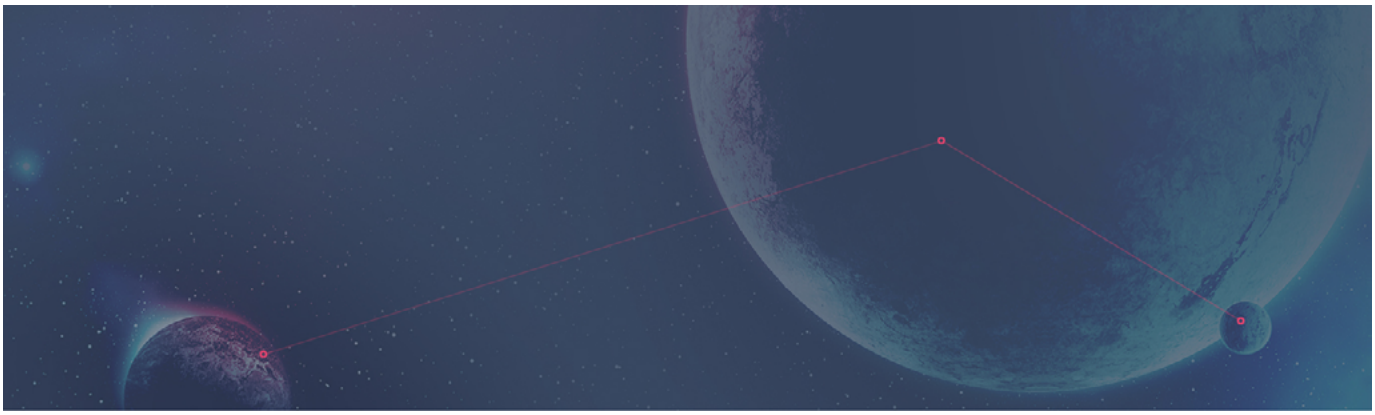
# Host Pack

## HOST SOFTWARE ESSENTIALS FOR CUMULUS LINUX



Host Pack optimizes visibility and connectivity into Cumulus Linux network fabric from end to end with the same language and the same tooling using the Linux networking model. Host Pack ensures real-time reliability and uptime to the container by leveraging NetQ to enhance visibility of the host. In addition to visibility, Host Pack enhances network scalability and connectivity by enabling the host to be part of the layer 3 network, while completely supporting popular layer 2 overlay networks.

## Eliminating the challenges with container networking

Containers have become a popular way to manage applications and microservices, but they've introduced new challenges. With Host Pack, those challenges disintegrate.

### HOST NETWORKING CHALLENGES:

- **Dangerous network blind spots:**
  The short-lived but accessible nature of containers makes them difficult to identify and track, while also making them easy to mistakenly put on untrusted network segments.
- **Significant performance delays:**
  Using containers at scale with tools traditionally used only by DevOps teams creates roadblocks and performance delays.
- **Increased network complexity:**
  Traditional network architectures and manual deployment methods aren't suited for the fleeting nature of containers and microservices.

### HOST PACK OFFERS:

- **Granular visibility for faster troubleshooting:**
  Easily identify vulnerabilities with precise visibility of each container and port.
- **Simplified connectivity:**
  Host Pack dynamically learns about containers and distribute addresses throughout the network to ensure predictable performance.
- **Simplification of the network:**
  By unifying the stack with one language, the same tooling and cohesive reporting — the entire network becomes easier to manage.

## Visibility

By using the power of NetQ on the host, Host Pack gives operational and development teams shared visibility of application availability through popular container orchestration tools such as Mesosphere, Kubernetes, and Docker Swarm. Enabled by NetQ running on the host, network operators can easily view the health of container services, keep track of container locations, track IP addresses and open ports, and have deep insights into where an issue resides, allowing for faster troubleshooting.

### CONTAINERS

Using the power of NetQ on the host, Host Pack provides granular visibility into the container for easy troubleshooting and management. Plus, it gives shared visibility to development and network teams.

The NetQ Agent monitors the following aspects of containers:

- **The health of container workloads**
- **Container location across hosts**
- **IP addresses and open ports**

### BARE-METAL HOSTS

Running NetQ on Linux hosts provides unprecedented visibility into the server-side of the datacenter network, giving the network operator a complete view of the entire infrastructure's network connectivity.

The NetQ Agent monitors the following services on Linux hosts:

- **Kernel Netlink Events**
- **Layer 2: LLDP and VLAN-aware bridge**
- **Layer 3: IPv4, IPv6**
- **Routing on the Host: BGP, OSPF**
- **systemctl for services**

### CONNECTIVITY

Cumulus Networks' Host Pack can be used to provide layer 3 connectivity and predictable performance between containers across host environments. This enables key advantages that contribute to web-scale efficiency for any network size. Host Pack for connectivity employs FRRouting (FRR), open source software for routing, along with BGP unnumbered directly on the host to dynamically learn about containers, advertise them and distribute IP addresses throughout the network. This knocks down the issues with layer 2, such as STP overlay complexities, and with the use of convoluted proprietary MLAG architecture — opening the doors to a transparent, all IP, layer 3 network.

This connectivity technology works in concert with Docker Engine to ease addressing, connectivity and the announcement of services through software — all without manual configuration of complex protocols. FRR can be deployed either as a bare metal application or inside a container for maximum deployment flexibility.

As an alternative to Host Pack connectivity, Cumulus Networks offers redistribute neighbor, which also provides layer 3 connectivity to the hosts without installing software on the host. Redistribute neighbor provides a mechanism for IP subnets to span racks without forcing the host to run a routing protocol. Use of these techniques enables interoperability and the use of open standards as they eliminate the complexity of managing a sometimes brittle layer 2 network.

## FEATURES AND SPECIFICATIONS

| TYPE | COMPONENT | DETAILS |
|---|---|---|
| Container identity tracking | Visibility | Track every container IP and MAC address, name, image, protocol and port pair, and more. |
| Container port mapping | Visibility | Track and identify protocol and ports exposed by a container. |
| Container connectivity | Visibility | Access data on network connectivity for a container, including adjacency, and identify containers that can be affected by a top of rack switch. |
| Container service-level Visibility | Visibility | Network graph for how a distributed service is deployed across hosts, the connectivity of each container in the service to ToR switch. |
| Kernel Netlink events | Visibility | Relevant Linux Kernel events trapped from hosts for complete network info. |
| Layer 2 support | Visibility | LLDP Info from the Host. |
| Layer 3 support | Visibility | Support for IPv4, IPv6 Connectivity. |
| systemctl for services | Visibility | View of services running on each host. |
| Docker store certified | Connectivity | The daemon for Host Pack Connectivity is certified in the Docker store. |
| FRRouting | Connectivity | Containerized FRRouting to bring routing features to the host. |
| Container event based advertisement | Connectivity | Addressing & announcement of services for containerized workloads deployed on Docker Engine. Advertises Docker. Container IP addresses into a routed fabric automatically. |
| BGP & OSPF Unnumbered | Connectivity | Achieves seamless integration of network fabric and hosts, and eases the migration from legacy L2 network designs to a unified L3 design from the network to the host. |
| Automatic layer 2 segmentation | Connectivity | Reduces the complexity of managing a layer 2 network with protocols like STP by eliminating or reducing the number of VLANs to the host and by providing automatic layer 2 segmentation. |
| Subnet freedom | Connectivity | IP addresses are independent of the rack or subnet; only the subnet on the connection between the leaf and the router on the host needs to be configured on the leaf. |
| Subnet mobility | Connectivity | All containers, subnets and so forth are advertised into the fabric automatically. Allows minimal configuration on the leaf switch, so you can deploy and move any host, anywhere. Or dynamically move containers across the data center as needed without changing their IP addresses. |
| Enhanced redundancy and flexibility | Connectivity | Three or more leaf (or ToR — top of rack) switches can be configured, giving much more redundancy. With routing on the host, you have the ability to gracefully remove a leaf switch from the fabric for maintenance. |

## SUPPORTED SOFTWARE

| | UBUNTU | REDHAT | CONTAINER /ORCHESTRATOR SUPPORT |
|---|---|---|---|
| **Connectivity** | | | |
| FRRouting for the Host | Ubuntu 16.04 | Red Hat Enterprise Linux 7<br>CentOS 7 | Docker Engine<br>Docker Swarm |
| Containerized FRRouting for the Host | Ubuntu 16.04 | Red Hat Enterprise Linux 7<br>CentOS 7 | Docker Engine<br>Mesos Universal Container Runtime |
| Container Advertiser | Ubuntu 16.04 | Red Hat Enterprise Linux 7<br>CentOS 7 | Docker Engine<br>Mesos Universal Container Runtime |
| **Visibility** | | | |
| NetQ for the Host | Ubuntu 16.04 | Red Hat Enterprise Linux 7<br>CentOS 7 | Docker Engine<br>Docker Swarm |

## AVAILABLE PACKAGES

| SKU | DETAILS |
|---|---|
| CN-HPK-1YR | Cumulus Host Pack: Host software essentials for Cumulus Linux Networks, 1 year support included |
| CN-HPK-3YR | Cumulus Host Pack: Host software essentials for Cumulus Linux Networks, 3 year support included |
| CN-HPK-5YR | Cumulus Host Pack: Host software essentials for Cumulus Linux Networks, 5 year support included |
| | |
| CL-SNS-HPK-1YR | Software Updates and Support for Cumulus Host Pack, 1 Year |

*A purchase of CN-HPK is required for each leaf switch, not for each server or host. Host Pack is used on hosts connected to a Cumulus Linux top-of-rack switch (or switches).

Interested in trying Host Pack? Give it a test drive with Cumulus in the Cloud.

**ABOUT CUMULUS NETWORKS***

Cumulus Networks is leading the transformation of bringing web-scale networking to enterprise cloud. Its network switch, Cumulus Linux, is the only solution that allows you to affordably build and efficiently operate your network like the world's largest data center operators, unlocking vertical network stacks. By allowing operators to use standard hardware components, Cumulus Linux offers unprecedented operational speed and agility, at the industry's most competitive cost. Cumulus Networks has received venture funding from Andreessen Horowitz, Battery Ventures, Capital, Peter Wagner and four of the original VMware founders.

For more information visit cumulusnetworks.com or follow @cumulusnetworks.



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