

# Introducing the Intel Optane DC persistent memory module

ES51965

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Lenovo

# Prerequisites

ES41950 – ThinkSystem servers with Intel second-generation Xeon Scalable processors

<https://lenovoedu.lenovo.com/course/view.php?idnumber=ES41950>

ES51757 – Introducing ThinkSystem tools

<https://lenovoedu.lenovo.com/course/view.php?idnumber=ES51757>

# Objectives

After completing the course, you will be able to:

- Describe the features of Intel Optane DC persistent memory modules (DCPMMs)
- Describe the DCPMM operation modes
- Describe the DCPMM population rules
- Describe the DCPMM configuration procedures
- Describe the DCPMM firmware update procedures
- Describe the DCPMM replacement procedures
- Describe the DCPMM problem determination and troubleshooting steps

# DCPMM overview

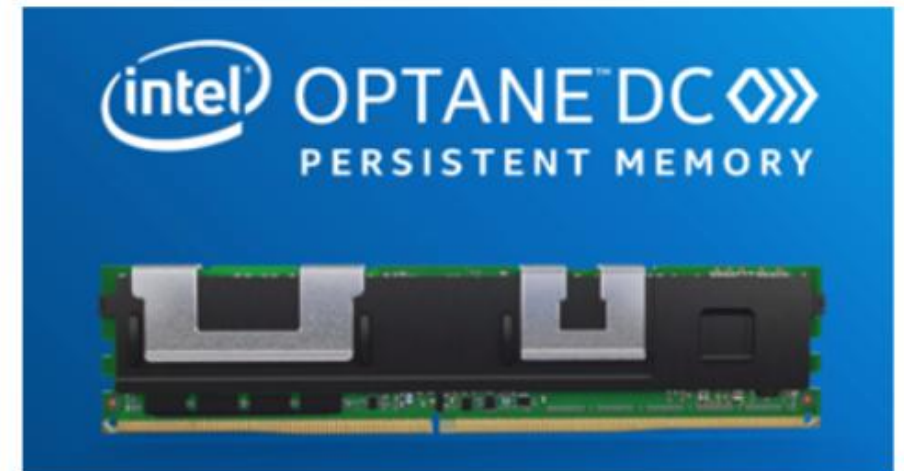
DCPMM features and specifications

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# DCPMM product overview

The DCPMM (now known as PMem) is a new type of memory module powered by Intel. DCPMMs support larger memory capacities (up to 512 GB) than DRAM DIMMs. DCPMMs can be used as traditional DIMMs for memory cache use or as storage devices for data saving use.

DCPMMs support software RAID only; they do not support hardware RAID.



## DCPMM installation requirements

- The host system must be installed with Intel second-generation Xeon Scalable Platinum or Gold series processors.
- DCPMMs support specific OSs. Refer to the DCPMM supported OS list slide for more information.
- Make sure the firmware for each DCPMM in a system is updated to the same level.
- Make sure the firmware for each DRAM DIMM in a system is updated to the same level.
- A DCPMM cannot work without a DRAM DIMM being installed.
- All installed DCPMMs must be of the same Lenovo part number.
- All installed DRAM DIMMs must be of the same type, rank, and capacity, and the minimum capacity must be at least 16 GB. It is recommended that Lenovo DRAM DIMMs of the same part number are used.
- Install DCPMMs in the normal DIMM slots. Refer to each system's Setup Guide – DCPMM installation order section for details of DCPMM population rules.

# ThinkSystem support for DCPMMs

High-End

SR950

SR850  
SR860

Rack

SR650  
SR630  
SR590  
SR570

Blade

SN550  
SN850

High-Density

SD530

SD650

Wave 1 launch  
(April 2019)

Wave 2 launch  
(June 2019)

**Note:** The ST550, SR530, and SR550 do not support DCPMMs.

## OS support

The DCPMM supports the following OSs:

- Linux
  - RHEL 7.6
  - SLES 12.4
  - SLES 15
- Microsoft
  - Windows 2019
- ESXi
  - ESXi 6.7u1

Each OS supports native DCPMM drivers.  
Users do not need to install additional drivers  
for DCPMMs.



## DCPMM exterior features

Click each number to see more information about DCPMMs.

DCPMMs support the following capacities:

- 128 GB
- 256 GB
- 512 GB

DCPMMs are pre-fitted with a full DIMM heat spreader (FHDS) (this is the black shell on a DCPMM). Do not disengage the FHDS from a DCPMM.



DCPMMs can be installed in traditional DIMM slots. Follow the memory installation order in the system's Setup Guide to install DCPMMs in the system board's DIMM slots.

## DCPMM operating modes

DCPMMs support the following operating modes. Click the buttons to see details of each operating mode.

App Direct mode

Memory mode

Mixed Memory mode

### App Direct mode

- In this mode, DCPMMs act as independent and persistent memory resources directly accessible by specific applications, and DRAM DIMMs act as system memory. In this mode, the total displayed system memory in UEFI is the plus of total DCPMM capacity and DRAM DIMMs capacity.
- In this mode, 0% of the DCPMMs act as the system memory.
- In App Direct mode, the installed DRAM DIMMs can be configured to mirror mode.
- When only one DCPMM is installed for each processor, only non-interleaved App Direct mode is supported.

### Note:

- ThinkSystem SN550 and SN850 support memory mode only.
- All three modes support independent mode.

# DCPMM operating modes

DCPMMs support the following operating modes. Click the buttons to see details of each operating mode.

App Direct mode

Memory mode

Mixed Memory mode

## Memory mode

- In this mode, DCPMMs act as volatile system memory, and DRAM DIMMs act as cache.
- In this mode, only DCPMM capacity is displayed as system memory.
- In this mode, 100% of DCPMM memory acts as system memory.

## Note:

- ThinkSystem SN550 and SN850 support memory mode only.
- All three modes support independent mode.

# DCPMM operating modes

DCPMMs support the following operating modes. Click the buttons to see details of each operating mode.

App Direct mode

Memory mode

Mixed Memory mode

## Mixed Memory mode

- In this mode, a percentage of DCPMM capacity is directly accessible to specific applications (App Direct), and the rest serves as system memory.
- In this mode, 1-99% of DCPMM memory acts as system memory.
- In this mode, the total displayed system memory in UEFI is the sum of DCPMM capacity (App Direct mode part plus Memory mode part).

## Note:

- ThinkSystem SN550 and SN850 support memory mode only.
- All three modes support independent mode.