

# Juniper Networks Cloud CPE Solution with Silver Peak Virtual WAN Optimization

Greater choice for dynamically delivering advanced managed services

## Challenge

The ability to rapidly deploy managed services is inhibited by closed, proprietary platforms that restrict scalability and require large up-front investments. Deployment is a time-consuming manual process that does not align with the geographically dispersed cloud facilities required by enterprises.

## Solution

Juniper automates service delivery with a scalable, carrier-grade Cloud CPE solution that, when combined with Silver Peak CPX virtual WAN optimization, helps service providers and enterprises intelligently orchestrate and automate provisioning, while accelerating data movement between data centers, remote offices, and the cloud.

## Benefits

- Automation replaces time-consuming truck rolls with simple mouse rolls
- Solution supports open protocols, APIs, and innovative third-party virtualized network functions (VNFs)
- Deduplication and compression reduce bandwidth constraints
- Traffic shaping improves application responsiveness
- Embedded vSRX provides edge-to-edge encryption and data protection



Service providers must deal with rigid service delivery infrastructures and escalating operating costs that seldom align with revenue, hindering their ability to quickly design and deploy new services. In today's market environment, providers must provide secure, high-performance, SLA-compliant services that use hybrid and public cloud infrastructure to enable enterprise customers to move very large datasets over WAN links. Network Functions Virtualization (NFV), in conjunction with WAN optimization, provides the flexibility to instantaneously provision new services to remote locations and improve the quality of data transfers between geographically dispersed cloud facilities at minimal operating expense. As NFV becomes the preferred architecture for service delivery, the ability to efficiently add WAN optimization into the service chain has become a critical capability for enterprise customers.

## The Challenge

Customer premises equipment (CPE) is essential to most managed service delivery models. However, CPE deployment is a time-consuming and manual process that requires devices be shipped to each location, where they must be configured and provisioned—a complex and manual process that requires highly specialized skills. Any additional functionality requires procurement of new hardware, while ongoing maintenance and operations contribute their own unique challenges. In short, the order and fulfillment process is not compatible with the speed at which businesses must operate.

Network Functions Virtualization (NFV) technologies have broken down many of these barriers and revolutionized the managed service delivery and life cycle operation. Enterprise customers can choose from a wide variety of innovative and customized services, available on demand. Thanks to NFV, service providers and enterprises alike are now less dependent on rigid, physical-only network infrastructure, manual workflows, and service silos, making them more relevant to their customers. NFV empowers service providers with a more software-centric approach to service delivery, accelerating innovation that ultimately increases competitiveness, revenue, and profitability.

## The Juniper Networks Cloud CPE Solution with Silver Peak Virtual WAN Optimization

Juniper Networks® Cloud CPE solution is the industry's most dynamic service creation platform. It automates service creation and simplifies the service life cycle, enabling service providers to quickly conceive and create highly customizable services in just minutes. Service performance capacities can be dynamically updated, improving the scalability and flexibility of managed services.

The combination of Juniper's Cloud CPE with Silver Peak CPX virtual WAN optimization accelerates data movement between data centers, branch offices, and the cloud. The solution, which uses real-time optimization techniques to solve network quality, capacity, and distance challenges commonly associated with WAN connectivity, works across all IP



applications, including asynchronous backup, replication tools, traditional enterprise software suites, non-TCP applications, and interactive applications like Virtual Desktop Infrastructure (VDI). Meanwhile, a built-in Juniper Networks vSRX virtual firewall ensures data security in end-to-end IPsec tunnels. Optimization, policy provisioning, and monitoring configurations can be performed through an intuitive GUI as well as a full featured CLI.

Juniper Networks Contrail Service Orchestration automates the provisioning, operations, and management of Silver Peak CPX virtual WAN optimization, enabling rapid instantiation of a service chain that combines WAN optimization with the Juniper Networks vMX virtual router and vSRX virtual firewall. The Silver Peak CPX supports up to 1 Gbps of WAN-optimized throughput.

Juniper's Cloud CPE solution is based on an open standard framework that is easily integrated into existing operations and business support systems (OSS/BSS), providing an open ecosystem supporting best-in-class third-party VNFs.

### Distributed Cloud CPE Model with Silver Peak CPX Virtual WAN Optimization

In a distributed cloud CPE model, Silver Peak CPX virtual WAN optimization is deployed on Juniper Networks NFX250 Network Services Platform. NFX250 provides the same functionality as physical CPE devices, with the flexibility to dynamically create services in an open environment for near instantaneous service delivery.

The NFX250 platform embeds the vSRX virtual firewall to provide the perimeter security required to protect the business-sensitive environment. Working together, the NFX250, Silver Peak CPX, and vSRX simultaneously virtualize IP routing to ensure site survivability and enable firewall security capabilities at the branch, meeting the stringent demands of always-on application availability.

### Branch-to-Branch WAN Optimization

Figure 2 depicts a basic service chain where the vSRX is implemented with the Silver Peak CPX virtual WAN optimization solution. The vSRX provides advanced security and firewall capabilities to protect branch connectivity. On the left, the vSRX interfaces with internal end users, while on the right, the vSRX interface points to an external network or the remote branch. The vSRX creates tunnels across the underlay network that spans all services, allowing multiple services to be joined in a chain. The packet flow within the NFX250 platform includes these features:

1. Network services are instantiated and orchestrated by Contrail Service Orchestration.
2. Internal packets arrive on the NFX250 platform's incoming interface.
3. The vSRX authenticates traffic by performing actions defined by the applied security policy.
4. Silver Peak CPX receives packets from the vSRX.
5. Silver Peak CPX performs the required WAN optimization functions, including forward error correction (FEC) and packet order correction (POC), then hands the packets back to vSRX for Internet or WAN routing.
6. The vSRX encrypts traffic in IPsec tunnels and routes it based on the best available path.

### Solution Features and Benefits Best-in-Class WAN Optimization

Juniper's Cloud CPE solution with Silver Peak CPX delivers the industry's most complete, highest performing virtual WAN optimization solution. Adaptive FEC and POC seamlessly reduce the need to retransmit traffic when networks are congested, while advanced fingerprinting techniques recognize repetitive

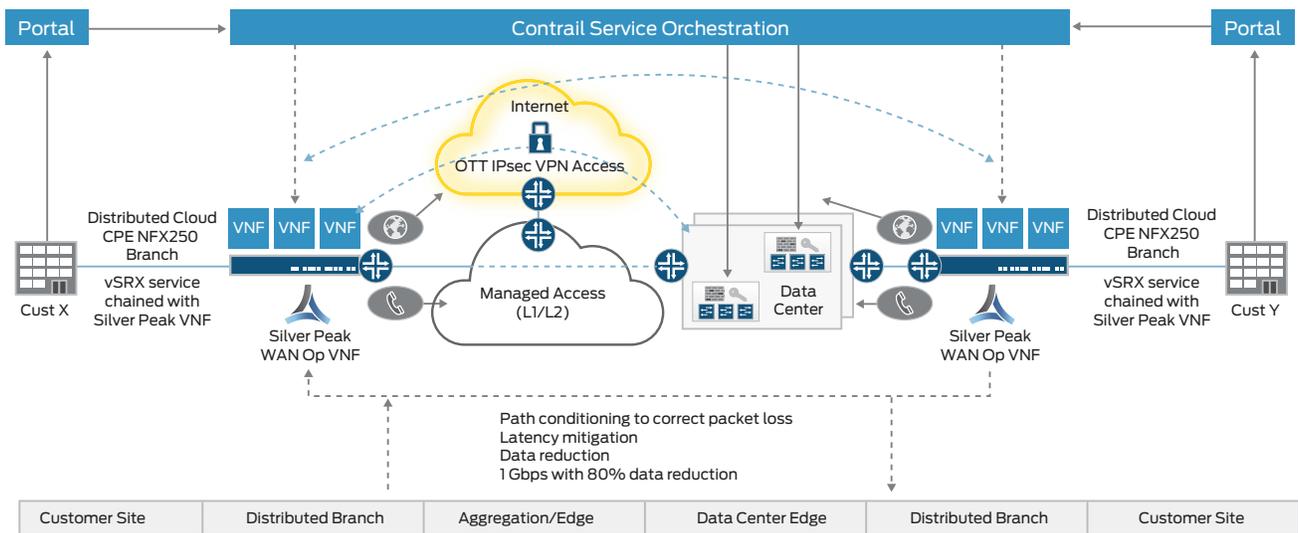


Figure 1: Distributed Cloud CPE model with Silver Peak CPX virtual WAN optimization

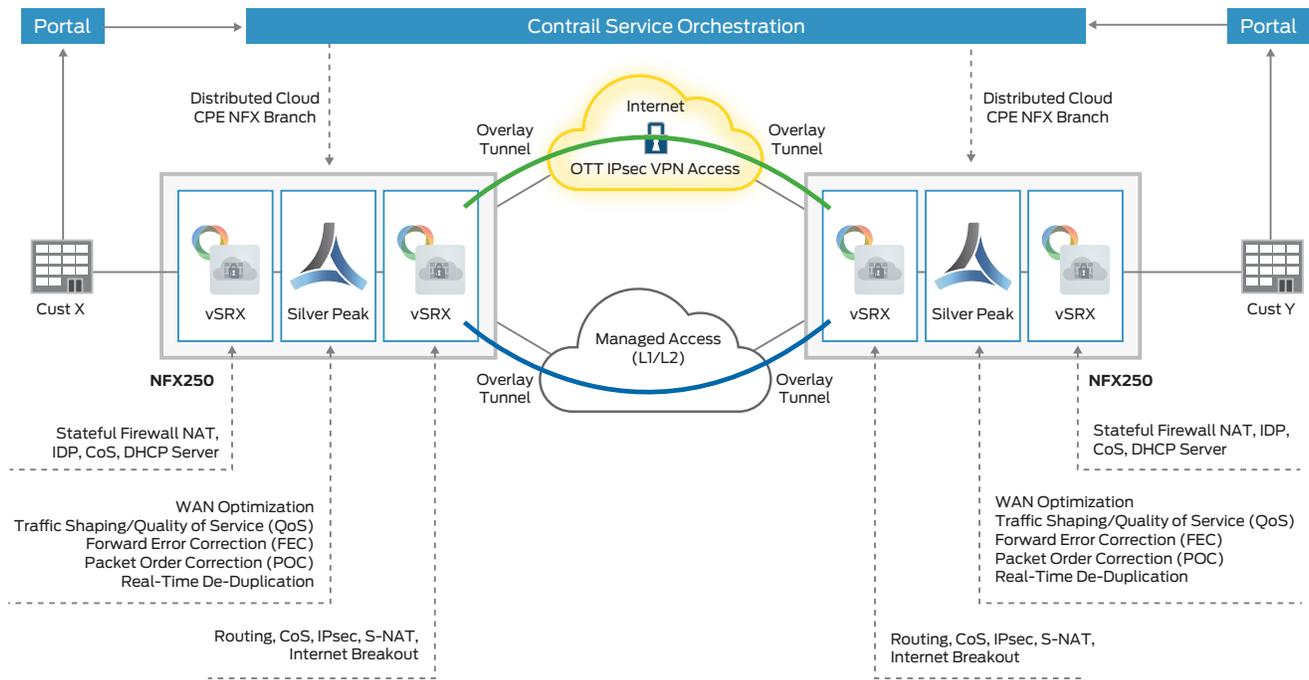


Figure 2: Branch-to-branch traffic pattern with the NFX250 Network Services Platform, the vSRX virtual firewall, and Silver Peak CPX virtual WAN optimization solution

data patterns to enable end-to-end deduplication across the WAN. TCP protocol acceleration techniques minimize the effects of latency on application performance, and dynamic path control and path conditioning leverage real-time network intelligence to determine the fastest, most reliable, and most available path for application performance.

### Security

The Juniper Cloud CPE solution features vSRX, the industry’s highest performing virtual firewall (up to 100 Gbps) that provides scalable, secure protection across the network. The vSRX serves as an advanced programmatic platform in a single VNF instance for scale-up and scale-out growth. With the built-in service design capabilities of Contrail Service Orchestration, vSRX can be easily configured to support a myriad of security applications, including next-generation firewall, Network Address Translation (NAT), path performance monitoring, dynamic application-based routing, application detection, intrusion prevention systems (IPS), content filtering, antivirus, and unified threat management (UTM).

### Revenue Growth

Unlike traditional managed CPE solutions where service deployment is a lengthy and manual process, Juniper’s Cloud CPE solution drastically shrinks new service delivery time from months to just minutes. This frees service providers to adopt a fast-fail approach toward service creation with very little risk, introducing customized services and a potentially rapid path to revenue for innovative new services and target segments.

### Reduced Operational Expenditure

Juniper’s Cloud CPE solution reduces OpEx by adopting automation along with centralized service management and orchestration. Automation improves all facets of the service life cycle, simplifies operations, and eliminates extensive manual processes such as provisioning, configuration, equipment installation, service delivery, and back-end database administration.

### Deployment Flexibility

Business requirements often change to reflect market dynamics. Juniper’s Cloud CPE solution lets service providers react and respond to these changes in near real time, quickly moving from a one-size-fits-all model to a highly personalized reactive model that transforms service providers into a trusted partner. Silver Peak CPX WAN optimization can be deployed in a distributed virtual deployment on the NFX250, or on a physical appliance to peer with the NFX250 NFV instance at the far end.

### Reliability

Juniper’s Cloud CPE solution enables highly dynamic multi-deployment models with zero touch provisioning and management that accelerate remote and branch office deployments. End-to-end visibility into network performance enables proactive detection and maintenance of application performance on the premises or in the cloud.

## Summary—Leverage Cloud CPE to Deploy Best-in-Class Virtual WAN Optimization

Juniper Networks Cloud CPE solution with Silver Peak CPX virtual WAN optimization lets service providers simplify and cost effectively deploy managed WAN services. Service providers can quickly and easily integrate best-in-class WAN optimization into their managed service offerings without integrating and deploying new dedicated hardware.

Cloud CPE revolutionizes traditional managed services. It overcomes the challenges associated with service deployment, management, and evolution by simplifying and automating customizable service creation and delivery from a comprehensive, vertically integrated, open NFV solution. Juniper's Cloud CPE multi-deployment solution supports flexible deployment models with unprecedented scale for expanding onsite and scaling up in the cloud with advanced routing, comprehensive security capabilities, and an open ecosystem for additional third-party VNFs. By focusing on simplified service creation, automated service delivery, and an open framework supported by a highly scalable end-to-end NFV solution, the Cloud CPE solution enhances network performance, lowers costs, and delivers differentiated services that elevate customer satisfaction and ultimately lead to increased profitability.

## Next Steps

For more information about Juniper Networks Cloud CPE, please contact your Juniper representative, or go to [www.juniper.net/us/en/solutions/nfv/cloudcpe/](http://www.juniper.net/us/en/solutions/nfv/cloudcpe/). For more information about Silver Peak CPX virtual WAN optimization, please go to <https://www.silver-peak.com/>.

## About Silver Peak

Silver Peak is the leader in building WAN optimization products. Silver Peak's solution offers a flexible environment to deliver WAN optimization service. With the help of Silver Peak WAN optimization solutions, customers benefit from unprecedented levels of visibility, control, and security while improving application and network performance by compression/deduplication, encryption/decryption, path conditioning and TCP, and application proxying. Learn more at [www.silver-peak.com](http://www.silver-peak.com).

## About Juniper Networks

Juniper Networks challenges the status quo with products, solutions and services that transform the economics of networking. Our team co-innovates with customers and partners to deliver automated, scalable and secure networks with agility, performance and value. Additional information can be found at [Juniper Networks](http://Juniper Networks) or connect with Juniper on [Twitter](https://twitter.com/juniper) and [Facebook](https://facebook.com/juniper).

### Corporate and Sales Headquarters

Juniper Networks, Inc.  
1133 Innovation Way  
Sunnyvale, CA 94089 USA  
Phone: 888.JUNIPER (888.586.4737)  
or +1.408.745.2000  
Fax: +1.408.745.2100  
[www.juniper.net](http://www.juniper.net)

### APAC and EMEA Headquarters

Juniper Networks International B.V.  
Boeing Avenue 240  
1119 PZ Schiphol-Rijk  
Amsterdam, The Netherlands  
Phone: +31.0.207.125.700  
Fax: +31.0.207.125.701



Copyright 2016 Juniper Networks, Inc. All rights reserved. Juniper Networks, the Juniper Networks logo, Junos and QFabric are registered trademarks of Juniper Networks, Inc. in the United States and other countries. All other trademarks, service marks, registered marks, or registered service marks are the property of their respective owners. Juniper Networks assumes no responsibility for any inaccuracies in this document. Juniper Networks reserves the right to change, modify, transfer, or otherwise revise this publication without notice.

**JUNIPER**  
NETWORKS