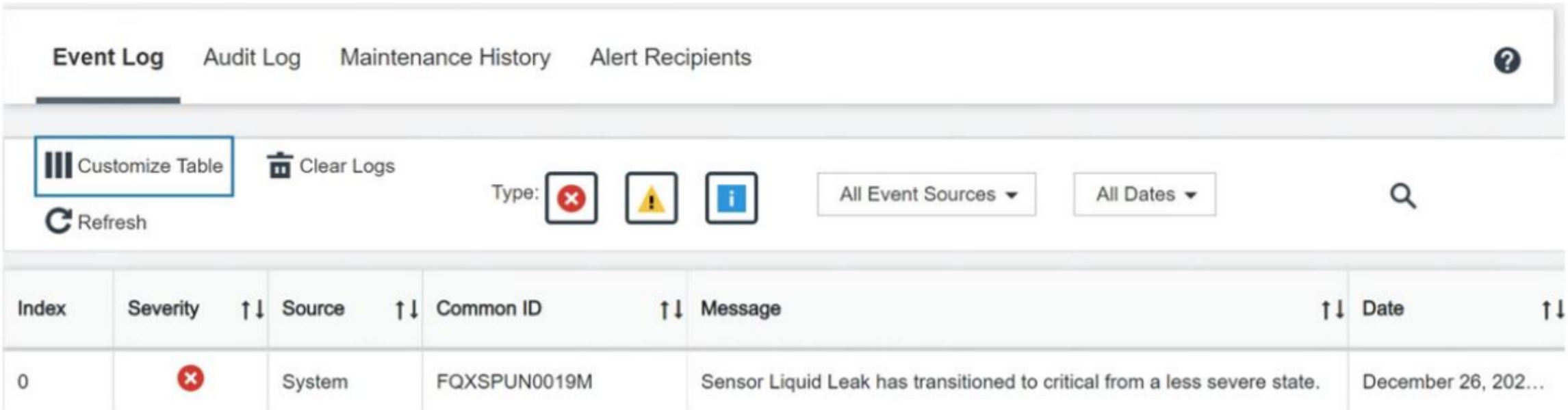
The leakage detection sensor module is used to detect coolant leakages in the system. When the module is installed in the hose holder, the leakage detection sensor LED should face up.



Leakage detection sensor LED		
Status	**Description**	**Action**
Solid green	No coolant leakage detected	No action required
Blinking green	Abnormal status detected	Replace the DWCM

Using XCC to identify a coolant leak

If the amber LED is lit on the front operator panel, check the XCC event log.
If the XCC event has an ID of **FQXSPUN0019M** and a message stating: **Sensor Liquid Leak has transitioned to critical from a less severe state**, it can be identified as a coolant leakage.



Using IPMI commands to identify a coolant leak

If the amber LED is lit on the front operator panel, IPMI commands with a `sel elsit` parameter can be used to check for a coolant leakage status.

```
sysadmin@Dev-Server:~$ ipmitool -C 17 -I lanplus -H 10.132.225.164 -U USERID -P  ********  sel elist
   1 | 12/26/2022 | 10:38:17 | Event Logging Disabled SEL Fullness | Log area reset/cleared | Asserted
   2 | 12/26/2022 | 10:38:22 | Cooling Device Liquid Leak | Transition to Critical from less severe | Asserted
```

This message signifies a cooling device liquid leak