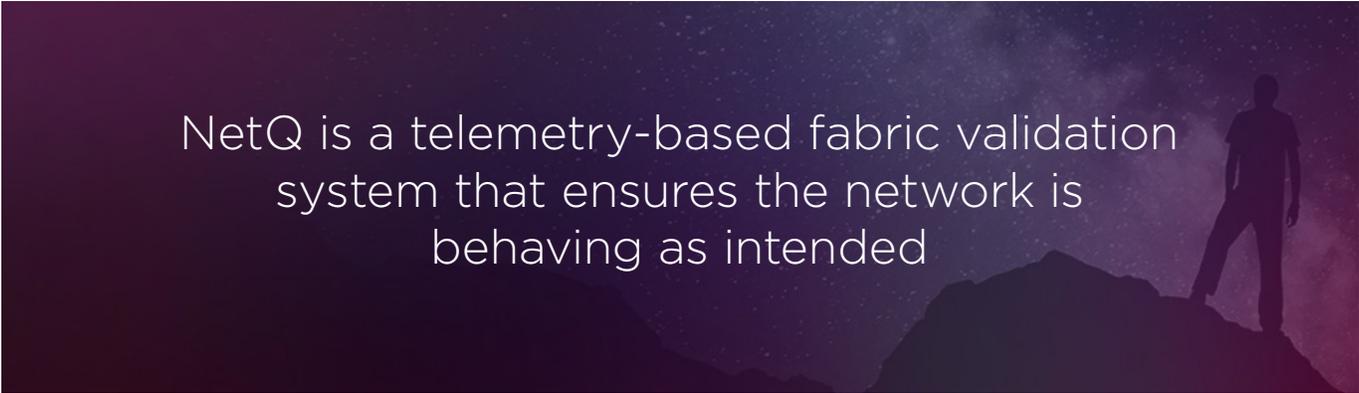


NetQ

IMPROVE NETWORK UPTIME WITH UNPARALLELED FABRIC VALIDATION



NetQ is a telemetry-based fabric validation system that ensures the network is behaving as intended

Inspired by world-class data centers, Cumulus Networks helps you build an efficient and affordable data center network using web-scale principles. Our powerful network operating system, Cumulus Linux, allows you to design and build a network that is scalable, automated and agile. NetQ, a telemetry-based fabric validation system that ensures the network is behaving as it was intended, is the next step in web-scale networking.

Built for modern, automated cloud networks, these two solutions work together to increase network efficiency and reduce costs. With Cumulus Linux and NetQ, we are bringing web-scale efficiencies to every stage of your network processes — designing, building and operating — so you can move at the speed business demands and innovate continually.

NetQ reduces network management complexity, dramatically improves network uptime, greatly enhances network agility, and is a critical step along the journey to intent-based networking. This modern management system upgrades network operations from a manual, reactive, box-by-box process to an automated, informed and agile one.

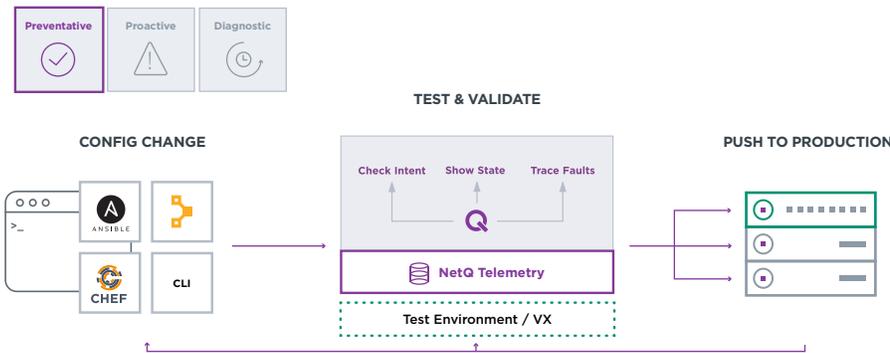
It collects and validates network state on a fabric-wide basis and across multiple layers of the data center — Layer 1, Layer 2, Layer 3 and the host. Preventative, proactive and diagnostic workflows allow you to reduce downtimes from occurring, manage risks when innovating at speed and feel confident that the network is behaving as it should.

BENEFITS

- Leverage web-scale IT
- Reduce downtimes
- Save on costs
- Innovate with confidence
- Increase agility
- Get holistic visibility
- Reduce complexities
- Remediate faster
- Simplify operations

The only closed-loop fabric validation system available

NetQ is built for the modern automated cloud network and gives network operators the comfort to identify, embrace, and manage risk of optimizing the network with incremental infrastructure updates. By validating fabric-wide network correctness using a DevOps workflow, NetQ prevents errors while rolling out deployment, provides proactive alerts of network state changes, and helps diagnose problems that would otherwise take hours to chase down or are impossible to solve with the naked eye.



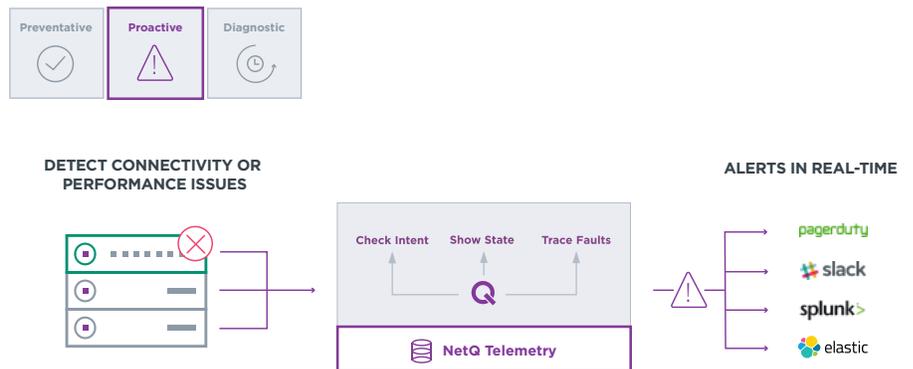
PREVENTATIVE

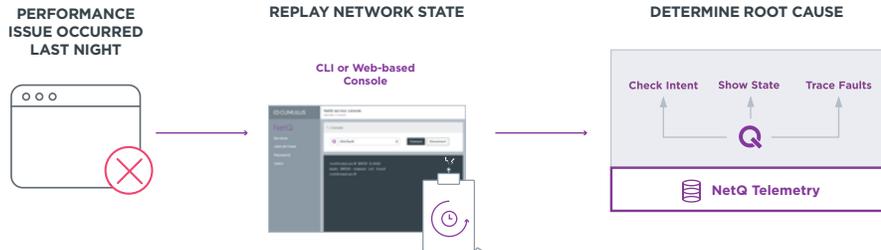
According to a recent study, most organizations (a whopping 98%) say that a single hour of downtime costs over \$100,000¹. Manual errors are the main culprit for network downtime, taking hours to quarantine and resolve a problem.

NetQ allows you to validate network behavior when rolling configurations into production so you can quickly rollback to previous configurations in case an error occurs. NetQ helps you efficiently determine if the configuration changes accurately reflect the network state as you intended. This results in minimizing errors making their way to production, and consequently, reduced downtimes.

PROACTIVE

Connectivity or performance issues are a symptom of faulty network behaviour that can result in downtime. In addition to validating configuration changes when rolling out, NetQ continually and algorithmically checks for these symptoms and sends real-time alerts to notify users that a network state deviation has occurred. When alerted, you'll know precisely where the fault occurred so you can remediate quickly.





DIAGNOSTIC

Just like if you had a time machine, NetQ allows you to go back in time to replay network state, see fabric-wide event changelog and find root cause state deviations. NetQ not only allows you to replay network wide events, but also allows for the ability to trace network paths. This state-of-the-art functionality allows you to determine whether or not the network was at fault and, if it is a network issue, find the exact cause so you can fix the problem and avoid it in the future.

Plus, all of this information is available in one single console so you can easily delegate access. Other team members can log in to prove the network and determine root cause without risking disruption.

Technical specification

NetQ is designed to work seamlessly in a web-scale environment running Cumulus Linux.

COMPONENTS		
		Description
Includes	Switch agents	Network Telemetry Agents feeding fabric data to Telemetry Server
	Host agents	Host Telemetry Agents feeding host network data to Telemetry Server
	Telemetry server	Distributed Key-Value Store - packaged as a VM. Receives data from agents
	Fabric validation application	Fabric Validation CLI & Notifier. Installable on Cumulus Linux or Ubuntu & RHEL hosts to query info from Telemetry Server

CHARACTERISTICS			
		NetQ	Description
Data	<i>Type</i>	Telemetry	Gathers data from host and switch agents
	<i>Frequency</i>	Real-time Granularity	Get alerted in real time of network issues or connectivity loss
	<i>Storage</i>	Big-data backend	A telemetry VM receives data from agents
	<i>Access</i>	Single console	Access all of your data from one screen without logging into the network. Delegate access to other teams to streamline network analysis.
Analysis	<i>Tools</i>	Check, Show, Trace	Get all the information you need with three easy commands that you can automate
	<i>Correlation</i>	Algorithmic	NetQ will check for errors and verify topology for you.
	<i>Human Interaction</i>	Preventive, Proactive, Diagnostic	Operators can use NetQ to validate configuration changes, get alerted of issues in real time and analyze issues after they occur.
Teams		Network + Cloud, Devops	Bring your entire cloud team together by allowing them to validate network without perturbing the actual network config
Deployment		In-Band	Baked into the network
		Cumulus Linux 3.3	NetQ requires minimum version Cumulus Linux 3.3 to operate

System requirements

NETQ TELEMETRY SERVER REQUIREMENTS:		
	Production Deployment	Lab Usage or Pre-Production Validation
Hypervisor	VMware ESX 6.5	VMware Workstation, Fusion or ESXi VirtualBox Vagrant box
Minimum Requirements	CPU: Quad core RAM: 16G Storage: 256G	CPU: Quad core RAM: 16G Storage: 256G

NETQ AGENT REQUIREMENTS		
	Production Deployment	Lab Usage or Pre-Production Validation
Cumulus Linux Software Version	Minimum CL Version: 3.3	Minimum VX Version: 3.3
Host Visibility*	Ubuntu 16.04, RHEL7	Ubuntu 16.04, RHEL7

FEATURES		
	Problem	Algorithmic solution
Host	Containers: Where is this container located? What ports are open? What image is being used? VM Questions	check/show docker container VM Answers (GA + .2)
Overlay	Is my overlay configured correctly? Can A reach B over an overlay/ underlay path?	check vxlan/Inv trace overlay
L3	Is BGP working as expected? Is there a STP loop? Can IP A reach IP B?	check/show BGP show stp trace I3
L2	Is CLAG configured correctly? Is there a STP loop? Is there a MTU mismatch? How does Mac A reach B?	check/show CLAG show stp check mtu trace L2
OS	Are all switches licensed correctly? Do all switches have NetQ agents running?	check/show cl-license check/show agents
Interfaces	Is my link down? Are all bond links up?	show interfaces
Hardware	Have any components crashed? What switches do I have in the network?	check/show sensors show Inventory

For more information, please visit our [technical documentation](#).

Interested in trying NetQ?

Schedule a free demo at cumulusnetworks.com/netq or simply contact your [dedicated sales representative](#)

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](#).

©2017 Cumulus Networks. All rights reserved. CUMULUS, the Cumulus Logo, CUMULUS NETWORKS, and the Rocket Turtle Logo (the "Marks") are trademarks and service marks of Cumulus Networks, Inc. in the U.S. and other countries. You are not permitted to use the Marks without the prior written consent of Cumulus Networks. The registered trademark Linux® is used pursuant to a sublicense from LMI, the exclusive licensee of Linus Torvalds, owner of the mark on a worldwide basis. All other marks are used under fair use or license from their respective owners.