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Automated DIMM Population Indicator

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Abstract

An Automated DIMM Population Indicator mechanism can be used to guide users to properly populate memory DIMM modules, optimizing performance and reducing service calls.

When server users populate memory DIMM modules into their systems without planning to capitalize on the maximum memory capacity available, they can often be confused by which order to insert their DIMM modules into the system to fulfill the memory population rules. This is due to several variables, such as the number of Processors (which contain the memory controllers) and where the processors were placed on the system boards during design, the number of DIMM sockets designed into the system, and the method in which each processor and DIMM socket location were labelled during the design phases (at least one label for design purposes to define memory channels, and one label designed for service personnel to reference slot locations). As a result, the users may have many different system types on hand with differing population rules and may need to constantly refer to manuals and user guides to verify the DIMM population rules on each system.

Currently, to fulfill memory population rules, labels and user guides are referenced in order to populate DIMM modules on each system in the correct order to allow the processor to have optimized performance balance.

The Proposed Automated DIMM Population Indicator (ADPI) mechanism below illustrates how LEDs can indicate to the user where each additional DIMM module inserted should be populated next. The numbered labelling system on the bottom of the figure is often used for field technicians to report which DIMM memory slot is experiencing issues when in the field, this might confuse users who may assume the numbering indicates the order in which the DIMMS should be populated into the system. The ADPI mechanism eliminates this confusion by clearly indicating the next slot where a DIMM module should be inserted. Figure 1, on the left, shows the location of indicator LEDs. The right diagram of Figure 1 shows how a programmable controller uses pre-defined memory population rules and DIMM presence pins to determine the location of the DIMM that the user should populate next.

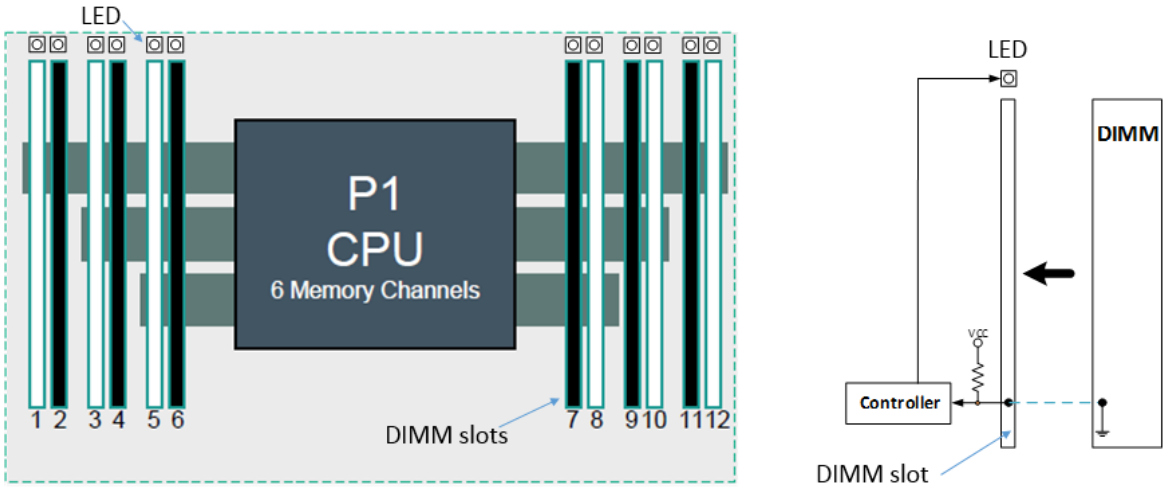

FIGURE 1

Figure 2 shows an example based on a typical Memory population rule. The first 3 figures show the sequence for inserting DIMM modules one by one, where solid green LEDs indicate the next DIMM module to be inserted. In the case of inserting 4 DIMM modules, the DIMMs are recommended to be placed where they provide balance in the system. The bottom right figure shows how a blinking green LED would indicate where a populated DIMM module should be removed while simultaneously illuminating solid green on the next DIMM socket to be populated next to meet the DIMM balancing rules. The memory population rule highlighted previously was used only as an reference, designers can design their own rules into the controller.

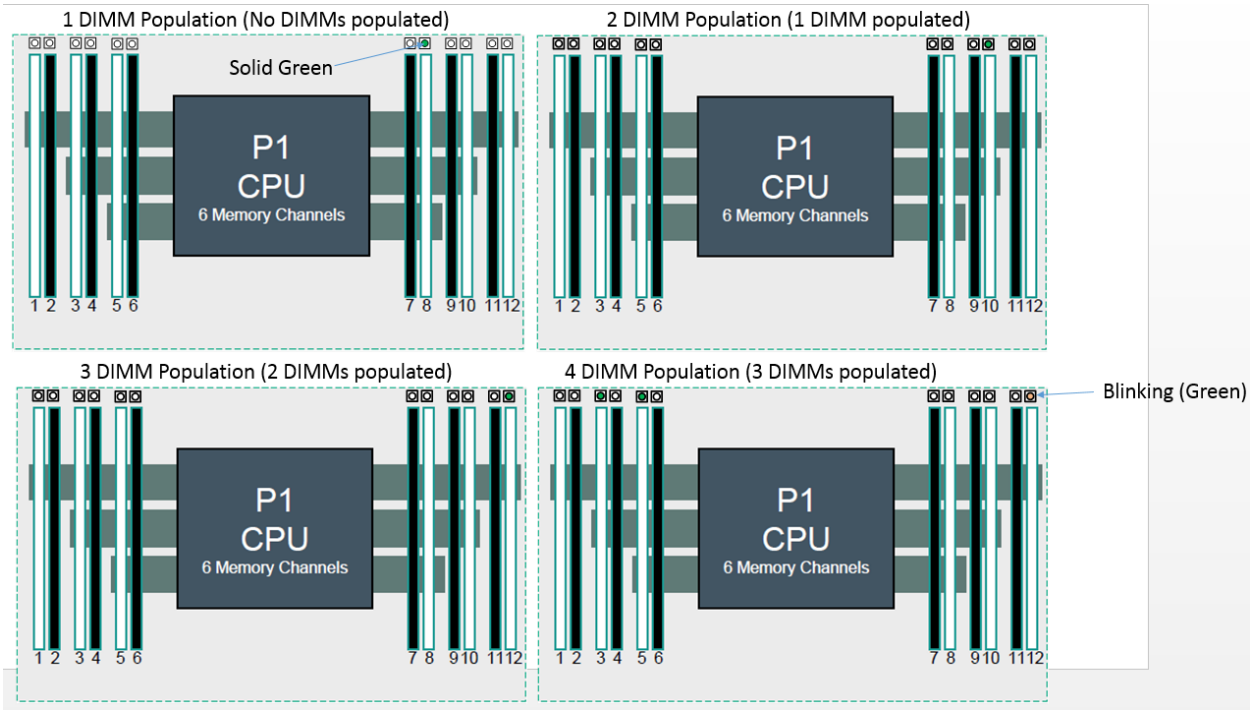

FIGURE 2

Utilizing the Automated DIMM Population Indicator provides the following benefits for users:

a. LEDs guide clearly guide memory DIMM module population rules without the user needing to access labels and user guides.
b. Reduces confusion on populating DIMM modules and can be utilized on various systems
c. Improve quality metrics based on service calls by reducing/eliminating the need for users to call service centers based on accessing confusing user guides.
d. Performance optimized when proper memory DIMM population rules are enforced.

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