



LTE Wireless Out-of-Band Management

Connected Device Serial
Console Support

WHAT YOU'LL GET:

- + An overview of secure remote access to your connected device's serial console over LTE.
- + Typical deployments that reduce costs utilizing Out-of-Band Management for the branch router.
- + How to maximize your network infrastructure.
- + An overview of the solutions to provide backup LAN/WAN connectivity and the tools to remotely troubleshoot your primary router and connections.

OVERVIEW

For distributed enterprises that have hundreds, or even thousands of branch locations to remotely manage; network reliability, diagnostic tools, and total cost of network infrastructure ownership are immense concerns. These IT teams must invest in highly resilient network infrastructure to proactively avoid unplanned network disruptions and downtime. The consequences of just a few minutes of downtime in these organizations can affect the entire company's operations.

In the past, Network Administrators managing distributed enterprises had to 'fly blind' – troubleshooting their network only after it went down. The most common form of troubleshooting was having location managers check connections, power cycle devices, and ultimately ship failed devices back to the corporate office. In turn, administrators had to ship out spares to the location that was disrupted. This resulted in frustrated branch staff, unreliable troubleshooting, and systems that could be down for up to 24 hours. The second option was to have a truck roll and send a technician on-site to fix or replace the device but the costs would accrue quickly to hit the bottom line. The third option was to store spare hardware on site – relying on untrained staff to replace the failing systems. If the problems were not solved by the hardware swap, the administrators would still have to visit the location to troubleshoot the root cause of the issue.

The legacy troubleshooting options equal a heavy load to manage and a hefty price tag; especially when these IT teams are graded on uptime. Multiply the costs of having spares for each location, unplanned downtime, and truck rolls, and the implications grow astronomically.

When time is money, how do you get the most of your network solutions? By choosing a wireless failover solution that also allows for secure, remote console Out-of-Band Management (OOBM).

OOBM to the console port of the primary router is a value-added layer to any distributed enterprise. A secondary secure path to the devices at remote locations when the primary network goes down means minimized disruption and downtime, ensuring business continuity and happy staff at remote locations. It also reduces the need for expensive truck rolls, on-site technical staff, and a safeguard for 'four-nines' network reliability.



**ACCORDING TO
GARTNER, 40%
OF DOWNTIME
IS DUE TO
OPERATIONAL
ERROR.¹**

SUCCESS STORY

POPULAR QUICK SERVICE RESTAURANT CHAIN

Cradlepoint provides a secondary WAN connection over LTE or Metro WiFi, as well as a secure remote method to access your primary branch router's serial console port for configuration, troubleshooting, and management over 3G/4G/LTE, along with providing a dependable backup WAN connection without the need to install expensive wireline circuits. Cradlepoint also offers products that provide the secondary WAN connection with remote Out-of-Band Management as well as router redundancy for the LAN via VRRP while ensuring high branch LAN availability with router redundancy and ease-of-use.

This white paper explores the typical challenges and deployments for Out-of-Band Management using Cradlepoint devices. Furthermore, it explains how to maximize network management by providing network redundancy and OOBM, all while reducing total cost of ownership for the Distributed Enterprise.

NETWORK CHALLENGES

With many distributed enterprises moving mission-critical applications to the cloud, there is an incredible importance on the branch LAN and WAN to be up and running 24/7. Not only is this important for the retail industry for Point-of-Sale systems, but also for the branch and mobile office as well.

Protecting uptime is everything to the IT staff at a headquarters location of a distributed enterprise. Most organizations quantify in thousands, if not hundreds of thousands per hour when their network is up and running. If a piece of equipment or the network does go down, the IT staff has to deal with not only the responsibility of lost revenue and productivity, but also repairing the issue. HQ must bring the circuit back up when down, but more often than not they don't have the ability to see what the issue with the remote router actually is.

Cost and resources are also a challenge. Managing hundreds or thousands of locations can get tricky if multiple locations go down and need attention. Generally, the distributed enterprise will have no on-site IT staff and limited budgets for truck rolls and spare equipment.

This global corporation of quick service restaurants has about 17,500 locations worldwide serving millions of customers each day with concepts including popular pizza, chicken, and Tex-Mex chains. Most of the restaurants are on a wired network with Cisco routers, the main function of which is to process credit cards. With so many transactions daily, the company decided to invest in a wireless failover system to guarantee uninterrupted connection.

After careful consideration, the corporation chose Cradlepoint to provide "four-nines" (99.99%) or better connectivity. Overall, the corporation sees in Cradlepoint a technology partner that can help it deliver increasingly more efficient and profitable results while ensuring the best customer service.

"Network outages can delay credit card transactions. That's a big deal for us. If one of our restaurants' drive-thru has 15 cars in it and it takes an additional 30 seconds to process each order, you can see the impact on customer service. Cradlepoint makes sure we have virtually uninterrupted network connectivity."

— CHAIN'S MANAGER OF IT INFRASTRUCTURE

TYPICAL DEPLOYMENTS

To maximize your network, Cradlepoint has two typical deployments that are configured for Out-of-Band Management. The first configuration is where the Cradlepoint is the backup router, supplying network and hardware redundancy via VRRP. The second is actually the most popular for those who have a primary branch router already on-site with MPLS link or other wireline WAN link and only require WAN link redundancy.

THE SERIAL REDIRECT FEATURE

The Serial Redirector feature can be utilized in two different ways: by connecting to the routers WAN IP address through SSH, then typing the command "serial" at the CLI; or you can also enable Telnet-to-Serial, then Telnet to the routers WAN IP address on a specified port and be immediately connected to the serial interface. The Telnet method is only recommended over a VPN tunnel as the traffic is not encrypted. For connectivity directly over the Internet the SSH method is recommended.

SETTING UP YOUR HARDWARE

Connect the USB-to-Serial adaptor to the USB port of the router, or if you have an IBR11x0 model use a null modem adapter to directly connect without a USB adapter. Then connect a console cable to the serial port on either the USB to serial adapter or the IBR11x0 serial port. Next, connect the other end of the cable to the console port of the device you'd like to manage. Keep in mind Cradlepoint routers contain embedded LTE modems supplying an immediate network infrastructure cost-savings because the expense of a dedicated OOBM modem and POTS line will no longer be required. For hundreds, or thousands of remote locations, this could compile to astronomical savings per month.

SUCCESS STORY AMERICAN APPAREL

American Apparel is a vertically integrated manufacturer and retailer. All phases of production, from cutting and sewing to marketing and photography, are done at the company's downtown Los Angeles factory. American Apparel has more than 280 stores globally. Its L.A. factory is the largest sewing facility in North America.

"The original impetus to work with Cradlepoint grew from American Apparel's need for a wireless failover solution to guarantee uninterrupted Internet access."

— OSVALDO HURTADO, AMERICAN APPAREL'S DIRECTOR OF STORE IT INFRASTRUCTURE

The locations also required PCI Compliant Internet access to process credit card transactions and handle mission-critical applications. Cradlepoint routers enable American Apparel to keep hundreds of its international retail locations online through wireless 3G/4G. The stores can also use Cradlepoint routers to create private networks to company headquarters.

To manage its network of routers, American Apparel uses Cradlepoint's cloud-managed network solution, which allows them to centrally deploy, configure, and manage all of their devices across different retail stores to improve the reliability and enhance the intelligence of their network.

MAXIMIZING NETWORK INFRASTRUCTURE

There are several scenarios for the Network Administrator to use Out-of-Band Management as a diagnostic tool. For instance misconfiguring an ACL, access control list (commonly known as 'fat-finger syndrome'), bouncing an interface and shutting down the wrong interface, non-responsive devices after reboots, and if a carrier/wired line goes down and there is no other way to login to that router. You can also use OOBM to remotely configure a replacement router without having to roll a truck or pre-configure a replacement (RMA) router before sending it out to the remote location. Having this extra diagnostic layer is an added bonus to maximizing your network downtime and redundancy solution.

Fig. 1: Typical Deployment – Network & Hardware Redundancy

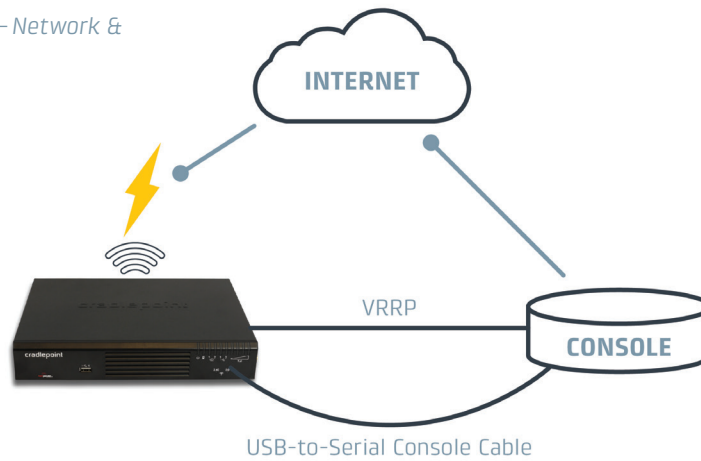
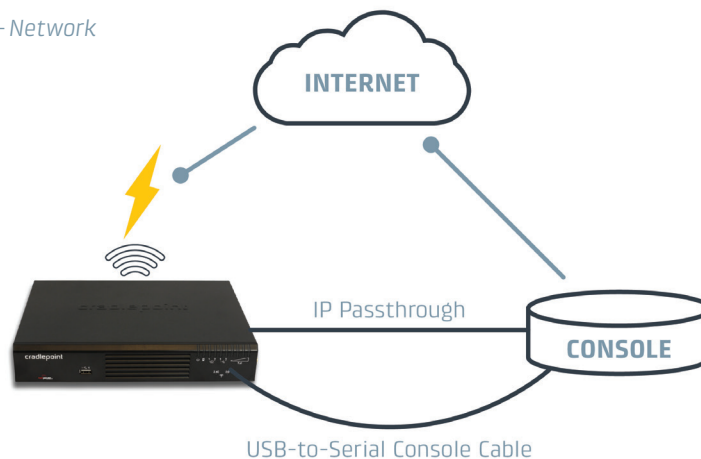


Fig. 2: Typical Deployment – Network Redundancy



RECOMMEND BEST PRACTICES FOR OUT-OF-BAND MANAGEMENT

Cradlepoint highly recommends the following best practices for Out-of-Band Management:

1. Utilize Cradlepoint routers with embedded modems for network redundancy, OOBM, and VRRP.
2. Use the SSH-to-Serial access because it is encrypted and requires a username and password. It's also recommended not using Telnet-to-Serial access unless the device is on a private network and not accessible from the Internet.
3. Do not use Telnet-to-Serial access for access over the Internet.
4. An USB-to-Serial adaptor that uses an FTDI chipset is required to use Serial Redirect or a Cradlepoint product with built-in serial port support.
5. Serial Redirect is currently supported on the following Cradlepoint Routers: COR IBR600, COR IBR650, COR IBR1100, COR IBR1150, CBA750B, MBR1400 (requires hardware version 2), and the AER2100.



CRADLEPOINT ADVANTAGES

Cradlepoint solutions are proven to deliver unparalleled ease of cloud-based deployment and management, with industry leading security, analytics, and best-in-class, high availability LTE integration. Cradlepoint solutions provide uncompromised 3G/4G/LTE wireless performance while delivering proven network system interoperability. With both integrated wireless WAN and non-integrated versions, the solutions are ideal for distributed operations and emerging industries that require either remote connectivity or multi-WAN redundancy.

AGILITY AND SPEED TO DEPLOYMENT

Cradlepoint solutions feature a fully integrated, enterprise-grade modem, so it is easy to set up a reliable, high-capacity, secure network instantly, and anywhere.

REMOTE MANAGEMENT

Limit truck rolls with Enterprise Cloud Manager, which makes it simple to configure, update firmware, troubleshoot, and monitor data usage across thousands of devices from a single, remote console.

OUT-OF-BAND MANAGEMENT

Cradlepoint provides secure remote access to a remote router's serial console port for configuration, troubleshooting, and management over LTE wireless networks, along with providing backup WAN connectivity as well as router redundancy for the LAN via VRRP while ensuring high availability and ease-of-use.

DATA OPTIMIZATION

Cradlepoint solutions allow for monitoring data usage both at the router level and across the enterprise using Enterprise Cloud Manager. Monitor device statuses in real-time and set proactive alerts for optimized 3G/4G/LTE data usage and network uptime to avoid data overages. Leverage Enterprise Cloud Manager's dynamic optimization and self-configuration features to improve quality of service.

WAN DIVERSITY

Cradlepoint offers WAN Diversity™ – the convergence of wired and wireless on one network – using dual cellular modems. Enterprises have the ability to deploy multiple wireless backup connections, load balance, and “Cut-the-Wire” for combined high-speed 4G LTE networks from diverse carriers, providing 99.99% uptime.

CLOUD-MANAGED SECURITY

Update firmware and security configurations remotely and en masse with Enterprise Cloud Manager. Cradlepoint's sophisticated security protocols help enforce device visibility on the network and are purpose-built for PCI Compliance. The platform's Intrusion Detection and Prevention functionality scans packets for attacks, malware, and Denial of Service attacks that can be blocked based on policy.

SIMPLIFIED SECURITY ARCHITECTURES

Create up to five secure VPN tunnels simultaneously, without the expense of purchasing a VPN service option. Improve ease of security configuration with Ethernet ports and WiFi SSIDs that can be individually assigned to specific network segments, or deploy parallel networks to keep sensitive data separate.

Sources

¹Gartner, "Increased Availability Through Best-in-Class Benchmarking and by Targeting causes of Downtime." September 26, 2014

²"Forecast Analysis: Mobile Connection by Technology, Worldwide, 2010-2017," Gartner.

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