



eGuide

A Primer to Zero Touch Provisioning (ZTP)





Introduction

Zero-Touch Provisioning (ZTP) alleviates complex network provisioning by introducing automation and enabling multipoint auto-configuration of network devices.

Nowadays, networks are faced with solving two main tasks

- Providing seamless access to their users and
- Supporting new collaborative applications that are increasingly complex and dynamic in their scale, use distributed resources, and require advanced networking services.

Rapid deployment and automation of new network services provisioning are difficult in large networks that incorporate different technologies and solutions. Providing a seamless user experience generates an additional burden for the configuration phases included in network provisioning. Network or system administrators need to maintain the uptime, define provisioning policies, modify user access based on user roles, frequently upgrade the firmware, and finish the tasks within the stipulated timelines, as per the Service-Level Agreement (SLA).

Zero-Touch Provisioning (ZTP) alleviates complex network provisioning by introducing automation and enabling multipoint auto-configuration of network devices. In this whitepaper, we will discuss the issues related to manual network device provisioning, how ZTP can solve the problem, and the steps to perform while implementing ZTP for your network.

Key Layers of an Enterprise Network

Before we dive into the nitty-gritty of network administration, let us refresh our knowledge about the key layers of corporate networks.

Network Device Maker

Network Device Makers are Original Equipment Manufacturers (OEMs) who manufacture network hardware components or companies that sell products and services to communication service providers, such as fixed line or mobile



operators and enterprise customers. Essentially, they establish the hardware backbone of device networks at customer locations.

Network Service Provider

A Network Service Provider is a business or organization that sells bandwidth or network access by providing direct Internet backbone access to Internet Service Providers (ISPs) and usually enabling access to the Network Access Points (NAPs). Service providers may consist of telecommunications companies, data carriers, wireless communication providers, Internet service providers offering high-speed Internet access, and cable television operators. They are the firmware layer of the enterprise network.

Problems with Manual Network Device Provisioning

Network devices are often configured by network administrators, one device at a time, through a Command-Line Interface (CLI). In large networks at customer locations, network provisioning might mean the provisioning and configuration of thousands of devices.

Manual configuration of such networks can easily push several expert network administrators to work round the clock for days to finish the configuration and provisioning activities—that too, without any guarantee of successful provisioning for these devices. Moreover, manual configuration leads to the following network management issues:

- 80% of all network downtime can be attributed to human errors during network provisioning and configuration
- Manual configuration is slow, decentralized, and prone to errors
- People and travel become expensive as system engineers need physical access to the devices

What is Zero Touch Provisioning (ZTP)

ZTP is a new feature that allows network devices to be provisioned and configured automatically, eliminating most of the efforts, time, and issues



arising from manual network provisioning at customer locations, enabling customers to set up devices with minimal help from trained personnel.

ZTP automates the following steps for network administrators and helps enhance efficiency:

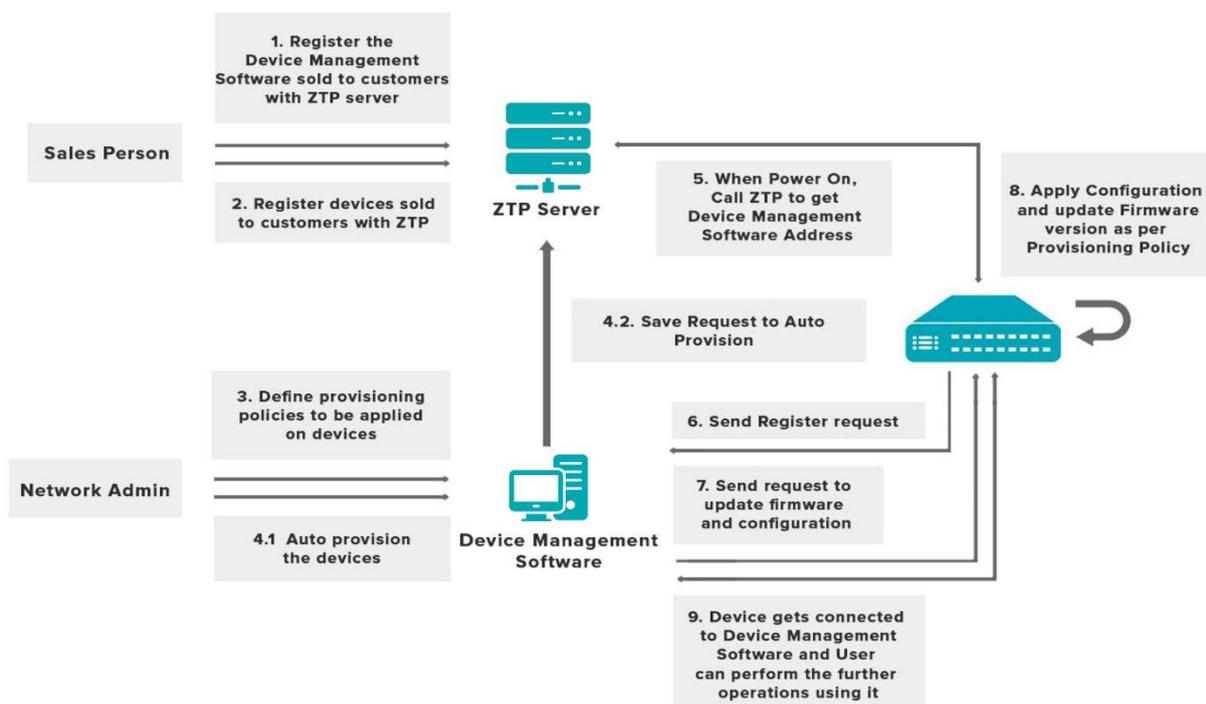
- Updating operating systems (Firmware) on the device
- Configuring the device with predefined custom configuration

Ness Solution that Enables ZTP

Ness developed a provisioning tool (for a network device maker) that enables the automatic configuration of devices and redirects a device to the Device Management Software (DMS) as soon as it is plugged in. The three main components that participate in the ZTP process are:

- Device Management Software
- ZTP Server
- Device

High Level Architecture





Before we dive into the actual steps of ZTP, let us look at these components. This section describes the major components of the automated ZTP system.

Device Management Software (DMS)

It manages networking devices, helping network administrators to monitor, manage, and configure them seamlessly.

ZTP Server

It is a centralized server managed by the IT/Sales team to identify the networking devices sold to various customers.

Device

This device is stationed at the customer location and can be any networking equipment, such as VoIP devices, routers, and switches. A network can have several devices of various types and configurations.

Implementation Steps

This section describes the implementation steps for registering a new device into a ZTP-enabled network.

Steps that require some human intervention:

- Register the DMS with the ZTP server
 - When a DMS is sold to the customer, the sales team registers it with the ZTP server.
 - Register the device with the ZTP server
 - When a device is sold to the customer, the sales team registers it with the ZTP server.
 - Define provisioning policies
 - The customer's network administrator defines the configuration and the firmware version they want to install on the new devices using the DMS.
-



- Auto-provision the device
 - The customer's network administrator enters the MAC address of the device(s) to be auto-provisioned.
 - DMS validates the device(s) with the ZTP server.
 - The customer's network administrator selects the provisioning policy to be applied on the device(s).
 - The mapping of the device(s) and DMS address gets saved on the ZTP server.
- Plug-in and Turn-on the device
- The network administrator plugs in the device to the network and turns it on.

Steps which are performed automatically:

- As soon as the device gets plugged into the network and turned on, it sends a registration request to the ZTP server.
- The ZTP server sends back the DMS address to the device.
- The device sends a registration request to the DMS.
- The DMS registers the device.
- The DMS, if required, upgrades the firmware of the device.
- The DMS, if required, applies the configuration defined in the provisioning policy on the device.
- The DMS sends back the register response to the device.

The device is now ready and starts sending heartbeat messages to the Device Management Software (DMS), from where it can be monitored and managed.



About Ness

Ness is a global Full-Lifecycle Digital Services Transformation company. Ness has been named a leader in overall Engineering, Research, and Development (ER&D) for two consecutive years by Zinnov Zones. Our team of 5000+ engineers is spread across 10 innovation hubs in the US, Eastern Europe, and India. For more than 20 years we have been specialists in product engineering and have a 5-star Forrester Agile Delivery rating

For more information, contact NDE.Marketing@ness.com

Visit www.ness.com

Stay Connected    