



CASE STUDY
LIVING SPACES FURNITURE



Saving \$300,000/year while scaling to 50 sites — with only three network staff

Collapsing the stack and centralizing management helps Living Spaces accelerate scaling across the United States

“Nodegrid is the cog that brings everything together. We’ve quadrupled business, but this solution is actually shrinking our workload, especially as we implement new automation. It’s a gamechanger for network folks. Period.” —Blake Johnson, Network Architect, Living Spaces Furniture

Living Spaces Furniture has become a prominent furniture retailer in the United States. Their store locations include large showrooms, where customers can view furnishings for indoor and outdoor spaces, and plenty of warehouse space for storing on-hand inventory. These locations must serve customers with responsive shopping experiences, which depend on the network infrastructure.

As demand increased, the company needed to expand out of its home state of California, into states including Arizona, Colorado, Oklahoma, Texas, and others. Their out-of-band infrastructure was crucial to spinning up new locations and maintaining operations. But they faced a significant problem: this infrastructure was incredibly complex and costly, requiring many dedicated cellular and out-of-band devices at each location. Their three-person network team would easily be overwhelmed by scaling this complexity, so they sought a solution that could overcome the following gaps:

- Reducing costs, by eliminating the need for \$75,000+ per year in LTE contracts
- Reducing administration timelines and attack surfaces, by centralizing management and minimizing cellular entry points
- Accelerating deployments, by enabling staff to use scripting and automation for configuration workloads

Continue reading to see how Nodegrid and ZPE Cloud delivered ongoing savings for Living Spaces

Background



Living Spaces Furniture is a retailer based out of California in the United States. They offer indoor and outdoor furniture and decor, from dining sets, home office setups, and mattresses, to outdoor daybeds, firepits, rugs, and everything in between. They also provide a modern shopping experience, serving customers both through their large retail locations and online webstore.

Like most modern retailers, Living Spaces relies on a networking infrastructure to support operations at their manufacturing sites, distribution centers, and retail showrooms. Their robust network includes two data centers at the core, which help provide accurate inventory data, up-to-date logistics tracking, and responsive customer experiences. Because uptime directly affects revenue, their network team is responsible for maintaining 100% availability for operations that run nearly 24 hours a day. Blake Johnson is the engineer and architect in charge of this lean, three-person team.

At the network team's disposal is out-of-band (OOB) management. This is a separate control plane that allows for administration of the production network, which is crucial to supporting operations and business goals. The team uses this OOB path to configure devices for new installs, apply firmware updates and security patches, and troubleshoot outages.

Living Spaces has experienced significant growth in recent years, more than quadrupling their number of retail locations from 12 to 50+. Their small network team shouldered the burden of scaling their IT operations to meet demand, and they would quickly discover that their existing OOB solution was weighing them down.

Problem and Gaps

As Living Spaces marched across the U.S., opening stores in Nevada, Colorado, Texas, and other states, Blake realized that they faced a significant problem: their three-person network team needed to support every new deployment as well as all existing locations. Two major factors came into play:

- 1. Location size** - Locations typically include large showrooms that showcase common spaces found in residential homes, such as living rooms, bedrooms, bathrooms, and outdoor patios. These sprawling locations require up to 12 or more Intermediate Distribution Frames (IDFs) connected to a Main Distribution Frame (MDF), each requiring out-of-band equipment. These IDFs are located 30-40 feet above the floor where signals won't be disturbed by physical traffic.
- 2. Out-of-Band complexity** - IDFs contain Wi-Fi access points, security cameras, PoE switches, display/signage computers, and other equipment, all connected to an out-of-band device. But their existing OOB vendor didn't support the fiber connectivity necessary to backhaul each IDF to the store's MDF. This meant each IDF required an independent LTE modem and its own SIM card and contract, to connect to the central access controller. This was the vendor's only available solution that could provide cellular connectivity to each IDF in case of maintenance or outage issues. In addition, their MDFs each required a network switch and cellular failover device with dedicated SIM/contract. Instead of seeing a dozen locations to manage, this OOB complexity presented Blake's team with 300+ separate devices to manage.

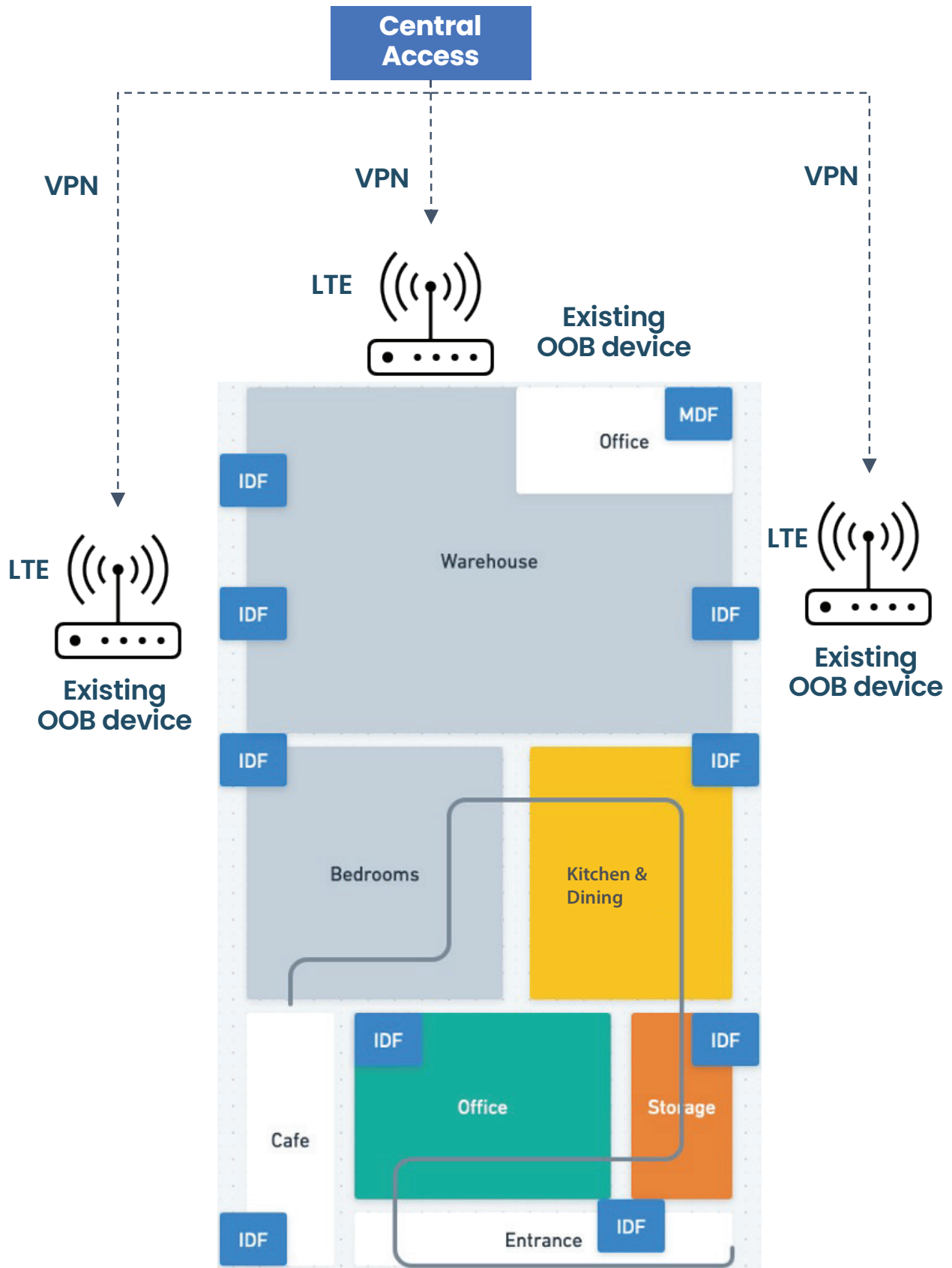


Image: The existing solution required dedicated LTE devices at each MDF and IDF, which created a complex management workload and inflated costs to \$75,000+ per year.

At the time, Blake and his team were juggling 300 separate OOB units, which cost \$75,000 per year in SIM contracts alone. This added security gaps as well, since there were up to 12 or more LTE entry points at each site. Further complicating their capabilities was their separate switch fabric, which introduced cable length limitations and forced them to find workaround solutions rather than use the fiber optic cables they had in place.

To be able to support a near-24/7 operation with only three network staff, while meeting demand to open new stores across the U.S., Blake would have to overcome the following gaps in their infrastructure and operations:

- Their existing OOB stack was inflated. Their OOB vendor required too many dedicated LTE contracts and offered no alternative solution. Just for a single location to be operational, Living Spaces would have to spend thousands in yearly LTE costs, not to mention the security and administration concerns that come with having so many devices.
- Their existing OOB administration was complex and insecure. Because their existing vendor could not centralize the LTE functionality or management, the network team was forced to remote-in to configure and manage each device separately. This was an administrative time sink, and also meant there were 300+ LTE entry points that could be exploited by attackers.
- To accelerate future deployments, they wished to incorporate automation. But their existing OOB vendor required expensive management software licenses, and limited automation only to specific tools and languages that required programming expertise. This locked the network team into slow, manual deployments.

To overcome these gaps, Living Spaces required an OOB solution that could:

- Eliminate the need for dedicated LTE SIMs and contracts at each IDF and MDF, by centralizing cellular functionality at each location.
- Minimize repetitive tasks as well as the attack surface, by providing a single entry point for remote access to configure and manage devices.
- Accelerate future deployments, by enabling scripting and automation for any skill level.

In addition, Blake knew they would need to save initial deployment costs. This would require a solution that could be implemented gradually while keeping some of their existing OOB equipment in place.

Solution

Blake vetted custom solutions from their current vendor and competitors, but these proved to be too cumbersome to maintain, much less scale to 50+ locations. He discovered that only Nodegrid could deliver the capabilities they needed for rapid growth.

To solve their physical infrastructure challenges, Blake chose a powerful combination of Nodegrid Services Router devices: the Net SR (NSR), Gate SR (GSR), and Link SR (LSR). He would also address their operational concerns by implementing ZPE Cloud for centralized management.

Nodegrid devices feature multi-core Intel CPUs. Compared to the previous vendor's ARM-based devices, this would prove to be a significant upgrade in terms of speed and responsiveness. At the heart of Nodegrid devices is the Linux-based Nodegrid OS. This operating system is extensible and enables integration of not only networking and management functions, but also automation tools and programming languages of any kind.

At both data center locations, Blake deployed the NSR. This modular device features five expansion slots that can accommodate serial, ethernet, fiber, cellular, storage, and compute add-ons. With the NSR, they got an all-in-one OOB solution at the data center, with serial, fiber, and cellular modules in a IRU device capable of hosting any applications they need.

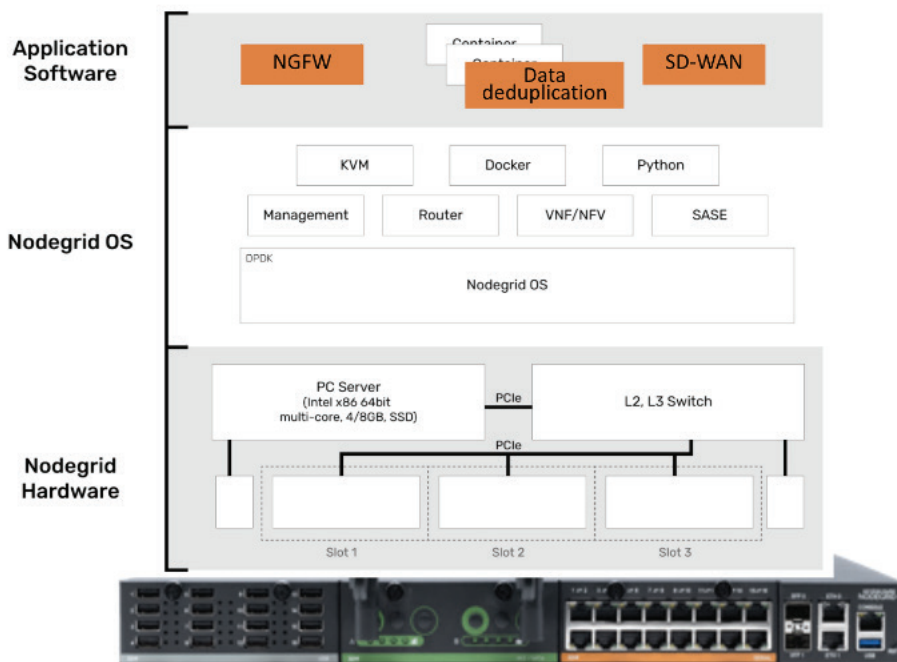


Image: The Nodegrid Net SR accepts up to five expansion modules for serial, ethernet, USB, cellular, storage, and compute capabilities, and the onboard Nodegrid OS directly runs VMs, containers, and applications of choice.

At their retail locations, Nodegrid was the ideal solution to address their complicated OOB architecture that stemmed from their previous vendor's lack of integration and features. Blake's team deployed the GSR and LSR based on their port density requirements.

- At the MDF, they deployed the GSR that features eight serial ports, eleven network ports (including 2 SFP+), and LTE. This would allow them to physically connect to their MDF stack and every IDF.
- For cellular connectivity, they activated the GSR's LTE. Critical to their use case was the device's fiber ports, which allowed them to use the existing fiber runs to connect each IDF to the MDF. The GSR would act as the central access point for each location, eliminating the need for each IDF's OOB device to have a direct internet connection.
- At each IDF, they replaced their existing OOB solution with the LSR. This compact device features an SFP port, along with a serial port and two USB ports. These allow for connecting to the IDF stack, as well as for adding dongles for more use cases, like providing Internet and Wi-Fi connectivity.

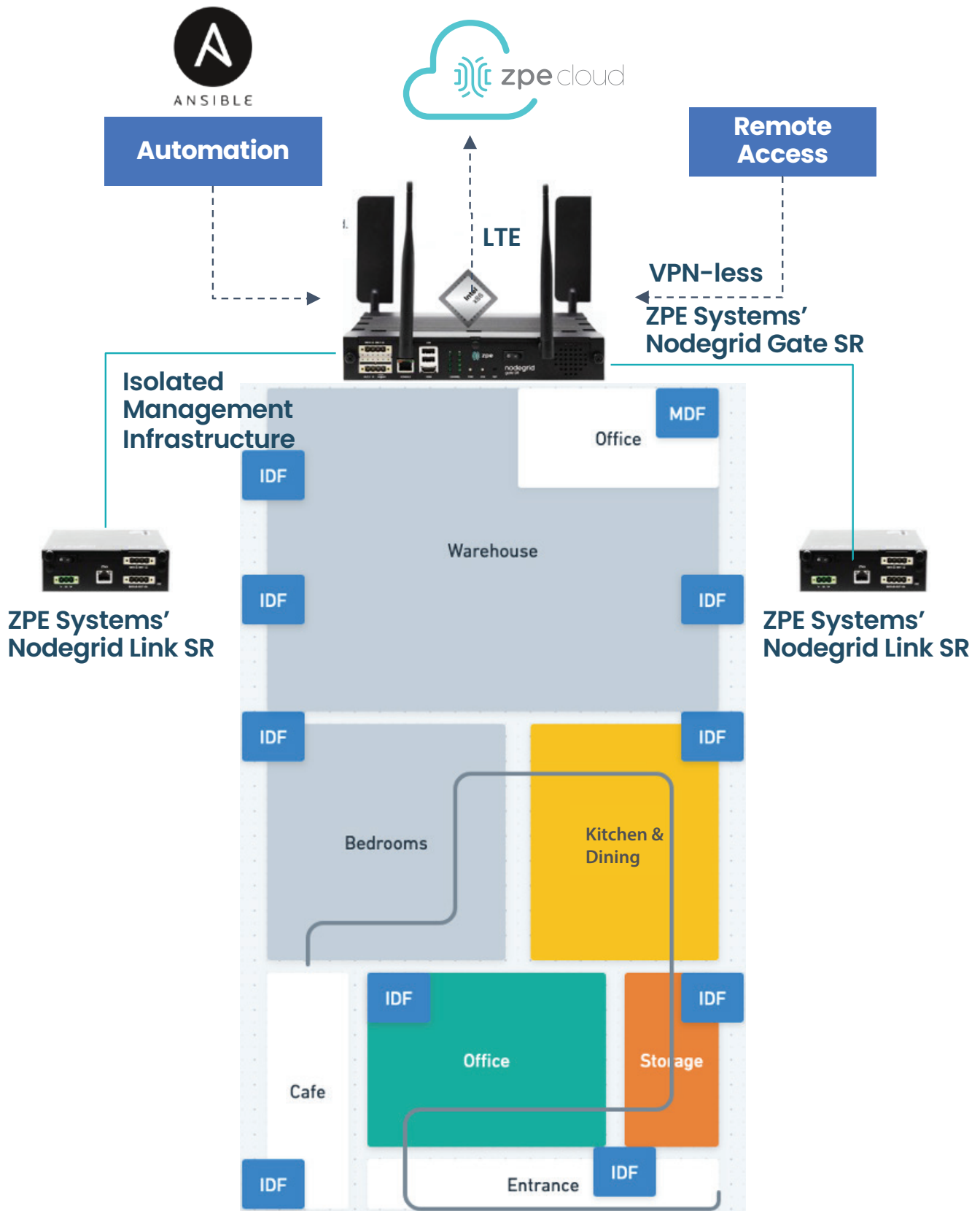


Image: Nodegrid Gate SR and Link SR devices provided a streamlined solution that eliminated the need for dedicated LTE devices at each IDF and MDF.

Results and Benefits

On the surface, it appears that Living Spaces simply replaced their existing OOB devices with ZPE Systems' Nodegrid devices. But Nodegrid's integration of features and functions allowed the team to address their infrastructure concerns and operational issues, while delivering additional benefits and the flexibility to meet changing future requirements.

Solving the initial problems

The LTE-enabled GSR they deployed at the MDF was the only cellular connection they needed at each store. Its long-run fiber capabilities took advantage of existing cabling to connect to each IDF, and as a result, they no longer needed 12+ LTE contracts per store. This removed each IDF's direct cellular connection, which improved the overall security posture as well. And because Nodegrid can also use cellular for the data path, Blake's team was able to provide full connectivity (including Wi-Fi) at sites that were slow to have their main connection installed.

With Nodegrid devices able to serve multiple functions, the GSR and LSR could be used to collapse their physical stack, not only by replacing their dedicated cellular devices, but also by replacing their switches. Nodegrid OS is also vendor-agnostic, which means it can integrate remnants of the existing OOB solution.

All of these Nodegrid features delivered the following benefits:

Benefit 1: Revenue Growth

Blake's team kept pace with Living Spaces' demand, since the GSR provided cellular for the production network. Sites could be deployed and operational without delay, even when a main connection was weeks away from being installed.

Benefit 2: \$75k/year Cost Savings

Living Spaces instantly cut cellular costs by \$75,000 per year. As they now have 50+ locations nationwide, these savings have scaled and are now \$300,000+ per year.

Benefit 3: Increased Security

Living Spaces drastically reduced their attack surface by eliminating 300+ cellular entry points. Now, Blake's team has peace of mind knowing that each store only has a single, tightly-secured cellular connection.

Benefit 4: Budget Conscious

Rather than having to rip and replace their OOB solution all at once, Nodegrid allowed the network team to save costs by gradually deploying the GSR and LSR. Nodegrid OS allowed them to continue to manage existing OOB devices at IDFs and MDFs, and gradually replace these (including switches) as budget allowed.

Realizing bonus benefits

Aside from these features and benefits, Blake deployed Nodegrid and ZPE Cloud because they are a platform – both for infrastructure and management – that allow his team to solve more than their initial problems. This is courtesy of Nodegrid’s vendor-neutral integration and normalized command interface, combined with ZPE Cloud’s global fleet management and automation capabilities.

On a local level, Nodegrid integrates with any solution – regardless of vendor – to centralize management access. The GSR serves as a single point of entry, through which Blake’s team can remote-in and gain access to every IDF and connected device. They can perform maintenance and troubleshooting as if they were physically on-site.

ZPE Cloud further centralizes management. This SaaS solution features an intuitive dashboard that allows Blake’s team to see every site, and then click into each for remote access to every device at that location. ZPE Cloud also serves as a file repository and orchestration platform. Blake’s team now deploys stores automatically by pushing scripts through ZPE Cloud down to each site and device.

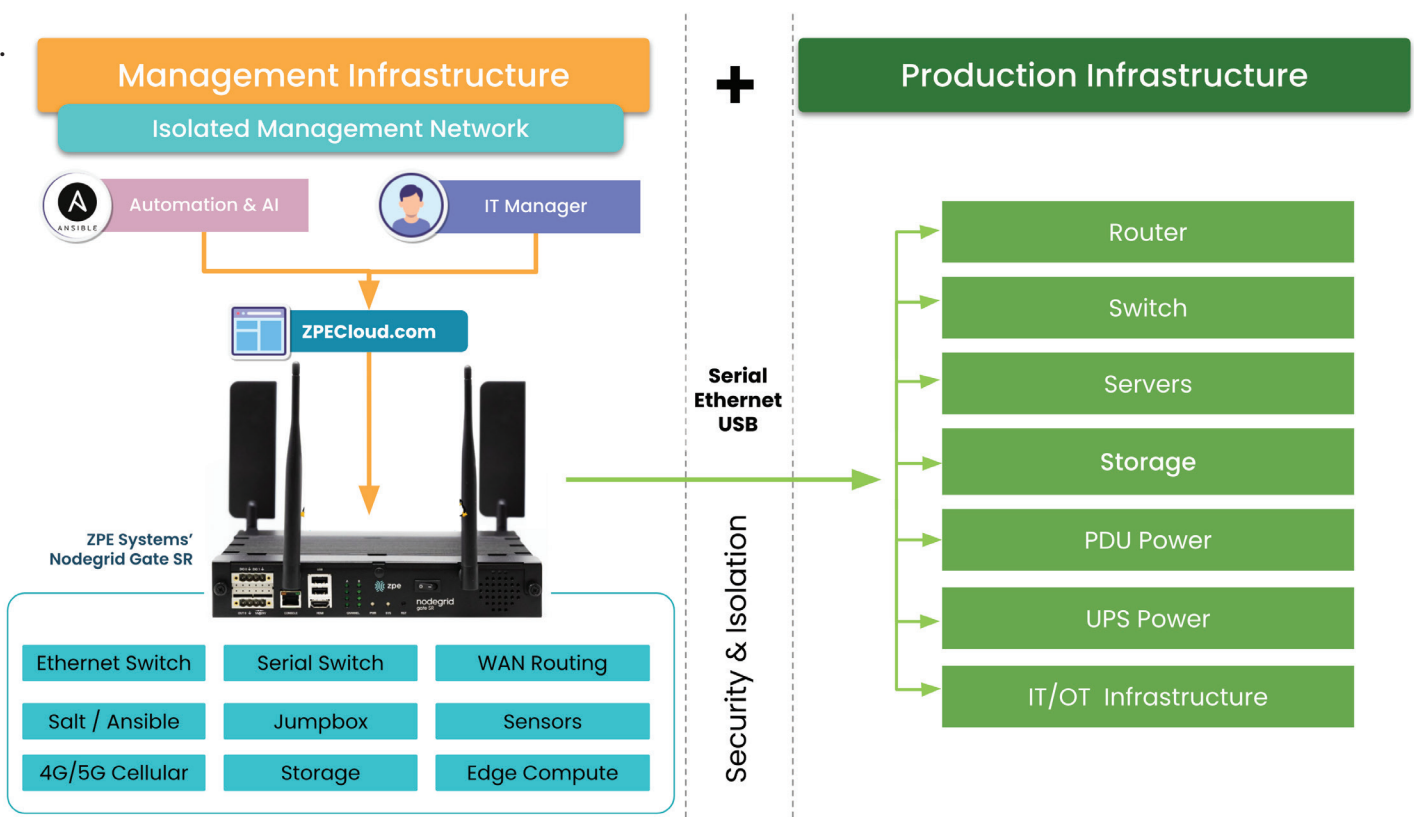


Image: Nodegrid and ZPE Cloud are a drop-in solution for creating the Isolated Management Infrastructure (IMI), a best practice perfected by Big Tech.

Blake also achieved the out-of-band best practice used by Big Tech and hyperscalers, by having dedicated control planes at the LAN and WAN levels. This is called Isolated Management Infrastructure (IMI), which allows teams to safely perform a variety of actions to production and management equipment. These actions can include testing automation integrity before deploying to production, or in the case of a cyberattack, decommissioning and completely rebuilding equipment. This continues to prove invaluable as Blake's team implements more automation.

With these integration and management features, Blake's team realized the following bonus benefits:

Bonus Benefit 1: Ease of Use

Whereas the previous OOB vendor required the network team to access and manage 300+ devices individually, Nodegrid reduces this workload by providing a single entry point and normalized interface. Blake's team enjoys a seamless management experience across MDFs and IDFs.

Bonus Benefit 2: Time Savings

ZPE Cloud saves time and reduces fatigue by centralizing management on a nationwide level. Now, the network team can fully manage every site and device from the convenience of the NOC.

Bonus Benefit 3: Less Work

Nodegrid and ZPE Cloud save hours on device provisioning and configuring. Blake and his team now easily scale to meet demand by executing scripts that automatically bring new sites online. This solution also provides the IMI for safely testing more complex automation and orchestration as Blake's team builds their programming skills.

"Nodegrid cut costs by \$75k per year and that was just the beginning. My team was sweating thinking about scaling our existing architecture. It would have taken so much time to spin up new sites and keep everything else running. But Nodegrid lets us operate 50 stores in a regular work week. We use ZPE Cloud to push scripts that automatically configure new sites. For everything else, we just click into a location and do what we need – reboot hanging gear, apply patches, update software, you name it." –Blake Johnson

Blake's future plans for Living Spaces include improving deployments by implementing more automation, as well as improving operations by using sensors, 5G, and additional ZPE Cloud features.

"We're working on fully automating deployments using Ansible. It really helps that ZPE has **libraries and playbooks on Github**. We also plan to incorporate USB sensors for airflow and temperature to keep a close eye on our gear. That way we can start feeding data to Nodegrid Data Lake for analysis and get ahead of gear failures or traffic spikes."

If you're ready to leave cluttered networking behind, count on Nodegrid and ZPE Cloud for the smoothest experience. Visit our website to get expert advice, walk through a reference diagram, or set up a free Nodegrid demo.

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