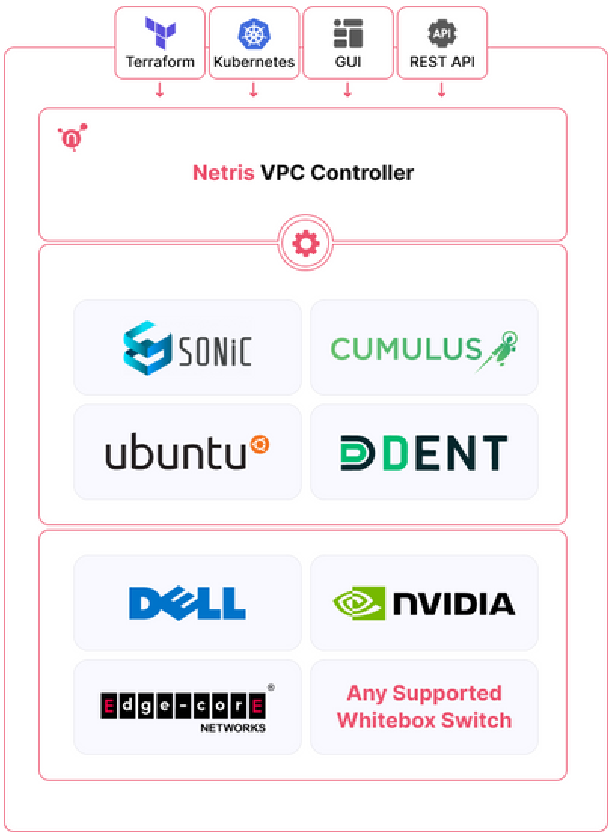
Netris Architecture

Netris delivers a VPC experience to your network by automatically configuring and managing an open networking NOS-based switch fabric and application support services - using Intuitive GUI, API, Terraform, and Kubernetes. A Netris system is comprised of three types of managed devices, softgates (the VPC gateway) nodes, switches and controllers.



Netris Controller can be hosted either on-prem as a VM, a standalone server, or a Kubernetes application.

Netris Agent is a software package that runs on top of the operating system on network switches and Linux-based high performance routers (SoftGates).

Netris agents communicate with the Netris controller through a secure gRPC SSL/TLS connection, over LAN or Internet. The role of Netris Agent is to dynamically generate and apply a fail-safe and validated configuration on every Netris-operated network unit automatically making the network work up to your needs. Just like in the cloud.

In addition, the Netris Agent automatically collects telemetry data from switches and gateways for automatic health monitoring and failure prevention.

Netris SoftGate is an optimized, Linux-based, and self-operating network gateway. Automatic configuration software and reference software architecture for enabling border routing, Layer-4 Load Balancing, Network Address Translation (NAT), and site-to-site VPN services.

The main job of a softgate is not to move packets but to automatically configure the pieces to make your network work for you.

Netris Operator is an optional software application that provides integration with the Kubernetes API. The Operator is deployed via a Helm Chart or with regular Kubernetes manifests.

Features

- On-Prem VNET Management
- Automatic Service Delivery
  - Load Balancer
  - Firewall
  - Site-to-Site VPN
  - NAT (SNAT, DNAT)
- Border Router (BGP)
- Network ACLs (Access Control Lists)
- DHCP
- Kubernetes Operator
  - Type: Load Balancer Provisioning, Load Balancer Health Check, Calico/Cilium BGP Scaling
- Automatic Switch and Gateway Configuration
- Fabric Monitoring and Detailed Telemetry
- Management: Web console, Terraform, REST API, Kubernetes CRDs

Workflows & Operations

- Switch fabric & Gateway deployment and operations
- Switch & Gateway High Availability (HA)
- Controller Maintenance Mode (Headless Operation)
- Upstream & Peering management (BGP)
- Routing on the host (ROH)
- Server Load Balancing
- Network Address Translation
- Virtual Private Networks
- Automatic Hardware Health Monitoring (CPU, Memory, Disk, Port, Fan, PSU, Temp, NTP, Services operation)
- Advanced Troubleshooting through interactive CLI Output (Looking Glass)
- Netris Controller Backup & Restore

Supported Protocols

- IPv4 & IPv6
- Border Gateway Protocol (BGP)
- DHCP
- ECMP
- Ethernet (1-100 Gigabit)
- 802.1q VLAN
- Layer-4 Load Balancing w/ probes
- Layer-3 Load Balancing (Anycast) w/probes
- IP Packet Filtering (src/dst/port)
- SNAT, DNAT, Masquerade

Minimum Requirements

Netris Controller

Virtual Machine

- Core/vCPU - 8
- RAM - 16 GB
- Disk - 100GB HDD
- Network - 1 virtual NIC, Layer-3 connectivity to management interfaces of network devices

Containerized Deployment

- Kubernetes 1.12+
- Helm 3.1+

Netris Agent

Switch NOS Support

- Cumulus Linux 3.7x/5.x
- SONiC
- Switchdev (Ubuntu 18.04)

Switch Hardware Support

- Nvidia Ethernet Spectrum 1/2/3
- Edge-Core (with Sonic Support)

Netris Operator (Optional)

- Kubernetes 1.18+
- Helm 3.1+ (optional)

SoftGate (VPC Gateway)

Softgate

- 8 CPU cores
- 16 GB RAM
- 100 GB HDD
- Ubuntu 22.04

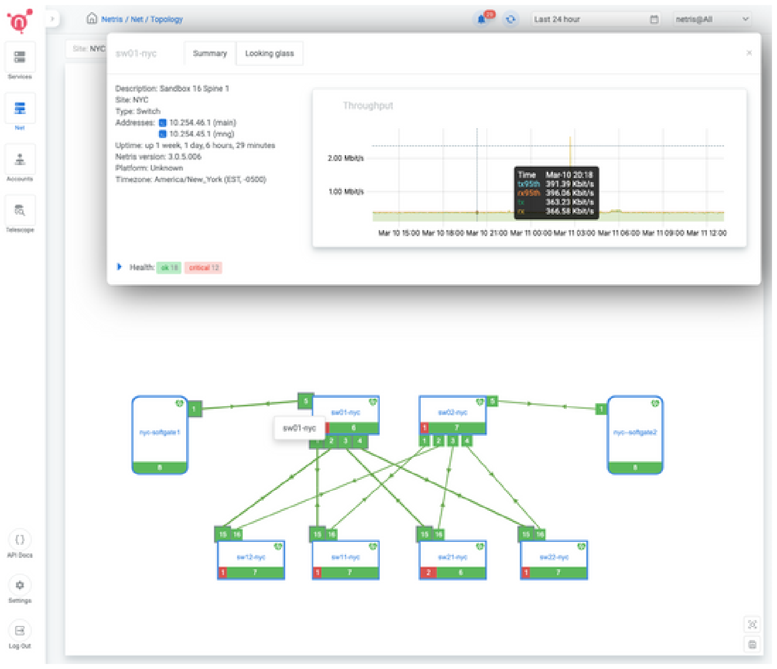
Softgate Pro

- 2 x Intel Xeon Silver CPU (BIOS settings documented on netris.io/docs)
- 128 GB (64 GB RAM per socket) in multichannel configuration
- Disk - 300 GB HDD
- NVIDIA Connect-X 5/6/6Dx SmartNIC card
- Ubuntu 22.04

Netris Operator (Optional)

- Kubernetes 1.18+
- Helm 3.1+ (optional)

Intuitive Web Console

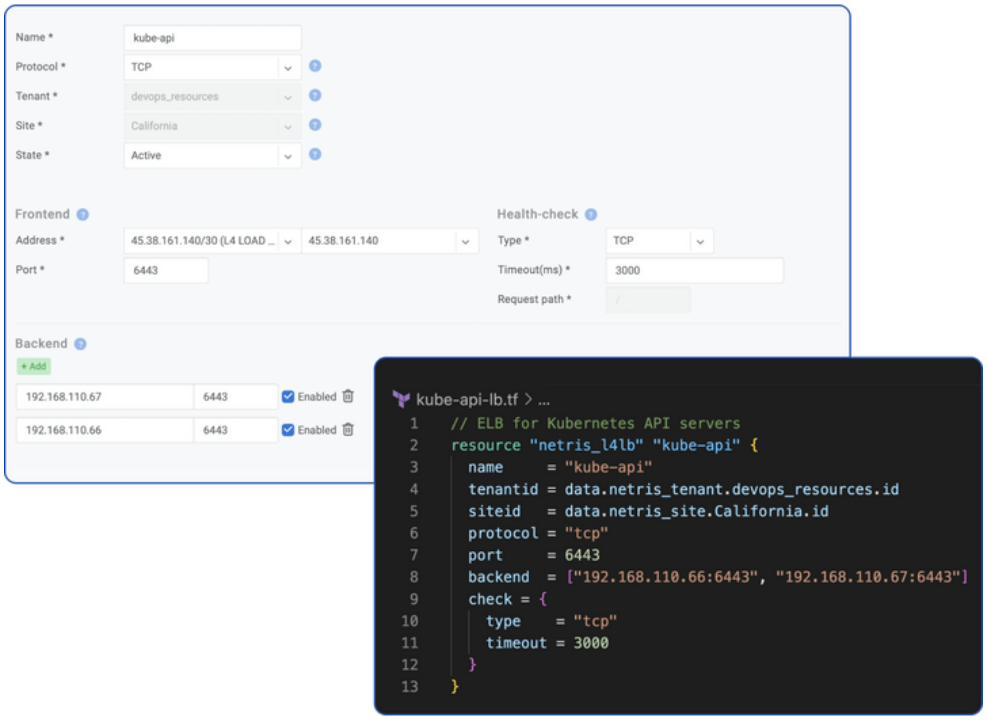


Description: Sandbox 16 Spine 1
Site: NYC
Type: Switch
Addresses: 10.254.46.1 (main)
10.254.45.1 (mng)
Uptime: up 1 week, 1 day, 6 hours, 29 minutes
Netris version: 3.0.5.006
Platform: Unknown
Timezone: America/New_York (EST, -0500)

Time Mar-10 20:18
tx95th 391.39 Kbit/s
rx95th 396.06 Kbit/s
tx 363.23 Kbit/s
rx 366.58 Kbit/s

Health: ok 18 critical 12

Cloud like declarative services with Terraform support



Name *	kube-api
Protocol *	TCP
Tenant *	devops_resources
Site *	California
State *	Active

Frontend

Address *	45.38.161.140/30 (L4 LOAD ...	45.38.161.140
Port *	6443	

Health-check

Type *	TCP
Timeout(ms) *	3000
Request path *	/

Backend

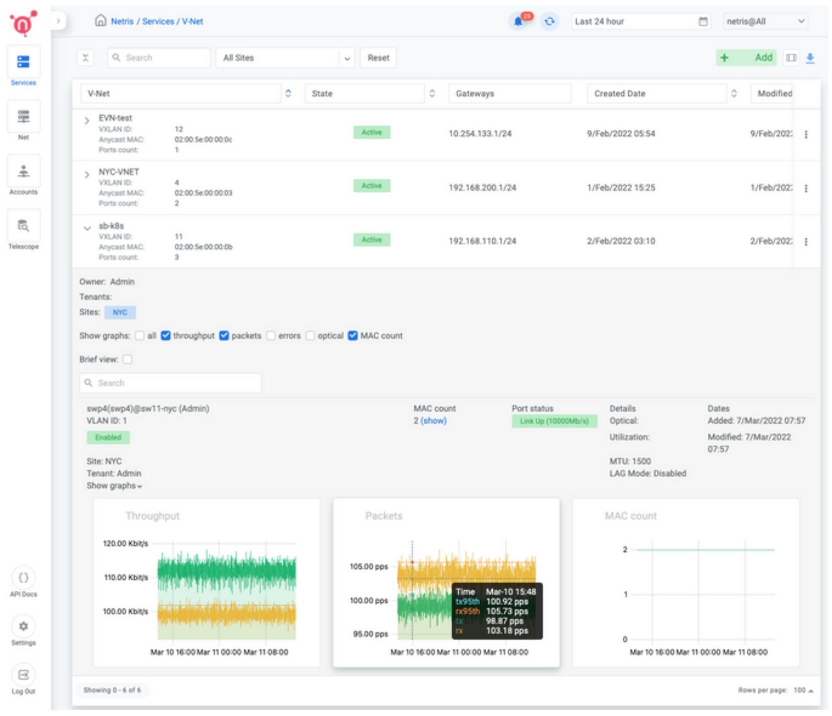
+ Add

192.168.110.67	6443	✓ Enabled
192.168.110.66	6443	✓ Enabled

kube-api-lb.tf > ...

```
// ELB for Kubernetes API servers
resource "netris_l4lb" "kube-api" {
  name      = "kube-api"
  tenantid = data.netris_tenant.devops_resources.id
  siteid   = data.netris_site.California.id
  protocol = "tcp"
  port     = 6443
  backend  = ["192.168.110.66:6443", "192.168.110.67:6443"]
  check = {
    type    = "tcp"
    timeout = 3000
  }
}
```

Built in Statistics and Monitoring



Netris / Services / V-Net

Last 24 hour netris@All

V-Net		State	Gateways	Created Date	Modified
EVN-test VXLAN ID: Anycast MAC: Ports count:	 12 02:00:5e:00:00:0c 1	Active	10.254.133.1/24	9/Feb/2022 05:54	9/Feb/202
NYC-VNET VXLAN ID: Anycast MAC: Ports count:	 4 02:00:5e:00:00:03 2	Active	192.168.200.1/24	1/Feb/2022 15:25	1/Feb/202
sb-k8s VXLAN ID: Anycast MAC: Ports count:	 11 02:00:5e:00:00:0b 3	Active	192.168.110.1/24	2/Feb/2022 03:10	2/Feb/202

Owner: Admin
Tenants:
Sites: NYC

Show graphs: ☐ all ☑ throughput ☑ packets ☐ errors ☐ optical ☑ MAC count

Brief view: ☐

swp4(swp4)@sw11-nyc (Admin)
VLAN ID: 1
Enabled
Site: NYC
Tenant: Admin
Show graphs

MAC count
2 (show)

Port status
Link Up (10000Mb/s)

Details
Optical:
Utilization:
MTU: 1500
LAG Mode: Disabled

Dates
Added: 7/Mar/2022 07:57
Modified: 7/Mar/2022 07:57

```
Time     Mar-10 15:48
tx95th   100.92 pps
rx95th   105.73 pps
tx       98.87 pps
rx       103.18 pps
```

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