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Out-of-Band Management: Maintaining Branch Deployments

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CONTENTS

IN THIS PAPER

This paper discusses how ZPE Cloud works with its Services Router (SR) family of products to enable IT staffers working in a NOC—or remotely via a secure Internet login—to interact with, manage, and maintain networks, infrastructure, and computers in branch and remote offices. This allows them to deploy, maintain, and troubleshoot those IT infrastructures. Optionally, organizations can also endow the SR products with additional compute cards, memory, and storage so they can host guest OSes, virtualized network functions, and even applications to extend local edge computing capabilities.

Highlights include:

- The role of OOBM in the branch
- The benefits of cloud-based maintenance
- Many means of remote access to the branch

Out-of-band management, aka OOBM, plays a vital role in modern IT operations of all sizes and scales. Indeed, OOBM might be judged "mission critical" for headquarters operations and data centers alike. But OOBM is tremendously important for satellite IT operations as well, most notably for branch and remote offices. Such operations span a wide range of locations and roles, with tens to hundreds of employees, and also benefit from OOBM. That's particularly true because onsite IT at such locations may not exist, or it may be available only when roving IT staffers drop in from time to time.

> Taken together, the combination of ZPE Cloud, Nodegrid Manager, and Nodegrid SR devices delivers a do-it-all solution for the delivery and management of IT services for remote and branch offices.

Though the lack or scarcity of a local IT presence in branch and remote offices may sound troubling, it need not be a concern. Why? Because ZPE's solutions are tailor-made to ease such concerns, and address the need for ongoing, always-available IT access, support, and services. These solutions can, in fact, keep branch and remote offices humming.

ZPE offers a particularly potent combination of capabilities that include:

- Robust, secure, and highly available remote access links and technologies (that keep working even if WAN links or remote networks fail or become unavailable)
- Zero Touch Provisioning capabilities that let IT staff install, set up, and configure computers and other equipment remotely
- Highly automated tools to assist set up and provisioning activities at branch and remote locations, including bare-metal install of computers and devices using KVM and remote access tools

The Role of OOBM in the Branch

ZPE offers a cloud-based service called ZPE Cloud. When used with hardware devices from ZPE's Services Router (SR) family of products, IT staffers working in a NOC (or remotely, through an Internet login) can interact with and manage networks, infrastructure, and computers in branch and remote offices. As explained in depth in the companion tech brief "Out-of-Band Management: Deploying to the Branch," this remote access architecture allows them to undertake the following specific tasks securely and remotely:

- **Deploy:** Using Zero Touch setup, installation, and configuration utilities, IT can access devices and computers in remote or branch offices through the ZPE Cloud. This allows authorized personnel to deploy OS images and software directly to devices, even to bare-metal (no OS present) or plain-vanilla (standard factory OS image from OEM) hardware.
- **Maintain:** Using automated scripts written in standard scripting languages such as Python, Bash, Ruby, and so forth, IT can work through ZPE Cloud to copy, stage, and deploy patches, fixes, and updates to computers and other devices in remote or branch offices. Thus, authorized personnel can handle maintenance, either on-demand or during scheduled maintenance windows.
- **Troubleshoot:** Using Nodegrid Manager's status information, alarms, and alerts, IT staff can keep tabs on devices and computers in remote or branch offices. If and when problems occur, IT staff can use ZPE Cloud to access equipment remotely, run diagnostics, and work through normal troubleshooting and problem-solving scenarios. Even if WAN links or the LAN at the remote or branch office are down, OOB links permit authorized staff to access equipment and troubleshoot issues.
- **Reset:** Because the SR devices are so essential to OOBM and all the capabilities it brings to remote and branch offices, they include a reset button that can be accessed locally or remotely. It resets the SR device and re-establishes a connection through ZPE Cloud to your organization's NOC, so that repair and recovery activities can get underway.

- **SASE:** SASE is short for Secure Access Edge Service: It defines a method for networking and security delivered via the cloud. It's identity-driven and supports all edges, so users get safe, reliable access to your network no matter where they're located. SASE addresses needs for more flexible and secure connectivity. It's ideal for a distributed user base, because it doesn't require backhauling traffic through main network firewalls (which leads to bottlenecks and added latency). Nodegrid offers a capable, innovative SASE platform with great flexibility (good for users) and security (good for peace of mind).

Taken together, the combination of ZPE Cloud, Nodegrid Manager, and Nodegrid SR devices delivers a do-it-all solution for the delivery and management of IT services for remote and branch offices.

Benefits of Cloud-Based Maintenance

Working through ZPE Cloud provides numerous advantages to organizations seeking remote management and maintenance for branch and remote offices. Improved security results from the ability to ship IT devices without pre-staging or pre-configuring them. Using ZPE Cloud, you can configure IT devices when they arrive at the branch or remote office and are under your direction and control.

This works through secure, always-available, remote access to branch and remote office locations. Only authorized personnel can access remote and branch offices via ZPE Cloud and the Nodegrid Manager software, including via direct network or out-of-band network links as circumstances dictate.

Because IT staff can safely and securely download, deploy, and install software remotely using ZPE Cloud and Nodegrid Manager through branch-based Nodegrid SR devices, all the real work happens in your best-staffed and most secure locations. Thus, definition, testing, and staging of all software packages, device images, patches, and fixes all occur in the NOC. When you're ready to deploy them in the field, ZPE Cloud and Nodegrid make that happen on your schedule (for regular maintenance or update windows) or on-demand (when new equipment is delivered to a branch or remote office, or when troubleshooting is required).

In this cloud-based environment, deployment only occurs by deliberate decision and direction, under the control of

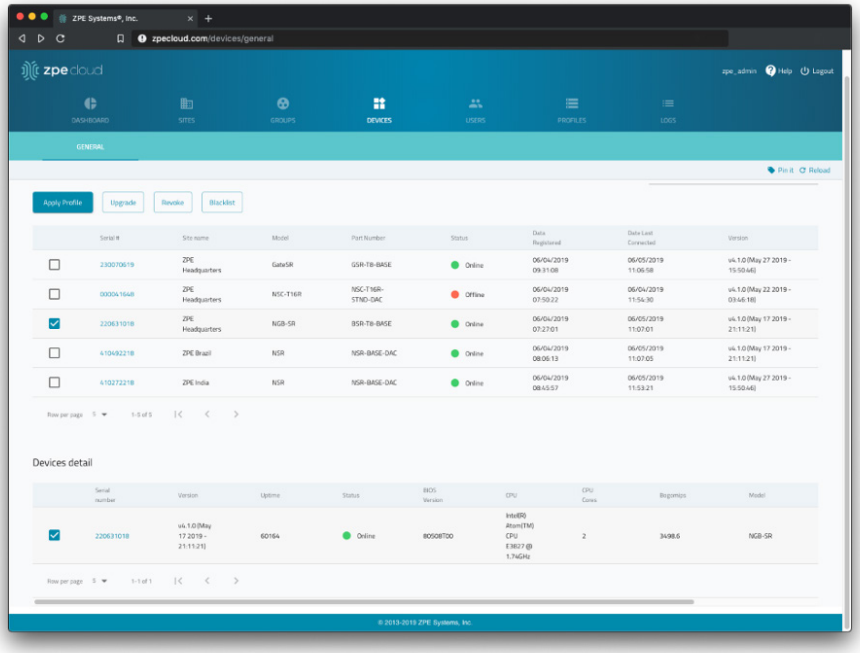

Figure 1: General device information shows SR device make, model, status, and software; further drill down is instantly available

centralized IT staff. Secure remote access ensures that automation can handle routine or repetitive tasks, with skilled operators ready to take over should problems occur.

ZPE Cloud is available as a mobile app through the Apple Store or Google Play Store. IT staff can use either app, or run the Nodegrid Manager software on a web browser running on a desktop OS (Windows, Linux, macOS, and so forth) through a secure Internet connection. Thus, ZPE Cloud and Nodegrid enable organizations to manage remote or branch offices from anywhere, safely and securely. **Figure 1** shows ZPE Cloud's General Devices view of the company's own HQ and branch office operations.

Working Through Routine Maintenance

ZPE Cloud makes all accessible SR devices readily visible and manageable through secure remote connections, either in-band using conventional networks, or out-of-band using the various OOB links that SR devices routinely support (serial, USB, Wi-Fi, cellular wireless, and RJ-45 or optical Ethernet connections). As **Figure 2** shows, individual sites and status information on the dashboard show up on a real map that displays physical locations and provides ready access to status and control information, along with remote access to connected computers and devices.

> Because ZPE consolidates OOBM, in-band management, and VNFs under a single umbrella, overall maintenance effort and needs are decreased.

ZPE Cloud and Nodegrid Manager work through firewalls and other security hurdles to access sites thoroughly and completely. OOB access may bypass such hurdles, depending on how out-of-band links are set up and configured. Using KVM technology through ZPE Cloud and Nodegrid Manager, IT staff can access SR devices, other network infrastructure elements, and local client and server computers.

Performing routine maintenance often means pushing patches or configuration changes to branch or remote office locations. This typically occurs at scheduled intervals. Many organizations schedule maintenance around holiday weekends every three months or so, to give IT staff more time to roll through a list of pre-tested, pre-staged, and

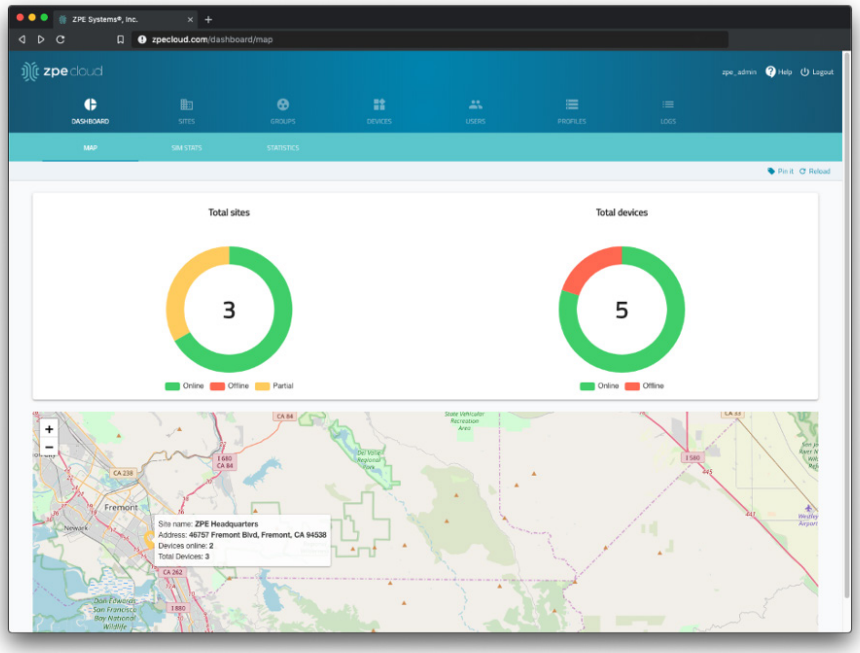

Figure 2: Sites appear on a 2D map generated from publicly available geo-mapping data, along with top-level dashboard indicators

carefully targeted patches and fixes. The longer time period that a three-day weekend offers also means that IT staff can, if necessary, roll back or recover from unexpected installation problems or functionality test failures when installation is complete.

> Because on-call staff can connect to sites anywhere (headquarters, data centers, remote or branch offices) safely and securely, 24/7 support becomes more humane and less location-dependent.

In some cases, routine maintenance must give way to non-routine recovery and repair activities. This might mean a network has gone down, or one or more pieces of equipment have become non-operational for a variety of reasons. This is when the OOB capabilities built into Nodegrid SR devices and available through ZPE Cloud really shine. IT staff can use an appropriate OOB link (the faster, the better is the usual basis for selection) to remotely access satellite locations and perform whatever troubleshooting or repair might be necessary to restore normal operation.

Because ZPE consolidates OOBM, in-band management, and VNFs under a single umbrella, overall maintenance effort and needs are decreased. Routine maintenance can be highly automated, based on well-tested scripts and tools checked out in advance in the test lab. By the time maintenance work starts, the targets should be well-defined and well-understood, and the results as certain as proper preparation allows. Overall, this means that quicker, more predictable, and more reliable maintenance for branch and remote offices is an achievable outcome.

Many Means of (Remote) Access to the Branch

Because of the way remote access is built into ZPE Cloud and Nodegrid, no VPN is needed for access. The feature uses industry-leading secure connections to provide safe, secure entry via browser and mobile client devices (using Nodegrid client access or the ZPE Cloud mobile app on Android or iOS).

Because on-call staff can connect to sites anywhere (headquarters, data centers, remote or branch offices) safely and securely, 24/7 support becomes more humane and less location-dependent. There's simply no need to staff the NOC round the clock, except perhaps during scheduled maintenance intervals, or if some kind of formal business continuity or disaster recovery effort is declared.

When you're ready to try ZPE Cloud and its family of Nodegrid SR devices, please visit the ZPE Systems' Nodegrid for Branch Networks pages, or request a demo today.