# Server U


# RACK-MOUNT SERVERS

## designed for BSD and Linux systems

8001 NW 64th St.
Miami, FL 33166

contactus@serveru.us
www.serveru.us

+1 (305) 421-9956

Server U

*presents*


# SERVERU NETMAP L-400

## datasheet & executive overview

# SERVERU NETMAP L-400


ServerU Netmap L-400 is a perfect 1U network appliance for medium-sized companies and organizations. It's powered with 6 Intel Gigabit LAN with independent RX and TX multithread queues, MSI-X supported and ready for Netmap high performance packet processing.

With up to 16GB RAM (8GB by default), 4 embedded Intel processors core and 6 Intel Server network ports (up to 14x1Gbit/s expansible), it's suitable for up to 2.6Gbit/s aggregated throughput.

## KEY FEATURES

- Hand picked 6 port Intel Gigabit NICs
- Netmap ready (FreeBSD & pfSense)
- Up to 14x 1Gbit/s expansion ports
- Up to 4x1Gbit/s SFP (fibre) expansion

## PERFECT FOR

- BGP & OSPF Routing
- Firewall & Security Appliances
- IDS/IPS & Anti-DDoS
- WAF (Web Application Firewall)

## DESIGNED WITH SECURITY IN MIND

- Defense in Depth: Perfect for bastion Host, Tier-1, Tier-2 and Tier-3 perimeter control
- Diversity of Defense: FreeBSD, Linux or OpenBSD; ProApps, pfSense or ROS


DESIGNED FOR FreeBSD · DESIGNED FOR ProApps · DESIGNED FOR GNU / Linux · DESIGNED FOR pfSense

## Here is a summary description for this product:

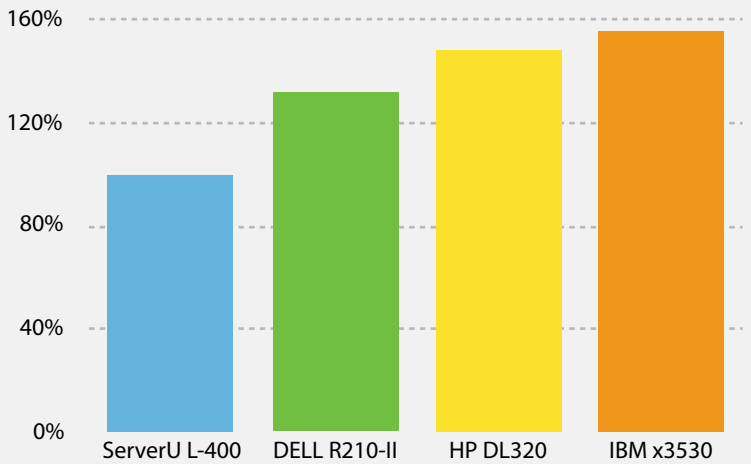
Designed for special purposes and systems.

| | |
|---|---|
| **Business Size:** | For SMB (small & medium) and medium-to-big business. Exceeds typical SOHO |
| **Recommended use:** | BGPv4 & OSPF Routing, Stateful Firewall, IDS/IPS, Web App Firewall, Anti-DDoS, NGFW |
| **Recommended use:** | Web Proxy & Content Filtering, E-mail security & server, SMTP Firewall & VPN |
| **Designed for:** | ProApps, FreeBSD, pfSense, OpenBSD, Linux, Vyatta (VyOS), Endian & ROS (no Windows) |
| **Certifications:** | FCC Class A, UL, RoHS, CE Emission, ANATEL |

## This is some spotlight technical information for Netmap-L400:

| | |
|---|---|
| **Processor:** | Intel® C2518 "Rangeley" 4x1.74Ghz (Quad Core) Embedded with AES-NI support |
| **Chipset:** | Intel® "Rangeley" w/ VT-x virtualization support; |
| **Memory Technology:** | 1x 8GB DDR3 on 240P DIMM socket (up to 16GB on 2x240P DDR3 DIMM) |
| **Network Interfaces:** | 6x Intel Gigabit server ports w/ 2x i210AT chipset and 4x 88E1543 chipset - igb(4) driver |
| **Network Features:** | WDT, RTC, MSI-X, CPU Affinity w/ 4 and 8 Queues |
| **Physical I/O:** | 4-key Pad & 2-line LCM Display (fully scriptable yeah!) |
| **BIOS:** | AMI BIOS, 16Mbit SPI Flash ROM |

## TCO COMPARISON - SERVERU L400 VS DELL, HP AND IBM SIMILARS




| VENDOR | UNIT VALUE |
|---|---|
| ServerU L-400 | Current listing price |
| DELL R210-II | 32% more expensive |
| HP DL320 | 48% more expensive |
| IBM x3530 | 56% more expensive |

IBM x3530
HP DL320
DELL R210-II
ServerU L-400

Compared products won't include LCM, Keypad, Intel NICs. ServerU provides a better feature set at a lower TCO.

** Prices based on online quotes from Jan '16.*

## TECHNICAL SPECIFICATIONS

| | |
|---|---|
| **Embedded Appliance System:** | Specially designed for advanced routing, firewalling, anti-DDoS, next generation firewall and IDS/IPS protection with expansions capability to act as a general purpose gateway and controlling border including high disk I/O performance. |
| **Processor:** | 1.74Ghz 4 core processor (Quad Core) on logical board 4MB cache; AES-NI support for crypto offloading; Intel VTx (virtualization) support.; |
| **Console:** | Full I/O supported from 10 pins RJ-45 RS232 console; |
| **Memory:** | 2 slots 240P DDR3 DIMM, up to 16GB RAM (powered by 1x8GB default); |
| **Chassis:** | 1U Rack Mount, with rack mount kit; |
| **Chassis Front:** | 4-keys Keypad & 2 independent lines LCM display (both are fully programmable/scriptable); 6x RJ45 LAN ports; 2xUSB 2.0 ports; 1x RJ45 S232 console port; power, disk and info led indicators; front expansion bay for ethernet optical (fibre) and electric (copper) expansions (see expansion ref sheet); |
| **Chassis Rear:** | Chassis cooling fans; power input; power supply; power/reset buttom; |
| **LCM display:** | Is BSD (and Linux) friendly: echo your text straight to device driver; |
| **Power Source:** | 110v/220Vac default; 48Vdc optional; 72Vdc optional; 36Vdc optional; |
| **Included Storage:** | 1x32GB SSD (Solid State Drive) on SATA3 controller; |
| **Virtualization:** | VT-x supported; |

## ADDITIONAL TECHNICAL SPECIFICATIONS

- **Logical Board & Processor Features:** FPU, VME, DE, PSE, TSC, MSR, PAE, MCE, CX8, APIC, SEP, MTRR, PGE, MCA, CMOV, PAT, PSE36, CLFLUSH, DTS, ACPI, MMX, FXSR, SSE, SSE2, SS, HTT, TM, PBE, SSE3, PCLMULQDQ, DTES64, MON, DS_CPL, VMX, EST, TM2, SSSE3, CX16, xTPR, PDCM, SSE4.1, SSE4.2, MOVBE, POPCNT, TSCDLT, AESNI, RDRAND, SYSCALL, NX, RDTSCP, LM, LAHF, Prefetch, TSCADJ, SMEP, ENHMOVSB
- **RTC Intel Watchdog triggers to reset the device when kernel interrupt timer overflows**;
- **Reset-on-failure; start on power; Internal lithium battery; CPU Fan Speed monitoring available**;
- **Full-Time North Bridge & South Bridge configuration access; P-State, HPET1 & HPET2**;
- **ACPI INTEL, TIANO**;
- **Thermal P-State information; Speedstep technology supported; C-State CPU Freq supported**;
- **1333Mhz Front Side Bus (FSB) mininal freq;** XD execute bit switch supported;

- **Hardware Diagnostics:** special mini-PCIe diagnostic module supported (not included);
- **MTBF:** 62,800h
- **Intel Video GPU, CPU Affinity capable; OpenCL capable; Video profile:** 2048x1536 pixels 32bits @ 85Hz;
- **USB:** 4 ports; 2 available on chassis front; 2 internal-only (expansion);
- **Storage temperature:** from -20 to 90 celsius;
- **Humidity:** 5~90% non-condensing;
- **Dimensions (mm):** 431 x 44 x 305;
- **Weight:** 4.1Kg, 8Kg (packed for shipping

## NETWORK INTERFACES SPECS

- **Device driver igb(4):** Intel i210AT chipset on ports 0 and 1; Intel 88E1543 on ports 2-5;
- **6x Intel Gigabit ports,** RJ45, 10/100/1000Mbit/s auto-select;
- **MSI-X Interrupts;** Adaptive Interrupt (no device polling required);
- **TSO, LRO and Jumbo Frames supported**;
- **10baseT/UTP, 100baseTX, 1000baseSX, 1000baseTX,** full-duplex, half-duplex operation mode;
- **IEEE 802.1q (vlan tagging);** IEEE 802.1Q-in-Q;
- **WOL** (Wake on Lan); **Link Aggregation** (trunking, lagging);
- **PXE boot** (port 4);
- **4 vectors MSI-X interrupts (minimum)** on all ports;
- **Per port RX/TX independent queues** (multi-threaded, CPU Affinity ready);
- **Netmap (BSD)** capable, ready, tested and recommended;
- **PF_RING (Linux)** capable, ready and tested;
- **Intel DPDK (Linux & BSD)** capable, ready and tested;
- **Perfect Choice for Bastion Host**;

## EXTREME CONDITIONS READY

- **Operating temperature:** from -10 to 70 celsius; cpu cooling available but optional (non mobile parts required)
- **Low Heat emission** and low energy comsuption;
- **Partial unstabilized** power source supported;
- **Uncooled processor** (only head dissipation) ready for mission-critical extreme environments;
- **Cooling flow dissipation**;
- **Certified System Cooling FAN** on chassis;

## EXPANSION

- **1 PCI Express 8x Gold Finger w/ expansion board (included);**
- Swapable front ethernet modules bay;
- **Up to 8 electric Intel 1Gbit/s ports** (total 14 ports 1Gbit/s Intel igb(4));
- **Up to 4 electric Intel 1Gbit/s ports** (total 10 ports 1Gbit/s Intel igb(4) ideal for best performance on all ports);
- **Up to 4 SFP optical ports Intel 1Gbit/s;**
- **2x SSD/HDD 2.5"** on SATA 3.0 (SATA600);
- **Chassis expansion:** 2x2.5" disk;
- **4x SATA slots, 1xSATA1; 1xSATA2; 2xSATA3** - chassis ready for 2x SSD/HDD 2.5", other disks must be SATA DOM;
- **1x mini-PCIe** (wifi ready);
- **1x Compact Flash Type II slot;**
- **Up to 4 USB ports;**
- **Dual mini-PCIe front expansion with SIM Card reader, for Wifi and 3G/4G/LTE cards** (USB or PCI signaled);

## INTEL® TECHNOLOGY

- **AES-NI supported for crypto offloading;**
- **x86_64 (64 bits) arch;**
- **MPS 1.4 Simetric Multi Processing (SMP) capable;**
- **Made for Open Source (BSD & Linux);**
- **Hand-picked Intel Servers chipset;**
- **Intel i210AT network chipset (netmap ready);**
- **Intel 88E1543 network chipset (netmap ready);**
- **All networking ports controlled by igb(4) driver;**
- **ICH8M intel logical board chipset;**
- **Chipset Intel "Rangeley";**
- **Virtualization VT-x;**

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## EXPANSIONS FOR NETMAP L-400, 1GBIT/S COPPER

Here is the listing for **1Gbit/s** wire (copper) expansion ports with **RJ45** connectors for ServerU Netmap L-400.

| MODEL | PORTS | CHIPSET | TECHNOLOGY |
|---|---|---|---|
| G801-1 | 8x 1Gbit/s | 8x Intel i210 AT | Copper, RJ45, Bypass 3G |
| G801-2 | 8x 1Gbit/s | 8x Intel i210 AT | Copper, RJ45 |
| G428-1 | 4x 1Gbit/s | 1x Intel i350 AM4 | Copper, RJ45, Bypass 3G |
| G428-2 | 4x 1Gbit/s | 1x Intel i350 AM4 | Copper, RJ45 |

## EXPANSIONS FOR NETMAP L-400, 1GBIT/S COPPER

Here is the listing for **1Gbit/s** expansion boards with Fibre (optic) ports and **SFP** connectors for ServerU Netmap L-400.

| MODEL | PORTS | CHIPSET | TECHNOLOGY |
|---|---|---|---|
| S406-1 | 4x 1Gbit/s | 1x Intel i350 AM4 | Fibre, SFP |

### FOR OPEN SOURCE

Specially designed for FreeBSD, ProApps, pfSense, OpenBSD & Linux

### NETMAP READY

Netmap technology enables up to 13x more performance for packet capturing and processing.

### S&M BUSINESS

ServerU Netmap L-400 is our best offer for S&MB as well as Medium-to-Big enterprises.

24 HOURS DISPATCH FOR PRODUCTS IN STOCK

MEASURED PERFORMANCE FOR INDIVIDUAL DEVICES

RACKMOUNT KIT INCLUDED WITH 1U DEVICES

WORLD WIDE SHIPPING FOR ALL SERVERU DEVICES

## RFC2544 BENCHMARKING

RFC2544 tests were performed without Netmap support and on a bidirectional IPv4 packets forwarding topology, without SMT/HTT support. This is the most fair and reliable scenario we want to guarantee to our customers. Tests are run by IXIA Systems. Contact-us if you want to have the full testing report.

### RFC2544 Testing Session 1 (2 ports)

* sender-DUT1-receiver (1:1 topology w/ 2 ports)

| FRAME SIZE | FPS | THOUGHPUT BIT/S | PORTS |
|---|---|---|---|
| 1508 | 97.6K | 758M | Port3-Port4 |
| 1024 | 121.2K | 647M | Port3-Port4 |
| 768 | 134.2K | 542M | Port3-Port4 |
| 512 | 152.2K | 416M | Port3-Port4 |
| 256 | 180.6K | 258M | Port3-Port4 |
| 128 | 185.5K | 145M | Port3-Port4 |
| 64 | 181.5K | 82M | Port3-Port4 |
| | **Best: 185.5K/s** | **Best: 758Mbit/s** | |

### RFC2544 Testing Session 2 (4 ports)

*** sender-DUT1-receiver (2:2 topology w/ 4 ports)**

| FRAME SIZE | FPS | THOUGHPUT BIT/S | PORTS |
|---|---|---|---|
| 1508 | 95K,96K | 744M,745M | Port3-Port4,Port1-Port5 |
| 1024 | 98K,97K | 505M,452M | Port3-Port4,Port1-Port5 |
| 768 | 95K,108K | 379M,339M | Port3-Port4,Port1-Port5 |
| 512 | 101K,98K | 260M,254M | Port3-Port4,Port1-Port5 |
| 256 | 112K,110K | 230M,226M | Port3-Port4,Port1-Port5 |
| 128 | 132K,131K | 120M,118M | Port3-Port4,Port1-Port5 |
| 64 | 144K,127K | 74M,65M | Port3-Port4,Port1-Port5 |
| | **Best: 271K/s** | **Best: 1.48Gbit/s** | |

## RFC2544 Testing Session 3 (6 ports)

*** sender-DUT1-receiver (3:3 topology w/ 6 ports)**

| FRAME SIZE | FPS | THOUGHPUT BIT/S | PORTS |
|---|---|---|---|
| 1508 | 64K,64K,64K | 866M,866M,866M | Port3-Port4,Port1-Port5,Port2-Port6 |
| 1024 | 93K,94K,92K | 598M,598M,596M | Port3-Port4,Port1-Port5,Port2-Port6 |
| 768 | 98K,98K,98K | 570M,572M,571M | Port3-Port4,Port1-Port5,Port2-Port6 |
| 512 | 99K,99K,99K | 504M,501M,501M | Port3-Port4,Port1-Port5,Port2-Port6 |
| 256 | 112K,110K,112K | 230M,226M,230M | Port3-Port4,Port1-Port5,Port2-Port6 |
| 128 | 132K,131K,132K | 128M,126M,128M | Port3-Port4,Port1-Port5,Port2-Port6 |
| 64 | 144K,127K,144K | 100M,100M,100M | Port3-Port4,Port1-Port5,Port2-Port6 |
| | **Best: 415K/s** | **Best: 2.6Gbit/s** | |

Bridged results tend to be 20% better, while Netmap VALE bridged interfaces tend to be 13 times better. Netmap L-400 device was tested in its default configuration, with 6 networking ports at 1000BaseT Intel 1Gb media type. Test results are kernel-path, expected much higher (9-13 times better) performance in Netmap mode.

## STORAGE PERFORMANCE

* tested with iobench, dd and stress

| | |
|---|---|
| **SATA 600 Channels:** *(Intel SSD tested)* | 440150261 bytes per second write; 641 tps write; 611319808 bytes per second read; 890 tps read; |
| **CF Card** | 81788928 bytes per second write; 42 tps write; 84341268 butes per second read; 56 tps read; |
| **SIM Card** | N/A |

## MEMORY PERFORMANCE

* stream_bench, iomem and stress

| | |
|---|---|
| **Memory Copy** | 4389MB/s; Avg time: 0.0364; Min time: 0.0364; Max time: 0.0364 |
| **Memory Scale** | 4521MB/s; Avg time: 0.0354; Min time: 0.0353; Max time: 0.0354 |
| **Memory Add** | 4718MB/s; Avg time: 0.0508; Min time: 0.0508; Max time: 0.0508 |
| **Memory Triad** | 4973MB/s; Avg time: 0.0482; Min time: 0.0482; Max time: 0.0482 |

## NETWORK PERFORMANCE

* RFC2544 tested results summary (sender-DUT1-receiver)

| | |
|---|---|
| **Aggregated Thorughput** (without Netmap) | **2.6Gbit/s forwarding rate** on DUT1; 415Kpps/s forwarding rate on DUT1<br>**2.72Gbit/s bridged rate** on DUT1 518Kpps/s bridged rate on DUT1 |
| **Aggregated Thorughput (with Netmap)** | 7Gbit/s send/recv rate on DUT1; 5.1Mpps send/recv rate on DUT1<br>8Gbit/s vale(4) bridged rate on DUT1 5.62Mpps vale(4) bridged rate on DUT1 |
| **Best Interface Pairs** | Port1 (igb1) & Port0 (igb0); Port4 (igb4) & Port5 (igb5) |
| **Worse Interface Pairs** | Port2 (igb2) only if second SATA disk in use |

## STATEFUL FIREWALLING

Tested systems had no tuning (standard reference); 4 allow rules +4 deny rules; latest systems

| | |
|---|---|
| **ProApps, FreeBSD** (IPFW firewall) | 1.3Gbit/s forwarding rate on DUT1; 382Kpps/s forwarding rate on DUT1; 1.1M sessions / states with 8GB RAM; 2.1M de sessions / states with 16GB RAM |
| **pfSense** (PF firewall) | 1.2Gbit/s forwarding rate on DUT1; 382Kpps/s forwarding rate on DUT1; 1M sessions / states with 8GB RAM; 2.1M de sessions / states with 16GB RAM |
| **Linux (RHE & Fedora)** (Netfilter firewall) | 1.22Gbit/s forwarding rate on DUT1; 380Kpps/s forwarding rate on DUT1; 1M sessions / states with 8GB RAM; 1.8M de sessions / states with 16GB RAM |
| **Mikrotik (ROS 7)** | 1Gbit/s forwarding rate on DUT1; 349Kpps/s forwarding rate on DUT1; 689490 sessions / states with 8GB RAM; 1.4M de sessions / states with 16GB RAM |
| **OpenBSD** | 708Mbit/s forwarding rate on DUT1; 156Kpps/s forwarding rate on DUT1; 826470 sessions / states with 8GB RAM; 1.6M de sessions / states with 16GB RAM |
| **Brocade vRouter 5600** *(DPDK mode)* | 5.6Gbit/s forwarding rate on DUT1; 1.6Mpps forwarding rate on DUT1; 1.1M sessions / states with 8GB RAM; 1.8M de sessions / states with 16GB RAM |

## IDS (Intrusion Detection System) INSPECTION

Tested systems had no tuning (default reference); latest systems

| | |
|---|---|
| **ProApps, FreeBSD** (Suricata IDP) | 1.19Gbit/s processing rate on DUT1; 893Kpps/s capture rate on DUT1; |
| **pfSense** (Snort IDP) | 1.08Gbit/s processing rate on DUT1; 629Kpps capture rate on DUT1; |
| **Linux (RHE & Fedora)** (Suricata IDP) | 1.12Gbit/s processing rate on DUT1; 780Kpps capture rate on DUT1; |
| **Mikrotik** (untested reliably) | - |
| **OpenBSD** (Snort IDP) | 900Mbit/s processing rate on DUT1; 581Kpps capture rate on DUT1; |

## ROUTING PERFORMANCE

Tested systems had no tuning (default reference); latest systems

| | |
|---|---|
| **ProApps, FreeBSD, pfSense** | 2.6Gbit/s forwarding rate on DUT1; 415Kpps forwarding rate on DUT1 |
| **Linux (RHE & Fedora)** | 2.6Gbit/s forwarding rate on DUT1; 408Kpps forwarding rate on DUT1 |
| **Mikrotik** | 2.1Gbit/s forwarding rate on DUT1; 349Kpps forwarding rate on DUT1 |
| **OpenBSD** | 604Mbit/s forwarding rate on DUT1; 188Kpps/s forwarding rate on DUT1 |
| **Brocade vRouter 5600 (DPDK)** | 8Gbit/s forwarding rate on DUT1; 2.3Mpps/s forwarding rate on DUT1; |

## NETMAP PERFORMANCE

Special interest Netmap performance on ProApps & FreeBSD

| | |
|---|---|
| **Suricata IDS mode & Anti-DDoS** (ProApps & FreeBSD) | 5.4Mpps/s aggregated; |
| **Firewall (IPFW)** (kipfw + VALE) | 1.48Mpps/s on a single port pair; 3x1.48Mpps per port pair (4.4Mpps agg); |

## MORE INFORMATION

More information about this product can be found on our website.

Contact-us online:

- E-mail: contactus@serveru.us
- Website: http://www.serveru.us

Contact-us by phone:

- Tel: +1 (305) 421-9956

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