



When Seconds Count Ensuring Business Continuity with 4G Failover

A SIERRA WIRELESS WHITE PAPER

The Importance of 4G Failover

In today's era of distributed enterprises, the average national or international organization relies on a complex network that involves hundreds of regional locations, each connected to headquarters via a local Internet connection. Local online access lets retail chains such as restaurants and stores, process sales and payment transactions, and let branches such as banks and travel agents, process secure service transactions. Local access also makes it easier to manage unmanned locations, such as ATMs and vending machines.

Using local resources to connect a regional location to the larger network is both affordable and scalable from an IT standpoint, since it lets regional locations run more autonomously without onsite IT staff, and new locations can be brought online quickly and cost-effectively. By and large, regional locations rely on a landline, such as T1, DSL, or cable for Internet connectivity. Landlines are widely available and relatively inexpensive to use, but they're vulnerable to unexpected outages.

Everyday occurrences like roadworks and other construction projects can damage an underground line, and even a simple traffic accident involving a car hitting a utility pole can create a widespread outage. Severe weather including lightning strikes, high winds, flooding, or earthquakes can disable services, and problems can also originate with the Internet service provider (ISP), since heavy network congestion or issues with the backbone can lead to downtime.

WHAT YOU NEED TO KNOW

- Temporary network outages – even those lasting just a few minutes – can cripple organizations that rely on local Internet access at remote locations.
- Failover systems that automatically switch to 4G LTE cellular when landlines go down let organizations maximize uptime, even when the unexpected happens.
- Sierra Wireless, a recognized leader in the deployment and management of mission-critical device networks, recommends 4G failover systems that use standalone gateways supported by a cloud-based management tool.
- This approach provides the best results in terms of flexibility, functionality, and cost because it ensures business continuity while also increasing operational efficiency.

Websites that track disruptions in Internet access such as www.outageanalyzer.com show that at any given moment, there can be dozens of outages worldwide, affecting hundreds if not thousands of sites. This means that for most organizations, dealing with a network outage is not a question of if, but of when.

Added to this is the fact that few organizations can tolerate more than a few minutes of downtime for business-critical applications. Network outages can affect just about every business process including POS transactions, online ordering, customer service, loyalty programs, inventory management, supply-chain applications, human resources, VoIP telephone and videoconferencing and more. Even a 10-15 second delay can disrupt operations, impact revenue, and frustrate customers.

The risk of Internet outages and the high costs associated with network downtime underscore the need for failover systems, since a failover system can automatically switch to a secondary network connection when the primary one fails. Something to consider, though, when selecting a failover solution is that the majority of landline outages are caused by nearby events that by and large, don't affect cell towers. Cellular service is almost always available when landlines aren't. Deploying a failover system that uses a cellular connection instead of a landline connection avoids the risk of relying on a single medium for network operations.

The broadband version of cellular known as LTE, has in recent years become widely available, and is being used by organizations around the world for network access. LTE has several advantages – it uses existing bandwidth more effectively and transmits and receives data using multiple inputs and outputs – and these advantages mean LTE networks deliver unmatched speed with exceptional reliability. Broadband data in a highly reliable format are what make LTE an ideal failover technology for distributed enterprises of all kinds.

**FEW ORGANIZATIONS CAN TOLERATE MORE THAN
A FEW MINUTES OF NETWORK DOWNTIME.**

Why a Standalone Cellular Gateway is the Better Choice for 4G Failover

Some network routers have a built-in cellular gateway for use when the landline is down. Deploying this kind of "all-in-one" router may seem like a convenient way to add LTE failover functions to a network, but combination router/gateway solutions have several drawbacks. They don't always offer state-of-the-art routing features, they may require non-standard configuration, and they may be more expensive. Separating the gateway from the router is a better option, for several reasons.



STRONGEST WIRELESS CONNECTION

The IT closet that houses the onsite router may not be in the best location for a strong cellular connection. The closet itself may be in a part of the building such as the basement, where reception is poor, but even if the room that houses network equipment is in a spot that gets a good signal, nearby equipment can cause RF interference. Using a standalone gateway instead of an all-in-one router makes it possible to position the gateway where it will get the best signal, and then connect it to the router.

BEST-OF-BREED COMPONENTS

The router is an essential piece of network equipment since it maintains the functioning and security of the local network. To streamline network configuration, simplify network management, and reduce overall costs, most distributed enterprises use a common vendor, such as Cisco or Juniper, across the organization. A specialty router, with an integrated gateway for LTE failover, may not be available from the preferred supplier. A specialty router may also have only limited firewall capabilities and may not offer state-of-the-art routing features. Also, using a different brand of router is likely to require the IT staff to learn and implement a different router configuration and this can add to the complexity (and cost) of the installation. A standalone gateway on the other hand, is typically compatible with routers from all vendors and is much simpler to configure. Using a standalone gateway for LTE failover means the IT department can select the best gateway for the site without sacrificing functionality in the router.

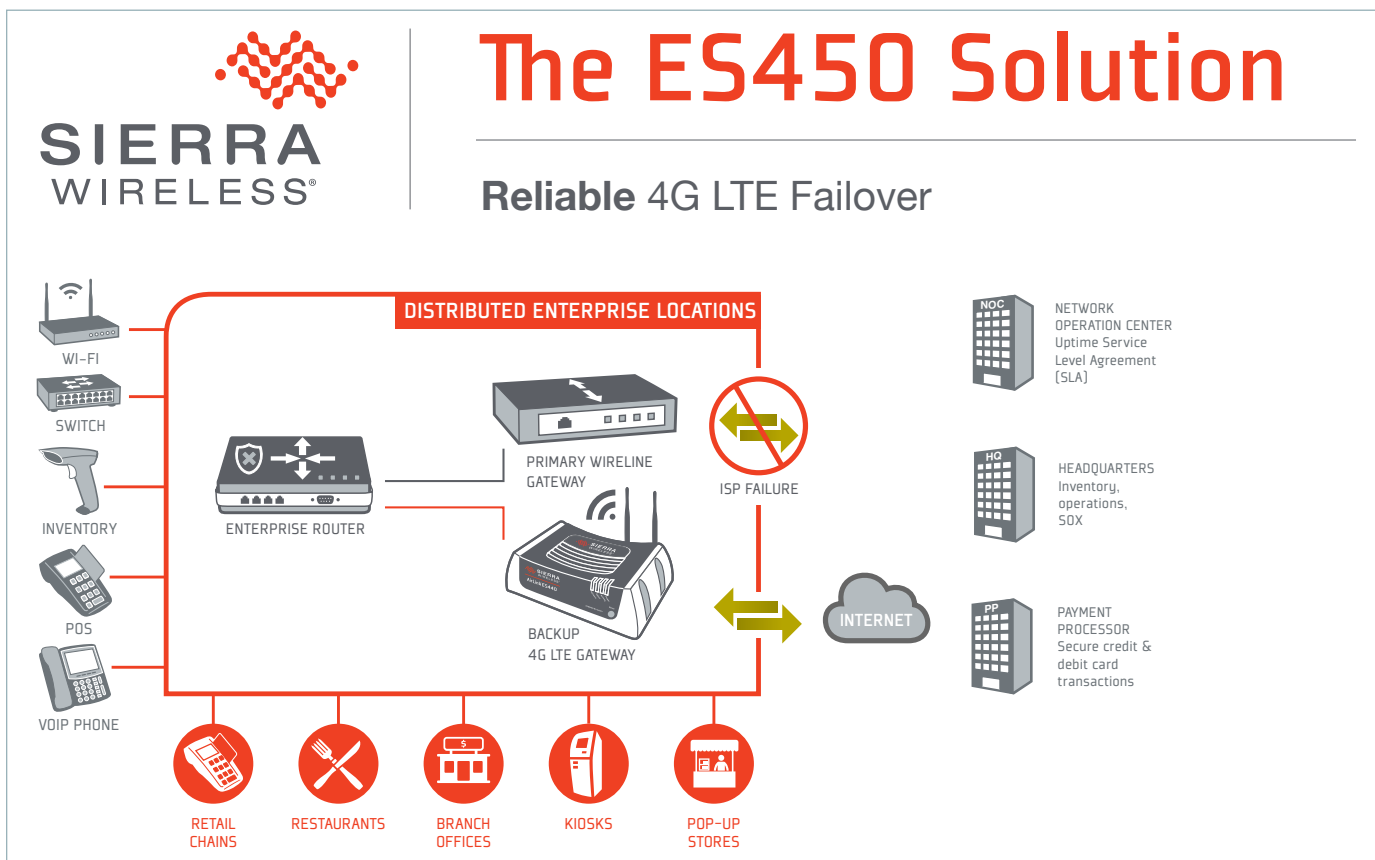
REMOTE ACCESS TO NETWORKING EQUIPMENT

Regional offices may not have onsite IT staff, and sending technicians to perform minor network fixes is both expensive and time-consuming. In most distributed enterprises, the network operations center avoids this issue by relying on remote out-of-band management (OOBM) functions to monitor and manage offsite network equipment. Remote OOBM makes it possible to reset equipment remotely, so administrators can respond to failures without sending a technician to each affected location for a manual reset. In a router that also includes a cellular gateway, the gateway's OOBM functions may not be accessible when the router experiences a problem. Using a standalone gateway keeps the OOBM function available at all times, and provides an extra level of redundancy. The standalone gateway's OOBM function can be used to wake or reset the router remotely at any time, without sending a technician to the site. If the router experiences a problem, such as freezing during a configuration cycle, network administrators can use the standalone gateway's OOBM function to reboot the attached router and avoid an expensive truck roll.

A STANDALONE CELLULAR GATEWAY DELIVERS THE BEST BALANCE OF EFFICIENCY, PERFORMANCE, AND COST FOR LTE FAILOVER.



FIGURE 1. THE SIERRA WIRELESS SOLUTION FOR LTE FAILOVER



The Sierra Wireless Solution for 4G Failover

Sierra Wireless has developed a LTE failover solution that draws on the company's more than 20 years of experience deploying and managing large-scale, cellular-based industrial networks. The solution, shown in Figure 1, combines the AirLink ES450, a standalone enterprise LTE gateway, with the AirLink Management Service, a comprehensive cloud-based application for deploying, monitoring, troubleshooting and servicing remote gateways.

The use of a robust standalone gateway supported by a dedicated management service provides the rapid response time needed to ensure business continuity while making the IT department better equipped to resolve issues faster and more efficiently. To meet the goal of making the failover operation both more powerful and more cost-effective, Sierra Wireless development teams have added special features that make AirLink ES450 LTE gateway and the AirLink Management Service an ideal combination for business continuity.



AIRLINK ES450 LTE GATEWAY HIGHLIGHTS

- Supports present and future high-speed LTE networks
- Proven reliability, with over one million AirLink devices deployed
- Enterprise-grade security
- AirVantage Management System for remote management
- Premium enterprise features, software updates, and hardware replacement included

AIRLINK ES450 LTE GATEWAY

The AirLink ES450 is a secure, robust LTE gateway designed for distributed enterprises. As an LTE failover device, it automatically provides Internet connectivity via wireless when the primary landline connections experience problems, so there's no disruption in online services.

Sierra Wireless has been a leader in industrial cellular gateways since the early 1990s. Sierra Wireless has deployed more than one million gateways, and has maintained a consistent track record of innovation. Most recently, for example, Sierra Wireless was first to deliver an LTE gateway rugged enough for industrial use. The AirLink ES450 LTE gateway builds on that expertise, and offers several features that enhance LTE failover operations.

- **Remote OOBM Function**

The AirLink ES450 LTE gateway supports remote out-of-band-management (OOBM), which means it can be used to reset the in-place router at any time. The function works whether or not the machine is powered on, and whether or not the machine has a functioning operating system.

- **Low Airtime Usage**

The AirLink ES450 LTE gateway saves money on airtime subscriptions by using the primary land connection, not the cellular connection, to send network-monitoring data. At the same time, the AirLink ES450 uses the familiar SNMP protocol for collecting information and implementing configurations so the IT department doesn't have to learn a new method for interacting with network devices.

- **Automatic Fallback to 3G**

The AirLink ES450 LTE gateway provides its own internal failover mechanism, providing a "backup for the backup" by automatically switching to 3G communication if a LTE connection isn't available.

- **Primary Connectivity**

The AirLink ES450 LTE gateway is robust enough to deliver the primary connection for business-critical equipment including POS systems and other wireless devices. For example, it can be used for mobile-only retail locations, such as pop-up stores at tradeshow, sporting events, festivals, or even food trucks. The AirLink ES450 LTE gateway can also provide complete coverage for specialty retail outlets like vending kiosks, or for digital signage that provides real-time personalized messaging or content.

- **Premium Support, At No Cost**

While some vendors charge for support services, Sierra Wireless includes three years of premium enterprise support delivered through channel partners as part of the purchase price. Customers receive free technical support as part of the product delivery including help with enterprise security and integration with VPNs.

- **Free Software Updates and Upgrades**

Sierra Wireless provides three years of software updates and upgrades which cover everything from bug fixes to new software features.



SIERRA'S HISTORY OF GATEWAY INNOVATION

1993: First with an industrial M2M gateway

1996: First with a rugged vehicle gateway

2007: First with a 3G M2M gateway

2012: First with a rugged LTE gateway

- **Advance Hardware Replacement**

The three-year warranty also includes advance hardware replacement, which means that in the event of a gateway failure, technicians will install temporary hardware so the connection remains operational while the item is repaired or replaced. That keeps down-time to a minimum, even when there's a problem beyond the reach of the AirLink Management Service.

SIERRA WIRELESS HAS DEPLOYED MORE THAN ONE MILLION GATEWAYS

AirLink Management Service

The AirLink Management Service is a cloud-based device-management service that gives IT departments a uniquely flexible, customizable way to manage remote gateways in distributed networks. Recognized by ABI Research as a best-in-class solution for configuring, deploying, controlling, and troubleshooting large-scale deployments, AirLink Management Service includes several features that make it ideally suited for use with LTE failover setups.

- **Failover Monitoring**

When the landline connection fails, the AirLink ES450 LTE gateway automatically takes over and begins sending traffic over the wireless connection. At the same time, the AirLink ES450 gateway alerts the AirLink Management Service and posts an event on the dashboard. This lets network administrators know, in real time, that there is a problem so they can begin troubleshooting right away.

- **Airtime Reporting**

IT administrators can set thresholds within the AirLink Management System to monitor traffic as it passes through the AirLink ES450 during a failover event. That way, the IT team can make certain that traffic is, indeed, moving smoothly over the cellular connection as they work to restore the landline.

- **Single Interface for All Airtime Subscriptions**

The AirLink Management Service lets the IT department manage every airtime subscription, even if there are deployments on multiple mobile networks. Having a single interface for all airtime subscriptions helps manage costs and balance usage for maximum efficiency.

- **Faster Deployments**

Designed for remote deployment and management of network devices, the AirLink Management Service makes it easy to configure and monitor gateways from a central location so new retail outlets, branch offices, and other remote locations can be configured quickly, without sending IT personnel to the site.



**ABI RESEARCH RECOGNIZES THE AIRLINK MANAGEMENT SERVICE
AS BEST-IN-CLASS**

AIRLINK MANAGEMENT SERVICE HIGHLIGHTS

- Centralized management of remote gateway software and applications eliminates truck rolls and equipment downtime
- A dashboard that can be tailored to monitor key metrics including failover monitoring, uptime, deployment progress, critical alerts and more
- Airtime reporting lets the IT team confirm that traffic is moving normally, even during a failover condition
- Specific actions such as automatic notifications can be integrated into existing business applications, so routine IT processes such as ticket creation remain streamlined
- Advanced diagnostics and reporting tools enable remote troubleshooting that can improve uptime

The Sierra Wireless Approach Delivers Premium Features at a Lower Cost

Better wireless connectivity, easier installation, and lower overhead make standalone cellular gateways the best option for implementing an LTE failover system.

The foundation of the Sierra Wireless LTE failover solution, the AirLink ES450 LTE gateway, builds on Sierra Wireless' unmatched expertise in delivering secure, reliable performance in large-scale, mission-critical networks.

The Sierra Wireless LTE failover solution is made stronger by the AirLink Management Service, the industry's most comprehensive platform for managing gateways in a distributed network. The AirLink Management Service provides the highest levels of configurability and ease of use, and as a result, lowers IT costs while making the IT team more efficient and more responsive.

Taken together, the AirLink ES450 LTE gateway and the AirLink Management Service create an LTE failover solution that offers the best combination of flexibility, functionality and cost.

To learn more about the Sierra Wireless approach to LTE failover, the AirLink ES450 LTE gateway and AirLink Management Service, please visit www.sierrawireless.com/ES450.

About Sierra Wireless

Sierra Wireless is building the Internet of Things with intelligent wireless solutions that empower organizations to innovate in the connected world. We offer the industry's most comprehensive portfolio of 2G, 3G, and 4G embedded modules and gateways, seamlessly integrated with our secure cloud and connectivity services. OEMs and enterprises worldwide trust our innovative solutions to get their connected products and services to market faster. Sierra Wireless has more than 950 employees globally and operates R&D centers in North America, Europe, and Asia.

For more information, visit www.sierrawireless.com.

