Panduit SZTP Bootstrap Server

Installation Guide

Version 1.0

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# Getting Started with SZTP

SZTP requires the following:

1. DHCP server that can provide an SZTP redirect option.
2. DNS that will resolve the name of the bootstrap server.
3. PKI (Public Key Infrastructure) for SZTP
4. A Windows server to run the bootstrap software.
5. EL2P Firmware version 1.4.1 or higher.

The first three steps will require assistance from your network administrator.

# Network Configuration

SZTP uses DHCP to provide a redirect URI to the bootstrap server. Redirect information may be provided either via DHCPv4(option 143) or DHCPv6 (option 136). The bootstrap information must be provided as a “URI” structure, per RFC8572 sections 8.2 and 8.3.

|  |  |
| --- | --- |
| uri-length | URI |

* uri-length: 2 octets long; specifies the length of the URI data.
* URI: URI of the SZTP bootstrap server.

The URI provided by DHCP must be in the form "https://<bootstrap hostname>[:<port>]".

Depending on your DHCP server software, setting up the SZTP URI option using the correct format may involve writing the option value in hex. For example, a boot strap server with the default HTTPS port 443 at sztpbootstrap.panduitlabs.com would have the following URI:

<https://sztpbootstrap.panduitlabs.com>

which encoded in ASCII hexadecimal is:

68 74 74 70 73 3A 2F 2F 73 7A 74 70 62 6F 6F 74 73 74 72

61 70 2E 70 61 6E 64 75 69 74 6C 61 62 73 2E 63 6F 6D

There are 37 bytes which is 0x0025 in hexadecimal, giving us the option value of:

00 25 68 74 74 70 73 3A 2F 2F 73 7A 74 70 62 6F 6F 74 73 74

72 61 70 2E 70 61 6E 64 75 69 74 6C 61 62 73 2E 63 6F 6D

On a Windows DHCP Server:

1. Open the DHCP Console.
2. Right click on IPv4 and select Set Predefined Options
3. Click Add and enter the configuration information:
   1. Name: SZTP
   2. Data type: Binary
   3. Code: 143
   4. Description: SZTP Redirect URI
4. Click OK to save the new option
5. Navigate to the desired scope under the IPv4 tree
6. Right-click Scope Options and select Configure Options
7. Check the box on the 143 SZTP option
8. Enter the hexadecimal data for the URI of the server where you will run the Panduit Bootstrap software.

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# PKI(Public Key Infrastructure) Configuration

SZTP requires configuration of at least a single CA certificate that will act as a trust anchor for authentication of the bootstrap server. The trust anchor certificate must be sent to Panduit and embedded within device vouchers.

* The trust anchor may be a root CA or an intermediate CA certificate, not the bootstrap server certificate itself.
* An existing corporate root of trust, or intermediate CA may be used.
* The bootstrap server must be configured with a certificate that includes a chain back to the trust anchor.
* The “Trust Anchor” is referred to as the “pinned-domain-cert" once it has been embedded in the voucher.

# Voucher Request

Vouchers provided by the bootstrap server to the Panduit device prove ownership of the device.

To receive vouchers from Panduit, the following must be provided:

* Device serial numbers
* Proof of ownership of devices
* Trust anchor certificate

Request SZTP ownership vouchers from systemsupport@panduit.com

# Bootstrap Server Installation

Panduit Bootstrap software is designed to run on a Windows computer. It provides bootstrapping information and firmware images to Panduit devices using SZTP.

1. Extract the Panduit Bootstrap software from [www.panduit.com](http://www.panduit.com).
2. Double click on the installer.
3. Read and accept the Panduit EULA

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1. Choose the software installation directory, the default is recommended.

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1. Choose the start menu folder.

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1. Click “Install” to start the software installation.

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1. Set bootstrap server configuration options, the defaults are recommended.

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1. Select post installation options.

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Note: SZTP will not work if a firewall on the server blocks the port selected earlier in the installation process. Leave “Install Firewall Rule” checked to have the installer to add a Windows firewall rule that allows devices on the network to communicate with the bootstrap server. You may uncheck this option if you are not running Windows firewall or will configure the rule manually.

# Bootstrap Server Configuration

1. Copy vouchers from Panduit into the "ownership-vouchers" folder in the installation folder.

There is one voucher file per device. If the device’s serial number is ABC123, name its voucher file "ABC123.vcj".

1. Copy bootstrap server certificate and key into the owner-credentials folder and name as specified in your server.cfg.

* The commonName (or subjectAltName DNS field) field in the Server Certificate MUST MATCH the bootstrap server address.
* Both commonName and subjectAltName must be present.
* Your Server Certificate cannot be the same as the pinned-domain-cert. Your Server Certificate must be signed by the pinned-domain-cert or signed by any number of intermediate entities leading back to the pinned-domain-cert.
* The Server Certificate must be in PEM format, and must include certificates for all intermediate entities leading back to the pinned-domain-cert. The order is: Server Certificate first, and then intermediates toward the pinned-domain-cert.

1. Download latest device firmware package and copy into the "boot-image" folder.
2. Create configuration files for each device.

* Configuration files may be created using a webUI on a Panduit device of the same type.
* Download the configuration file from Settings->System Management -> Actions ->Download Configuration

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1. Copy configuration files for each device into the "configurations" folder.

There is one configuration file per device. If the device’s serial number is ABC123, its configuration file must be named "ABC123.json".

1. Run services.msc and start "Panduit SZTP Bootstrap Service"

By default, the server is automatically started on reboot. This behavior can be modified with services.msc.

# SZTP Operation

An out of the box Panduit device with a voucher and configuration on the SZTP bootstrap server will now auto-provision itself when powered on and plugged into the network.

SZTP is designed to be run once on each device and will disable itself if any of the following happens:

* Successful bootstrapping occurs (via SZTP)
* There is login activity.
* The device becomes a Linked Unit in a Daisy Chain.

If you would like to use SZTP after the device has disabled it, you must factory reset the device. For periodic firmware updates, use the Auto Update feature.

# Troubleshooting

1. Open the Windows Event Viewer
2. Under Event Viewer -> Windows Logs -> Application, review all "PanBootstrapService" events

You can filter like so:

Filter Current Log... -> Event sources: -> select "PanBootstrapService"

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1. All vouchers are verified at startup, and any issues will be logged.

1. SZTP progress is logged for all SZTP clients that connect.

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