

Nodegrid Net Services Router™

Modular x86 Appliance with Software-Defined Networking (SDN), Network Function Virtualization (NFV), & Out-of-Band (OOB) Technologies

Benefits

- **Software Defined Networking & Network Function Virtualization**
- **Modular Platform** for the Edge, Cloud, Colocation, Data Center, & DevOps
- **Quick Deployment** with ZTP, automation, RESTful
- **Encrypted Data Transit** with SSL, IPsec, WireGuard VPN technologies
- **Consistent Services & Policies** with centralized management
- **Separation of Control Plane & Data Plane**
- **Run Multiple Functions Concurrently on a Single Device**
- **Reduce Operational Costs** by keeping configuration current via ZTP automation
- **Reduce Downtime** with alerting, automation & cellular failover



Nodegrid Net Services Router™ (NSR) is a modular open platform appliance designed for Software-Defined Networking (SDN), Out-of-Band (OOB) management, DevOps, SD-WAN, remote/branch offices, retail locations, and Network Function Virtualization (NFV) capabilities. **NSR is optimized to perform various network functions** including switching, routing, security, WAN acceleration, provide secure OOB remote access, run Docker applications, and control IT devices at the edge of the network, and within Converged Infrastructure (CI) environments.

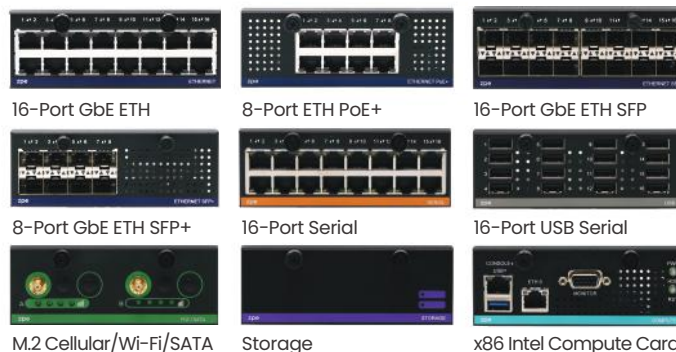
Features

- **Modular Open Platform Appliance** with SDN, NFV & Docker capabilities
- **Networking** with Layer 2 switching, Layer 3 routing, QoS, MPLS, client/server VPN, multi-site IPsec
- **Vendor-Neutral Gen 3 Out-of-Band** for Serial & USB consoles / IPMI / WebUI / Power Management
- **An Assortment of Interface Cards**
- **Firewall** IP packet & security filtering
- **Centralized Configuration & Automation** via Zero-Touch-Provisioning (ZTP)
- **5G/4G/LTE Cellular Modem** with dual SIM for failover/on-demand
- **Wi-Fi AP** (Hotspot or Client)
- **Compute Server Card** for additional processing capabilities
- **Fine Grain Security Policy-based** via AD/LDAP
- **Data logging (sessions), Environment Monitoring, Event Notification & Alarms**
- **Modern x86_64bit Linux Kernel** for fast security patching & widespread software availability
- **Nodegrid Clustering Feature** for 360° view, central management, natural search & clustering
- **Modular Design** with 5 slots providing connectivity for 8-80 devices

NSR has modular services cards for networking, OOB serial and USB, 5G/4G/LTE cellular, Wi-Fi, compute and storage. It also has the latest generation of networking switch backplane for SDN, an assortment of modular services cards, a multi-core Intel CPU for concurrent NFV's and Nodegrid 64-bit Linux OS – a combination that enables flexible interfaces, dependable non-blocking network capabilities, an ever-evolving open platform and lightning-fast response times. **Future-proof your investment as your business evolves.**

NSR addresses modern infrastructure challenges

Modern network infrastructure needs to be versatile to keep up with the growth of the industry. Scalability, more than ever, is at the center of business needs. Is your infrastructure scalable? Enterprises face challenges in their cloud transformation because traditional networks were not built for the Cloud. Networking teams typically spend a long time during evaluation, especially when numerous appliances are required (for Networking, OOB, Failover, Firewall, IPsec). Deploying multiple appliances, setting consistent configurations and adding network functions on new branches is time consuming. NSR addresses all these needs.



Technical Specifications

Accessibility

- Multiple Routing Tables
- Wi-Fi Hotspot
- 2X SFP+ 2 Gbit Ethernet Ports
- Failover to 5G/4G/LTE Modem
- Console Port

Managed Power Devices

Vendor-neutral PDU support

Managed IPMI Devices

OpenBMC, HP iLO, Dell iDRAC, Supermicro/Quanta IPMI, IPMI 2.0 compatible devices, Cisco CIMC/UCS, IBM IMM, Oracle ILOM, EMC/NetApp Storage IPMI

Sensors

Support for a wide range of USB sensors

Networking

- IPv4/IPv6 Support
- Embedded Layer 2 switching, Layer 3 routing, BGP, OSPF, RIP, QoS, MPLS, MSTP, VLAN, DHCP (Client & Server)

Port Access

- Direct access by port name, TCP port, device name & IPv4/IPv6
- High performance port login: <1 sec on SSH, <3 sec on Telnet
- 1,000 simultaneous sessions
- Port sharing, port custom field support, port icon configuration, port search
- Device clustering across multiple Nodegrid units
- DeviceURL™ bookmarks, FireTrail™ secure tunnels
- Break-over SSH support
- Power Management Integration within user's session
- HTML5 viewer (No Java) for IPMI SoL & KVM, WEB, Console, Virtual Media support

Access Protocols

HTTPS, SSHv2; optional HTTP, Telnet & SSHv1

Power Specifications

- Dual AC 100-240 VAC, 50/60 Hz
- Power Consumption 90W typical

Operating System

Built-in 64-bit Nodegrid OS

Warranty

2-Year Limited Warranty

CPU & Storage

- Intel x86_64 multi-core (4 & 8 core options available)
- 8GB of DDR4 DRAM (Upgradable) (See add on SKU's)
- 32GB FLASH (mSATA SSD) (Upgradable) (See add on SKU's)

Device View Options

Tree, Table, Geo Map, Node & WEB Interface with search

Interface

- 2X SFP+ Ethernet
- 1X Console on RJ45
- 2X USB 2.0
- 2X Gigabit Ethernet
- 1X USB 3.0
- 1X HDMI

Physical

- Front-Rear mounting brackets
- Size (L X W X H): 438 X 332 X 43mm (17.2 X 13.1 X 1.7 in), 1U
- Weight: 4.9 kg (10.8 lb), depending on options
- Air Exhaust or Air Intake Fans (Swappable)

Data Logging & Notifications

- Local port buffering: 20 MB per port
- Local, NFS, syslog, off-line data logging
- Time stamp & rotation for data logging
- Event destination: email, syslog, local, syslog, email, ZPE Cloud, Splunk & more
- Notification: syslog, email, ZPE Cloud, Splunk & more

System Management

- Extensible, automated control based on actionable real-time data
- Web GUI management portal, web console, Command Line Interface (CLI), Linux root shell, SNMP, RESTful API
- Zero Touch Provisioning (ZTP) via LAN/DHCP, WAN/ZPE Cloud, USB for configuration & firmware updates
- Multiple & customizable user levels of access
- Auto-discovery via network scan & custom probes
- SNMPv1,v2 & SNMPv3-v1 IPv4/IPv6 with MD5, SHA-224, SHA-256, SHA-384, SHA-512, DES, AES-192, AES-256
- Orchestration Integration & Automation: Puppet, Chef, Ansible, RESTful, ZPE Cloud & a Cluster feature
- File sharing via FTP, NFS, SSHFS, Windows Sharing, web file browser, ZPE Cloud
- Remote Procedure Call (RPC, gRPC)
- NetFlow, LLDP APIs

Security

- Hardened device with BIOS protection, TPM 2.0, UEFI Secure Boot, Self-Encrypted Disk (SED), Signed OS, Geofencing
- X.509 SSH certificate support, 4096-bit encryption keys
- Selectable cryptographic protocols for SSH & HTTPS (TLSv1.3, TLSv1.2, TLSv1.1, TLSv1)
- Selectable cypher suite levels: high, medium, low, custom
- Local, AD/LDAP, RADIUS, TACACS+, Kerberos authentication
- SAML 2.0 support via Duo, Okta, Ping Identity, ADFS
- Two-Factor Authentication with RSA & DUO
- Local, backup-user authentication support
- User-access lists per port
- Group/role-based authorization: AD/LDAP, RADIUS, TACACS+ & SAML 2.0
- Fine Grain port access, power access, appliance privilege
- IP packet & security filtering, IP forwarding support
- SSL VPN (Client & Server), IPsec, Firewall
- MD5/SHA System configuration checksum
- System event logging to file, syslog, email, ZPE Cloud, Splunk & more
- Custom security with secure default settings
- Strong password enforcement
- Network Function Virtualization (NFV)

Environmental

Operation: 0 to 45° C (32 to 113° F), 5-95% RH, non-cond.
Storage: -20 to 67° C (-4 to 153° F), 10-90% RH, non-cond.



Ordering Information

Channel SKU	Description	CPU	Memory	Power
ZPE-NSR-48-SAC	ZPE Nodegrid Net SR modular chassis. 4-Core Intel CPU, Backplane Switch, 8GB DDR4, 32GB MSATA, 5 Slots, 2 SFP+, 4X USB, 2X GbE, 1X HDMI, 1X console. Single AC Power supply & cord included. Order NSR Expansion Card separately. Includes Standard 2-Year Support, HW warranty, & 90-day ZPECloud.com subscription.	4 Cores	8GB	Single AC
ZPE-NSR-48-DAC	ZPE Nodegrid Net SR modular chassis. 4-Core Intel CPU, Backplane Switch, 8GB DDR4, 32GB MSATA, 5 Slots, 2 SFP+, 4X USB, 2X GbE, 1X HDMI, 1X console. Dual AC Power supply & cord included. Order NSR Expansion Card separately. Includes Standard 2-Year Support, HW warranty, & 90-day ZPECloud.com subscription.	4 Cores	8GB	Dual AC
ZPE-NSR-48-DDC	ZPE Nodegrid Net SR modular chassis. 4-Core Intel CPU, Backplane Switch, 8GB DDR4, 32GB MSATA, 5 Slots, 2 SFP+, 4X USB, 2X GbE, 1X HDMI, 1X console. Dual DC Power supply & cord included. Order NSR Expansion Card separately. Includes Standard 2-Year Support, HW warranty, & 90-day ZPECloud.com subscription.	4 Cores	8GB	Dual DC
ZPE-NSR-48-SAC-POE	ZPE Nodegrid Net SR modular chassis. 4-Core Intel CPU, Backplane Switch, 8GB DDR4, 32GB MSATA, 5 Slots, 2 SFP+, 4X USB, 2X GbE, 1X HDMI, 1X console. Single AC Power supply with 160W PoE Power. Order NSR Expansion Card separately. Includes Standard 2-Year Support, HW warranty, & 90-day ZPECloud.com subscription.	4 Cores	8GB	Single AC-POE
ZPE-NSR-48-SDC-POE	ZPE Nodegrid Net SR modular chassis. 4-Core Intel CPU, Backplane Switch, 8GB DDR4, 32GB MSATA, 5 Slots, 2 SFP+, 4X USB, 2X GbE, 1X HDMI, 1X console. Single DC Power supply with 160W PoE Power. Order NSR Expansion Card separately. Includes Standard 2-Year Support, HW warranty, & 90-day ZPECloud.com subscription.	4 Cores	8GB	Single DC-POE
ZPE-NSR-816-SAC	ZPE Nodegrid Net SR modular chassis. 8-core Intel CPU, Backplane Switch, 16GB DDR4, 32GB MSATA, 5 Slots, 2 SFP+, 4X USB, 2X GbE, 1X HDMI, 1X console. Single AC Power supply & cord included. Order NSR Expansion Card separately. Includes Standard 2-Year Support, HW warranty, & 90-day ZPECloud.com subscription.	8 Cores	16GB	Single AC
ZPE-NSR-816-DAC	ZPE Nodegrid Net SR modular chassis. 8-core Intel CPU, Backplane Switch, 16GB DDR4, 32GB MSATA, 5 Slots, 2 SFP+, 4X USB, 2X GbE, 1X HDMI, 1X console. Dual AC Power supply & cord included. Order NSR Expansion Card separately. Includes Standard 2-Year Support, HW warranty, & 90-day ZPECloud.com subscription.	8 Cores	16GB	Dual AC
ZPE-NSR-816-DDC	ZPE Nodegrid Net SR modular chassis. 8-core Intel CPU, Backplane Switch, 16GB DDR4, 32GB MSATA, 5 Slots, 2 SFP+, 4X USB, 2X GbE, 1X HDMI, 1X console. Dual DC Power supply & cord included. Order NSR Expansion Card separately. Includes Standard 2-Year Support, HW warranty, & 90-day ZPECloud.com subscription.	8 Cores	16GB	Dual DC
ZPE-NSR-816-SAC-POE	ZPE Nodegrid Net SR modular chassis. 8-core Intel CPU, Backplane Switch, 16GB DDR4, 32GB MSATA, 5 Slots, 2 SFP+, 4X USB, 2X GbE, 1X HDMI, 1X console. Single AC Power supply with 160W PoE Power. Order NSR Expansion Card separately. Includes Standard 2-Year Support, HW warranty, & 90-day ZPECloud.com subscription.	8 Cores	16GB	Single AC-POE
ZPE-NSR-816-SDC-POE	ZPE Nodegrid Net SR modular chassis. 8-core Intel CPU, Backplane Switch, 16GB DDR4, 32GB MSATA, 5 Slots, 2 SFP+, 4X USB, 2X GbE, 1X HDMI, 1X console. Single DC Power supply with 160W PoE Power. Order NSR Expansion Card separately. Includes Standard 2-Year Support, HW warranty, & 90-day ZPECloud.com subscription.	8 Cores	16GB	Single DC-POE
ZPE-NSR-832-SAC	ZPE Nodegrid Net SR modular chassis. 8-core Intel CPU, Backplane Switch, 32GB DDR4, 32GB MSATA, 5 Slots, 2 SFP+, 4X USB, 2X GbE, 1X HDMI, 1X console. Single AC Power supply & cord included. Order NSR Expansion Card separately. Includes Standard 2-Year Support, HW warranty, & 90-day ZPECloud.com subscription.	8 Cores	32GB	Single AC

Ordering Information

Channel SKU	Description	CPU	Memory	Power
ZPE-NSR-832-DAC	ZPE Nodegrid Net SR modular chassis. 8-core Intel CPU, Backplane Switch, 32GB DDR4, 32GB MSATA, 5 Slots, 2 SFP+, 4X USB, 2X GbE, 1X HDMI, 1X console. Dual AC Power supply & cord included. Order NSR Expansion Card separately. Includes Standard 2-Year Support, HW warranty, & 90-day ZPECloud.com subscription.	8 Cores	32GB	Dual AC
ZPE-NSR-832-DDC	ZPE Nodegrid Net SR modular chassis. 8-core Intel CPU, Backplane Switch, 32GB DDR4, 32GB MSATA, 5 Slots, 2 SFP+, 4X USB, 2X GbE, 1X HDMI, 1X console. Dual DC Power supply & cord included. Order NSR Expansion Card separately. Includes Standard 2-Year Support, HW warranty, & 90-day ZPECloud.com subscription.	8 Cores	32GB	Dual DC
ZPE-NSR-832-SAC-POE	ZPE Nodegrid Net SR modular chassis. 8-core Intel CPU, Backplane Switch, 32GB DDR4, 32GB MSATA, 5 Slots, 2 SFP+, 4X USB, 2X GbE, 1X HDMI, 1X console. Single AC Power supply with 160W PoE Power. AC power cord included. Order NSR Expansion Card separately. Includes Standard 2-Year Support, HW warranty, & 90-day ZPECloud.com subscription.	8 Cores	32GB	Single AC-POE
ZPE-NSR-832-SDC-POE	ZPE Nodegrid Net SR modular chassis. 8-core Intel CPU, Backplane Switch, 32GB DDR4, 32GB MSATA, 5 Slots, 2 SFP+, 4X USB, 2X GbE, 1X HDMI, 1X console. Single DC Power supply with 160W PoE Power. Order NSR Expansion Card separately. Includes Standard 2-Year Support, HW warranty, & 90-day ZPECloud.com subscription.	8 Cores	32GB	Single DC-POE
ZPE-NSR-864-DAC	ZPE Nodegrid Net SR modular chassis. 8-core Intel CPU, Backplane Switch, 64GB DDR4, 32GB MSATA, 5 Slots, 2 SFP+, 4X USB, 2X GbE, 1X HDMI, 1X console. Dual AC Power supply & cord included. Order NSR Expansion Card separately. Includes Standard 2-Year Support, HW warranty, & 90-day ZPECloud.com subscription.	8 Cores	64GB	Dual AC
ZPE-NSR-864-DDC	ZPE Nodegrid Net SR modular chassis. 8-core Intel CPU, Backplane Switch, 64GB DDR4, 32GB MSATA, 5 Slots, 2 SFP+, 4X USB, 2X GbE, 1X HDMI, 1X console. Dual DC Power supply included. Order NSR Expansion Card separately. Includes Standard 2-Year Support, HW warranty, & 90-day ZPECloud.com subscription.	8 Cores	64GB	Dual DC
ZPE-NSR-864-SAC-POE	ZPE Nodegrid Net SR modular chassis. 8-core Intel CPU, Backplane Switch, 64GB DDR4, 32GB MSATA, 5 Slots, 2 SFP+, 4X USB, 2X GbE, 1X HDMI, 1X console. Single AC Power supply with 160W PoE Power. AC power cord included. Order NSR Expansion Card separately. Includes Standard 2-Year Support, HW warranty, & 90-day ZPECloud.com subscription.	8 Cores	64GB	Single AC-POE
ZPE-NSR-864-SDC-POE	ZPE Nodegrid Net SR modular chassis. 8-core Intel CPU, Backplane Switch, 64GB DDR4, 32GB MSATA, 5 Slots, 2 SFP+, 4X USB, 2X GbE, 1X HDMI, 1X console. Single DC Power supply with 160W PoE Power. AC power cord included. Order NSR Expansion Card separately. Includes Standard 2-Year Support, HW warranty, & 90-day ZPECloud.com subscription.	8 Cores	64GB	Single DC-POE

Nodegrid Net SR Lite

Nodegrid Net Services Router Lite (NSR Lite) is a modular open-platform appliance offering the same capabilities for Out-of-Band (OOB) management, DevOps, OOB-I-WAN (SD-WAN) as the NSR models. The NSR Lite utilizes a shared network switching plane to provide connectivity to connected end devices. It is optimised to provide an Automation Infrastructure for remote/branch offices, retail and IoT applications, in which the NSR Lite directly provides access and management to all connected IT and OT devices.

Channel SKU	Description	CPU	Memory	Power
ZPE-NSR-48L-DAC	ZPE Nodegrid Net SR Lite - Modular chassis. 4-core Intel CPU, No dedicated Backplane Switch, 8GB DDR4, 32GB MSATA, 5 Slots, 2 SFP+, 4X USB, 2X GbE, 1X HDMI, 1X console. Dual AC Power supply & cord included. Order NSR Expansion Card separately. Includes Standard 2-Year Support, HW warranty, & 90-day ZPECloud.com subscription..	4 Cores	8GB	Dual AC

Expansion Cards

ZPE-NSR-8ETH-POE-EXPN	ZPE Nodegrid Net SR. 8-Port 1G w/ POE Ethernet Expansion Card
ZPE-NSR-16SRL-EXPN	ZPE Nodegrid Net SR. 16-Port RJ45 Serial Rolled (Cisco) Expansion Card
ZPE-NSR-16ETH-EXPN	ZPE Nodegrid Net SR. 16-Port 1G Ethernet Expansion Card
ZPE-NSR-16USB-EXPN	ZPE Nodegrid Net SR. 16-Port USB Type A Expansion Card
ZPE-NSR-16SFP-EXPN	ZPE Nodegrid Net SR. 16-Port 1G SFP Expansion Card
ZPE-NSR-8SFP-EXPN	ZPE Nodegrid Net SR. 8-Port 10G SFP Expansion Card
ZPE-NSR-COVER	ZPE Nodegrid Net SR. Cover Plate
ZPE-NSR-COMP-EXPN	ZPE Nodegrid Net SR. Compute 4-core, 8GB DDR4, 32GB SATA Expansion Card
ZPE-NSR-COMP1-EXPN	ZPE Nodegrid Net SR. Compute 8-core, 8GB DDR4, 32GB SATA Expansion Card
ZPE-NSR-COMP2-EXPN	ZPE Nodegrid Net SR. Compute 16-core, 16GB DDR4, 32GB SATA Expansion Card
ZPE-NSR-COMP3-EXPN	ZPE Nodegrid Net SR. Compute 8-core, 32GB DDR4, 240GB SATA Expansion Card
ZPE-NSR-FAN-OUT	ZPE Nodegrid Net SR. Replacement Fan, Exhaust (air out)(default option on NSR)
ZPE-NSR-FAN-IN	ZPE Nodegrid Net SR. Replacement Fan, Intake (air in)
ZPE-NSR-S512G	ZPE Nodegrid Net SR. Module w/ 512GB 2.5" Storage
ZPE-NSR-S1024G	ZPE Nodegrid Net SR. Module w/ 1TB 2.5" Storage
ZPE-NSR-M2-4G	ZPE Nodegrid Net SR. M.2 Card w/ Single 4G LTE (CAT 12) Module
ZPE-NSR-M2-5G	ZPE Nodegrid Net SR. M.2 Card w/ Single 5G LTE (CAT 20) Module
ZPE-NSR-M2-EXPN	ZPE Nodegrid Net SR. M.2 Card w/ 2X Blank M.2 Slots (Key B)
ZPE-NSR-M2-4G-WIFI	ZPE Nodegrid Net SR. M.2 Card w/ Dual 4G LTE (CAT 12) Modules
ZPE-NSR-M2-5G-WIFI	ZPE Nodegrid Net SR. M.2 Card w/ Dual 5G LTE (CAT 20) Modules
ZPE-NSR-M2-4G5G	ZPE Nodegrid Net SR. M.2 Card w/ 1X 4G LTE (CAT12) & 1X 5G LTE (CAT 20) Modules
ZPE-NSR-M2-4G-128GB	ZPE Nodegrid Net SR. M.2 Card w/ 1X 4G LTE (CAT12) & 1X 128GB SSD Modules



-  16-Port GbE ETH
-  8-Port GbE ETH SFP+
-  M.2 Cellular/Wi-Fi/SATA
-  8-Port ETH PoE+
-  16-Port Serial
-  Storage
-  16-Port GbE ETH SFP
-  16-Port USB Serial
-  x86 Intel Compute Card

Support

ZPE-NSR-BASE-ALL-EW1G	ZPE Nodegrid Net SR. 1Y 24X7 Gold Upgrade Support
ZPE-NSR-BASE-ALL-EW2G	ZPE Nodegrid Net SR. 2Y 24X7 Gold Upgrade Support
ZPE-NSR-BASE-ALL-EW3G	ZPE Nodegrid Net SR. 3Y 24X7 Gold Upgrade Support

NOTE: If you need more storage or other combinations please contact ZPE Sales: sales@zpesystems.com

