

Application Note

067

System profiles on DXM blade workstations

This application note provides an overview of system profiles on DXM blade workstations.

1. About system profiles

For 12G Dell blade servers, a system profile is a group of BIOS-level tuning parameters. Various profiles are available, with each profile featuring predefined values for the various parameters.

The available system profiles are:

- **Performance Per Watt Optimized (DAPC):** This profile balances system performance with energy efficiency. The *Turbo boost* parameter is enabled, but so are *C States* and *C1E* to conserve power. The *Memory* parameters are set to their basic values. (See the [section 3](#) for parameter descriptions.)
- **Performance Per Watt Optimized (OS):** This profile is the same as the DAPC profile, except for the *CPU Power Management* parameter, which passes power management to the operating system.
- **Performance Optimized:** This system profile focuses on pure performance. *Turbo boost* is enabled; *C States* and *C1E* are disabled.
- **Dense Configuration Optimized:** This system profile is for systems with high DIMM count configurations, where reliability is prioritized over power savings or performance considerations. Performance parameters such as *Turbo boost* are disabled, and *Memory* parameters are prioritized.
- **Custom:** This system profile allows you to specify each parameter individually. It does *not* feature a set of predefined parameters. The Custom system profile is outside the scope of this application note.

2. System profiles in DXM blade workstations

By default, Dell M series blades are configured to use the **Performance Per Watt Optimized (DAPC)** system profile.

However, our experience in the field indicates that the **Performance Per Watt Optimized (OS)** system profile delivers the best performance. We therefore configure Amulet Hotkey DXM blade workstations to use this system profile.

For optimum performance under the **Performance Per Watt Optimized (OS)** system profile, we also recommend that you select the **High Performance** power plan on individual blades (configurable in the Power Options applet in Windows Control Panel).

3. Key tuning parameters

The key parameters covered by system profiles include:

- **Turbo boost:** This parameter improves performance by increasing the CPU frequency over the base operating frequency. When enabled, Turbo boost is *engaged* only when there is available power headroom and the system is operating below power, current, and temperature specification limits.
- **C States** and **C1E:** These are power saving parameters that allow frequency scaling to individual CPU cores, unlike Demand Based Power Management (DBPM) which operates at the socket level.

- **CPU Power Management:** This parameter determines how the processor power management is controlled. Supported options are:
 - **System DBPM (Demand Based Power Management):** This option passes power management to Dell's Active Power Controller (DAPC). It enables hardware-based control from the iDRAC.
 - **OS DBPM:** This option passes power management to the operating system.
 - **Maximum Performance:** This option maintains full voltage to internal components such as memory and fans, even during periods of inactivity. This option extracts maximum performance, potentially at the expense of higher power consumption.
- **Memory Frequency:** This parameter sets the speed at which the memory operates. This depends on the actual DIMMs used and the system memory configuration.
- **Memory Patrol Scrub:** This parameter determines how often the system memory is checked for errors and correctable errors repaired. Select 'Standard' to run the scrub once every 24 hours. Select 'Extended' to run the scrub every hour.
- **Memory Refresh Rate:** This parameter determines how often the memory is refreshed. The 2x option allows the memory to operate more reliably by refreshing the memory data at twice the normal rate, at the expense of performance.

4. How to select a system profile

To specify the system profile on a DXM blade workstation:

1. Enter System Setup:
 - a. Turn on or restart your system.
 - b. Press <F2> immediately after you see the following message:
<F2> = System Setup
If the OS begins to start up before you press <F2>, allow the system to finish booting. Then restart the system and try again.
2. In the System Setup main screen, select System BIOS.
3. In the System BIOS screen, select System Profile Settings.
4. In the System Profile Settings screen, select the System Profile.

See the *Dell PowerEdge Systems Owners Manuals* for details about selecting a system profile.

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