Customer Benefits Through Automation with SDN and NFV

Helping service providers solve specific challenges they are facing today while improving the overall customer service life cycle

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Executive Summary

The telecommunication industry has experienced unprecedented change over the past 10 years. The emergence of connected devices, over-the-top (OTT) applications, and the Internet of Things (IoT) has resulted in the exponential growth of communication services, data traffic, and cloud applications. Enterprises, with increasingly higher expectations, are demanding customizable services that add tremendous complexity to the network.

To succeed in this rapidly changing environment, service providers must take a collaborative approach with their enterprise customers by providing automated, programmable, and scalable services that address this exponential growth. By automating workflows, service providers will also improve operational processes, resulting in greater revenue growth and higher margins in their service delivery networks.

Introduction

Software-Defined Networking (SDN) and Network Functions Virtualization (NFV) are transformational technologies that enable service providers to create highly programmable networks with automated workflows. Automation solves the specific challenges that service providers are facing today with respect to managing complexity, reducing operational costs, and improving the overall customer service life cycle.

Functions to Automate in a Service Delivery Network

Juniper Networks believes that certain key functions in a service delivery network will benefit immediately from automation. With SDN and NFV, service providers can create an automated framework that supports every step of the service life cycle. To date, many of the steps involved in the service life cycle are complex and labor-intensive. Automation enables service providers to efficiently plan, build, and operate innovative services while adding responsiveness throughout the entire life cycle. The resulting gain in efficiency and responsiveness ultimately improves the overall customer experience.
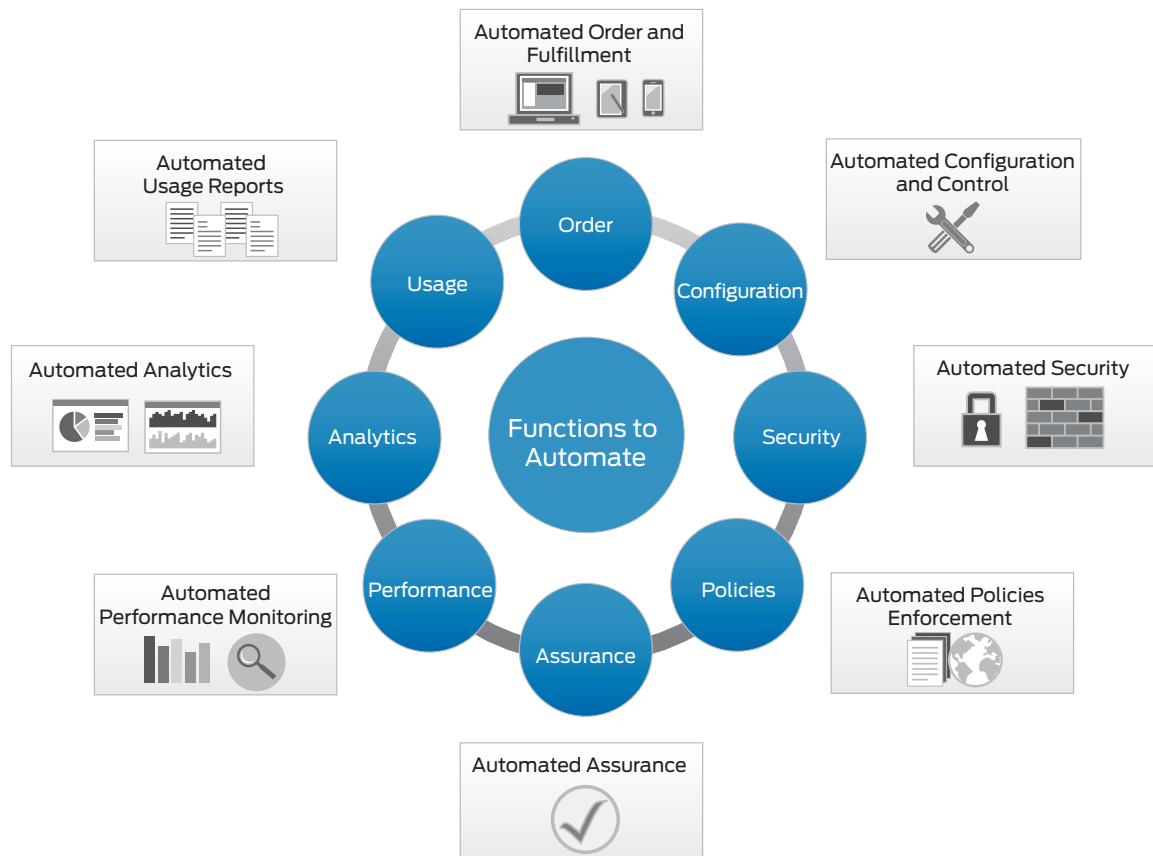

Figure 1: Functions to automate in a service delivery network.

The following section highlights how automation improves each element of the service life cycle.

- **Order and Fulfillment:** A self-care portal provisions services based on existing repeatable templates to deliver services in minutes.
- **Control:** Customers have substantial visibility into and control over their services, giving them the ability and flexibility required to activate, modify, remove, and relocate services. Requested changes are automatically configured in the network, with fewer errors.
- **Security:** Automated security detects malicious traffic and enforces policies designed to safeguard network access.
- **Policies:** Policy-based service management adjusts network resources, including bandwidth and traffic priority, allowing the network to dynamically provide differentiated services and role-based access.
- **Assurance:** Proactive error detection and fault reporting provide insights that enable network operations to reroute traffic and limit service disruptions.
- **Performance:** Automation provides active traffic management while maintaining service performance objectives.
- **Analytics:** Analytics capabilities enable service data to be collected and analyzed from across the network domain for network optimization purposes.
- **Usage and Reporting:** Reporting features record and measure usage patterns, traffic volume, and any specific usage of network resources for network planning purposes.

For a more in-depth look at how the Juniper automation framework improves the service life cycle, please refer to the "Transforming Service Life Cycle through Automation with SDN and NFV" white paper.

Benefits of Automation for the Enterprise Customer

Automation provides clear benefits for the service provider through operational excellence and reduced operational costs. Automation also gives service provider customers unprecedented power over their services, enabling them to adapt to changing business requirements and market dynamics. The following sections detail the key benefits of automation.
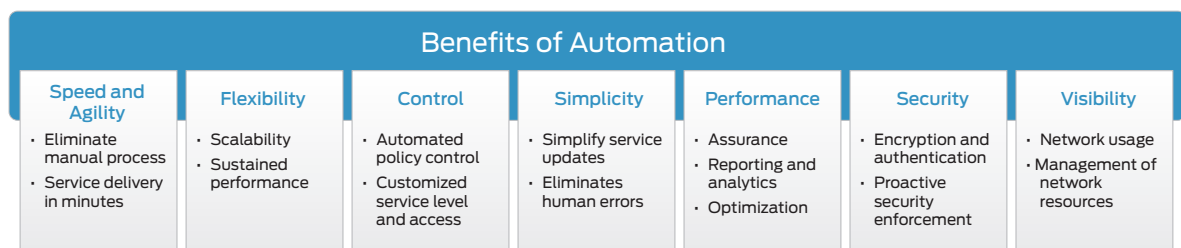
Benefits of Automation						
Speed and Agility	**Flexibility**	**Control**	**Simplicity**	**Performance**	**Security**	**Visibility**
· Eliminate manual process · Service delivery in minutes	· Scalability · Sustained performance	· Automated policy control · Customized service level and access	· Simplify service updates · Eliminates human errors	· Assurance · Reporting and analytics · Optimization	· Encryption and authentication · Proactive security enforcement	· Network usage · Management of network resources

Figure 2: The benefits of automation

Speed and Agility

Automation expedites the service fulfillment process. The order process is intuitive; customers, using a simple self-guided user interface, can select and manage a variety of virtual network functions (VNFs) from a service catalog. Service fulfillment occurs in minutes and eliminates a lengthy manual installation and configuration process.

Flexibility

Automation enables highly flexible and scalable service deployments. Customers can quickly roll out new services with a small and affordable initial deployment that can be swiftly expanded and provisioned for high availability and performance. Automation, combined with analytics, can actively predict network traffic growth and capacities to ensure a sustained and consistent network performance.

Control

Customers have the ability to activate, modify, remove, and relocate service resources. Policy-based controls automatically manage bandwidth and service levels, allowing customers to customize differentiated services and access privileges based on departments, geographical locations, and role-based access.

Simplicity

Automation simplifies evolution over the life of a service. Under today's systems, any service update is a complicated process that requires technical support visits from the service provider. Automation eliminates manual processes and the potential for human error.

Performance

Automation provides a complete real-time operational picture. Assurance proactively measures usage patterns, traffic volumes, error detection, and fault reporting to establish a service provisioning feedback loop that optimizes and sustains service Key Performance Indicators (KPIs) irrespective of deployment size.

Security

Automated security provides encryption, key management, authentication, and role-based access to the service. Automation proactively uses real-time feeds on emerging threats so that security enforcement points within the network can automatically filter malicious traffic without requiring any human interaction.

Visibility

Automation gives customers visibility into their services. Network usage and quality across services are constantly monitored, analyzed, and benchmarked. Customers can design service policies that automatically manage network resources, including bandwidth, traffic priority, and quality-of-service (QoS) levels, allowing networks to dynamically provide differentiated services.

The Juniper Networks NFV Solution

Juniper Networks market-leading NFV solution consists of a Management and Orchestration (MANO) platform, Network Functions Virtualization Infrastructure (NFVI), and VNFs.

At the heart of Juniper's end-to-end NFV solution is the Juniper Networks® Contrail Cloud Platform, an intelligent, policy-driven, automated service delivery, resource allocation, infrastructure configuration, assurance, and security solution. Juniper's automation framework and Contrail Cloud Platform combine to deliver business agility, predictable KPIs, and lower TCO.

NFVI serves as the network foundation to deliver services and an open platform for third-party applications and multivendor integration. Juniper's NFVI includes: Juniper Networks MX Series 3D Universal Edge Routers, which provide the routing foundation for NFVI; SDN gateways, which perform traffic analysis and policy enforcement; and the MetaFabricTM architecture, which creates high-performance data center and cloud networks.

Juniper is one of the first vendors to introduce VNFs, which include the carrier-grade vMX virtual routing platform, IP VPN, and the expansive virtual security services platform, vSRX. Juniper's NFV solution also facilitates an open ecosystem for Juniper partners and third-party developers to create new and innovative VNF services. Additional information about Juniper's NFV solution can be found here.

vCPE Use Case: How Automation Improves Service Delivery and Customer Satisfaction

Traditional managed services using customer premises equipment (CPE) are a prime example of how SDN and NFV improve the service delivery process. Service providers traditionally have to support diverse proprietary hardware and software platforms with complex configurations and limited programmability. Virtual CPE (vCPE) revolves around an x86 appliance, where it replaces multiple dedicated CPE hardware components. vCPE supports a variety of customizable services, including IP VPN, virtual firewall, and other security applications on a single device. vCPE is highly flexible; it gives service providers the ability to rapidly configure and deliver new, consistent services in minutes and dynamically insert them across existing devices. Customers have substantial visibility into their services, and vCPE gives customers control over service policy design, access level, and QoS. Service changes and updates are automatically implemented, replacing traditional labor-intensive processes and reducing the chance for error and network interruptions.

Juniper Networks has been at the forefront of delivering vCPE and on-demand VNFs as part of a complete automated and programmable end-to-end NFV solution. Juniper offers a market-leading NFV solution that combines carrier-grade reliability, security, and automation, enabling service providers to lower TCO and offer managed CPE services as well as a flexible platform to rapidly roll out innovative VNFs. Additional vCPE information and customer use cases can be found here.

Conclusion

Automation improves and accelerates the entire service life cycle. It facilitates an agile and flexible platform that empowers enterprises with the ability to customize and control their service design, deployment, and policy management. Automation allows service providers to evolve from current infrastructures to deploy a highly intelligent network optimized for the performance and delivery of innovative services. The resulting efficiency gain lowers TCO to provide new services and improves the overall customer experience.

The Juniper Networks vision for network automation revolves around its automation framework, which leverages SDN and NFV to automate many steps of the service life cycle. Juniper's innovation in NFV delivers automation that effectively streamlines services provisioning, minimizes complexity, reduces time to market, and drives business results while meeting customer expectations.

For more information about Juniper's NFV solution, please visit www.juniper.net/us/en/solutions/nfv/. To inquire about the opportunity to automate, contact your sales representative or Juniper Networks at 1-866-298-6428.

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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