HP Z420 Memory Configurations and Optimization

The purpose of this document is to provide an overview of the memory configuration for the HP Z420 Workstation and to provide recommendations to optimize performance.

Supported memory modules[1]

Types of memory supported on a HP Z420 are:

- 2 GB, 4 GB and 8 GB PC3-12800E 1600MHz DDR3 Unbuffered ECC DIMMs
- 1.35V and 1.5V DIMMs are supported, but the system will operate the DIMMs, safely, at 1.5V only.
- 2 Gb and 4 Gb based DIMMs are supported.

See the Memory Technology White Paper for additional technical information.

Platform capabilities

Maximum capacity: 64 GB

Total of 8 memory sockets

- 4 channels with 2 sockets per channel

Speed

- 1600 MHz, 1333 MHz and 1066 MHz DIMMs are supported
- Memory will operate at the speed of the slowest rated installed processor or DIMM

Dynamic power saving is enabled.

Memory features

ECC is supported on all of our supported DIMMs.

- Single-bit errors are automatically corrected.
- Multi-bit errors are detected and will cause the system to immediately reboot and halt with an F1 prompt error message.

Non-ECC memory does not detect or correct single-bit or multi-bit errors which can cause instability, or corruption of data, in the platform. See the Memory Technology White Paper for additional technical information.

Optimize performance

Generally, maximum memory performance is achieved by evenly distributing total desired memory capacity across all operational channels. Proper individual DIMM capacity selection is essential to maximizing performance. Refer to the Optimal Memory Configuration table on page 2 (figure 1) for more information.

Figure 1

Optimal memory configurations for HP Z420

(Note: The following table does not include all available factory installed configurations)

Total Capacity	DIMM1	DIMM2	DIMM3	DIMM4	DIMM5	DIMM6	DIMM7	DIMM8	Rating
2 GB*	2 GB								Fair
4 GB*	2 GB							2 GB	Good
6 GB	2 GB		2 GB					2 GB	Better
8 GB	2 GB		2 GB			2 GB		2 GB	Best
8 GB~	4 GB							4 GB	Good
12 GB~	2 GB	2 GB	2 GB			2 GB	2 GB	2 GB	Best
	4 GB		2 GB			2 GB		4 GB	
16 GB	2 GB	2 GB	2 GB	2 GB	2 GB	2 GB	2 GB	2 GB	Best
	4 GB		4 GB			4 GB		4 GB	
24 GB~	4 GB	2 GB	4 GB	2 GB	2 GB	4 GB	2 GB	4 GB	Best
32 GB	4 GB	4 GB	4 GB	4 GB	4 GB	4 GB	4 GB	4 GB	Best
	8 GB		8 GB			8 GB		8 GB	
48 GB~	8 GB	4 GB	8 GB	4 GB	4 GB	8 GB	4 GB	8 GB	Best
64 GB	8 GB	8 GB	8 GB	8 GB	8 GB	8 GB	8 GB	8 GB	Best

*   For 32-bit operating systems, there is a memory limit of 4 GB.
~   Although supported, these configurations are not factory installed at this time.

Loading rules

- Each channel includes two DIMM sockets; black and white connector pairs represent a channel. Load all black slots first and then load the white slots.
- Load the memory modules in order of size, starting with the largest module and finishing with the smallest module.
- The DIMMs should be loaded first in the black sockets and then in the white sockets. The DIMMs should be loaded starting with the DIMM furthest from the CPU, with the first DIMM loaded in the socket on the right side of the system
- See diagram below for loading order

Figure 2

Loading order
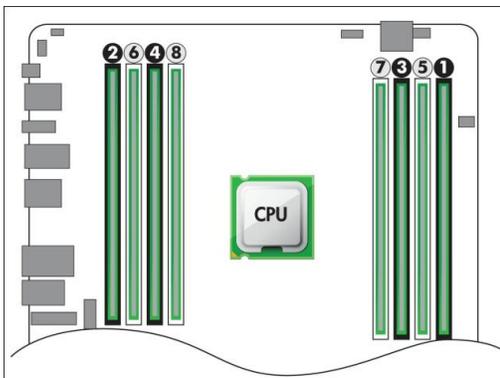
Additional resources

hp.com/go/whitepapers

hp.com/support/Z420_manuals

1 Each processor supports up to 4 channels of DDR3 memory. To realize full performance at least 1 DIMM must be inserted into each channel.