



JUNIPER-NETCRACKER ENTERPRISE SERVICE AUTOMATION

Service providers increase business value by unifying LAN and WAN environments

Challenges

While service providers can add more value to their enterprise customers by extending their services into the LAN, they must first overcome the exponential operational complexity this brings.

Solution

Enterprise Service Automation from Juniper and Netcracker unifies and automates services end to end, from WAN to LAN and from the business layer to the network layer, delivering efficiency and unique value via built-in artificial intelligence.

Benefits

- Increases revenues with greater ownership
- Increases profitability by automating manual processes
- Shortens time to market with a pre-integrated solution
- Expands into new 5G vertical markets

Managed SD-WAN has become a must-have for many enterprises globally to augment or even replace their existing MPLS VPNs. Enterprises benefit from multiple WAN access technologies to lower their costs and increase their service flexibility and performance.

However, traditional SD-WAN solutions must evolve from static, policy-driven architectures to dynamic, self-driving networks. Furthermore, enterprises require managed services that go beyond the WAN demarcation point to provide visibility into and control over both wired and wireless LANs.

The Challenge

By moving the demarcation point further into the enterprise, service providers assume full responsibility for all enterprise WAN and LAN networks and services. That means service providers must expand from merely managing the WAN router to managing the switches and Wi-Fi access points at each enterprise branch location, as well as tackling the associated challenges with the connected users and devices.

This increases operational complexity exponentially, as each network will have its own disparate management systems with no correlation between troubleshooting incidents across the WAN and LAN domains. Service provisioning and configuration are typically manual processes, making it hard to scale. And there is a great deal of complexity in managing multiple vendors and expanding into new domains. To expand connectivity services deeper into the enterprise, service providers need to do the following:

- Implement a single service level expectation (SLE) from WAN to LAN that focuses on user experience.
- Manage the entire solution more efficiently than the enterprise's own IT department, with its local and domain expertise.
- Provide functionality that would be hard or impossible to match internally.

Juniper Networks and Netcracker have created a managed Enterprise Service Automation solution that overcomes these challenges, providing unique value for both the enterprise and the service provider.

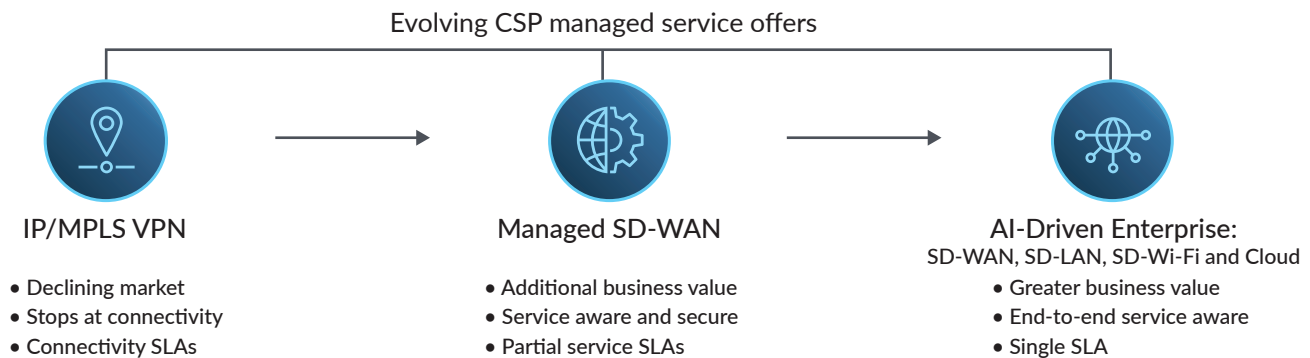


Figure 1: Evolution of CSP managed services

The Juniper Networks-Netcracker Solution

Enterprise Service Automation fully automates the service provisioning and lifecycle management of WAN and LAN services. With an AI-driven user experience, services can scale on demand and problems can be resolved automatically. Working together, Juniper and Netcracker make networks more predictable, reliable, and measurable, allowing managed service providers (MSPs) to lower costs through automation while delivering highly differentiated value to customers.

Features and Benefits

The combined Enterprise Service Automation solution provides MSPs and their customers with the following unique benefits:

- Complete management of the WAN/LAN IT infrastructure from a single pane, reducing IT investments
- End-to-end orchestration and assurance from client to cloud
- AI-driven analytics and insights based on user interactions, alerts, and diagnostics, with full correlation across the LAN and WAN
- One overarching SLE that focuses on the user experience
- Full visibility into and control over services from an intuitive, branded, centralized portal

Solution Components

Juniper provides the LAN, WLAN, and WAN solutions driven by its Mist AI that complement Juniper's secure SD-WAN portfolio to bring robust insight, automation, and self-driving actions with the following components:

- Juniper® Contrail® Service Orchestration, which provides key SD-WAN functionality such as link provisioning, network/application monitoring, security, reporting, and CPE device configuration (such as Juniper Networks SRX Series Services Gateways and Juniper Networks NFX Series Network Services Platforms).

- Juniper Mist Wired Assurance, Wi-Fi Assurance, and WAN Assurance to complement Contrail Service Orchestration with AI-driven insight, automation, and actions for the LAN, WLAN, and WAN, respectively. These cloud services work in conjunction with Juniper Networks EX Series Ethernet Switches, SRX Series WAN edge devices, and wireless access points.
- The Marvis Virtual Network Assistant, driven by Mist AI, which delivers integrated help desk functions and proactive support via simple natural language queries.

Netcracker augments these capabilities with end-to-end service orchestration and a digital marketplace, based on its **Netcracker 2020 Digital business/operations support systems (BSS/OSS) portfolio**, to automate the full lifecycle of services across multiple network domains with management from a single pane:

- **Netcracker Domain Service Orchestration** provides automated service provisioning, life-cycle management, and unified configuration across the multiple WAN and LAN domains. The intent-based system translates the enterprises' business requirements into network-level commands and uses industry-standard service models and domain-specific languages (DSLs) to automate the execution of the business intent.
- **Netcracker Digital Marketplace** includes a self-service portal to unify the different LAN and WAN offerings into a single, intuitive portal, providing self-service capabilities for the MSP and enterprise including service ordering, service administration, and service monitoring.

Working together, the joint Juniper-Netcracker solution revolutionizes IT with AI and creates a new service with end-to-end process automation from the business layer (BSS) to the network resource layer.

Service-Level AI-Driven Automation

At the service level, Netcracker's Digital Marketplace delivers a branded self-service portal that enterprise customers can use to input business intent, provision new capacity, add functionality, view reports, and manage networks from one interface.

Netcracker's Domain Service Orchestration processes the declarative business intent and uses the service models to automatically provision the Juniper technical LAN and WAN subsystems. It unifies configurations through its abstraction layer and simplifies troubleshooting by correlating LAN and WAN alarms.

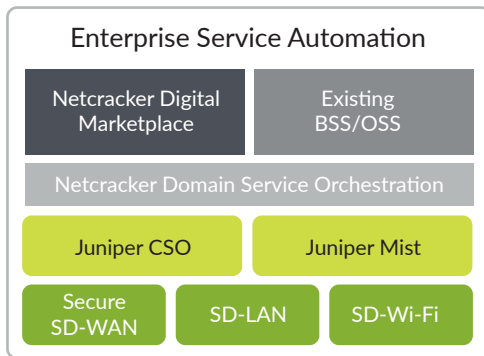


Figure 2: The Juniper-Netcracker Enterprise Service Automation solution

With Netcracker's AI/analytics solutions, the operation of the service model can be enhanced to suggest parameters based on previous experiences and the learnings from previous business intents. The AI/analytics solutions are also used in service assurance to make suggestions on the best possible outcomes or to prevent failures.

Open APIs abstract the complexity of the underlying networks, allowing the enterprise to interact with the joint Juniper-Netcracker solution at a business level. For example, an enterprise can enter parameters about the rooms and offices on their premises, such as capacity, usage, and where the Juniper access points are located. The Netcracker Domain Service Orchestration system then provides end-to-end automation from service provisioning to full lifecycle management, ordering and dispatching any physical equipment needed. It then provisions and configures the underlying networks, adding new VLANs or implementing policies using open APIs from Juniper that expose the underlying primitives from the network.

Network-Level AI-Driven Automation

At the network level, when a firewall is powered up in a branch location, it automatically "calls home" to Juniper's Contrail Service Orchestration. It then uses zero-touch-provisioning (ZTP) to set up parameters previously defined in Netcracker's Digital Marketplace, such as intelligent traffic handling or

security policies, in order to select the best available SD-WAN connection in each location, reducing costs and improving the overall experience.

Juniper Mist Wired Assurance, Wi-Fi Assurance, and WAN Assurance, coupled with Marvis, assist with ongoing AI-operations including:

- SLEs, which enable customers to set, monitor, and enforce customizable metrics for key LAN, WLAN, and WAN criteria.
- Simplified troubleshooting, where AI automates root cause analysis by correlating events across the LAN and WAN in near real time.
- Anomaly detection, which helps identify problematic device types or software versions before users even know they exist.
- Policy enforcement applied at different end points and for different users.
- Dynamic packet capture, which logs historical events in real time for retrospective analysis to investigate the root cause of problems without waiting for them to re-occur. Data is stored in the cloud, eliminating the need for onsite truck rolls.
- Marvis Virtual Network Assistant, which gives service providers advice and recommendations about conditions such as which users may be dissatisfied with their experience.

Using AI at both the service and network levels introduces organizations to a new era of IT that uses AI to save time and money, deliver unprecedented scale, and provide unparalleled user experiences.

Cloud-Native Architecture

Both the Juniper and Netcracker platforms are based on cloud-native microservices architectures for rapid deployment, scale, and seamless updates. Systems are developed with an Agile/DevOps approach for frequent releases and rapid deployment. The architecture also supports multivendor solutions, allowing service providers to add alternative network equipment in the future.

Solution Validation and Openness

Enterprise Service Automation is a fully pre-integrated and validated solution providing out-of-the-box service ordering, management, and monitoring capabilities. A number of artifacts are readily available, including service models and configured APIs, enabling rapid and simplified deployments.

The entire solution is based on industry standards with open APIs so it can easily expand into additional network domains, such as the transport network and 5G, and incorporate additional partners seamlessly.

Adding Advanced Wireless Location Services

The Enterprise Automation Solution also provides a platform for advanced wireless location services such as asset location, user engagement, and contact tracing, based on Juniper's patented virtual Bluetooth™ LE technology. The following unique managed services can be added:

- Proximity services: Identify users who are too close to one another for Covid-19 concerns, or retroactively track users who were near each other for a prolonged period of time
- Occupancy and vacancy services: Understand whether facilities are really being used or if they are too full, allowing you to reduce energy usage in under-utilized areas and provision additional capacity during busy times
- Wayfinding services: Provide turn-by-turn directions to navigate hotels, conference centers, and campuses
- Asset location: Find high-value assets such as wheelchairs, pallets, and security guards
- User integration: Integrate with a smartphone app for loyalty card holders to track a user's location and behavior, even when they haven't logged in to the Wi-Fi network, and make them relevant offers or automatically check them into a hotel upon arrival

Summary—Increasing Business Value for Service Providers

Enterprise Service Automation represents a significant new opportunity for service providers by tapping into new areas of the lucrative enterprise information and communications technology (ICT) market. This integrated solution enables providers to:

- Open up new revenue streams
- Increase profitability through the automation of manual processes

- Shorten time to market with a proven pre-integrated solution
- Expand into new domains or add new vendors in the future

With Juniper and Netcracker, it is now possible for service providers to provide fully automated connectivity and value-added services deep into the enterprise environment, across the WAN, LAN, and WLAN.

Next Steps

For more information on Enterprise Service Automation, please contact your Juniper Networks or Netcracker representative.

About Juniper Networks

Juniper Networks brings simplicity to networking with products, solutions and services that connect the world. Through engineering innovation, we remove the constraints and complexities of networking in the cloud era to solve the toughest challenges our customers and partners face daily. At Juniper Networks, we believe that the network is a resource for sharing knowledge and human advancement that changes the world. We are committed to imagining groundbreaking ways to deliver automated, scalable and secure networks to move at the speed of business.

About Netcracker Technology

Netcracker Technology, a wholly owned subsidiary of NEC Corporation, offers mission-critical digital transformation solutions to service providers around the globe. Our comprehensive portfolio of software solutions and professional services enables large-scale digital transformations, unlocking the opportunities of the cloud, virtualization and the changing mobile ecosystem. With an unbroken service delivery track record of more than 25 years, our unique combination of technology, people and expertise helps companies transform their networks and enable better experiences for their customers.

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