

ZPE Systems Introduces Gen 3 Out-of-Band (OOB) & the Zero Pain Ecosystem

ZPE Systems' secure & scalable downtime recovery solution built in secret with the world's top tech giants

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CEO & Co-Founder



Koroush Saraf
VP, Product Management



Rene Neumann
Network Solutions Architect



Agenda

Problems that led ZPE to develop the Zero Pain Ecosystem

Explore the gaps in existing solutions and the downtime-inducing issues that inspired development of our **Zero Pain Ecosystem**. See ZPE's core elements that enable the world's largest enterprises to improve network reliability, address personnel & expertise shortages, and strengthen weak security postures. Learn about the latest Gen 3 requirements and see the blueprints for implementing the Zero Pain Ecosystem in data center, campus, colocation, branch, and edge environments.

How ZPE customers use Gen 3 OOB to automate remote critical infrastructure and edge networks

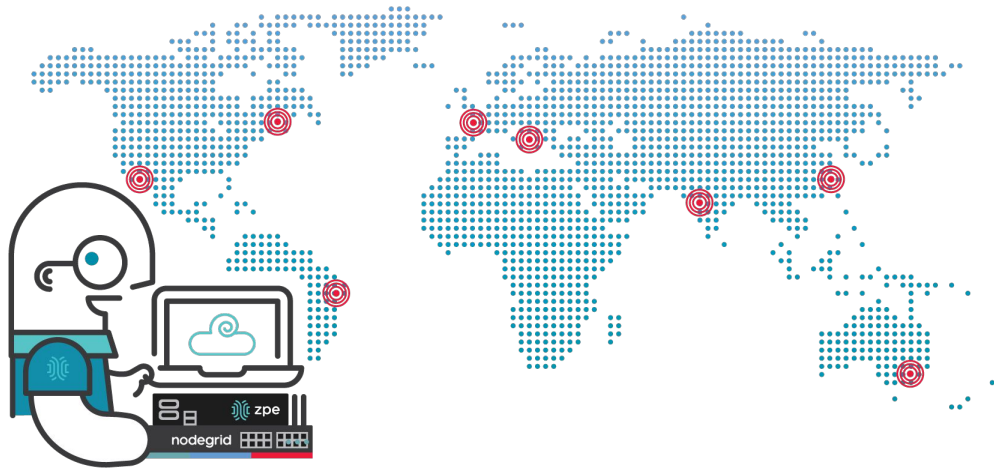
See how ZPE transformed critical data center infrastructure for tech giants, and extended this technology to enable the same openness, security, and scalability for remote critical infrastructure. Explore modern use cases for Gen 3 OOB, end-to-end automation, NetOps / NetDevOps, next-gen SD-Branch gateways, and AIOps.

Demo No. 1: Hands on with Gen 3 OOB to resolve edge operational challenges

Live demo of a real customer deployment. We will remotely demo an IT admin in Europe managing infrastructure as if they are virtually present in California. Including connectivity, security, automation of critical edge infrastructure.

Demo No. 2: Go beyond standard OOB and explore the automated Zero Pain Ecosystem

Demo 2 goes beyond the standard of remote access. ZPE will show the open ecosystem that makes IT wishes come true by enabling flexible automation & orchestration by Zero Touch/Zero Trust Provisioning, and open 3rd party orchestration stack as well as 3rd party tools like Rumble scanners, pen testing, and automation playbooks.



Hello!

We are ZPE Systems.

Founded: 2013

Headquarters: Silicon Valley, CA

Global & Enterprise Customers: >100

- At ZPE Systems, we deliver end-to-end datacenter infrastructure automation at million node scale through a combination of out-of-band serial console HW, SW, and Cloud SaaS offerings.
- We have expanded our Gen3 out-of-band automation solution to address the customer needs for critical remote infrastructure and branch edge.

Customer Problems that led ZPE to develop the Zero Pain Ecosystem



Growing Outages & Security Threats

Alert: Problems Reported

SCC data center takes Oxford City Council services offline over the weekend.

[Computer Weekly](#) reports that a “botched platform firewall upgrade” ...

Service Disruption

At 15:46 UTC today, a software configuration update triggered a bug in the DNS system, the system that directs browsers to websites. This caused a disruption impacting availability of ...



**Lack of Reliability
& Availability**

**Lack of Personnel
& Expertise**

**Lack of
Holistic Security**

“ Almost half (44%) of data center operators surveyed think that **concern about resiliency of data center mission-critical IT has increased** in the past twelve months. [UPTIME INSTITUTE](#) ”

By 2025, as enterprises continue to converge OT/IT, **25% of edge networks will be breached**, up from less than 1% in 2021. [GARTNER](#) ”

What Causes These Problems

Too many products • Too many experts • Too many gaps

Lack of Reliability & Availability



- Complexity of technology, environment, & scale
- Gaps in automation and hurdles in orchestration
- Compromise due to cost

Lack of Personnel & Expertise



- Lack of expertise
- Lack of remote help
- Human error

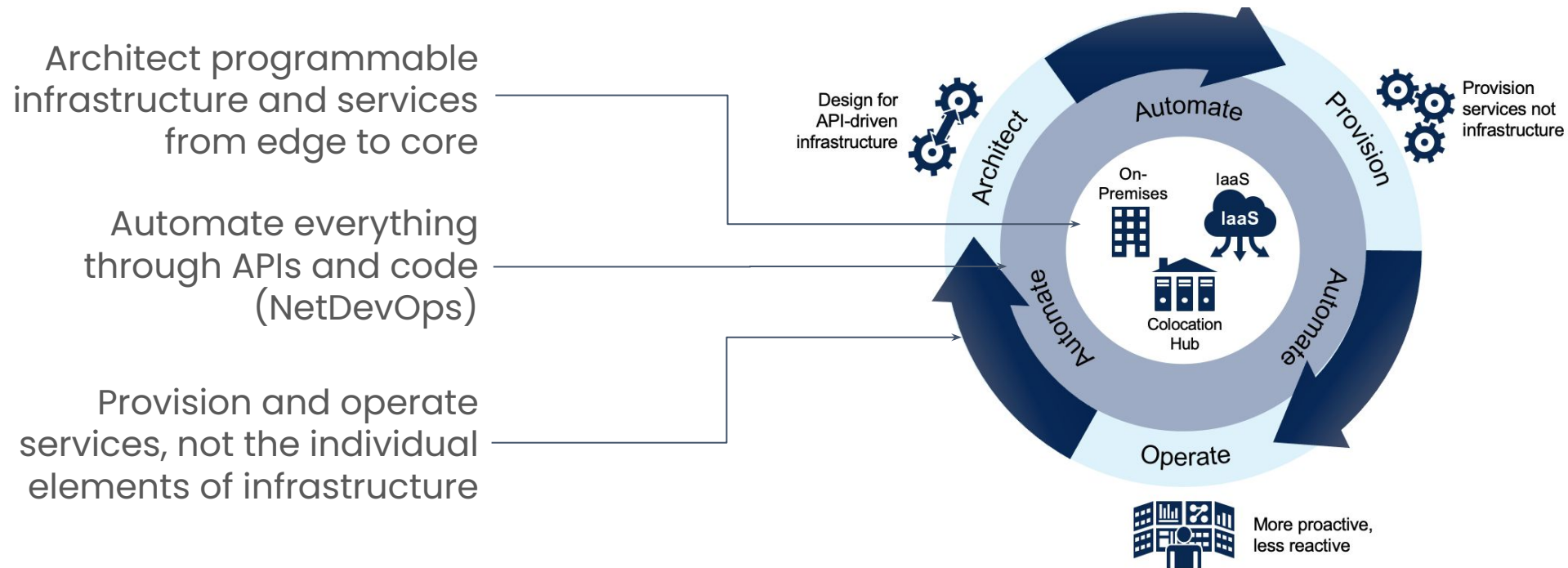
Lack of Holistic Security



- Old OS & weak links
- Configuration gaps
- Lack of interoperability

Recommended Solution

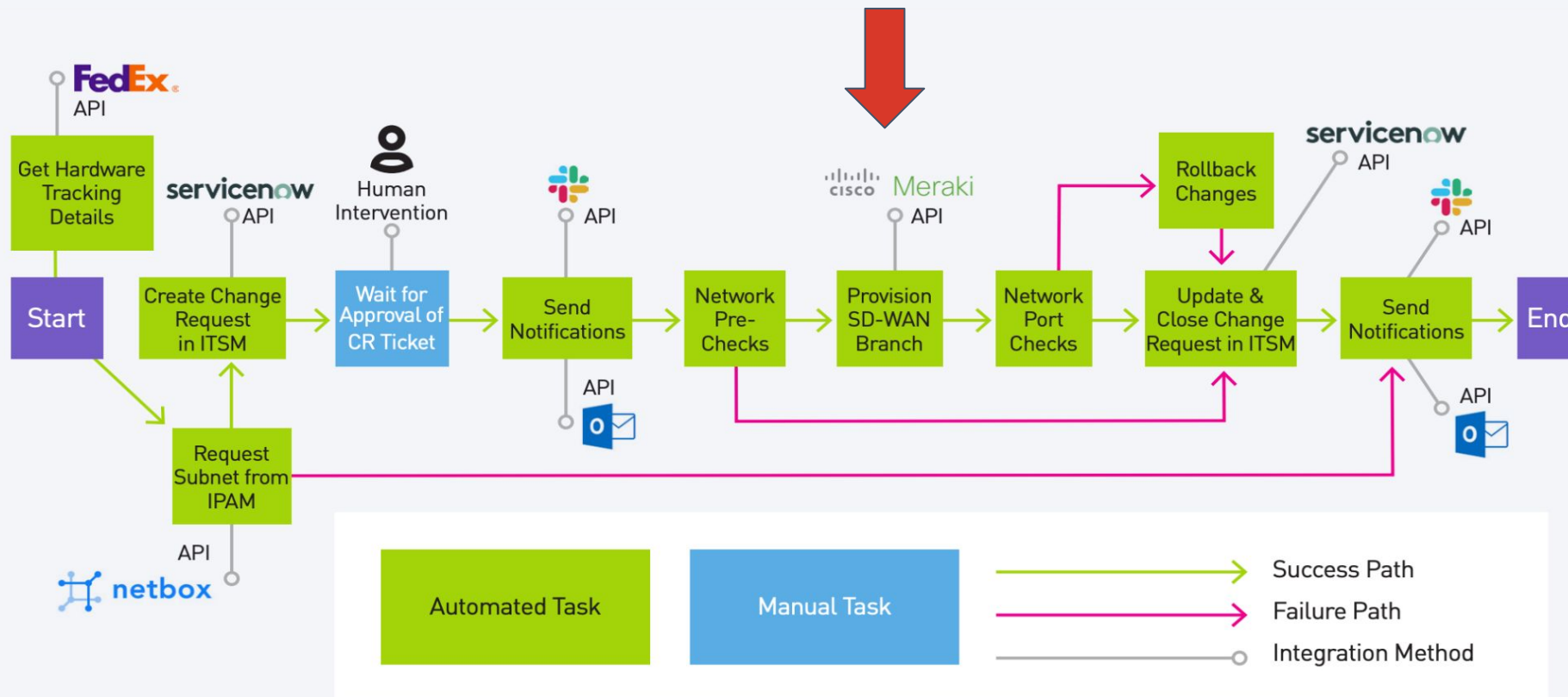
Build Programmable Infrastructure Through Orchestration



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Example of Automation for SD-WAN

A real scenario from ONUG working group



Automation needs to:

- Be end-to-end
- Support diversity
- Recover from error out-of-band

NOTE THE RED ARROW:
If the Meraki upgrade fails, the entire automation halts.

Gen 3 OOB

Enables NetDevOps & Infrastructure Automation

**Gen 1 – OOB
Remote Access**

**Gen 2 – OOB
Troubleshooting**

**Gen 3 – OOB
End-to-End
automation**

CYCLADES 

- Out-of-band
- Minimal scripts
- Manual provisioning and troubleshooting
- Simple serial console for connectivity only

 **Avocent.** 

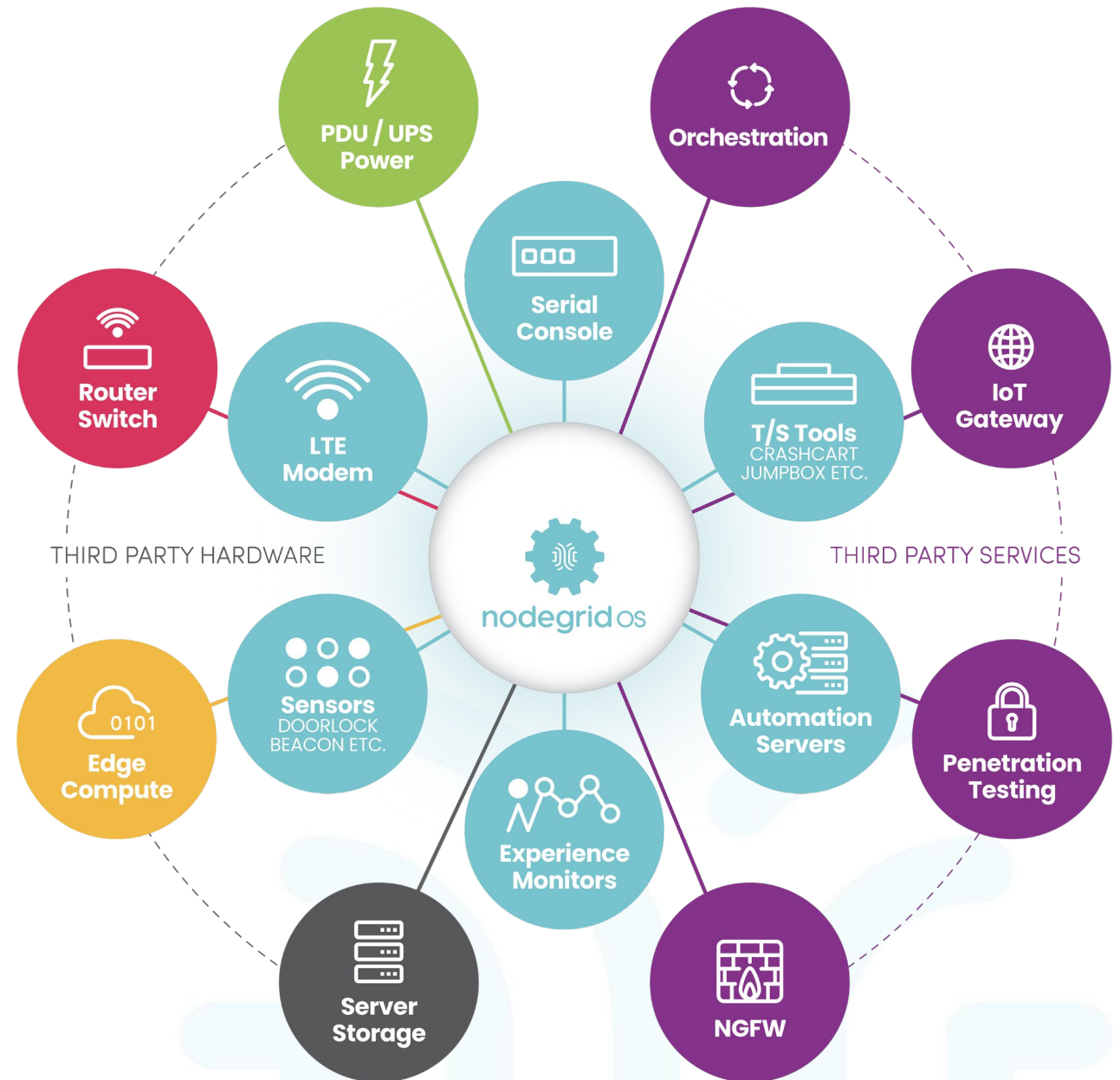
- Scripts
- Automation with gaps - Vendor specific or servers
- Limited workflows & playbooks



- End-to-end automation orchestration
- Security: Zero Trust HW & modern OS
- Open: platform for choice of tools, 3rd party containerized apps & VMs
- Control: all of the equipment
- Simple: Centralized cloud management & Zero touch provisioning
- 360 visibility: physical to user / app
- AI Ops enabled prediction/ detection / response

Gen 3 OOB & End-to-End Automation

Zero Pain Ecosystem



Zero Pain Ecosystem

Gen 3 Out-of-Band & Infrastructure Automation

OOB + SD-Branch Gateway



FOR DATA CENTER, CAMPUS, COLO

- **Out-of-band Serial Consoles with Zero Trust Security**
- 1M+ node scale
- Vendor Agnostic Lights-Out-Management
- High performance Intel x86
- Ansible, Puppet, Chef, RESTful automation
- Smart PDU Control

Nodegrid Serial Consoles



FOR BRANCH & EDGE

- **Out-of-band service routers with Zero Trust Security**
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Nodegrid Services Routers

OOBI MODE



FOR BRANCH & EDGE

<<< **Same OOB Features + Inband**

- Branch Gateway Router
- SD-WAN
- Firewall
- On-ramp to SASE
- ZPE Access Points
- ZPE Cloud Management and NetDevOps orchestration

Nodegrid Services Routers +

GATEWAY MODE + AP + SWITCH

Zero Pain Ecosystem

Gen 3 Out-of-Band & Infrastructure Automation

OOB + SD-Branch Gateway



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OOB + SD-Branch Gateway



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GATEWAY MODE + AP + SWITCH

ZPE Product Portfolio

Data Center Campus & Colocation

Nodegrid Serial Consoles (NSC)

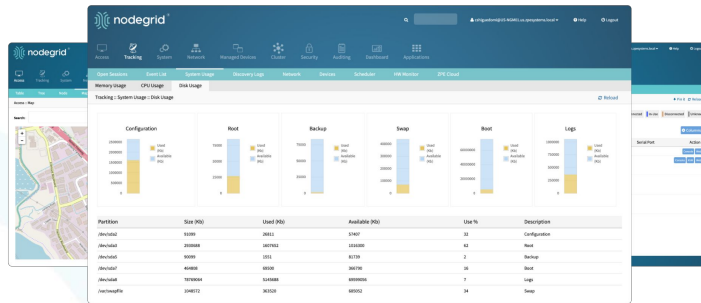


Remote Branch & Edge

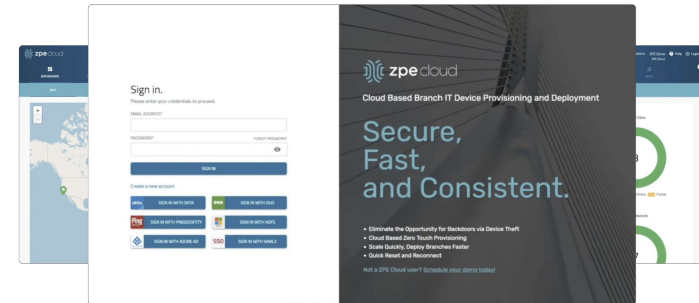
Nodegrid Services Routers (NSR)



Nodegrid Manager



ZPE Cloud



Sensors / Actuators



Cloud Applications



News Since NFD26



4 Core Intel CPU
4G / 5G / LTE
10GbE Interfaces

16GB DRAM
Wi-Fi 6
128GB Storage

■ New Hive SR Hardware

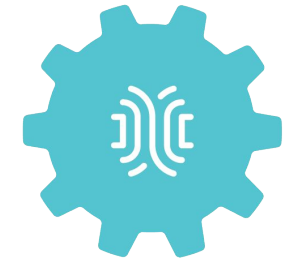
Consolidate 6 devices into 1

1. Router / SD-WAN
2. Out-of-band control
3. 4G / 5G / LTE Access & OOB
4. Firewall
5. Automation & Jumpbox Server
6. Edge VMs, Docker, Apps



■ ZPE Cloud App: SD-WAN

Cloud Tunnel Orchestration
Mesh or Hub-Spoke
End-to-End Link Measurements
Dynamic WAN Path Switching



nodegridos


■ Nodegrid OS v5.4 Release

5G Support
921,600 Baud
New Gateway mode


How ZPE Customers Use Gen 3 OOB to Automate Remote Critical Infrastructure & Edge Networks

Use Cases

- Tech Giant: Rideshare Service
- Tech Giant: Social Media Provider
- Finance: Multinational

Zero Pain Ecosystem info@ZPEsystems.com @ZPEsystems 


Next Gen Out-of-Band & Infrastructure Automation → OOB + SD-Branch Gateway



FOR DATA CENTER, CAMPUS, COLO

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Nodegrid Services Routers +

GATEWAY MODE + AP + SWITCH



Gen 3 OOB for NetOps Automation

USE CASE FOR DATACENTER, CAMPUS & COLOCATION

Customer	<ul style="list-style-type: none">■ Tech Giant / Rideshare Service■ Tech Giant / Social Media Provider■ Finance / Multinational Investment Bank
Environment	<ul style="list-style-type: none">■ 12+ Data Centers (Owned and in Equinix)■ Needed to access, upgrade remotely (Virtual Lights Out Presence)■ Need for end-to-end automation (NetDevOps)
Customer Pain	<ul style="list-style-type: none">■ Human error brings sites down. Without automation it's impossible minimize human intervention & errors■ Diagnostic & recovery tools are usually tethered to each site, which limits remote remediation■ Traditional out-of-band solutions don't allow for deep control, such as recovering devices, updating BIOS, or rebooting individual units
Gaps	<ul style="list-style-type: none">■ Security: Need extremely robust security when everything is connected, automated, & reachable via OOB■ Open Architecture: So they can integrate into their own NetDevOps Orchestration, run external tools & containers■ Ecosystem control of 3rd party devices, data lake, sensors■ Needed large serial console buffers with data lake collection so they don't lose last-gasp error logs



The Zero Pain Ecosystem

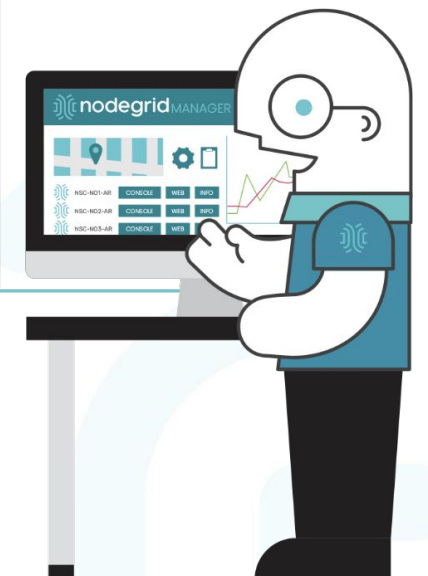
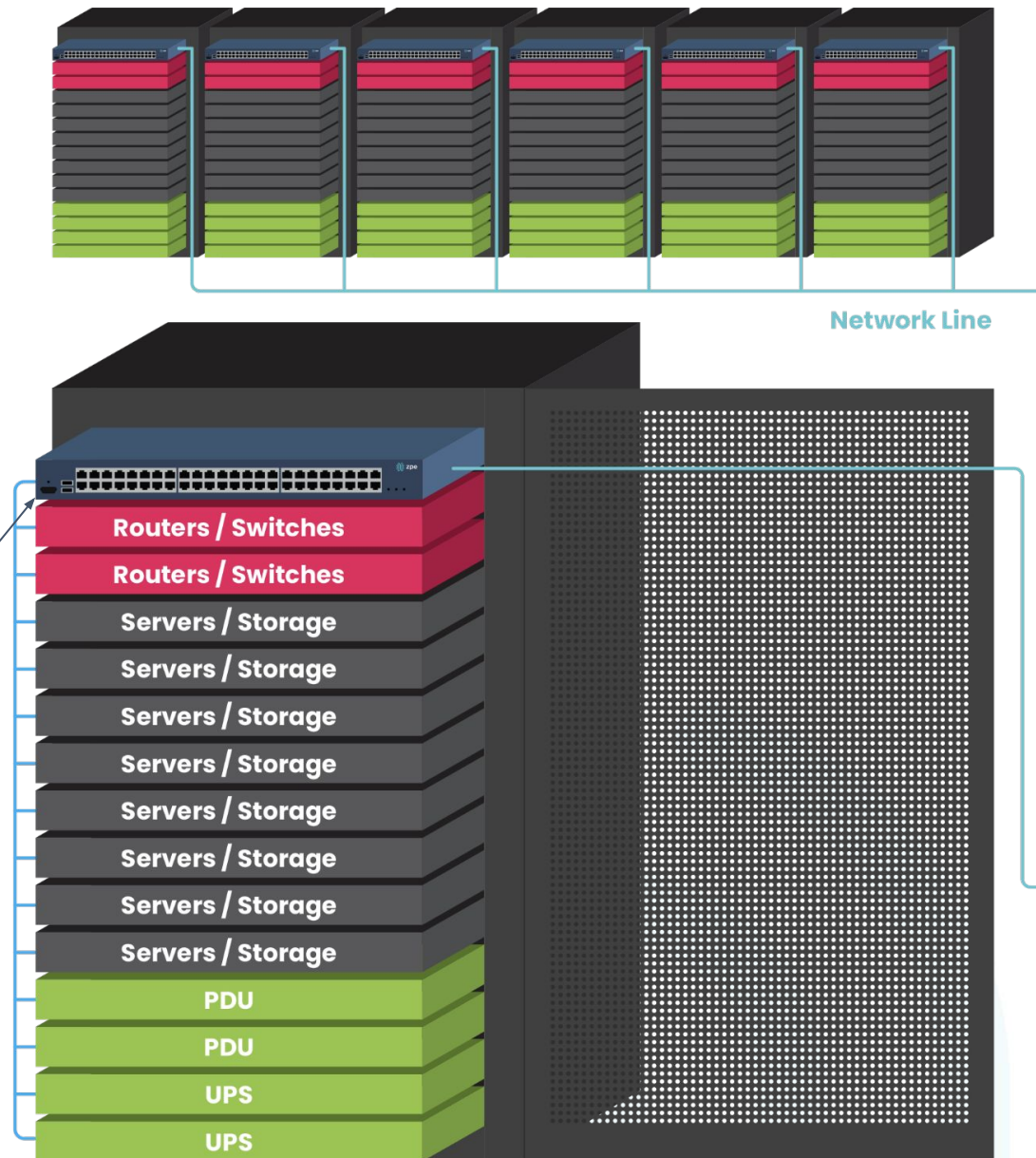
The Solution

- End-to-end Automation: Improved availability, reliability, and security
- Space savings, fewer appliances to remotely manage, ability to do OOB
- Improved Security



Nodegrid Serial Consoles with 48 & 96 port NSCP

Out-of-Band Serial RS-232



Why We Win

USE CASE FOR DATACENTER, CAMPUS & COLOCATION

Solution	Other Vendors	ZPE Nodegrid
Port Count	<ul style="list-style-type: none">48 port serial console	<ul style="list-style-type: none">96 ports in 1RU (front & back)20 MB line buffering per port
CPU	<ul style="list-style-type: none">ARMNo Docker or Virtual Machine Support	<ul style="list-style-type: none">Fast Multicore Intel X86Open Architecture for Virtual Machines & Python scripts and tools
Security	<ul style="list-style-type: none">Old Unpatched OS	<ul style="list-style-type: none">SW: Latest Linux Kernel with all security patches quickly applied (i.e. Log4j address in less than 24 hours)HW: Zero Trust Provisioning (Encrypted HW, Boot sequence, Addresses "Supply Chain Risk Management (SCRM)")
Automation	<ul style="list-style-type: none">Closed systemNot enough 3rd party interoperability	<ul style="list-style-type: none">Automation with Chef, Puppet, Ansible, Python

Gen 3 OOBI & NetDevOps Automation, Remote Critical Infrastructure & Edge Networks

Use Cases

- Credit Union
- Distributed Retail 1200 locations
- Warehouse Tech giant logistics center
- University Campus

Zero Pain Ecosystem
Next Gen Out-of-Band & Infrastructure Automation

Info@ZPEsystems.com @ZPEsystems zpe

Next Gen Out-of-Band & Infrastructure Automation → OOB + SD-Branch Gateway

FOR DATA CENTER, CAMPUS, COLLEGE

- **Out-of-band with Zero Trust Security**
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Nodegrid Services Routers

OOBI MODE

FOR BRANCH & EDGE

←← Same OOB Features + Inband

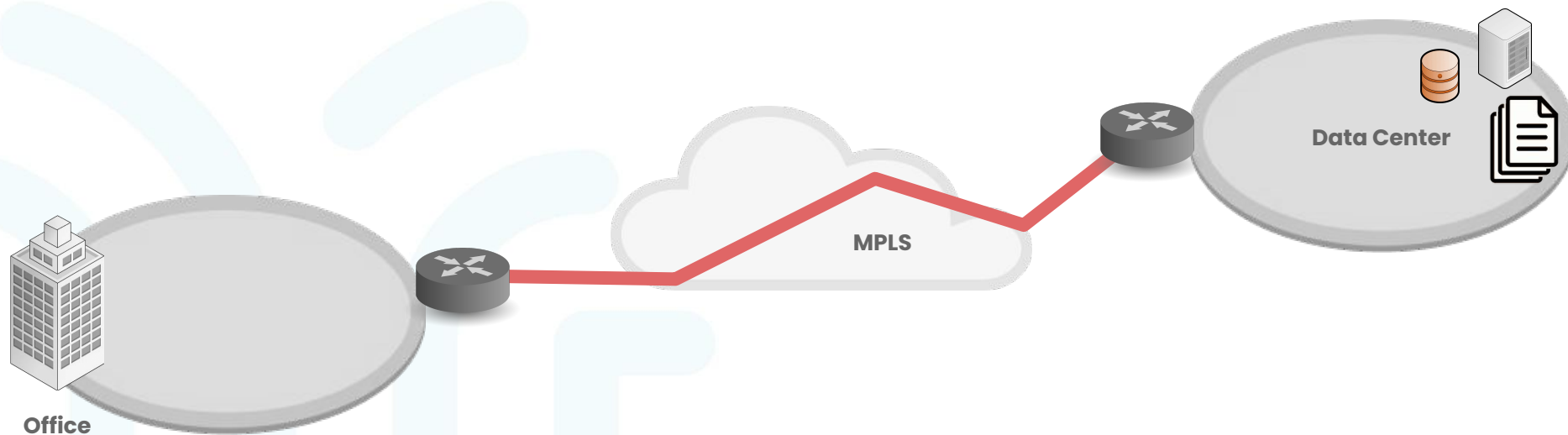
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Nodegrid Services Routers +

GATEWAY MODE + AP + SWITCH

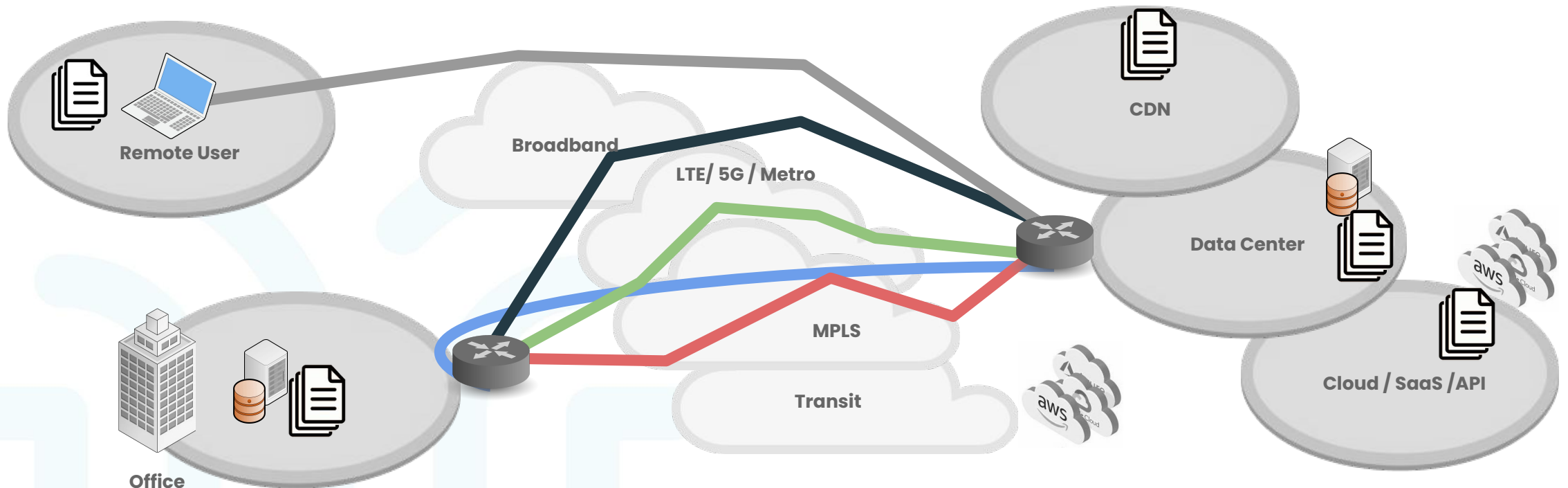
Networking was simple

Centralized data. Security.
Turnkey connectivity.



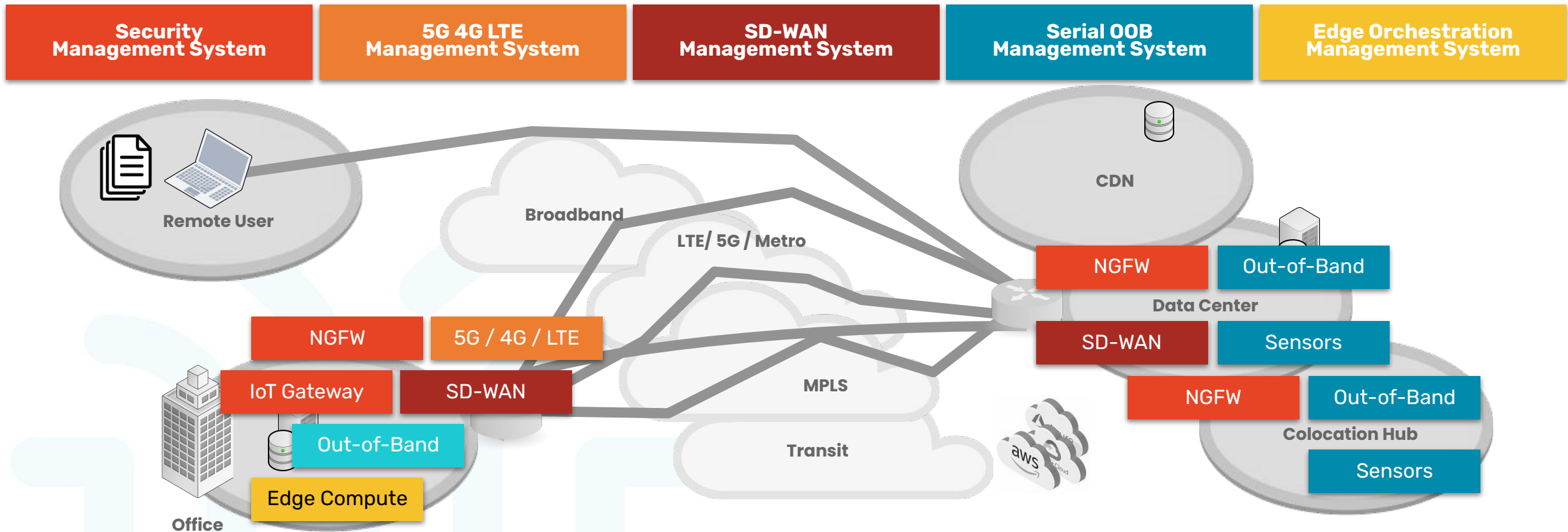
Then cloud & edge came along...

- Data moved from data center to cloud, SaaS & edge
 - Security & compute moved from centralized
 - Networks transitioned from turnkey
- ▶ Hybrid infrastructure
 - ▶ Distributed
 - ▶ DIY built out



...and infrastructure grew out of control

Resulting in many vendors, complex & disjointed management, the need for many experts to operate different solutions, overwhelming costs, and security gaps.



ZPE Solution for the Modern Network Infrastructure

A simple, scalable platform that connects, secures, and enables automation & orchestration of your infrastructure



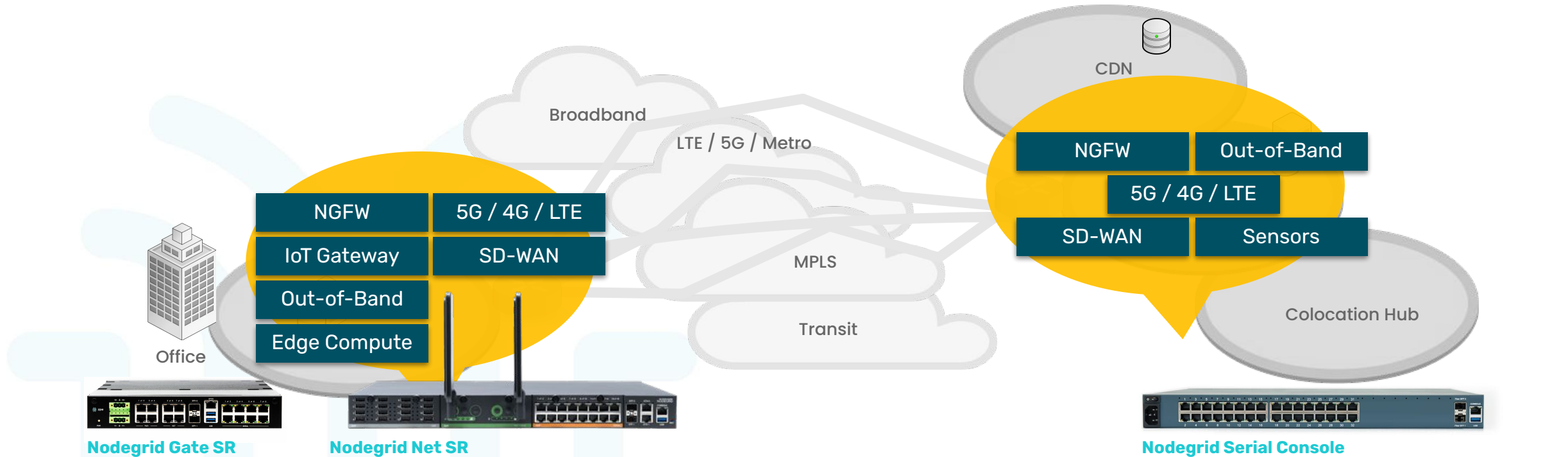
Security Management System

5G 4G LTE Management System

SD-WAN Management System

Serial OOB Management System

Edge Orchestration Management System



Gen 3 OOB & NetDevOps Automation

USE CASE FOR BRANCH & EDGE

Customer	<ul style="list-style-type: none">■ Retail Newstands: 1,200 locations■ Credit Union: 90 branch locations■ Tech Giant: 100s of warehouses■ Large University: with campus & satellite locations
Environment	<ul style="list-style-type: none">■ Remote, hard-to-access locations with business-impacting SLA■ Heterogeneous equipment at IDF/Warehouse/IDFs with servers, POS, audio system, security video recorder, firewall, access points, sales kiosks, battery backup, conferencing equipment■ Needed to access & upgrade remotely (virtual lights out presence)■ Need for end-to-end automation (NetDevOps)
MSP & Customer Pain	<ul style="list-style-type: none">■ Human error brings sites down. Without automation it's impossible to minimize human intervention & errors■ Diagnostic & recovery tools are usually tethered to each site, which limits remote remediation■ Traditional out-of-band solutions don't allow for deep control, such as recovering devices, updating BIOS, or rebooting individual units
Gaps	<ul style="list-style-type: none">■ Security: Need extremely robust security when everything is connected, automated, & reachable via OOB■ Open, flexible architecture to be automation target and also remotely run troubleshooting & security tools■ Ecosystem control of 3rd party devices, data lake, sensors to prevent downtime



Retail Newsstands: 1200 Locations

MSP USE CASE

The Solution

- Nodegrid enables remote out-of-band to all rack devices, including to remediate Meraki through its HTTP web interface
- Dedicated LTE serves as life-saving OOB path, and also as backup data connection

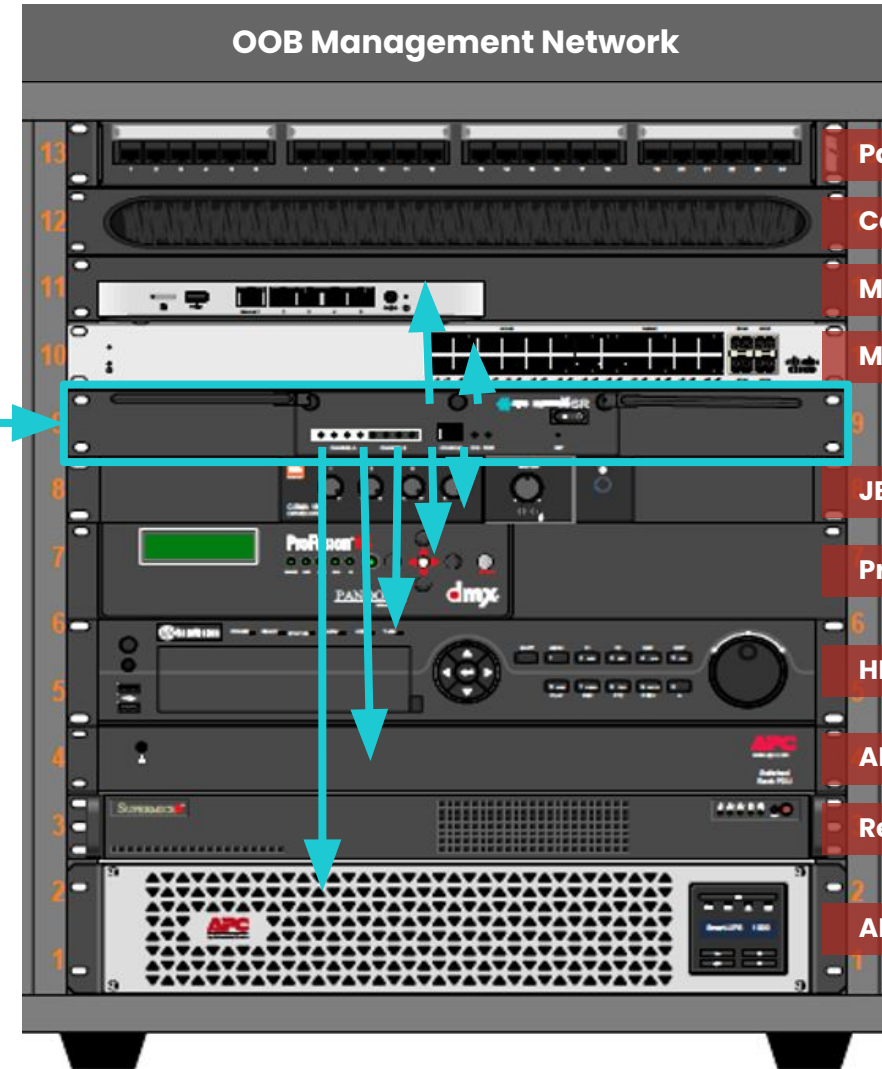


**Nodegrid Bold SR
(BSR-T8-BASE)**
ZPE Cloud Global Management
& Remote Access
Automation /
Nodegrid Data Lake

Connect to ecosystem via

- USB
- Ethernet
- Power
- USB-VGA
- IPMI
- Serial
- Web interface
- Sensors (future add on)

THE ZERO PAIN ECOSYSTEM



Patch Panel

Cable Manager

Meraki MX65

Meraki MS120-24P

JBL CSMA 180

ProFusion iS

HNVRHD16P16

APC AP7900B

Reliant Server

APC SMTL1000RM2UC

Credit Union with 90 Branch Locations

CUSTOMER USE CASE

The Solution

Same as retail newsstand solution, plus:

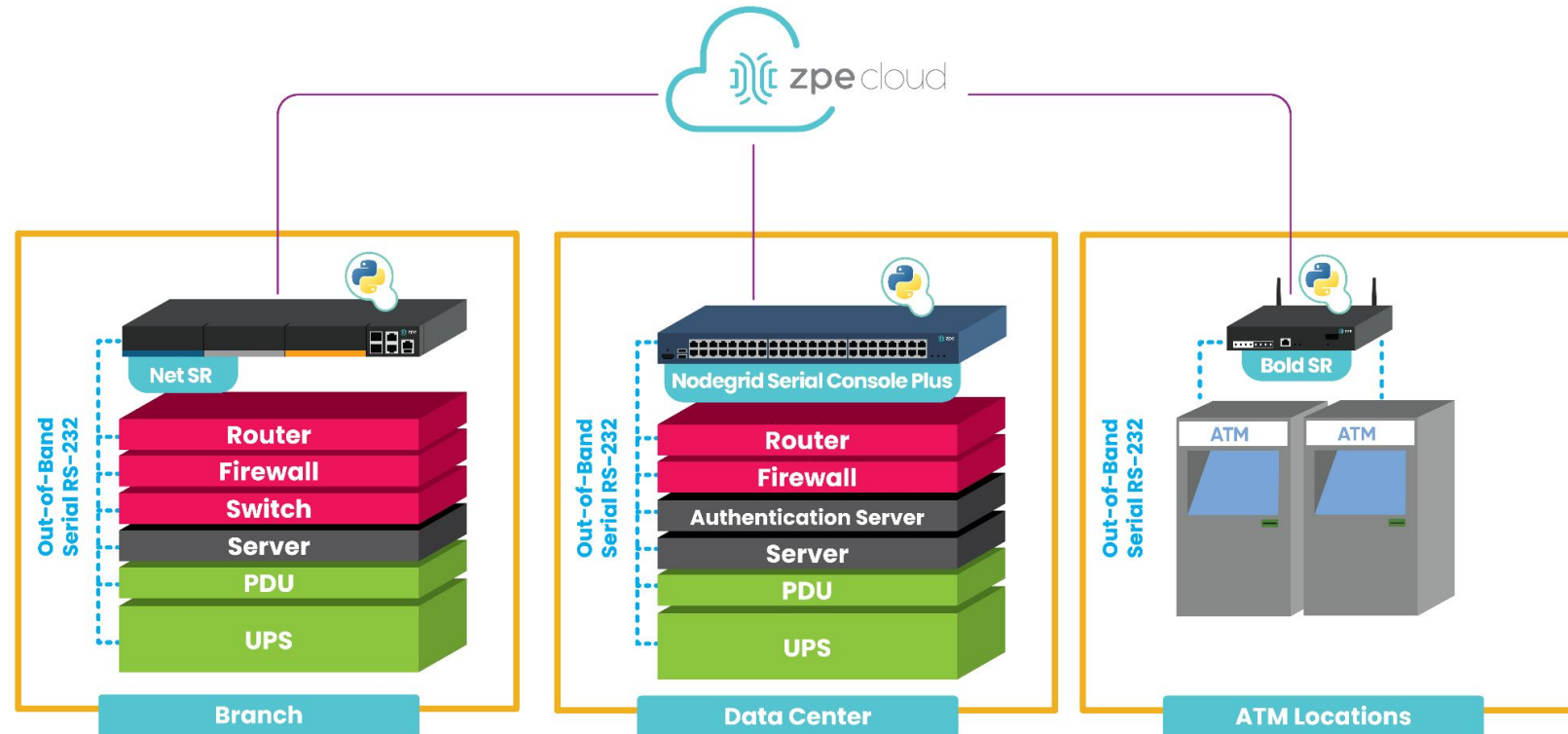
- IT requirement for centralized orchestration and automation
- ZPE Cloud serves as a repository for automation scripts, which can be pushed to all branch locations
- ZPE Cloud enables remote troubleshooting & management of all locations, for truck roll cost savings (\$1,800 x 90 branches)



Nodegrid Bold SR (BSR-T8-BASE)

ZPE Cloud Management Automation/Data Lake

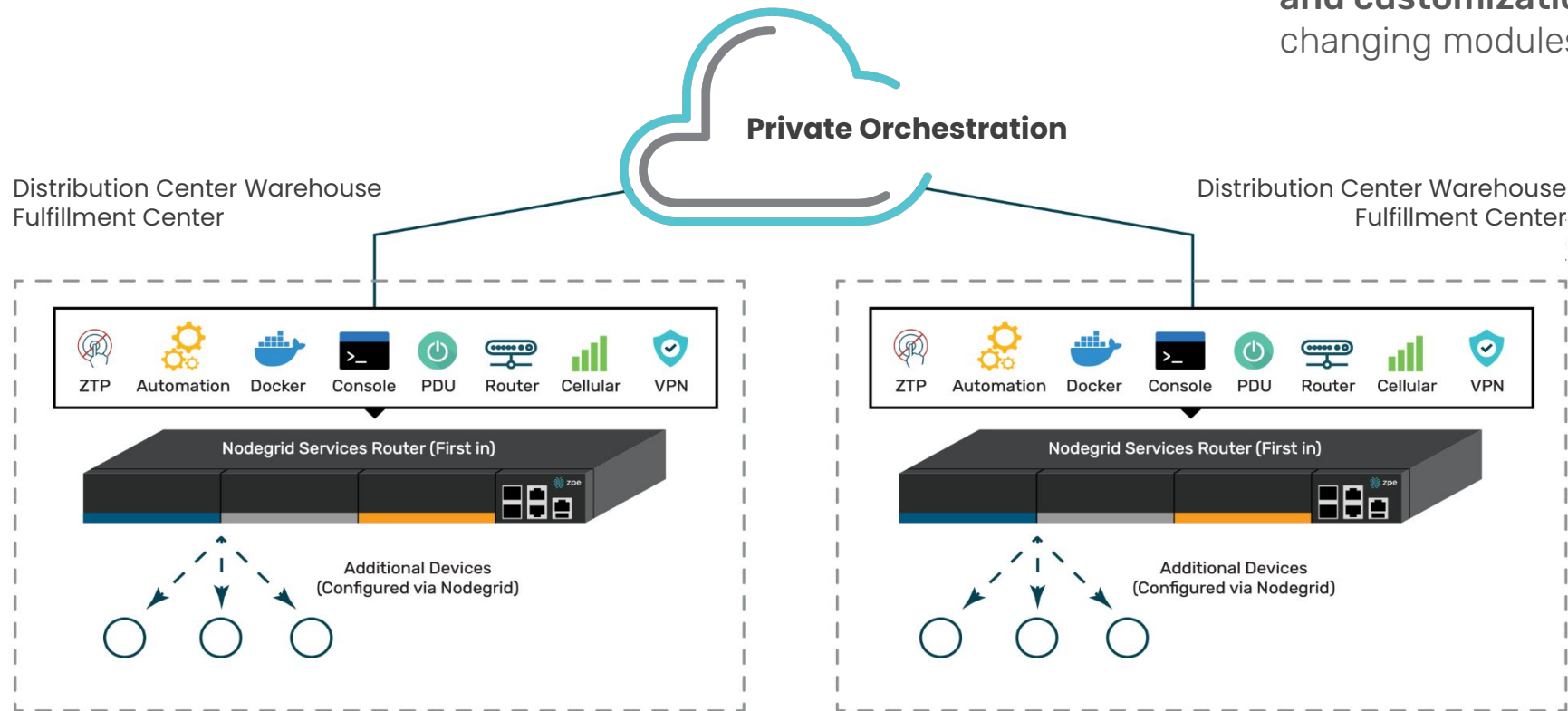
THE ZERO PAIN ECOSYSTEM



Multinational Retailer with 300+ Warehouses

CUSTOMER USE CASE

THE ZERO PAIN ECOSYSTEM



The Solution

- **Nodegrid's open architecture** directly hosts their orchestration library, for centralized management
- **Modular platform enables field upgrade and customization** (4G to 5G upgrade by changing modules, not forklifting)



Nodegrid Net SR (NSR-TOP1-DAC)

ZPE Cloud Global Management
& Remote Access
Automation / Data Lake

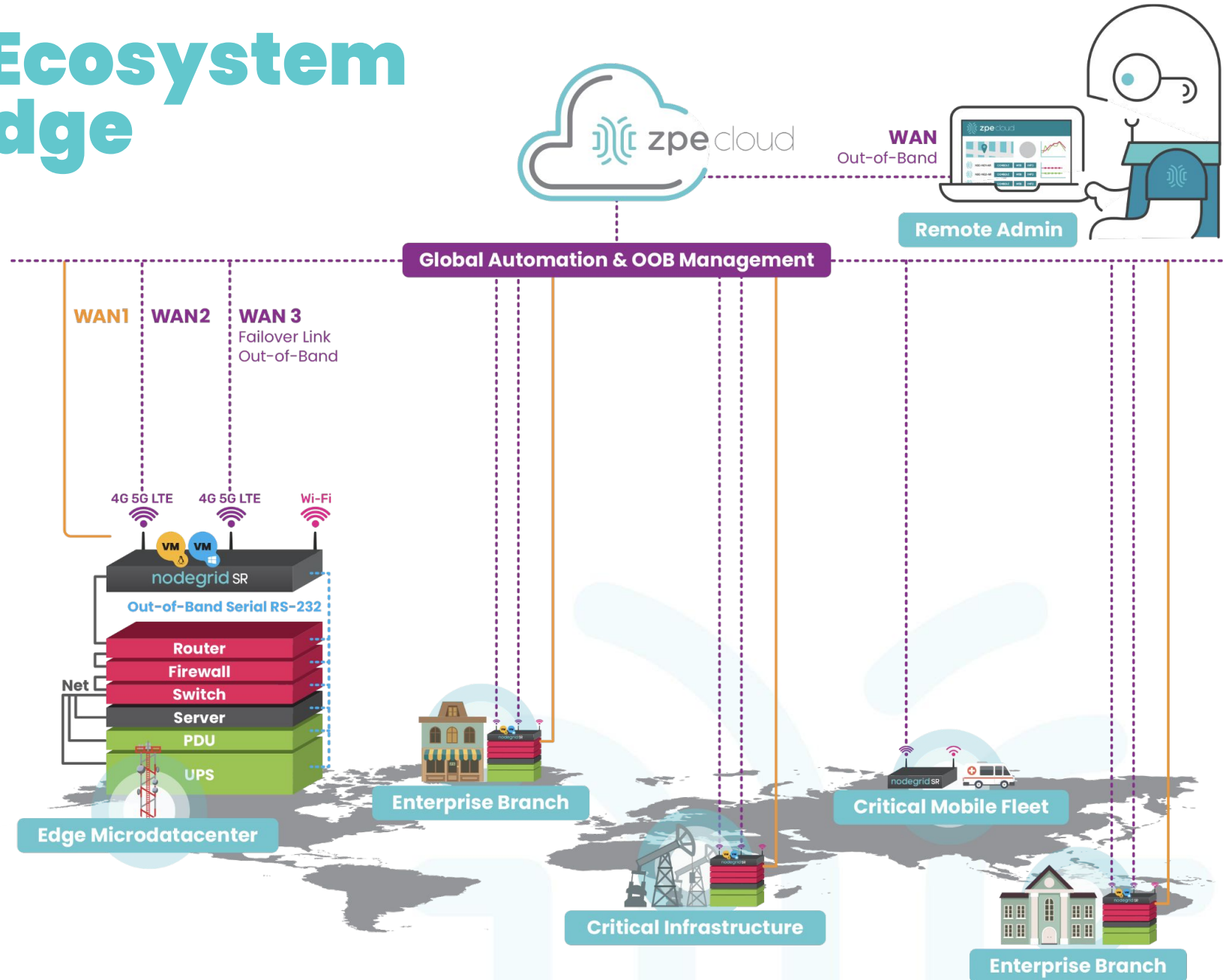
The Zero Pain Ecosystem for Branch & Edge

The Solution

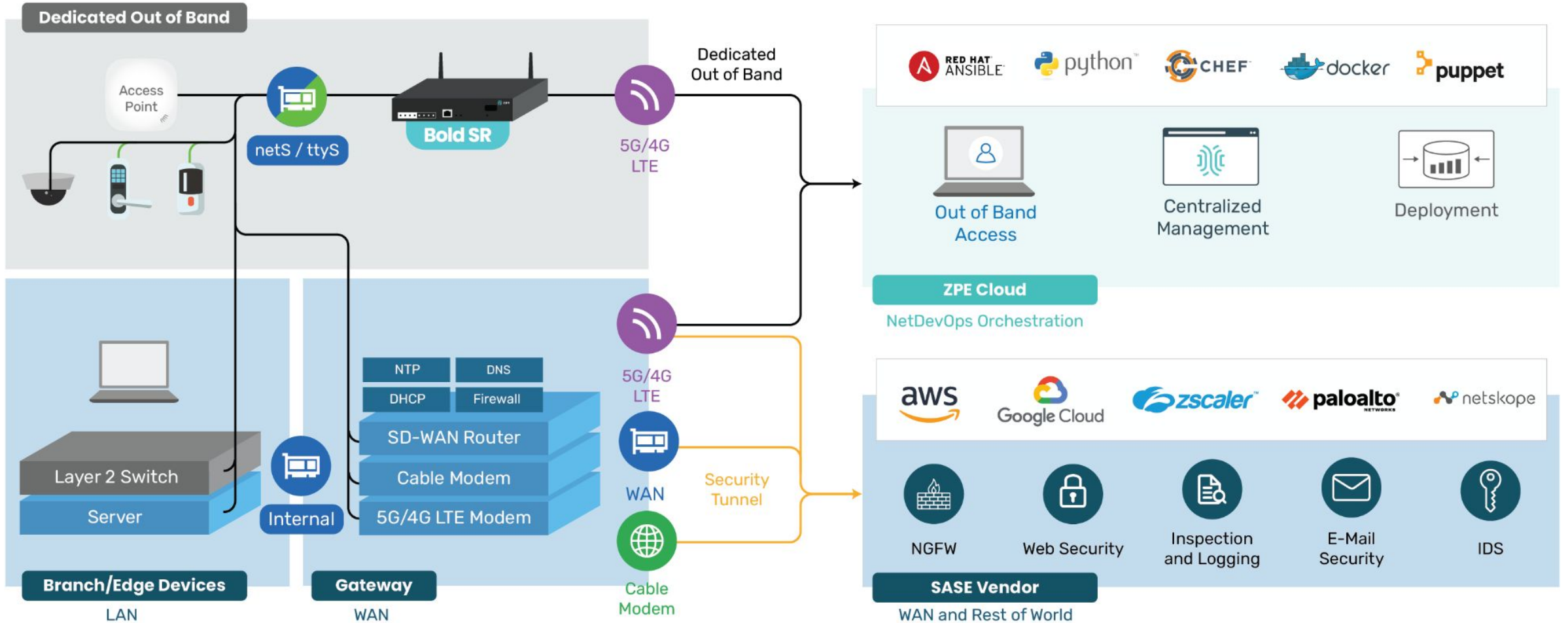
- **Cloud managed remote OOB** to increase availability around the world
- **Open ecosystem automation** → 3rd party equipment, tools, scripts automation & orchestration
- **Zero trust HW, SW & secure seed-of-life™ provisioning**



Nodegrid Family of Service Routers



Demo of ZPE Gen 3 OOB in Next Section



ZPE Gen 3 OOB Solves The Root of The Problem

Problem

**Lack of Reliability
& Availability**

**Lack of Personnel
& Expertise**

**Lack of
Holistic Security**

Solution

End-to-End Automation

Simplicity

Complete Security

ZPE

1. **Open Ecosystem** - to connect all existing elements of infrastructure
2. **Open X86 platform** - to run all tools and SW (scripting, automation, troubleshooting, containers, vms, etc...)
3. **Solution Harmony** - Everything works together

1. **Centralized Cloud management**, automation, Data lake, visualization
2. **Versatile hardware** and sensors to orchestrate without gaps
3. Journey to **AI Ops**

1. **Zero Trust Approach** HW and SW
2. Always up-to-date SW with **latest security patches**
3. **Seed-of-life™ Zero trust provisioning** and OOB access for supply chain risk management

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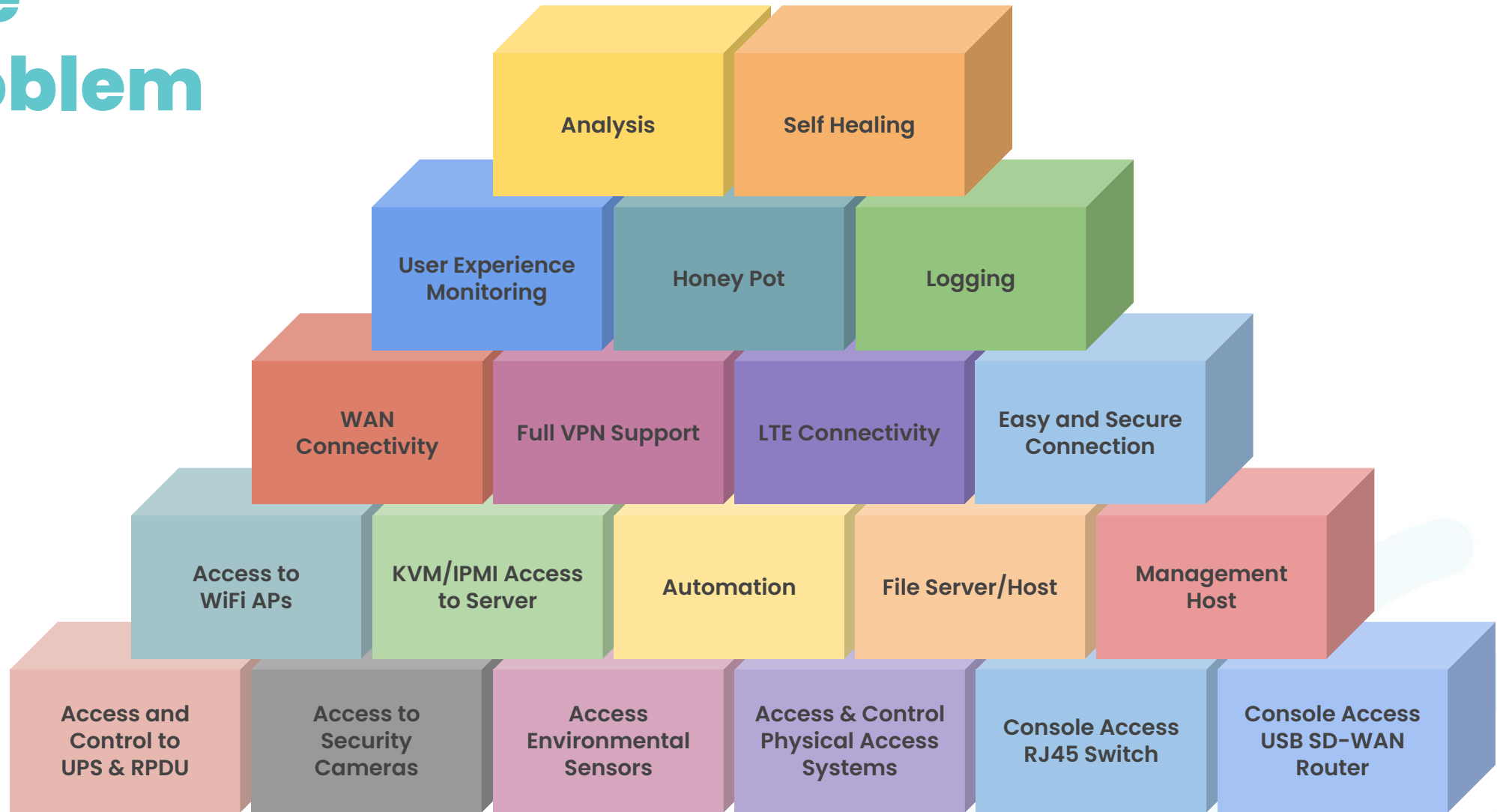


Hands-On with Gen 3 OOB to Resolve Edge Operational Challenges

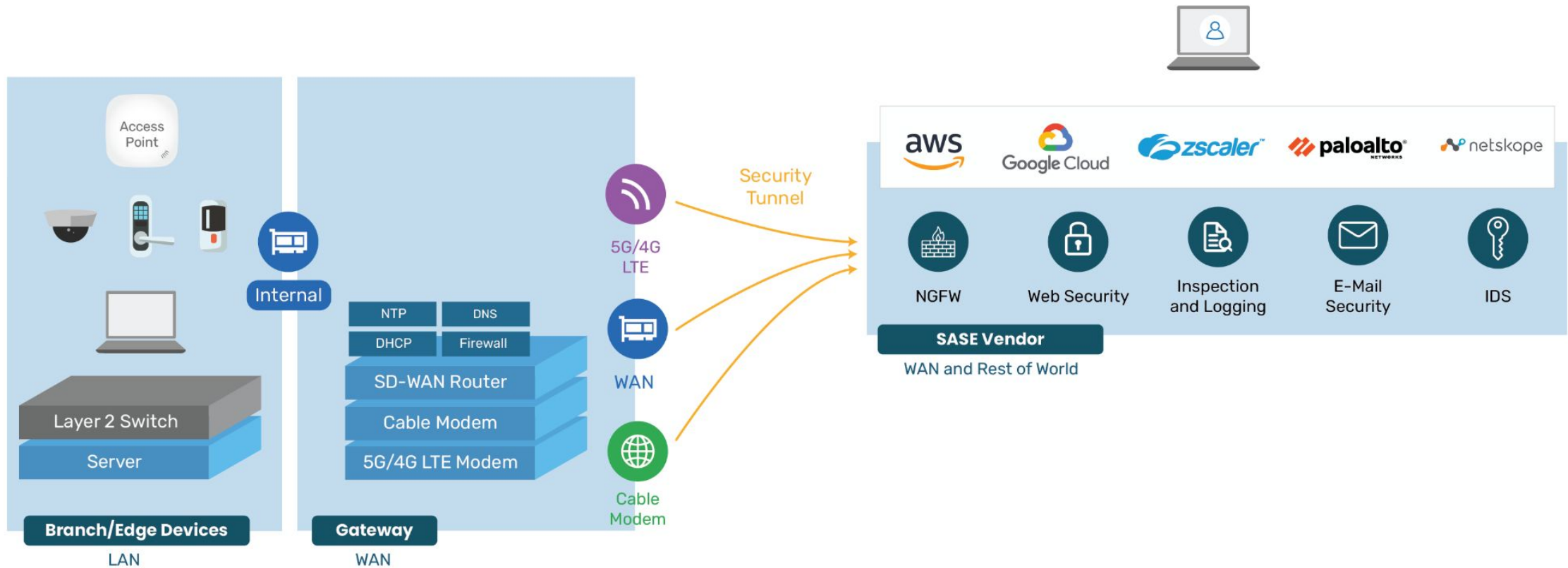
Demo No. 1



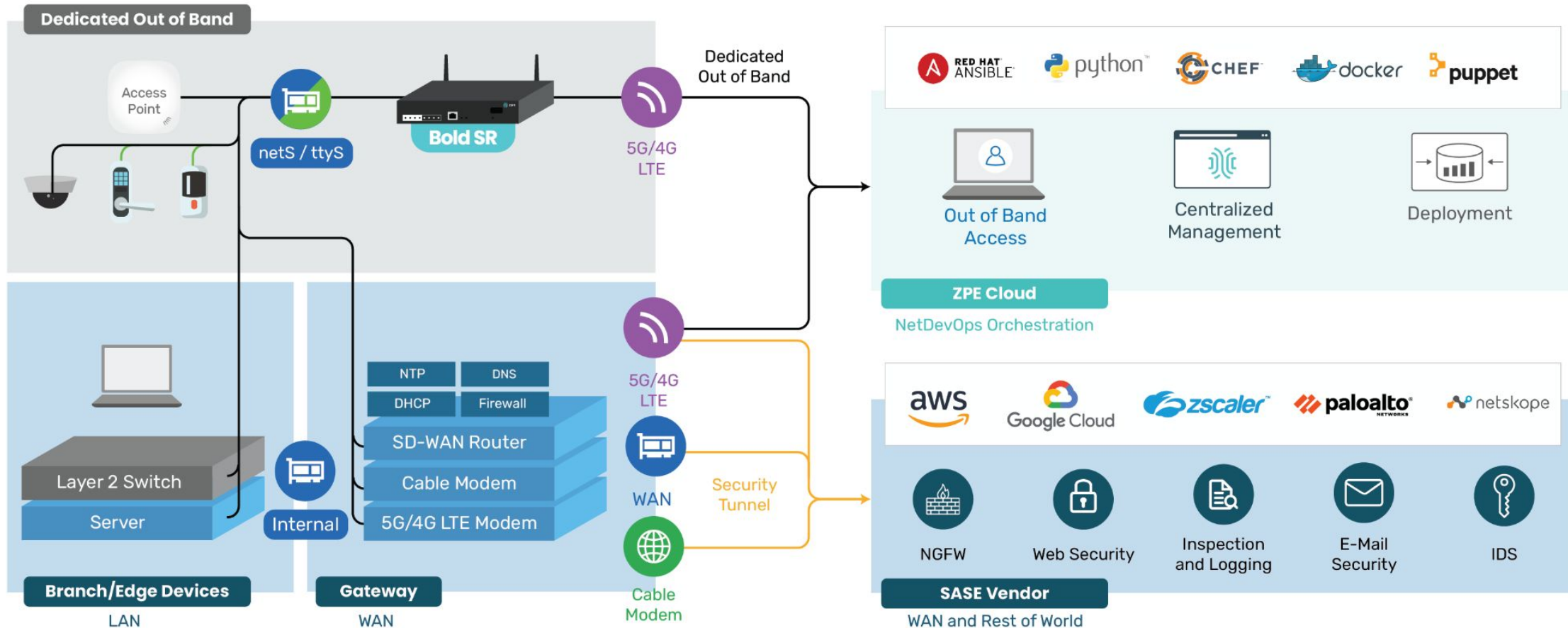
The Problem



Branch Location



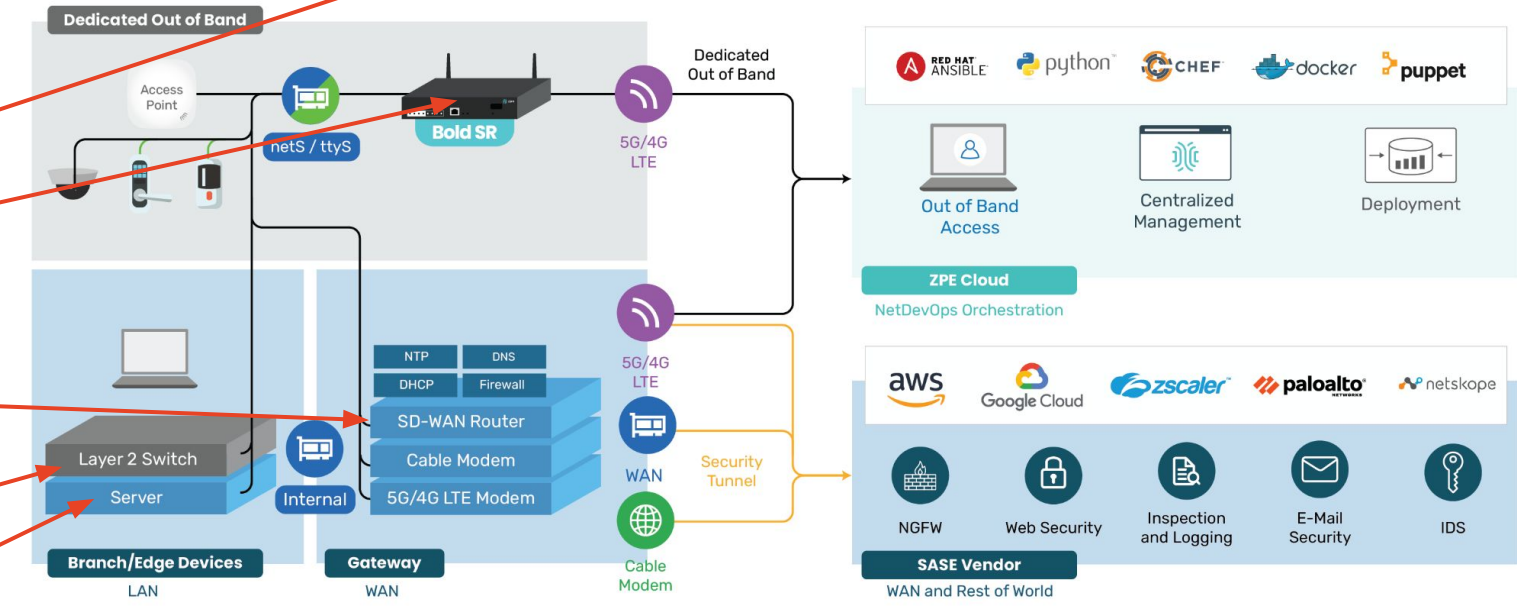
ZPE Cloud & Nodegrid SR



Demo of ZPE Gen 3 OOB in Next Section

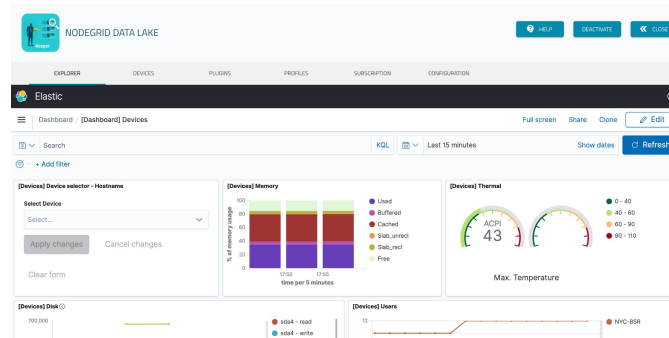


Sensors / Actuators



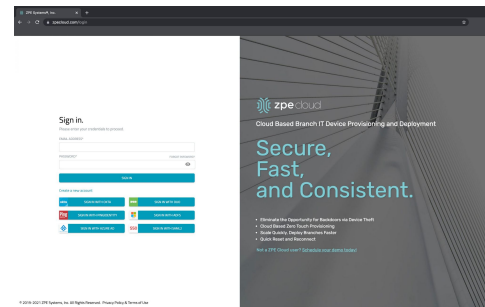
ZPE Cloud & Nodegrid SR

Nodegrid Apps & Data Lake



Visibility & Analytics Automation

ZPE Cloud



Central Management

Nodegrid Bold SR



Connect & Control

Sensors / Actuators



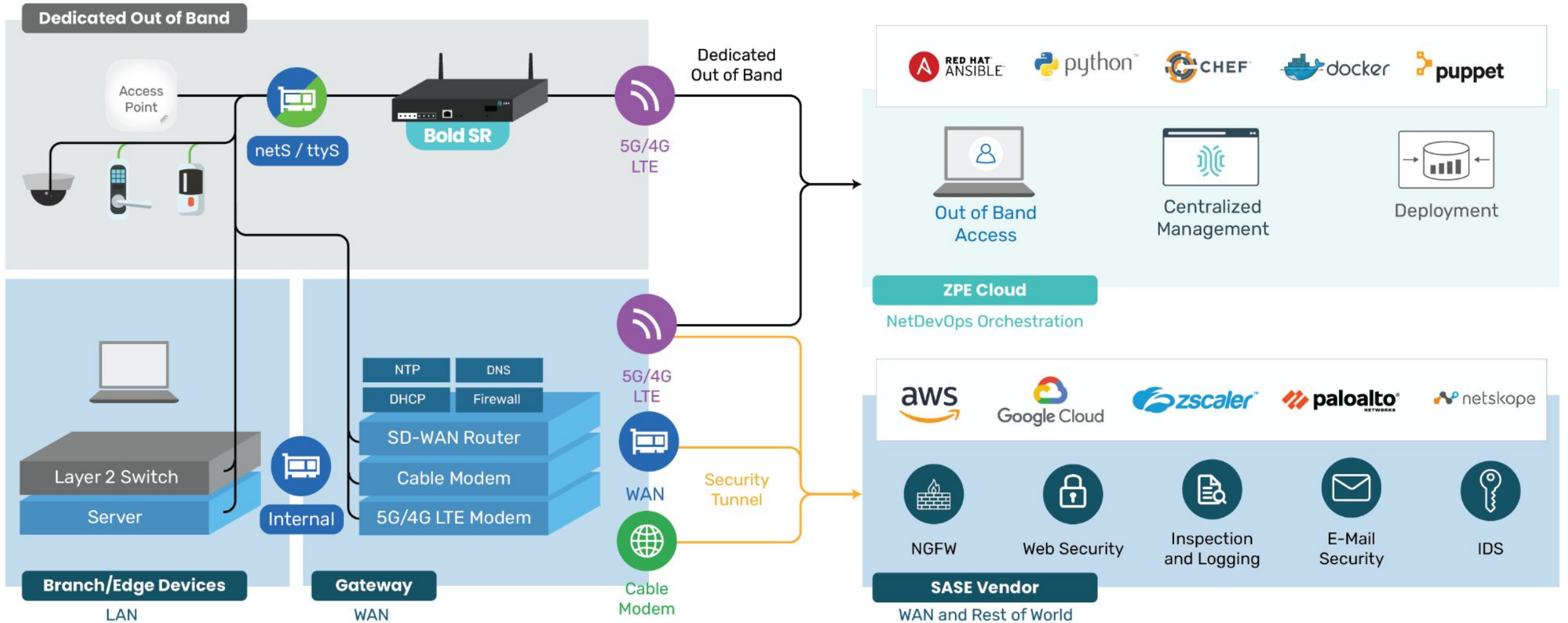
Detect & Prevent

Go Beyond Standard OOB & Explore the Automated Zero Pain Ecosystem

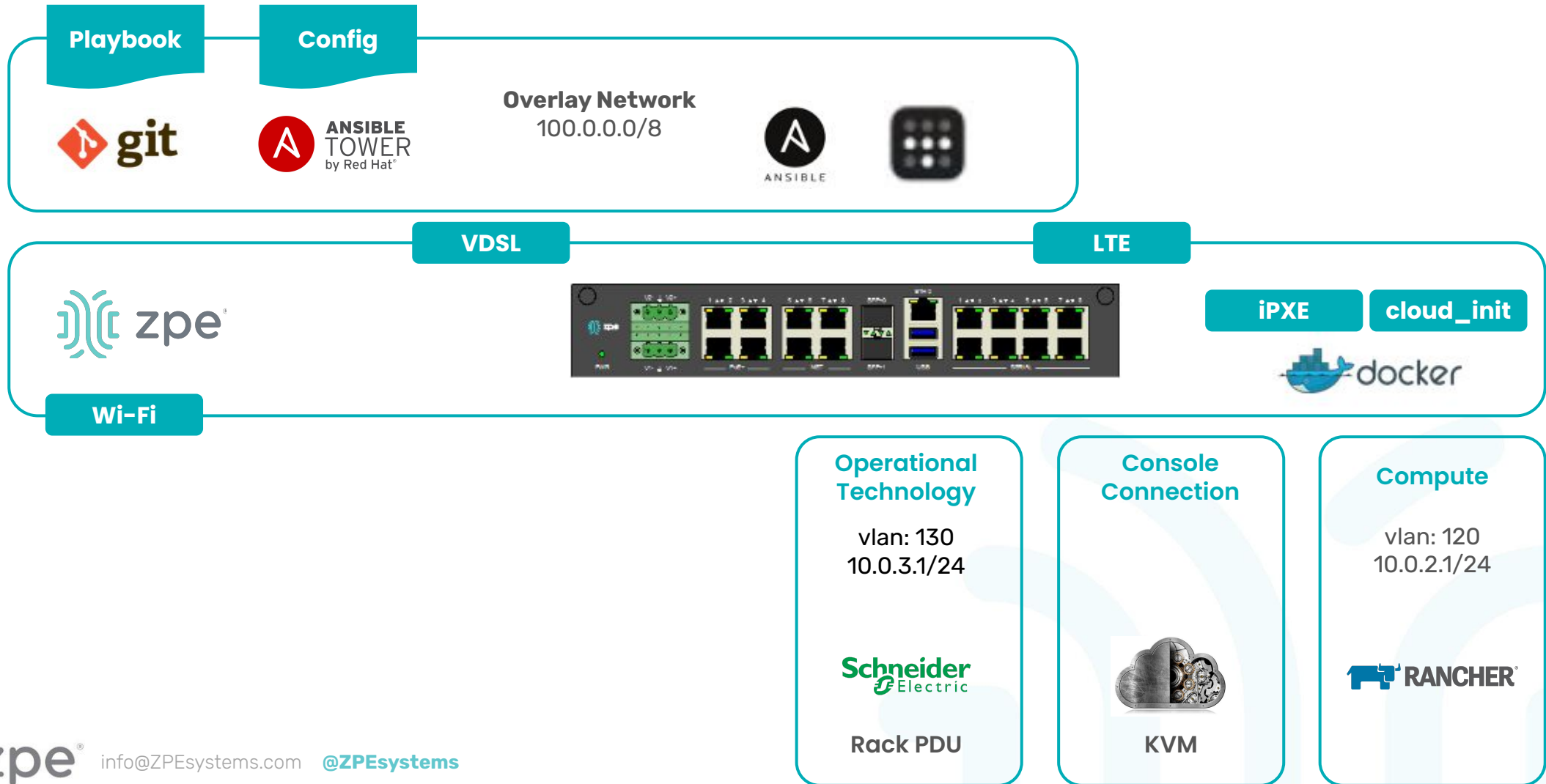
Demo No. 2



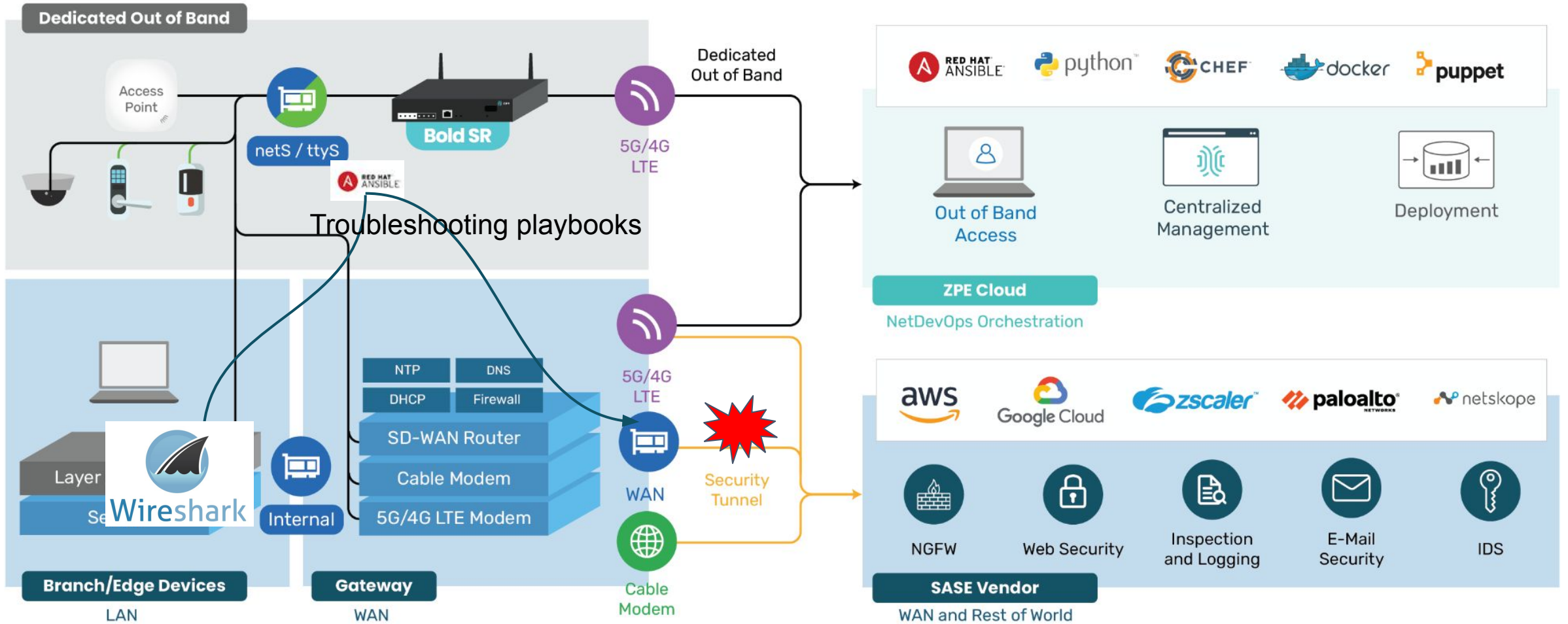
ZPE Cloud & Nodegrid SR



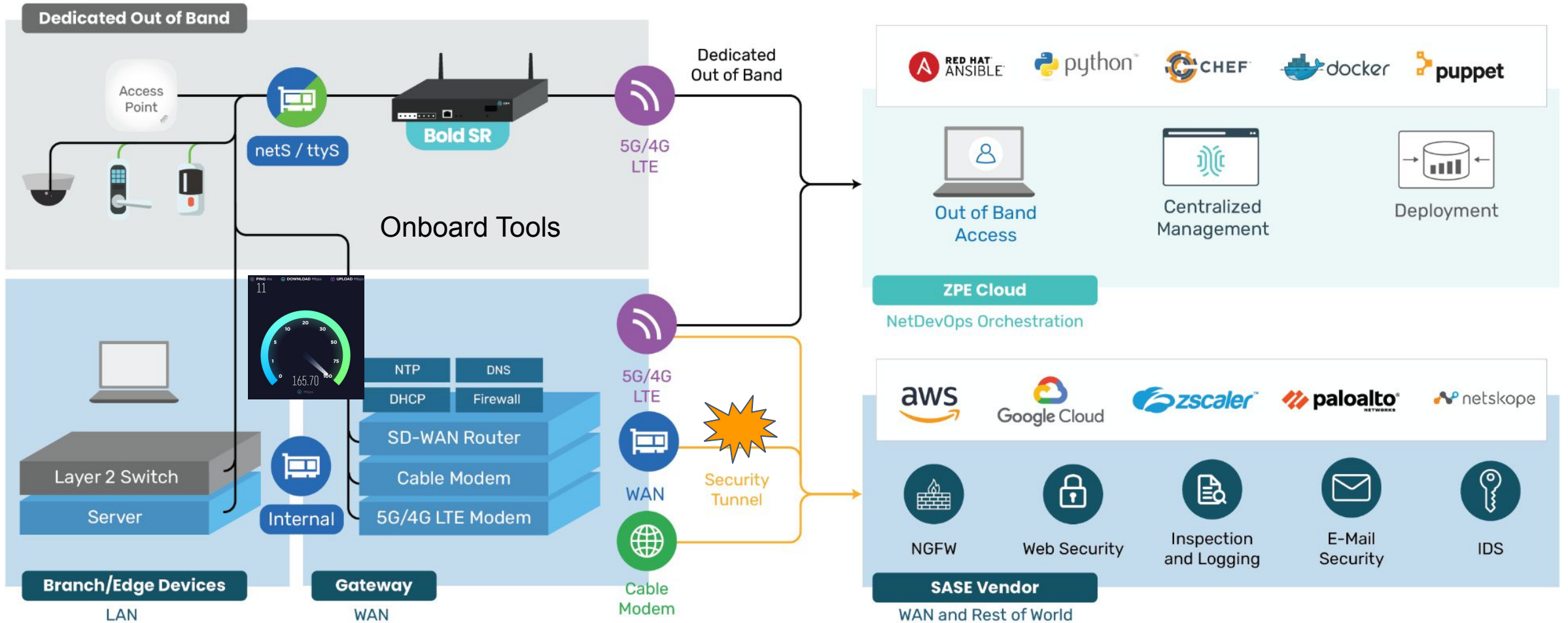
Zero Touch Provisioning



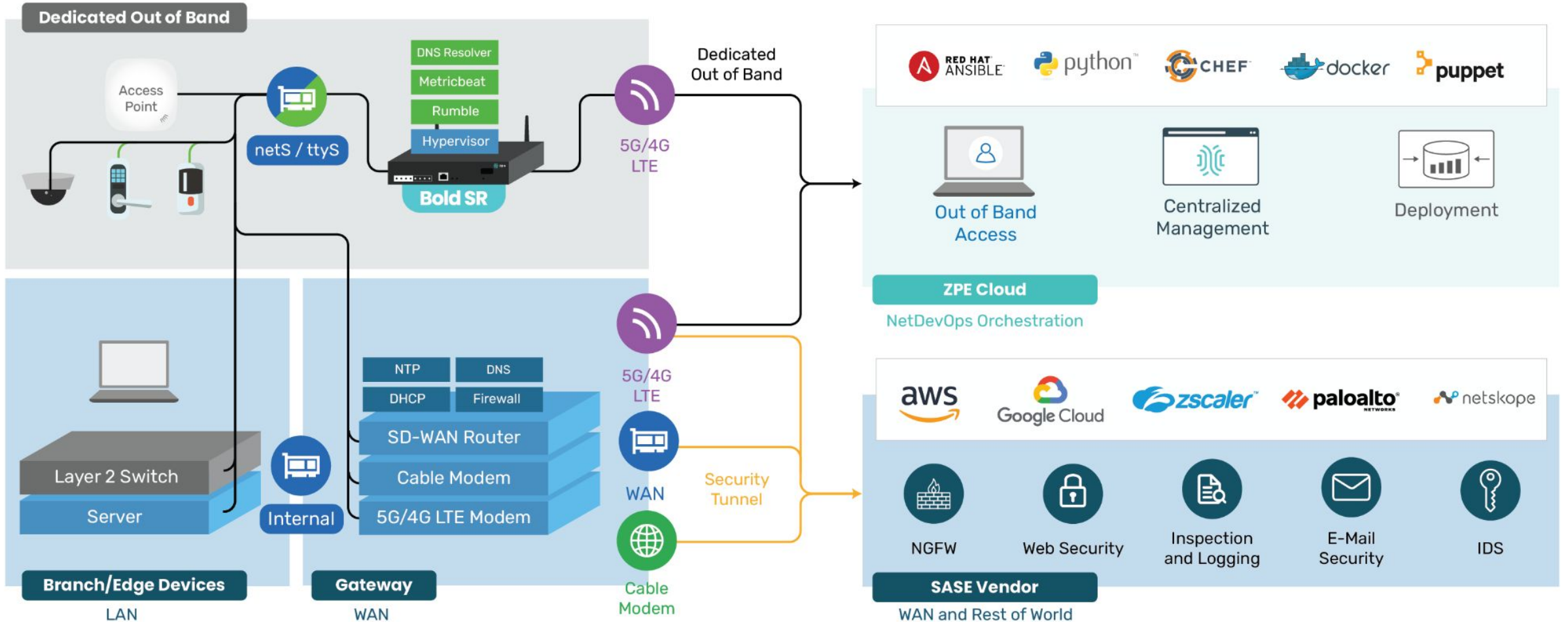
Problem Identification



Experience Measurements



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