Memory Configurator

Lenovo ThinkStation P7

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Overview

ThinkStation P7 is a single processor, 39L tower added to the Lenovo workstation portfolio in the spring of 2023. This document describes the P7 memory subsystem architecture and provides configuration guidelines to help you obtain optimal system performance.

Section 1 – Platform Memory Architecture

ThinkStation P7 is powered by the Intel 4th generation Xeon Sapphire Rapids-WS CPUs and supports DDR5 memory. All P7 models have the following memory specifications:

Channels	8 channels, DDR5, 1 DIMM per Channel (DPC)
Slots	8 slots, supporting DDR 4800 MHz speed
Controllers	4 memory controllers
Type	DDR5-4800 ECC RDIMM DDR5-4800 ECC 3DS-RDIMM
Speed	Up to 4800MHz*
Qualified DIMM Sizes	16GB, 32GB, 64GB RDIMM / 128GB 3DS-RDIMM
Max System Memory	Up to 1TB maximum

Note: All qualified memory is capable of 4800MHz speed, but may be limited to 4400MHz by CPU memory support capability

Section 2 – Physical Memory Layout

The diagram below (*Figure 1*) shows a high level representation of the physical memory slot layout on the P7 motherboard.

Figure 1 – DIMM slot layout

DIMM 8
DIMM 7
DIMM 6
DIMM 5

CPU

Front of System

DIMM 4
DIMM 3
DIMM 2
DIMM 1
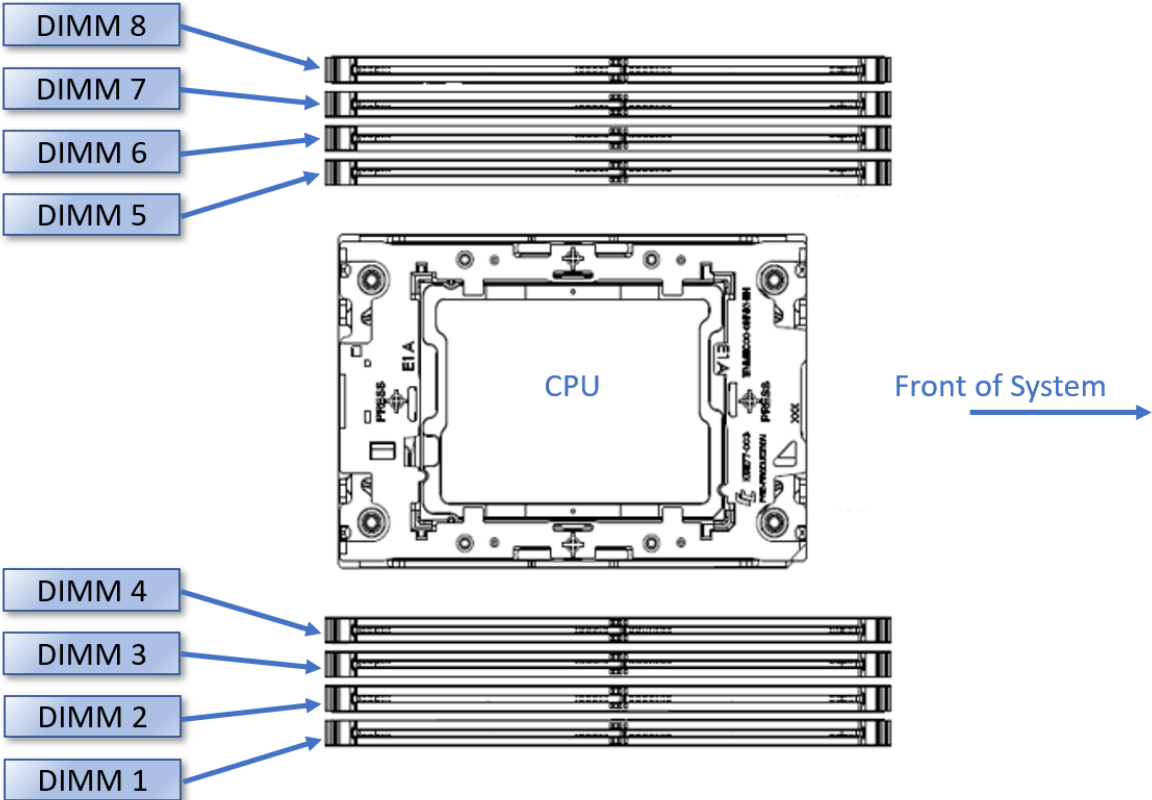
Every P7 ships with an active cooling system for each memory bank. The DIMM cooling system consists of a 40mm fan/baffle kit that fully surrounds the memory bank and latches into place on the motherboard. The fans are then plugged into 4-pin headers located between the memory banks and the front of the system. A picture of the memory cooling system is shown in *Figure 2* below.

Figure 2 – DIMM cooling system
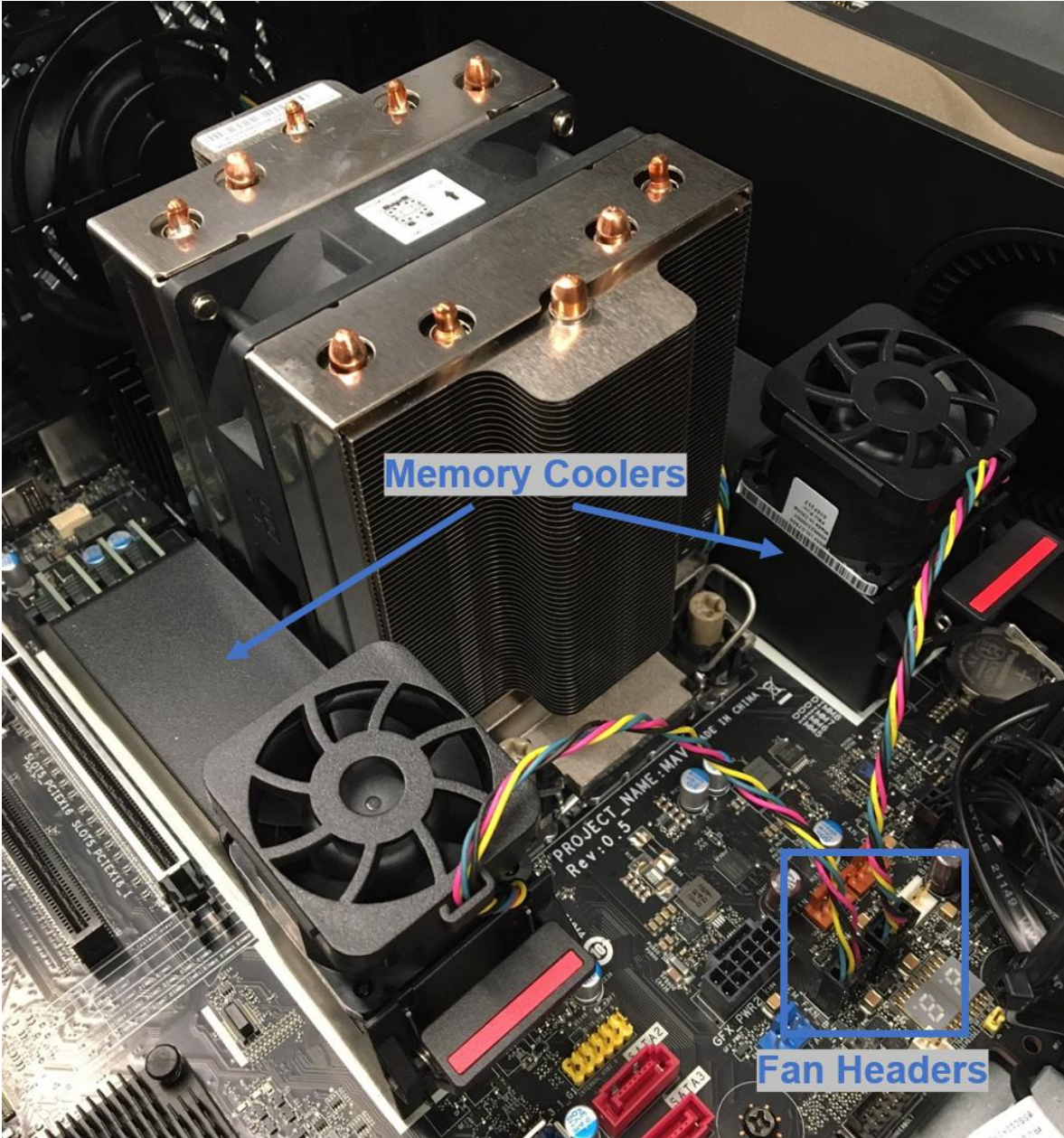
Section 3 – Memory Slot Fill Order

The best way to optimize P7 system memory performance is to populate all memory DIMM slots with the same size and type of memory. However, this may not be practical in your particular implementation. Lenovo recommends following the slot fill order rules below to ensure optimal memory performance for all possible memory configurations.

Table 1 – Memory Slot Install Order

# of DIMMs	DIMM Slot Install Order
1 DIMM	DIMM 4
2 DIMMs	DIMM 4, 7
3 DIMMs	Not Supported[1]
4 DIMMs	DIMM 2, 4, 5, 7
5 DIMMs	Not Supported[1]
6 DIMMs	DIMM 1, 2, 4, 5, 6, 7
7 DIMMs	Not Supported[1]
8 DIMMs	DIMM 1, 2, 3, 4, 5, 6, 7, 8

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[1] Configurations with an odd total number of DIMMs greater than 1 can adversely affect performance and are therefore not supported.

Section 4 – Memory Configuration Notes

The following guidelines are recommended by Lenovo for obtaining the best memory bandwidth from the ThinkStation P7 platform.

- Single Rank and Dual Rank DIMMs cannot be mixed

- 3DS-RDIMMs cannot be mixed with RDIMMs

- ECC and non-ECC UDIMMs are <u>not</u> supported

- DIMMs should be of the same type and capacity

- Lenovo recommends populating every DIMM slot for optimal memory performance

Revision History

Version	Date	Author	Changes/Updates
1.0	4/26/2023	Jim P	Initial Version