

# Nodegrid Net Services Router 2U™

Modular Platform for Centralized Out-of-Band (OOB) Access and Control

## Benefits

- **Built for large edge deployments** — colocation data centers, major branches, and remote facilities with diverse device populations
- **10-slot modular platform** — backward-compatible with NSR 1U expansion cards
- **4x 10G SFP+ uplinks** with next-gen backplane delivering more bandwidth
- **Up to 400W PoE budget** — 70W per expansion card
- **Intel X86\_64 4-Core CPU**
- **Hot-swappable CRPS power supplies and fans** for toolless replacement
- **Fully redundant, independent 1300W power supplies**
- **Dual NVMe with RAID** for resilient local storage

## Features

- **Dedicated OOB interconnect** for remote power/reset of paired systems (*patent pending*)
- **Vendor-neutral Nodegrid OS** — OOB access for serial, USB, IPMI, and PDU
- **Built-in L2/L3 networking, VPN (SSL, IPsec, WireGuard), QoS, and firewall**
- **Centralized management with ZTP, clustering, monitoring, and automated failover**



Net Services Router 2U – Front

## Overview

**Nodegrid Net Services Router 2U™ (NSR 2U)** is a high-density, modular open-platform appliance purpose-built for large edge environments — colocation data centers, major branch offices, and remote facilities — where diverse device populations, high PoE demands, and limited on-site staff require a single platform that does more.

Expanding on the proven Nodegrid NSR platform, the NSR 2U doubles expansion capacity to 10 slots, adds 4x native 10G SFP+ uplinks, and delivers up to 400W of PoE power — all in a field-serviceable 2U chassis with hot-swappable power supplies and fans that any on-site personnel can replace without specialized training or service interruption.

Powered by an Intel X86\_64 4-Core CPU and the 64-bit Linux-based Nodegrid OS, the NSR 2U consolidates routing, switching, security, OOB access, and Docker application hosting into a single platform with modular expansion cards for networking, serial/USB, 5G/4G LTE, Wi-Fi, compute, and storage — Replacing the sprawl of single-purpose appliances that large edge sites typically accumulate.

# Nodegrid Net SR – Expansion Modules



16-Port GbE ETH



8-Port ETH PoE+



16-Port GbE  
ETH SFP



16-Port Serial  
(Switchable)



8-Port Ethernet  
SFP+



16-Port Serial



16-Port USB Serial



USB OCP Debug



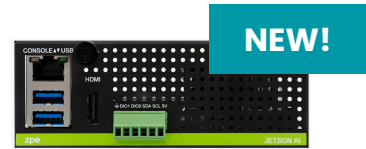
M.2 Cellular  
/Wi-Fi/  
SATA



Storage

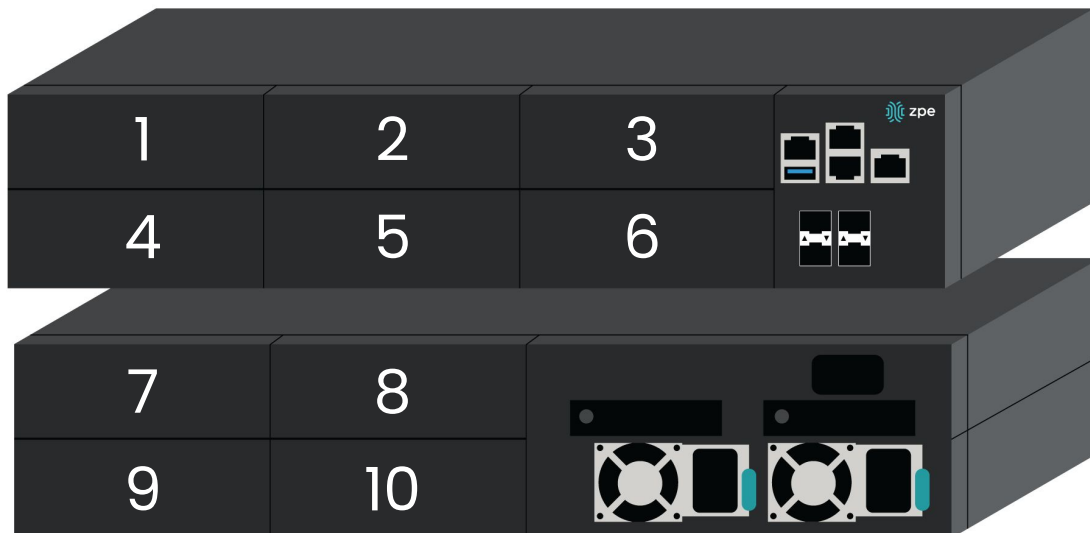


x86 Intel  
Compute Card



Jetson AI Card

## Expansion Slot Layout



**Nodegrid Net  
Services Router 2U**  
Front

**Nodegrid Net  
Services Router 2U**  
Rear

# Expansion Module Compatibility Chart

Part Number	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6	Slot 7	Slot 8	Slot 9	Slot 10
<b>16-Port Serial</b> ZPE-NSR-16SRL-EXPN	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
<b>16-Port Serial (Switchable)</b> ZPE-NSR-16S-EXPN	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
<b>16-Port OCP</b> ZPE-NSR-16OCP-EXPN	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
<b>16-Port USB Serial</b> ZPE-NSR-16USB-EXPN	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
<b>16-Port GbE</b> ZPE-NSR-16ETH-EXPN	✓	✓	✓	✓	✓	✓	*Isolated	*Isolated	*Isolated	*Isolated
<b>16-Port GbE SFP</b> ZPE-NSR-16SFP-EXPN	✓	✓	✓	✓	✓	✓	*Isolated	*Isolated	*Isolated	*Isolated
<b>8-Port SFP+</b> ZPE-NSR-8SFP-EXPN	✓	✓	✓	✓	✓	✓	*Isolated	*Isolated	*Isolated	*Isolated
<b>8-Port POE+</b> ZPE-NSR-8ETH-POE-EXPN	✓	✓	✓	✓	✓	✓	*Isolated No PoE	*Isolated No PoE	*Isolated No PoE	*Isolated No PoE
<b>Compute</b> ZPE-NSR-COMP-EXPN	✓	✓	✓	✓	✓	✓	*Isolated	*Isolated	*Isolated	*Isolated

*\*Isolated – The card will work as a standalone card, without an internal network connection*

## Expansion Module Compatibility Chart (Continued...)

Part Number	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6	Slot 7	Slot 8	Slot 9	Slot 10
<b>M.2 Expansion</b> ZPE-NSR-M2-4G	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
ZPE-NSR-M2-5G	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
ZPE-NSR-M2-4G-4G	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
ZPE-NSR-M2-4G-W5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
ZPE-NSR-M2-5G-W5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
ZPE-NSR-M2-4G-5G	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
ZPE-NSR-M2-4G-128GB	-	-	-	-	-	-	-	-	✓	✓
<b>Storage</b> ZPE-NSR-S512G	-	-	-	-	-	-	-	-	✓	✓
ZPE-NSR-S1024G	-	-	-	-	-	-	-	-	✓	✓
<b>Jetson AI Card</b> ZPE-NSR-M2-NVIDIA-128G -N8G	✓	✓	✓	✓	✓	✓	-	-	-	-

## Technical Specifications

### Accessibility

- Multiple Routing Tables
- 4X SFP+ 10 Gbit Ethernet Ports
- Failover to 5G
- 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, VLAN, DHCP (Client & Server)
- LLDP and DHCP Snooping
- SSL, IPsec, WireGuard VPN technologies

### 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
- Device URL TM bookmarks, Fire Trail TM 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
- Hot swappable PSU
- 400W PoE Power Budget

### Operating System

Built-in 64-bit Nodegrid OS

### Warranty

2-Year Limited Warranty

### CPU & Storage

- Intel x86\_64 multi-core - 4 Core CPU (all models)
- 8 (Non-ECC) to 64GB (ECC) of DDR4 DRAM
- 32GB FLASH (mSATA SSD) (Upgradable)
- 2X NVMe Empty Slots (upgradable, max 8TB)

### Device View Options

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

### Interfaces

- 1X RJ-45 Serial RS-232 Port
- 4X SFP+ Ethernet
- 1X Console on RJ45
- 2X USB 2.0
- 2X 2.5Gb Ethernet
- 1X USB 3.0
- 1X RJ11 (Power Control)

### Physical

- Front-Rear mounting brackets
- Dimensions (WxDxH): 565mm x 438mm x 88.8 mm (2U)
- Weight (Chassis): 29.6 lbs

### Data Logging & Notifications

- Local port buffering: 20 MB per port
- Local, NFS, syslog, offline 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 networks can & custom probes
- SNMP v1, v2, and v3 over IPv4 and IPv6. SNMP v3 with authentication MD5, SHA-224, SHA-256, SHA-384, SHA-512, encryption DES, AES-128, 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-NSR2U-48-DAC	ZPE Net SR 2U Chassis - 4-Core Intel CPU, 8GB (Non-ECC) RAM, 32GB Storage. 1x USB Serial, 2x 2.5GbE, 4x SFP+, 2 NVMe Slots, Backplane Switch. Dual AC (DAC) Hot Swappable Power.	4 Cores	8GB	Dual AC
ZPE-NSR2U-48-DDC	ZPE Net SR 2U Chassis - 4-Core Intel CPU, 8GB (Non-ECC) RAM, 32GB Storage. 1x USB Serial, 2x 2.5GbE, 4x SFP+, 2 NVMe Slots, Backplane Switch. Dual DC (DDC) Hot Swappable Power.	4 Cores	8GB	Dual DC
ZPE-NSR2U-416-DAC	ZPE Net SR 2U Chassis - 4-Core Intel CPU, 16GB (Non-ECC) RAM, 32GB Storage. 1x USB Serial, 2x 2.5GbE, 4x SFP+, 2 NVMe Slots, Backplane Switch, RAID support. Dual AC (DAC) Hot Swappable Power.	4 Cores	16GB	Dual AC
ZPE-NSR2U-416-DDC	ZPE Net SR 2U Chassis - 4-Core Intel CPU, 16GB (Non-ECC) RAM, 32GB Storage. 1x USB Serial, 2x 2.5GbE, 4x SFP+, 2 NVMe Slots, Backplane Switch, RAID support. Dual DC (DDC) Hot Swappable Power.	4 Cores	16GB	Dual DC
ZPE-NSR2U-432-POE-DAC	ZPE Net SR 2U Chassis - 4-Core Intel CPU, 32GB (Non-ECC) RAM, 32GB Storage. 1x USB Serial, 2x 2.5GbE, 4x SFP+, 2 NVMe Slots, Backplane Switch, RAID support, POE-Out support. Dual AC (DAC) Hot Swappable Power.	4 Cores	32GB	Dual AC - PoE
ZPE-NSR2U-432-POE-DDC	ZPE Net SR 2U Chassis - 4-Core Intel CPU, 32GB (Non-ECC) RAM, 32GB Storage. 1x USB Serial, 2x 2.5GbE, 4x SFP+, 2 NVMe Slots, Backplane Switch, RAID support, POE-Out support. Dual DC (DDC) Hot Swappable Power.	4 Cores	32GB	Dual DC - PoE
ZPE-NSR2U-464-POE-DAC	ZPE Net SR 2U Chassis - 4-Core Intel CPU, 64GB (ECC) RAM, 32GB Storage. 1x USB Serial, 2x 2.5GbE, 4x SFP+, 2 NVMe Slots, Backplane Switch, RAID support, POE-Out support. Dual AC (DAC) Hot Swappable Power.	4 Cores	64GB	Dual AC - PoE
ZPE-NSR2U-464-POE-DDC	ZPE Net SR 2U Chassis - 4-Core Intel CPU, 64GB (ECC) RAM, 32GB Storage. 1x USB Serial, 2x 2.5GbE, 4x SFP+, 2 NVMe Slots, Backplane Switch, RAID support, POE-Out support. Dual DC (DDC) Hot Swappable Power.	4 Cores	64GB	Dual DC - PoE