Hewlett Packard
Enterprise

HPE ProLiant Gen10 Server - Configuring Persistent Memory on HPE ProLiant Gen10

Table of contents

Issue

HPE ProLiant Gen 10 Servers with Persistent Memory and BIOS firmware version 2.30 or later.
Configure Persistent Memory to Balanced Performance Mode on HPE ProLiant Gen10.

Environment

- HPE ProLiant ML350 Gen10 Server
- HPE ProLiant DL360 Gen10 Server
- HPE ProLiant DL380 Gen10 Server
- HPE ProLiant DL560 Gen10 Server
- HPE ProLiant DL560 Gen10 Server

Cause

HPE added a new BIOS/Platform Configuration (RBSU) option to the Intel Persistent DC Performance Settings called Balanced Performance Mode in BIOS firmware version 2.30.

Intel Optane persistent memory 100 series (Intel Optane PMem) coexists with traditional DDR4 DIMMs on the same bus. The memory controller in the 2nd Generation Intel Xeon Scalable processor arbitrates between the memory transactions coming from DRAM and Intel Optane PMem. Different arbitration profiles have been defined to determine the algorithm for when the memory controller switches between DRAM and Intel Optane PMem memory transactions. These profiles are configurable op tions through a persistent memory BIOS setting.

Previously, systems could choose profiles to either optimize DRAM bandwidth or latency. A new BIOS profile called Balanced Profile was dev eloped to optimize Memory Mode performance. The three profiles now available include:

- Bandwidth Optimized Profile arbitrates between DRAM and Intel Optane PMem to maximize DRAM bandwidth on the memory bus.
- Latency Optimized Profile arbitrates between DRAM and Intel Optane PMem to minimize DRAM latency on the memory bus.
- Balanced Profile is optimized for Memory Mode by allowing the controller to switch more often between DRAM and Intel Optane PMem so that eviction transactions in DRAM can execute faster. In Memory Mode, DRAM is used as cache and Intel Optane PMem is used as volatile main memory to deliver DRAM-like performance, depending on the workload.

Resolution

Update BIOS firmware version to 2.30 or later.
Later boot the server to RBSU and perform below setting.
Configuring Persistent Memory
System Utilities only displays this menu if you have installed Persistent Memory.

NOTE: This menu is not available from the F9 boot screen.

Procedure

1. From the **System Utilities** screen, select **System Configuration** > **BIOS/Platform Configuration (RBSU)** > **Memory Options** > **Persistent Memory Options**.

2. Configure options.

• **Persistent Memory Backup Power Policy**—Controls whether the system waits during system boot for batteries to charge if sufficient battery backup power for the installed persistent memory is not available.

◦ **Wait for Backup Power on Boot**—The system waits during boot for batteries to charge.

◦ **Continue Boot without Backup Power**—The system boots even if sufficient battery backup power is not available.

If sufficient battery backup power is not available, the configured memory is not used by the operating system as persistent storage or as system memory.

• **Persistent Memory Integrity Check**

◦ **Enabled**—Persistent memory is checked during system boot to determine data integrity. Depending on the **Persistent Memory Address Range Scrub** setting, discovered errors during the data integrity check are either presented to the operating system for recovery, or cause the persistent memory to be mapped out and unavailable to the operating system.

◦ **Disabled**—Disables data integrity checking. Any persistent memory unable to read data, or that has bad data might cause uncorrectable errors that result a system crash.

• **Persistent Memory Address Range Scrub**

◦ **Enabled**—Enables a supported OS to attempt recovery from an uncorrectable memory error detected in the NVDIMM memory.

◦ **Disabled**—Disables the NVDIMM memory on the next boot after detecting an uncorrectable memory error in the NVDIMM. If the NVDIMM memory **Memory Interleaving** option is enabled, a disabled NVDIMM includes all the modules or regions within the set.

3. Save your setting.

Changing Performance Options using UEFI System Utilities

IMPORTANT: Be sure to observe all pop-up messages displayed in UEFI System Utilities that pertain to persistent memory. Failure to follow the instructions in these messages might cause persistent memory data loss.

IMPORTANT: Always follow recommendations from your software application provider for high-availability best practices to ensure maximum uptime and data protection.

Procedure

1. From the System Utilities screen, select **System Configuration** > **BIOS/Platform Configuration (RBSU)** > **Memory Options** > **Persistent Memory Options** > **PMM Options** > **Performance Options**.

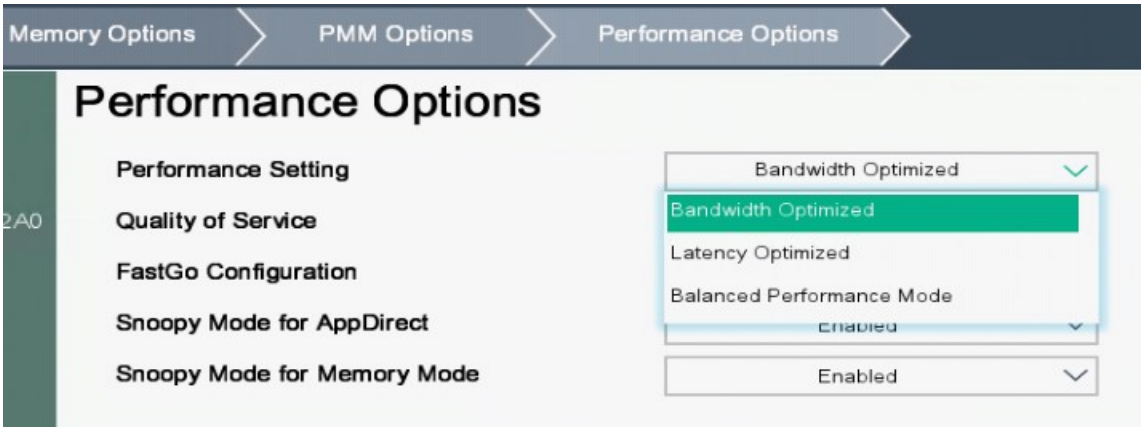
2. Based on your server workload and performance requirements, update the following options:

• **Performance Setting**—Controls the baseline performance setting, depending on the workload behavior:

◦ **Bandwidth Optimized**—Default

◦ **Latency Optimized**

◦ **Balanced Performance Mode**



Below is the snapshot for your reference which was taken from the same model on our testing unit.

• **Quality of Service**—Controls the Quality of Service profiles:

◦ **Disabled**—Default

◦ **Profile 1**—Recommended for four or more HPE Persistent Memory modules per socket.

◦ **Profile 2**—Recommended for two HPE Persistent Memory modules per socket.

◦ **Profile 3**—Recommended for one HPE Persistent Memory module per socket.

• **FastGo Configuration**—Controls optimization of traffic within the processor:
◦ **Auto**—Default
◦ **Enabled**
◦ **Disabled**

• **Snoopy Mode for App Direct**—Enable this option to avoid directory updates to HPE Persistent Memory modules for non-NUMA (non-unif orm memory access) optimized workloads:
◦ **Disabled**—Default
◦ **Enabled**

• **Snoopy Mode for Memory mode**—Enable this option to avoid directory updates to HPE Persistent Memory modules for non-NUMA opti mized workloads:
◦ **Disabled**—Default
◦ **Enabled**

3. To save your changes, press the **F12** key.