Application Note

Configuring Cavium SmartAN for HPE Ethernet 10/25GbE Adapters

Products Supported

Adapter Model	Part Number
HPE Ethernet 10/25Gb 621SFP28 Adapter	867328-B21
HPE Ethernet 10/25Gb 622FLR-SFP28 CNA	867334-B21

1 Introduction

New high-performance adapters from HPE® and Cavium® support 10-Gigabit Ethernet (GbE) and 25GbE bandwidth. Unlike 1GbE/10GbE, there is no standard for autonegotiation when transitioning between the two different speeds. When running at 25GbE (depending on the type of physical connection), additional forward error correction (FEC) may be needed, of which there are two different types that can be implemented. To use 25GbE reliably, both ends of the link must be set correctly for both bandwidth and FEC.

To use these new adapters, network architects must understand the dependencies and make sure the adapter and switch configurations are set appropriately. To address part of this complexity, Cavium has created smart autonegotiation (SmartAN™) technology. This technology, available in the HPE 10/25Gb adapters listed in the *Products Supported* table, eliminates the need for any configuration changes at the host side of the link. With SmartAN enabled, the network administrator only needs to configure the switch for a successful link at 25Gbps speeds.

2 FEC Types

For any device, as the bandwidth increases, there are always more uncorrected bit errors in the data stream. Using FEC reduces the number of these errors.

The 25GbE standards define two different types of error correction: Base-R FEC (also known as Fire Code or FC-FEC) and Reed-Solomon FEC (RS-FEC). When FEC is enabled in any adapter, latency is induced. The penalty (latency) for error correction is as follows:

FC-FEC ~80ns

RS-FEC ~250ns

These latency numbers are not Cavium-specific.

Depending on the application, architects may chose specific cable types to eliminate the need for FEC.

3 SmartAN Operation

When enabled, SmartAN first checks the physical connection type (direct-attach copper (DAC), active optical cable (AOC), or optical transceiver), and then polls the connected link for the supported speed (10Gbps or 25Gbps). Once enabled, no other configuration changes are required on the host side of a connection to establish reliable network link status.

SmartAN can be enabled on the HPE Ethernet 10/25Gb 621SFP28 and 622FLR-SFP28 adapters using the human interface infrastructure (HII) setup utilities on HPE ProLiant® Gen9 and Gen10 servers (DL, ML, Apollo). See Section 4 for instructions.

For 25GbE connections, if link is not established with SmartAN enabled, troubleshooting can be focused on the switch port settings and configuration. Once the switch port settings are properly configured to meet the 25GbE standards, the link will be established. The 25GbE requirements (per IEEE) are based on connection type, a shown in Table 3-1.

Table 3-1. 25GbE Connection Requirements

Cabling Connection Type	25GbE FEC Setting
1-meter DAC	No FEC required
2-meter DAC	FC-FEC required
3-meter DAC	RS-FEC required
AOC	RS-FEC required
25G SFP28 SR-optics	RS-FEC required

Best practice for 25GbE connectivity with most applications is to set the 25Gb Ethernet switch port to RS-FEC, which works with any cabling connection type.

For latency-sensitive applications like High Frequency Trading, a cabling approach that requires no FEC (for example, 1-meter DAC) should be considered.

For more details, see the Cavium SmartAN™ Technology Brief.

4 Enabling SmartAN on HPE ProLiant, Apollo Gen10 Servers

To enable SmartAN on your HPE Ethernet 10/25Gb adapters from Cavium:

1. Power-on or reboot the server.
2. When prompted, select **F9** to enter System Utilities.
3. Select **System Configuration** (Figure 4-1).

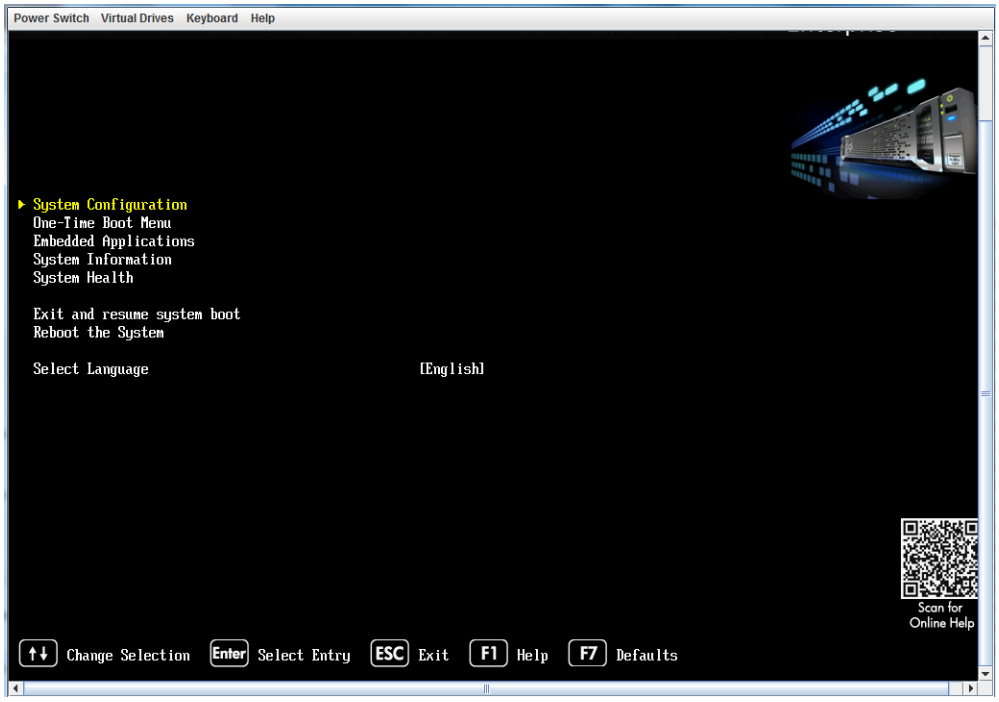

Figure 4-1. System Configuration

4. Select the port of the adapter on which you want to enable SmartAN. Figure 4-2 shows an example.

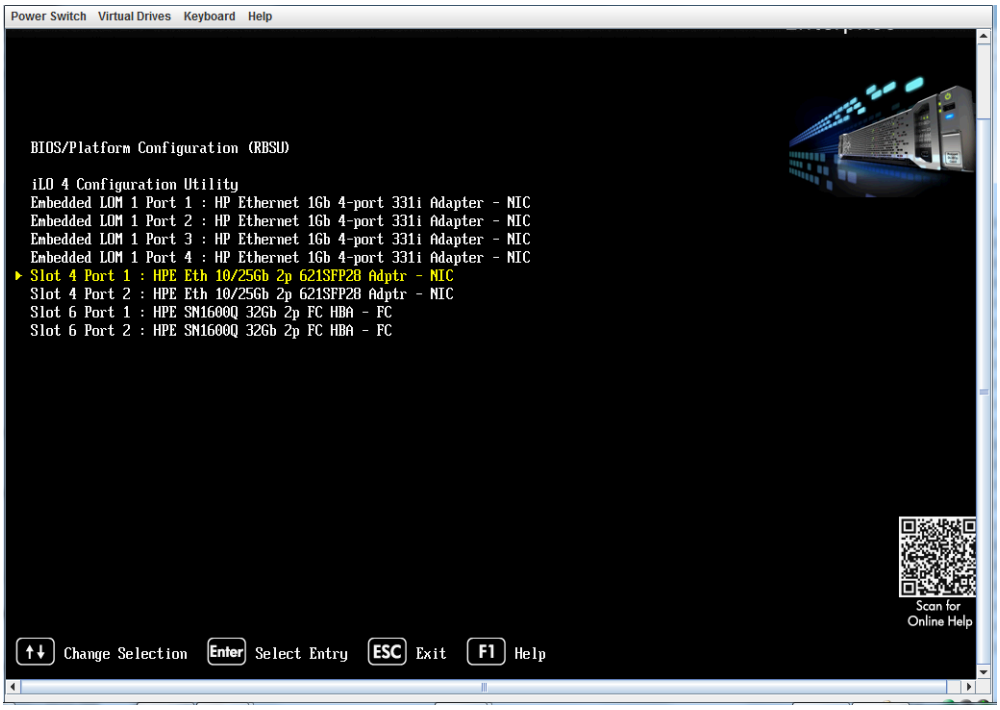

Figure 4-2. Adapter Port Selection

5. From the Main Configuration Page, select **Port Level Configuration** (Figure 4-3).

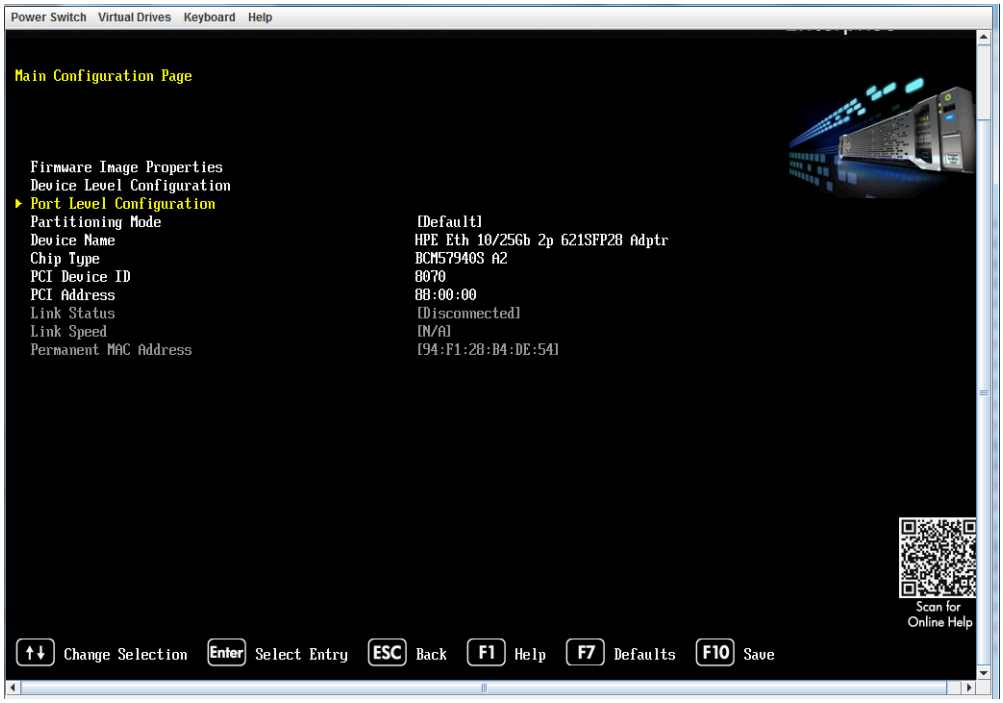

Figure 4-3. Port Level Configuration

6. From the Port Level Configuration page, select **Link Speed**, and then select **SmartAN** (Figure 4-4).

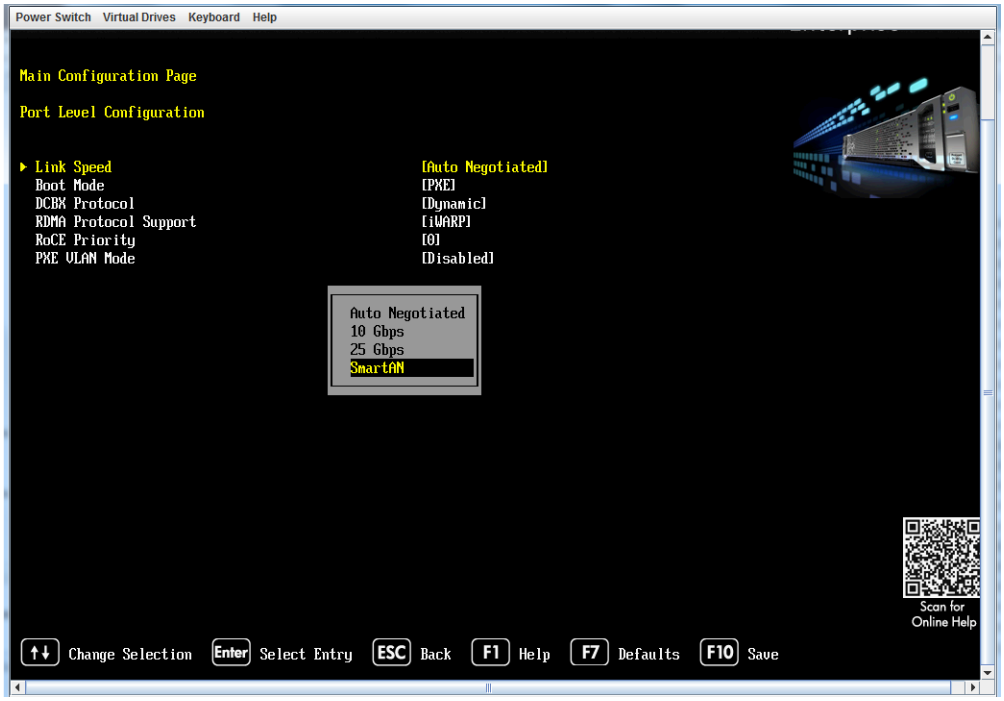

Figure 4-4. Link Speed Selection

7. Verify that the Link Speed is **SmartAN** (Figure 4-5).

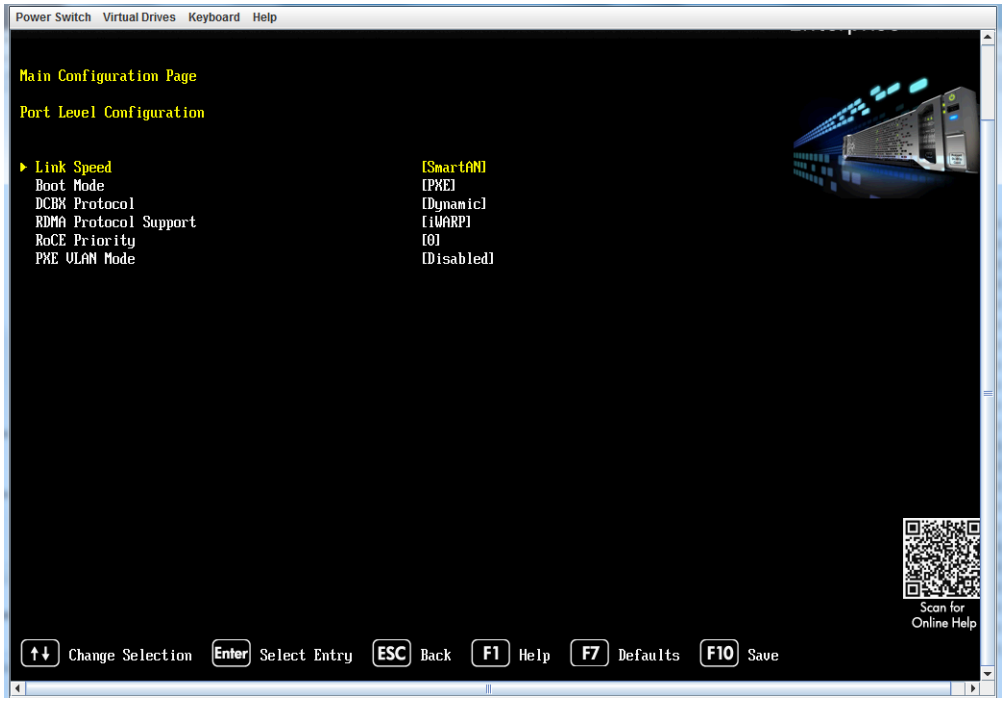

Figure 4-5. SmartAN Link Speed Verification

8. Press **F10** to save the configuration changes, and then press ESC return to the System Utilities page (Step 3).
9. Do one of the following:
   - ❑ Repeat Steps 4 though 8 for each port for which you want to enable SmartAN.
   - ❑ Press **ESC** to exit and continue the server boot process.

Document Revision History
Revision A, April 27 2018
Changes
Initial release of new application note.

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