Technical white paper

Enable End to End Encryption feature for HP Access Control Pull Print

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Overview

HP Access Control (HP AC) provides end-to-end encryption through a combination of **Encryption at rest** and **Encryption in transit**. When **Encryption at rest** is enabled, print jobs stored on the HP AC pull print server are encrypted.

When **Encryption in transit** is enabled, print jobs are transmitted through an encrypted communication channel between the user PC and pull print server and between the pull print server and the destination printer or MFP via IPPS.

Enable **Encryption at rest** to encrypt print jobs using AES 256 while the jobs are on the HP Access Control server.

When the printing protocol TCPIP/IPPS is set on the server and IPPS is enabled on the device, the print job is decrypted on the server but sent securely over the network via HTTPS.

> **Note:** End-to-end encryption is not enabled by default. This document describes the process to enable it.

Figure 1 illustrates how HP AC end-to-end encryption works.

Figure 1: An overview of the End to End encryption

End to End Encryption
End to End Encryption is typically defined as:

1. In transit to Server - Encrypt Print Jobs from PC to Server.

2. At rest - keep Stored Jobs secure on the Pull Print Server

3. Upon selecting Print at the device, the print job is decrypted at the HP AC Server and sent securely via HTTPS to the IPPS-supported device.

HP AC Server

2. With *Encryption at Rest* enabled on the HP AC Server, the print job remains encrypted while it is stored on the HP AC Server.
(see HP AC Admin Guide, Section 2.8 (pgs 93,96) or Section 2.9 (pgs 96-98)

1. With HP AC Print Client installed and configured on User workstation, the print job is sent encrypted (**AES 256 encryption**) from the work station to the HP AC Server.
(see HP AC Admin Guide, Section 2.4.5 (pgs 42,43) or Section 2.5.6 (pgs 49,50)

3. Upon selecting Print at the device, the print job is decrypted at the HP AC Server and sent securely via HTTPS to the IPPS-supported device.

User1

User 1

Prerequisites

o LPR print queues installed on the client

  For instructions, see [Creating an HP AC LPR Print Queue](#).

o HP Access Control Print Client

o The HP Access Control Print Client installs Microsoft .NET framework 2.0 on the client workstation.

o Client PC connected to the domain and logged in as an authenticated user.

Creating an HP AC LPR Print Queue

This section provides the steps to configure an HP AC Enterprise print queue for client-based print queues.

- Step one: Add a direct print queue

- Step two: Create an HP AC LPR port

- Step three: Assign the Enterprise port to the new print queue

Step one: Add a direct print queue

Note: This step is required to prepare the pull print queue to support all the printers' features, such as duplex and color printing. After installed and configured, if required change the printer's port to support pull printing.

1. Open Print Manager: select **Start** and type **Print Management** in the **Search program and files** box.

2. Expand **Print Servers**, right-click on the local server and click on **Add Printer.**

Figure 7: Add Printer in Print Management
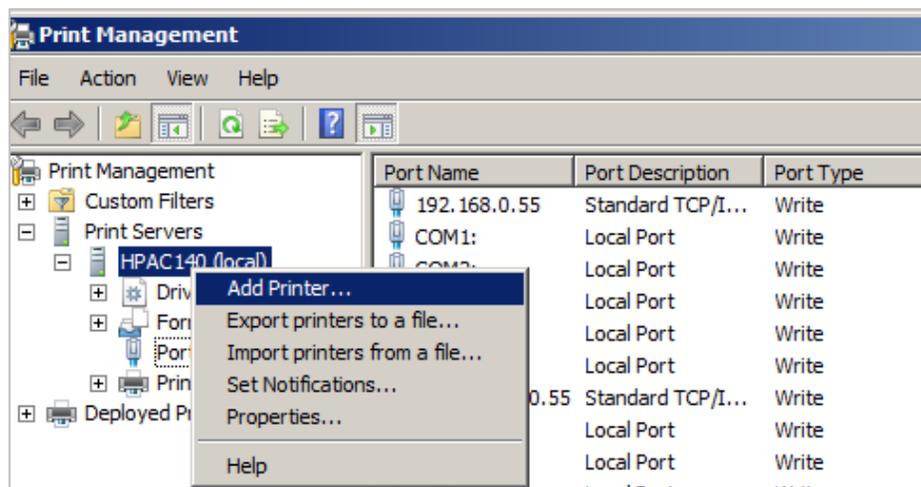
3. Select Add a TCP/IP or Web Service Printer by IP address or hostname then select Next.

4. Select **TCP/IP Device** from the **Type of Device** drop-down list.

5. Type the IP address of a LaserJet printer.

6. Create a name for the port to reflect an HP AC Pull Print port.

7. Uncheck Auto detect the printer driver to use.

8. Click **Next**.

Figure 8: Network Printer Installation Wizard
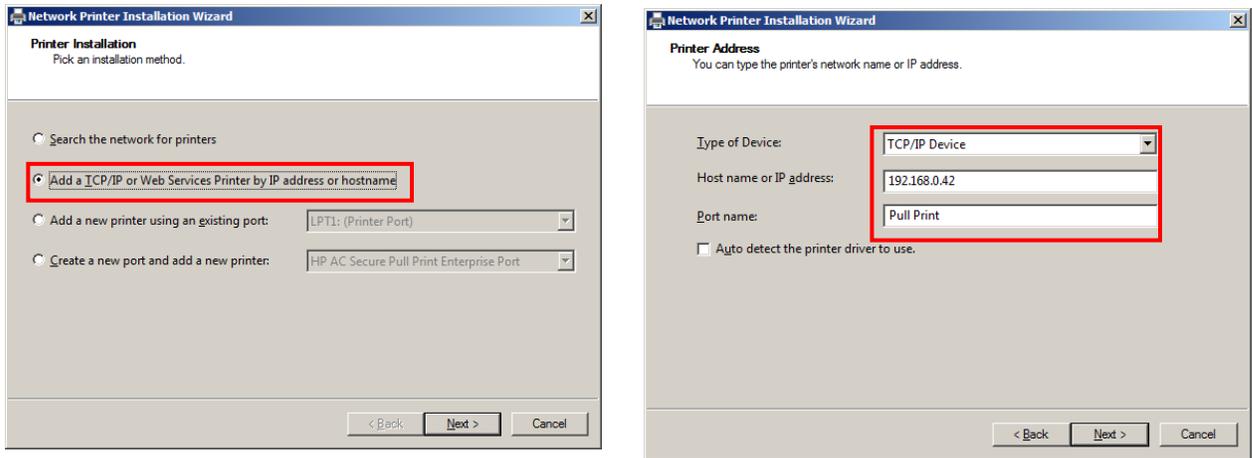
9. Select one of the driver options and click **Next.**

10. Locate your Universal Print Driver and complete the installation.

Step two: Create an HP AC LPR port

After the installation of the direct IP queue is complete, create a new LPR port that points to the HP AC print queue.

Note: Do not use the HAPC Secure Pull Print Enterprise Port for this configuration. This port is reserved for use with ePrint.

1. In Print Management, right-click on **Ports** and select **Add Port.**

2. Select **a Standard TCP/IP Port** and click **New Port.**

Figure 9: Add port in Print Management
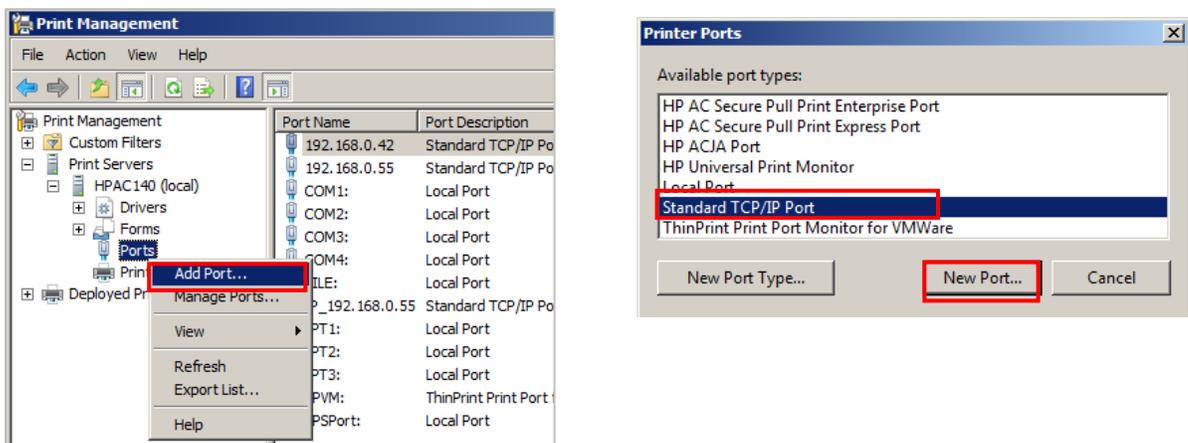
3. Select **Next** on the wizard prompt.

4. In the **Printer Name or IP address** text box**,** type the IP address of the HP AC server.

5. In the **Port Name**, assign a name that will reflect a pull print port, and then select **Next.**

6. Select **Custom-Settings** on the **Additional port information required** window.

Figure 10: Add Standard TCP/IP port
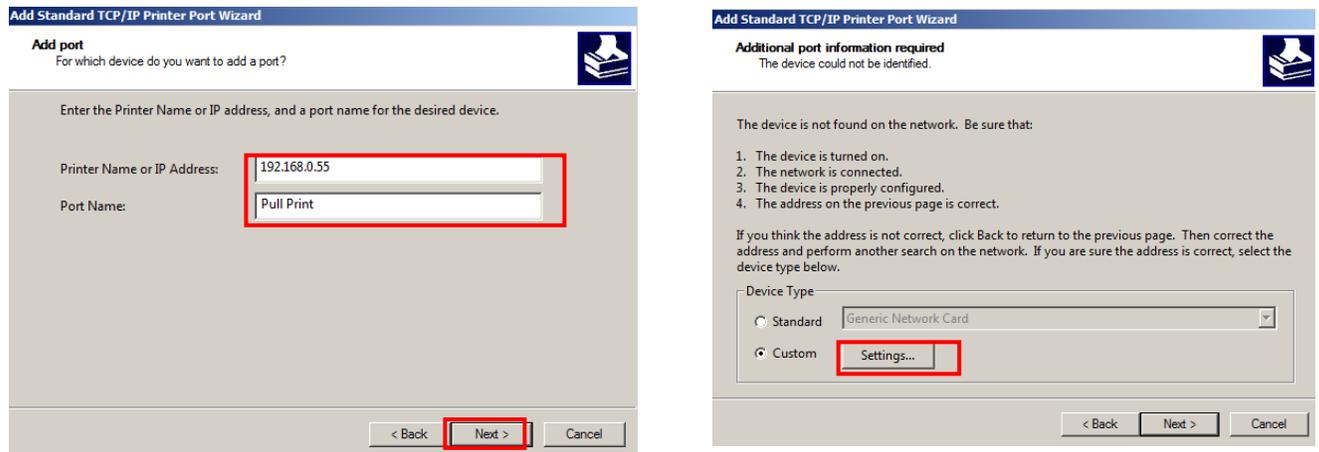
7. On the **Port Settings** tab, under the **Protocol** section, select the **LPR** option.

8. Under the **Raw Settings** section, change the **Port Number** to **515.**

9. Under LPR settings, add the HP AC Enterprise queue name that is created in the PersonalQ tile (HP AC admin console>PersonalQ tile), and then select **OK** to complete the configuration.

10. Select **Next** on the **Additional port information required** window.

Figure 11: Configure Standard TCP/IP port

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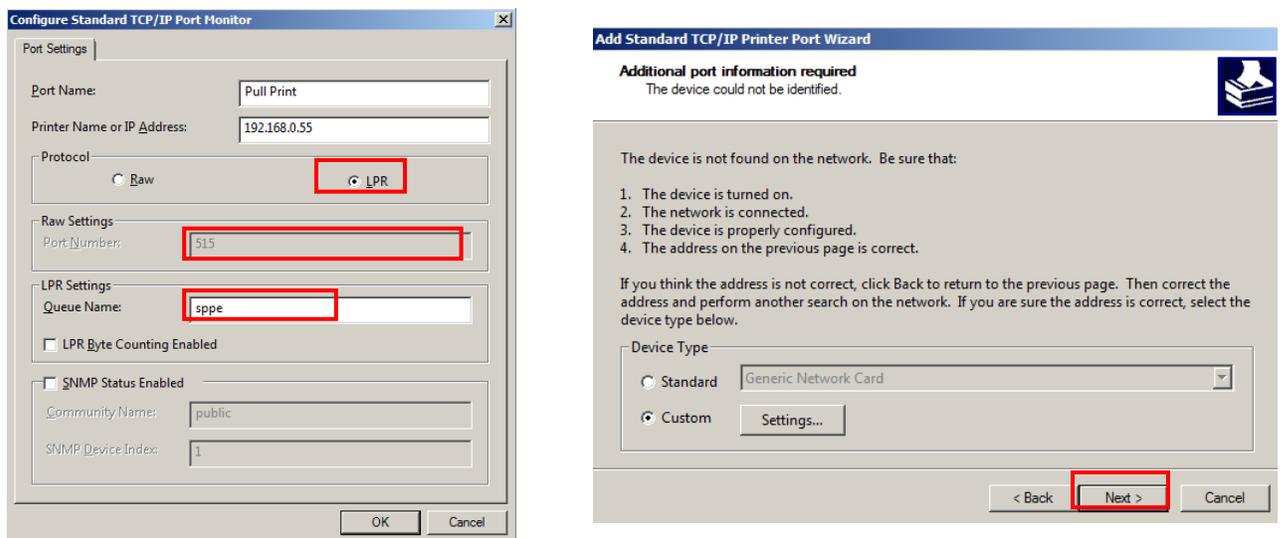
11. Click **Finish**, and then click **Close** to close the printer ports window.

Figure 12: Close the printer ports wizard
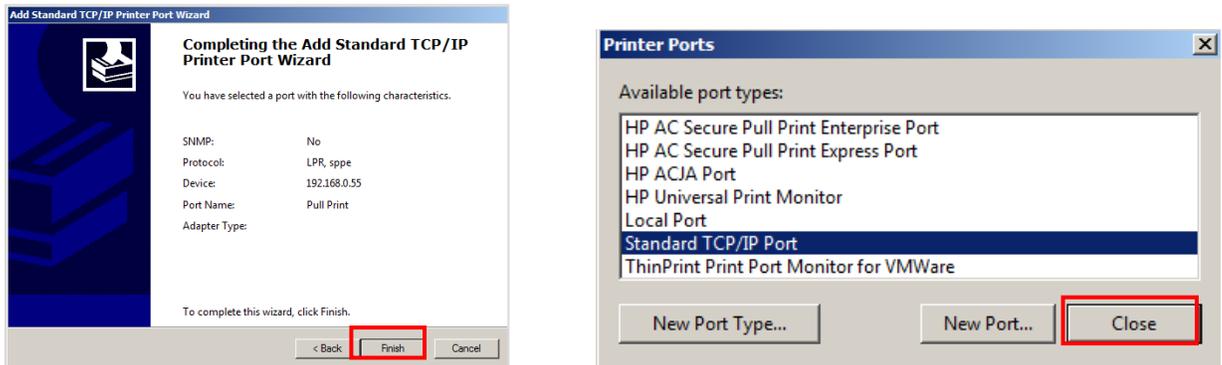
Step three: Assign the Enterprise port to the new print queue

After the port is created, it needs to be assigned to the print queue.

1. Right click on the original TCP/IP printer that was created in "Step one", and then select the **Ports** tab.

2. Select the LPR port created in Step 2, and then click **OK.**

3. Select the **General** tab and print a test page.

Figure 13: Pull Print Properties

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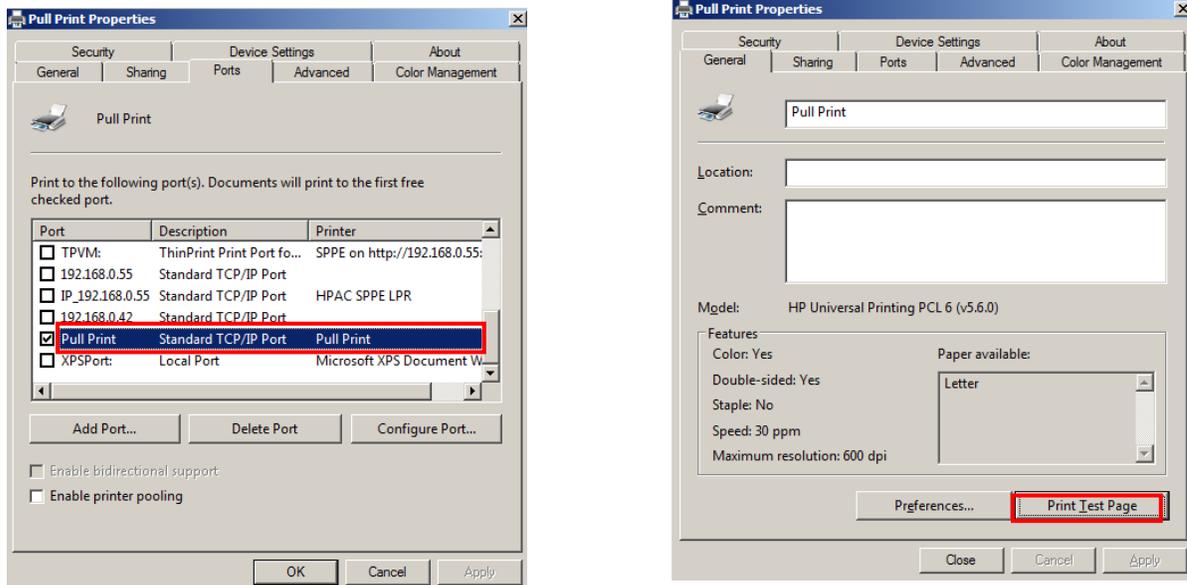
4. Navigate to the PersonalQ tile in the HP AC admin console to verify if the test page was printed.

Figure 14: HP AC admin console
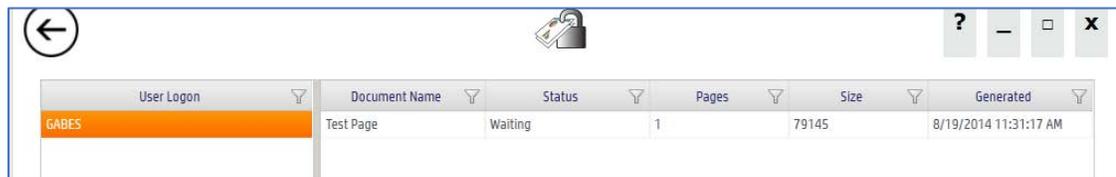
User Logon	Document Name	Status	Pages	Size	Generated
GABES	Test Page	Waiting	1	79145	8/19/2014 11:31:17 AM

Enable Encryption at Rest on the HP AC server

1. In the HP AC admin console, navigate to the **Settings** tile and select the **Pull Print** tab.

2. On the **Pull Print** tab, select the pull print server from the host name list and choose **Configure**.

3. Select the **Advanced** tab.

4. Expand **Pull Print options** and enable **Encryption at rest**. When the Encryption Key box displays, enter a key.

   Preview the key requirements

   - Encryption at rest requires an Enterprise port when used in a point and print (shared printer on the HP AC server) environment.

   - LPR print queues installed on the client do not support Encryption at rest.

   - LPR shared queues on the server do not support Encryption at rest.

     o If you want to use an LPR print queue on a client PC and Encryption at rest, we need the Enterprise Client

     o If you want to use a shared LPR queue and Encryption at rest- not supported

5. Select **TCPIP/IPPS** as the Printing Protocol.

6. Select **Update**.

7. Update the printer definition files after changing the print protocol to IIPS.

8. Click the **Update** printer definition button on all servers.

9. Restart Services.

   Note: Enabling **Encryption at rest** will only encrypt jobs that are printed after this feature is enabled. Exiting jobs are not encrypted.

   Figure 15: SPP Enterprise

Install the HP Access Control Print Client

Follow these steps to install HP AC Control Print Client:

1. Locate the HP Access Control Print Client (x86 or x64), typically located on the HP AC server:
   C:\Program Files\Hewlett-Packard\HP Access Control\client setup.

2. For a single client install, right-click on the Setup.exe and **Run as Administrator**, and then follow the setup wizard.

   > **Note:** When deploying on a larger scale, the Enterprise Print Client Setup.exe might be used to customize MSI.

3. Select a proper installation directory location, and then click **Next**.

4. When installing **Encription at Rest**, only the HP Access Control Pull Print server name is required.

   > **Note:** Fully qualified host names are required**.**

   Figure 2: HP AC Print Client
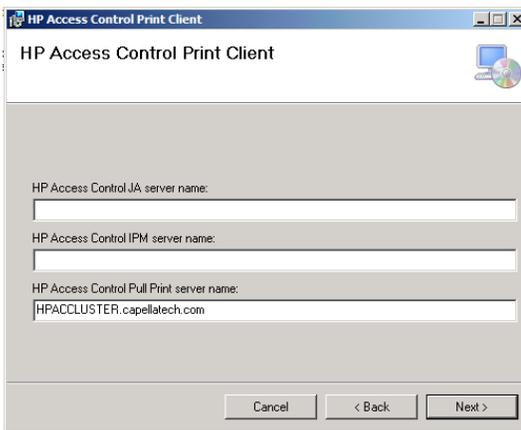
5. If only using the encryption feature, clear or uncheck all the check boxes in **Configuration**, and then select **Next**.

   Figure 3: HP AC Print Client Configuration

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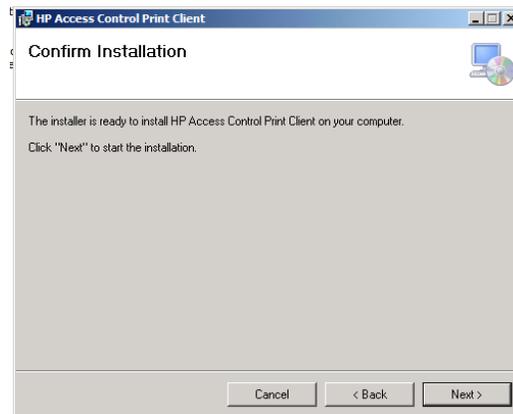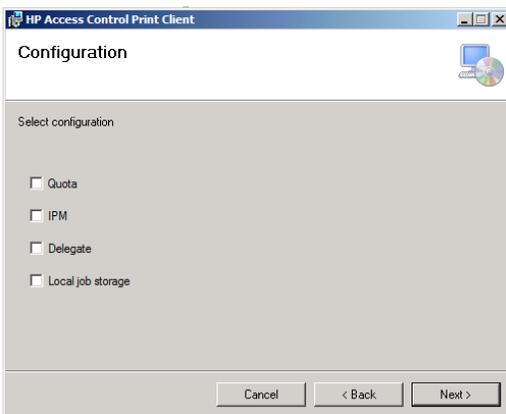
6. Complete the installation by selecting **Next.**

Figure 4: Installation of the HP AC Print Client
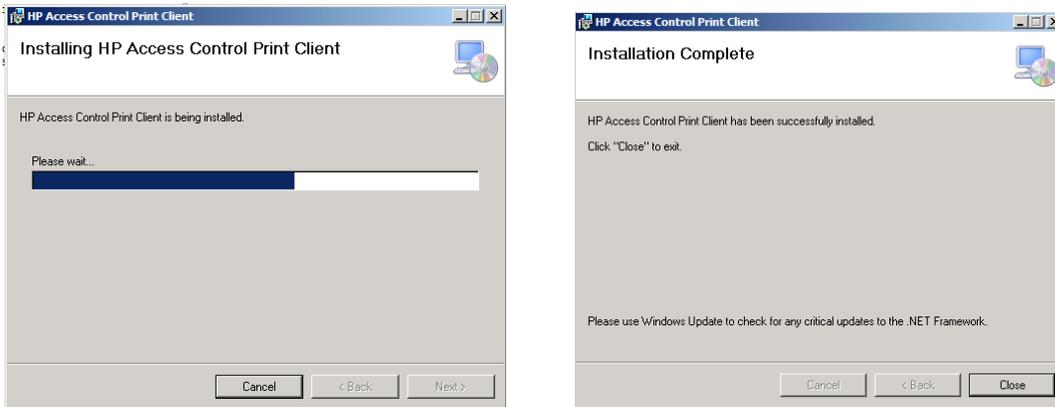
Set up the Networking settings in the HP Embedded Web Server

Ensure that IPPS Printing is enabled.

1. Open the HP Embedded Web Server.

2. Click the **Networking** tab.

3. On the left navigation pane, select **Other Settings**, and then make sure to select the **IPPS Printing**.

Figure 5: Enable IPPS Printing option
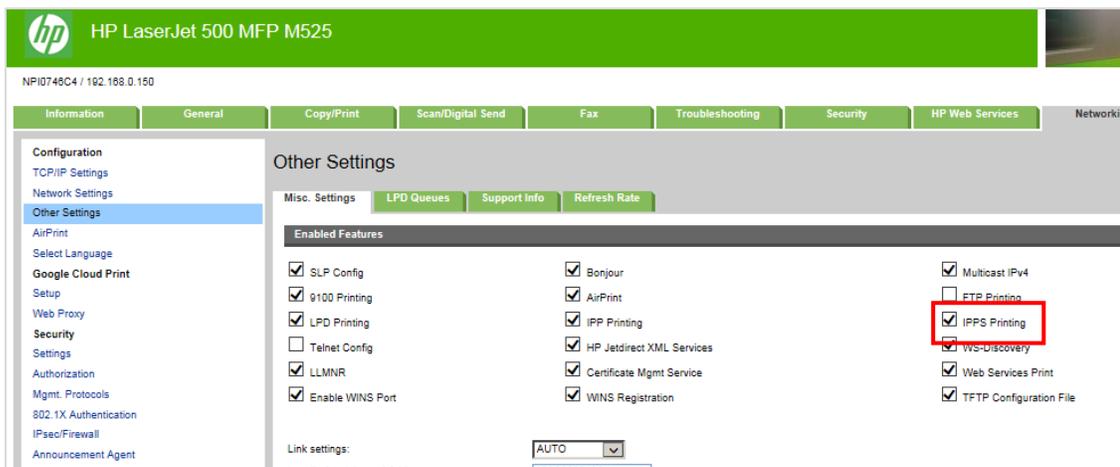
Changing the client encryption key

If the encryption key is changed after the print client is installed on the client, run the command in the following steps to update the client:

This command will update the encryption key and the pull print queue name on the client if they are changed on the server.

1. Open a command prompt as an administrator.

2. Go to the following path:

   `C:\Windows\Microsoft.NET\Framework64\v4.0.30319\InstallUtil.exe /servername=hostname.domainname.local "c:\Program Files\HP\HP Access Control Print Client\bin\Configure.dll"`, where "hostname.domainname.local" is the FQDN of the HP AC server.

   Note: This command displays the encrypted encryption key, pull print queue name, and the length of the encryption key.

   Figure 6: Command Prompt