NixOS on routers

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Why?

Why?

- Unified deployment
- Unified management
- Unified monitoring
- Unified tools

- Reproducible

```
cynerd@binky:~$ ssh omnia.spt
Last login: Fri Jan 30 13:23:18 2026 from 10.8.1.10
cynerd@spt-omnia:~$ /nix/store/kvpbb3yf7sw8ndd91zwsnigq1l3m6gr2-fastfetch-armv7l-unknown-linux-gnueabihf
-2.58.0/bin/fastfetch
```

```
cynerd@spt-omnia
----------------
OS: NixOS 26.05 (Yarara) armv7l
Host: Turris Omnia
Kernel: Linux 6.1.158
Uptime: 7 days, 15 hours, 5 mins
Packages: 352 (nix-system)
Shell: bash 5.3.9
Terminal: /dev/pts/0
CPU: armada380 (2)
Memory: 462.81 MiB / 1.95 GiB (23%)
Swap: 22.25 MiB / 1.56 GiB (1%)
Disk (/): 27.66 GiB / 238.47 GiB (12%) - btrfs [External]
Local IP (pppoe-wan): 188.75.170.225/32
Locale: en_US.UTF-8
```

```
cynerd@spt-omnia:~$
```

```
cynerd@binky:~$ ssh mox2.spt
Last login: Fri Jan 30 13:21:51 2026 from 10.8.1.10
cynerd@spt-mox2:~$ /nix/store/blfx3zk58c00wrbip0jcqrq0rsgppnbp-fastfetch-aarch64-unknown-linux-gnu-2.58.
0/bin/fastfetch
```

```
cynerd@spt-mox2
---------------
OS: NixOS 26.05 (Yarara) aarch64
Host: CZ.NIC Turris Mox Board
Kernel: Linux 6.12.58
Uptime: 3 days, 3 hours, 31 mins
Packages: 316 (nix-system)
Shell: bash 5.3.9
Terminal: /dev/pts/0
CPU: armada3700 (2) @ 1.00 GHz
Memory: 194.92 MiB / 452.68 MiB (43%)
Swap: 21.43 MiB / 361.60 MiB (6%)
Disk (/): 11.15 GiB / 14.84 GiB (75%) - btrfs
Local IP (brlan): 10.8.2.3/24
Locale: en_US.UTF-8
```

```
cynerd@spt-mox2:~$
```

Network Setup

SystemD Networkd

```
boot.kernel.sysctl."net.ipv6.conf.all.forwarding" = 1;
networking.useNetworkd = true;
systemd.network = {
  "eth1" = {
    matchConfig.Name = "eth1";
    networkConfig = {
      Address = "192.168.1.1/24";
      IPv4Forwarding = "yes"; DHCPServer = "yes"; DHCPPrefixDelegation = "yes";
      IPv6Forwarding = "yes"; IPv6SendRA = "yes"; IPv6AcceptRA = "no";
    };
    dhcpServerConfig = {
        UplinkInterface = "eth0";
        PoolOffset = 100; PoolSize = 100;
    };
    dhcpPrefixDelegationConfig = {
      UplinkInterface = "eth0"; SubnetId = 1; Announce = "yes";
    };
  };
};
```

Resolved

```
services.resolved = {
  enable = true;
  settings.Resolve = {
    DNSStubListenerExtra=["192.168.1.1"];
    FallbackDNS = ["1.1.1.1" "8.8.8.8"];
  };
};

systemd.network."eth1".dhcpServerConfig = {
  EmitDNS = "yes";
  DNS = "192.168.1.1";
};
```

Firewall

```
networking.firewall = {
  interfaces."eth1".allowedUDPPorts = [
    53 67 68
  ];

  nat = {
    enable = true;
    externalInterface = "eth0";
    internalInterfaces = ["eth1"];
  };
};
```

Choosing Hardware

Hardware Requirements

- 2-? Ethernet interfaces
- Wi-Fi?
- Storage (NixOS at least 16G): NVMe / mSD card
- CPU architecture: Watts vs. support

SOHO Router

Commonly ARMv7l or AArch64.

Advantages

- Small form factor
- Lower power consumption

Disadvantages

- Harder to get running
- Requires cross-compilation
- ARMv7l on NixOS is pain

x84_64 with PCIe cards

Advantages

- Architecture fully supported
- Not different from server
- More powerful for service hosting

Disadvantages

- Possibly higher power consumption
- Large form factor

Most likely better paired with SOHO for Wi-Fi and non-NixOS switch.

Bonus: Porting to ARM

```
nixpkgs.hostPlatform.system = "armv7l-linux";
boot = {
  loader = {
    grub.enable = false;
    systemd-boot.enable = false;
    generic-extlinux-compatible.enable = true;
  };
  kernelPackages = pkgs.linuxPackagesFor pkgs.linux_6_1_turris_omnia;
  initrd.includeDefaultModules = false;
  kernelParams = [ "earlyprintk" "console=ttyS0,115200" ];
  kernelModules = [ "leds_turris_omnia" ];
  initrd.availableKernelModules = [ "ahci_mvebu" "rtc_armada38x" ];
};
```

Thank you

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https://gitlab.com/Cynerd/nixos-personal

https://git.cynerd.cz/presentations/tree/2026-fosdem