Juniper Networks and NEC/ Netcracker: Agility and Innovation for Cloud Transformation

Industry leaders deliver joint enterprise vCPE solution

Challenge

Today's service providers are challenged to reduce business operational costs while accelerating time to market and increasing revenue generation by delivering more customized services to customers. This requires moving from a rigid hardware-based infrastructure with complex operational overhead to a more automated, software-based dynamic cloud infrastructure.

Solution

By joining forces, Juniper Networks and NEC/Netcracker deliver a highly effective Network-as-a-Service (NaaS) solution for both small and medium-sized businesses as well as large enterprises.

Benefits

- Faster time to market and greater flexibility for customized services
- Reduced support and equipment costs
- Improved customer satisfaction
- Quick and automated migration strategy from present to future mode of operations

NEC/Netcracker
SDN/NFV Solutions

The competitive environment is pressuring traditional service providers to transform their business and operations model in order to offer agile, flexible, and innovative services. This transformation is made possible by moving from more traditional physical customer premises equipment (CPE) to newer technologies such as Network Functions Virtualization (NFV) and virtual CPE (vCPE) in cloud environments. Additionally, the use of software-defined networking (SDN) in CPE architectures reduces operational costs by enabling faster, more efficient deployments while creating new revenue streams through the delivery of dynamic new virtual services.

The Challenge

Business CPEs work as service delivery points in connectivity solutions that service providers offer to their enterprise customers. Traditionally, the CPE is composed of physical on-premise devices selected for their ability to provide a specific set of services, with different offerings requiring different hardware. This dedicated hardware-based service model results in:

- A large collection of physical devices that the service provider must maintain and stock
- A number of vendor boxes, or complex all-in-one boxes, deployed inline at the customer site
- Repeated onsite visits by technicians to install the hardware, onboard new customers, and update existing or add new services
- Numerous refreshes when the installed hardware becomes obsolete and reaches the end of its useful life
- A complex network environment that is difficult to replicate or customize

The cumulative effect of this scenario is excessively long wait times for customers and increased operational costs for the service provider. Creating new services can take months, and they must be deployed at massive scale before overcoming fixed costs and realizing a return on investment, making the price of innovation too high.

Once the services are developed and deployed, support is inefficient at best, requiring numerous return visits by technical specialists on the field team. As a result, service providers struggle to meet customer expectations, resulting in diminishing brand value, eroding profit margins, and an inability to maintain new revenue streams.

For customers who require rich service offerings, rapid service delivery, and the ability to manage their services via self-service portals, this is unacceptable.

Competition—specifically from over-the-top (OTT) and cloud providers—combined with the need to deliver innovative new services quickly and cost effectively are driving service providers to transform their operations with NFV technologies, moving towards a more software-driven, cloud-based model. This transformation requires re-architecting the

service delivery infrastructure to be policy-driven, programmable, scalable, automated, and aligned with a customized services approach. This means service providers must transition from a static, manual, hardware-based solution to an automated, software-based approach that enables more flexible and agile service offerings.

The Juniper Networks-NEC/Netcracker Joint Solution

To meet this challenge, Juniper Networks and NEC/Netcracker have joined forces, combining the strengths of Juniper's networking and virtualization products with the service orchestration and management expertise of Netcracker to deliver a truly integrated, end-to-end vCPE solution that helps service providers meet their business customers' expectations.

Juniper provides both the underlay physical network as well as the overlay virtual network elements to the joint solution. The Juniper Networks® vSRX virtual firewall acts as both a virtual branch router, used where on-premise CPE has been replaced by simple Layer 2-only devices, as well as a virtual network function (VNF) security device for value-added services such as firewall, deep packet inspection, web filtering, and antivirus.

Juniper Networks MX Series 3D Universal Edge Routers, in either physical or virtual form, are used as gateways between virtual and physical networking domains, while Juniper's award-winning Contrail Networking SDN controller manages virtual network creation and connectivity as well as service chain setup. When a physical underlay connectivity layer is required, an IP-based platform such as Juniper Networks QFX Series switches or any third-party solution can be deployed to connect the various elements.

Meanwhile, NEC/Netcracker provides its NaaS solution, which encompasses hybrid service orchestration, to manage the end-to-end solution over both physical and virtual components. Additionally, NEC/Netcracker contributes network orchestration, compliant with European Telecommunications Standardization Institute (ETSI) Management and Orchestration (MANO); a VNF manager; a cloud marketplace that combines all VNF and IT/cloud services; and a self-service portal that allows customers to select, add, or modify services on demand. The solution is backed by Netcracker's comprehensive operations/business support systems (OSS/BSS) offering.

Features and Benefits

- **Lower CapEx and OpEx:** Simplifying on-premise CPEs reduces CapEx, while reducing the number of onsite visits and eliminating the need for technical specialists to manage the automation and provisioning process lowers OpEx.
- **Additional revenue with flexible new service offerings:** Services are no longer restricted to the feature set offered by onsite CPE. Value-added services can be provided in the cloud by virtual appliances as well as by customized service chains.
- **Faster time to market:** With the joint Juniper-NEC/Netcracker solution, new services can be deployed in minutes rather than weeks or months.
- **Reduced risk:** A fully integrated end-to-end cloud solution, from the customer self-service portal down to the VNFs, including integration with critical OSS/BSS components, is validated and virtually fail-safe.

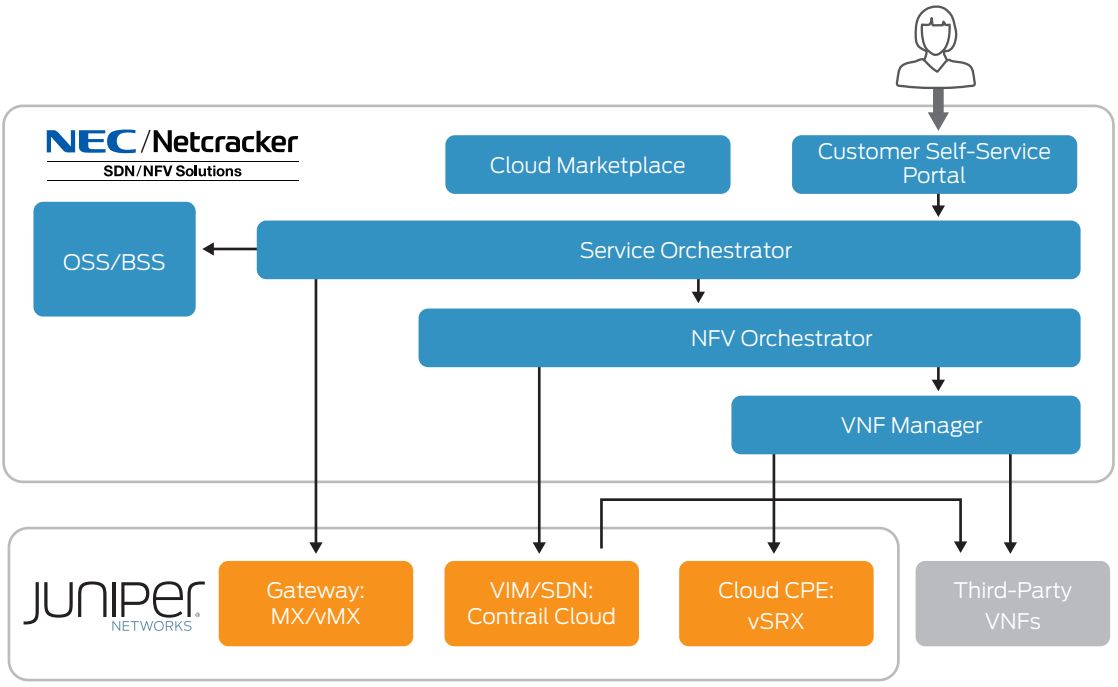

Figure 1: vCPE architecture

Centralized or Distributed Services Scenarios

While service providers can simplify on-premise CPEs by centralizing services, there are situations ruled by regulations or corporate policies where agile and flexible service deployment is desired—not only within a centralized point of presence (POP) or data center, but at customer premises as well. Some of the advantages of a distributed vCPE model include:

- Better local performance for services such as firewalls and WAN optimization
- More effective security policies (such as encryption), which must start at the on-premise CPE
- Greater survivability when the primary WAN goes down (enabled by local services)
- Easy transition from hardware-based CPE to a virtual model

To provide this distributed vCPE model, NEC/Netcracker's orchestration software works with Juniper's Distributed Cloud CPE Network Service Controller (NSC) to manage the Juniper Networks NFX250 Network Services Platform, an on-premise device that supports multiple VNFs. The Juniper NSC bootstraps and configures the NFX250 and manages its virtual infrastructure, all under the direction of NEC/Netcracker's orchestration, enabling end-to-end orchestration from NFX250 devices at the customer premises to virtual appliances deployed in service provider data centers.

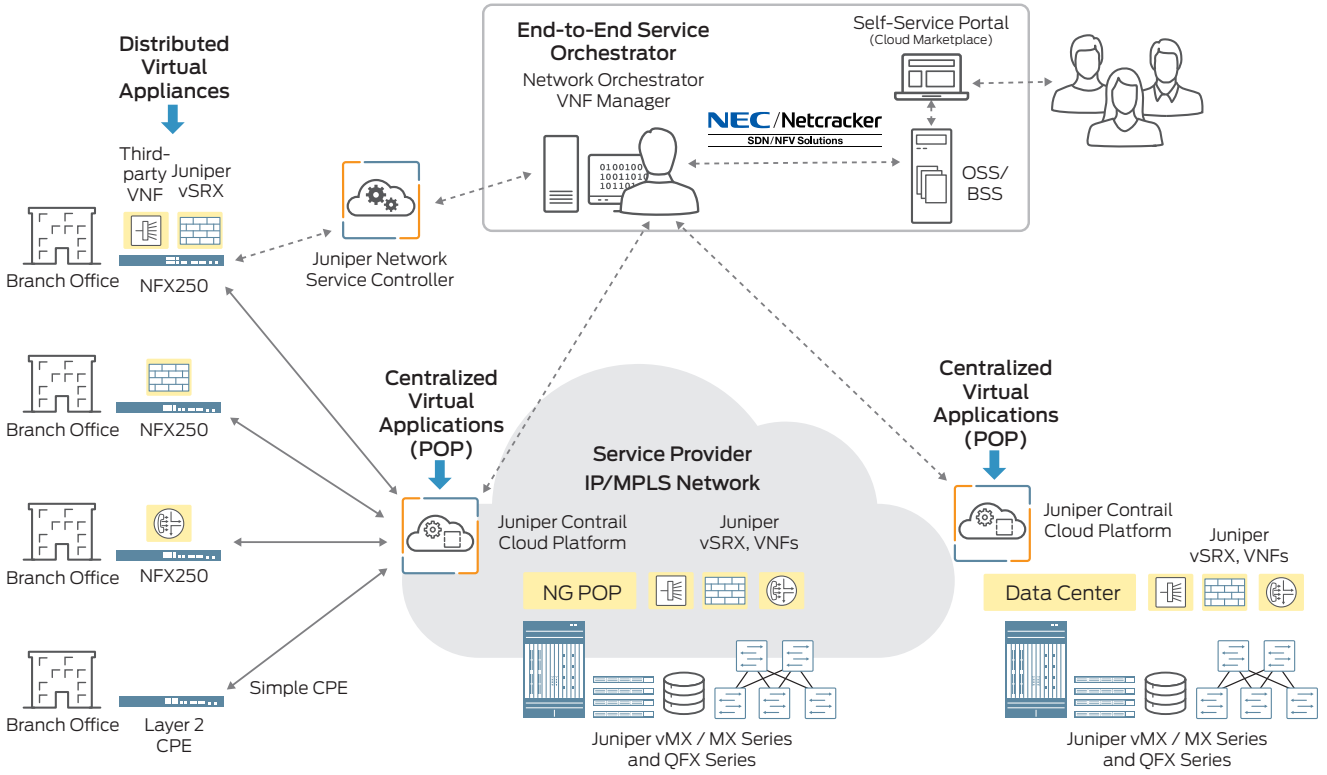

Figure 2: vCPE services in service provider networks

Solution Components

Components	Description
Juniper Networks vSRX virtual firewall	High-performance security gateway commonly used as a next-generation firewall for securing virtualized and cloud environments. Can be used as a virtual branch router as well as a VNF for value-add security services such as Web filtering, antivirus, and deep packet inspection (DPI).
Juniper Networks MX Series 3D Universal Edge Routers and virtual MX (vMX)	Revolutionary carrier-grade virtual routing (vMX) for enterprise and service provider networks. Used as a gateway between the physical and the virtual networks. Alternatively, physical MX Series routers could be used by service providers to leverage their existing install base.
SDN controller	The role of SDN controller can be fulfilled either through Juniper's Contrail controller or NEC's Programmable Flow Networking Suite, both of which have been tested and integrated into the solution.
Netcracker OSS/BSS	Comprehensive, modular, industry-leading OSS/BSS suite, including service, resource, and network management as well as converged charging and billing.

Components	Description
NEC/Netcracker cloud marketplace and self-service portal	Cloud marketplace unifying VNF and IT/cloud services and a customer portal which provides self-service, on-demand capabilities including service ordering, service administration, and service monitoring.
NEC/Netcracker E2E service orchestrator	End-to-end service orchestration, which provides smooth integration of the virtual environment and existing infrastructure and allows the integration of all pieces—existing BSS/OSS, MANO, and SDN controllers. Service orchestration allows for cross-domain service life cycle management across all hybrid network domains, including legacy networks, SDN networks, cloud, and NFV infrastructure (NFVI) environments.
NEC/Netcracker network orchestrator	ETSI MANO-compliant NFV orchestrator, which supports multivendor VNF onboarding and end-to-end life cycle. Responsible for managing the virtualized network services life cycle, namely orchestrating components of network services (VNFs, connectivity) within designated NFVI domains.
NEC/Netcracker VNF manager	ETSI-compliant VNF manager responsible for initiating necessary VNF onboarding and creation of initial configuration for the VNFs by means of the VNF manager. Supports onboarding of third-party VNFs using YANG description.
Juniper Networks NFX250 Network Services Platform (optional)	Secure, software-driven, on-premise CPE platform capable of supporting multiple VNFs.
Juniper Networks Distributed Cloud CPE Network Service Controller (optional)	Controller providing full life-cycle management of the NFX250, including zero-touch provisioning and configuration.

Summary

To stay competitive in today's markets, service providers must reduce the cost of their business solutions while accelerating time to market, increasing revenue generation, and offering a superior customer experience. By choosing the joint Juniper Networks-NEC/Netcracker enterprise vCPE solution, service providers gain the agility and flexibility of a cloud architecture, delivered through best-of-breed components integrated into a comprehensive end-to-end solution.

Next Steps

For more information, contact your Juniper Networks or NEC/Netcracker representative.

About NEC/Netcracker

NEC/Netcracker SDN/NFV Solutions is the joint initiative between NEC Corp. and Netcracker Technology to address the opportunities associated with software-defined networking (SDN) and network functions virtualization (NFV) for service providers of all sizes around the world. The combined NEC/Netcracker entity brings together the best of NEC's network innovation with Netcracker's IT leadership and telecom expertise to deliver comprehensive, end-to-end cloud and virtualization solutions in multidomain environments. For more information, visit www.netcracker.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 or connect with Juniper on Twitter and Facebook.

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