

2nd Generation Intel Xeon Scalable Processors: Balanced Memory Reference Guide

Tech Note by

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Summary

Understanding how to configure balanced memory on a PowerEdge server running Intel® Xeon™ scalable processors (CPUs) is critical for securing high memory bandwidth and low memory access latency.

This tech note explains the required guidelines that must be obeyed to achieve balanced memory, as well as supporting tables and illustrations for visual clarity.

When DIMMs are populated in an unbalanced or near balanced fashion, memory bandwidth can be reduced by up to 33% from its maximum potential. PowerEdge customers seeking maximum memory bandwidth and minimized memory access latency should populate DIMMs in a balanced configuration. Populating memory in accord with the guidelines in this technote will ensure optimized performance.

Guidelines for Balanced Memory

1. Memory modules configured to CPU must have identical properties
 - Identical capacity/size, speed, rank and DIMM type
2. Memory subsystems are identically populated
 - Channels must be fully populated with one or two DIMMs
3. All server sockets should have identical memory configurations

Memory Population Table

DIMMs per CPU	Configuration Type	Recommended (Y/N)
1	Near Balanced	N
2	Near Balanced	N
3	Near Balanced	N
4	Near Balanced	N
5	Unbalanced	N
6	Balanced	Y
7	Unbalanced	N
8	Near Balanced	N
9	Unbalanced	N
10	Unbalanced	N
11	Unbalanced	N
12	Balanced	Y

If you are interested in reading the full white paper on balanced memory, please click [here](#)
If you are interested in further understanding Intel CPU/DIMM supportability, please click [here](#)



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