FUJITSU

Solution Brief
Virtuora Service Orchestrator

Automate multidomain network services delivery

Yesterday's workflows are fine for managing monolithic applications and aging servers. But it simply isn't feasible to retrofit yesterday's configuration automation for today's event-driven digital service delivery systems. Something beyond process-driven orchestration is required–and it needs the situational awareness that service-oriented architectures and purpose-built microservices can provide. Only Virtuora Service Orchestrator (SO) delivers the scale, independence, resilience, and extensibility that orchestration lacked until now.

No matter how a service is delivered, whether it's IoT, 5G, cloud-native, containerized, component-based, Multi-access Edge Computing (MEC), or at the edge, Virtuora SO is the key to delivering products and services that respond to individual customer behavior. This responsiveness is accomplished with a wide range of multidomain operations that are integrated and automated, with multiple resource domains overlaid with new technologies, enabling CSPs to minimize time to market and manage costs and complexity.

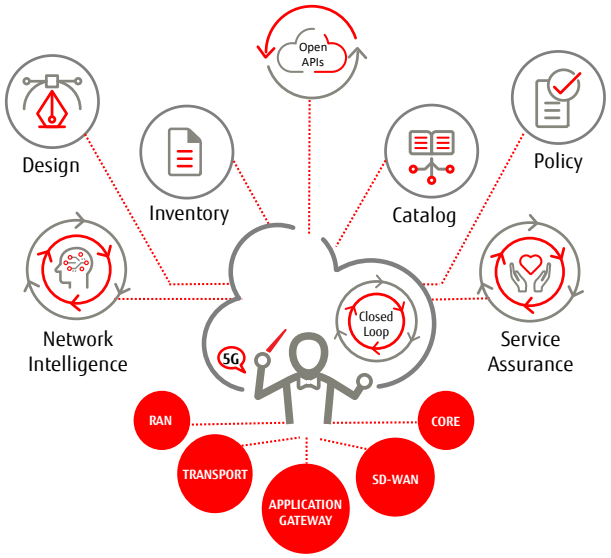
The Virtuora Service Orchestrator Solution

Virtuora SO automates service delivery for multidomain network resources by abstracting complex networks, and then managing what those resources do and when. Traditional orchestration functions within the construct of simple workflows, but Virtuora SO lays the foundation for much richer and higher-value network event response. This can only be accomplished with a full-scale implementation of an open digital architecture. The ability to function within an open architecture is what distinguishes Virtuora SO from other orchestration solutions.

An open digital architecture supports dynamic services and provides the ability to quickly enhance the network to match customers' needs. As an

Virtuora Service Orchestrator Highlights

- Combine choreography and orchestration to simplify, abstract, and automate the modern network
- Enable touchless interactions with catalog-based orchestration, repeatable processes, and commonly defined services
- Streamline order to cash processes with component-based operations and cloud-native microservices
- Provide resilient service delivery and recovery with network slicing across multiple domains
- Leverage open standards, including TM Forum Open Digital Architecture (ODA) and open APIs



Orchestration that Supports Truly Autonomous Networking

essential component of autonomous networking, Virtuora SO orchestrates closed-loop automation with standard interfaces for service assurance, network intelligence and domain control. Finally, Virtuora SO uses policy-based information as inputs for network resource and services optimization, with cutting edge network slicing capabilities and management, delivering innovation and flexibility that can accelerate revenue realization.

Virtuora Service Orchestrator Overview

Virtuora SO automates, designs, instantiates and operates end-to-end network services across a range of resource domains and technologies. The underlying network is abstracted; common interfaces and protocols, as well as standard function descriptors and services from each domain are combined and presented as a single aggregate service.

Virtuora SO is a based on a microservices architecture, and supports:

- Service design
- Service catalog
- Resource inventory management
- Service inventory lifecycle management
- Policy management

Virtuora SO makes a common information model possible and thus provides open, standard northbound interfaces, integration with service assurance solutions, and analytics. Third-party network function management and orchestration (MANO) systems are also supported, with the ability to instantiate virtual and containerized network functions (VNFs and CNFs) over Virtualized Infrastructure Manager (VIM) and Common Information Model (CIM) cloud-enabled environments.

Virtuora SO Functionality

Cloud-Native Architecture

Virtuora SO is delivered on a scalable microservice architecture framework that supports DevOps and CI/CD processes for new models and workflows, as well as for SaaS deployments.

Network Abstraction

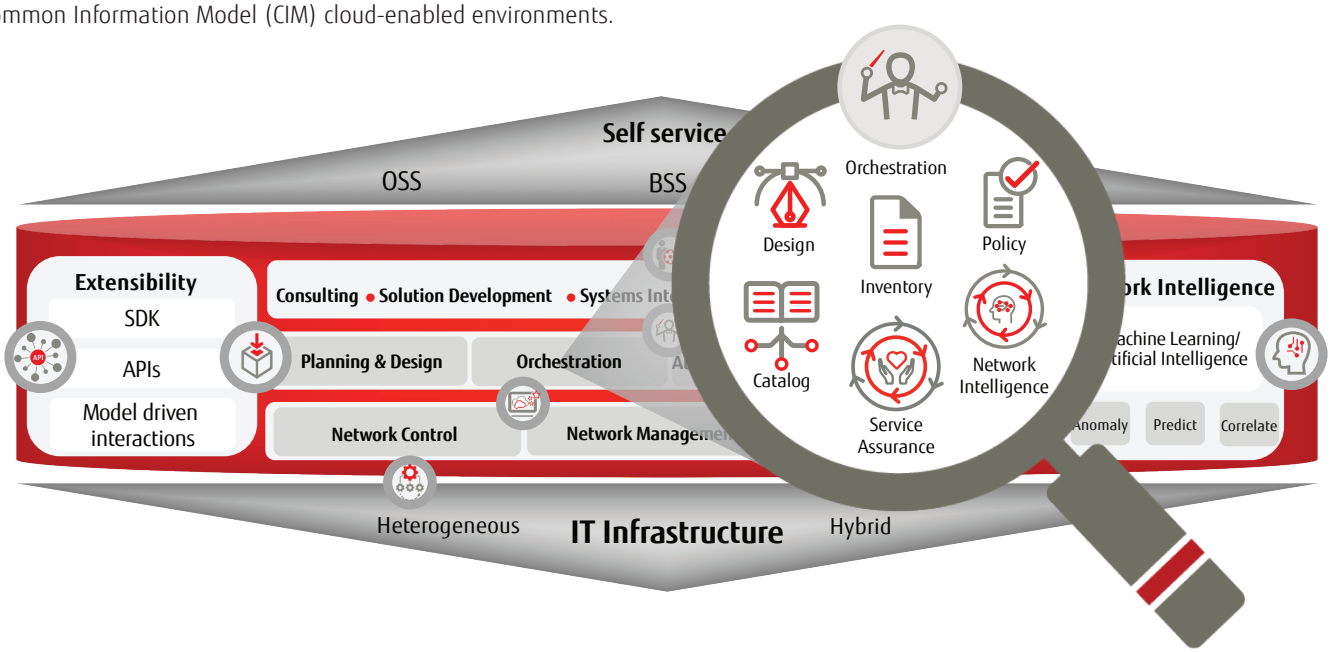
By decoupling infrastructure, applications, and services, Virtuora SO creates virtual routes that offer more networking flexibility, and improves overall infrastructure agility.

End-to-End Network Service Delivery

Virtuora SO's capabilities enable services to be designed, instantiated, and operated for multiple network domains including cloud, core, edge, transport, and other technologies.

Supports TM Forum ODA Approach for Building Software

- Common language and design principles
- Common data models, such as standard YAML-based descriptors for customer- and resource-facing services(CFS/RFS), network service descriptors (NSDs), and VNFs
- Exposes a service catalog using open APIs and a full complement of TM Forum open APIs
- Exposes event hubs that support messaging subscriptions to service inventory, service management, and service catalog communications
- Supports System Information Framework (SIF), products, services, and resources



Technical Specifications

A Key Component of Digital Service Delivery Architecture

Virtuora SO can be a building block for CSPs who are architecting their own service delivery capabilities from the ground up. With Virtuora SO, it becomes possible to build applications that enjoy more flexibility, lower network latency, more capacity, and connectivity for millions of network endpoints.With Virtuora SO, CSPs can build an architecture that improves their ability to:

- Deploy 5G services in the cloud
- Launch streamlined SD-WAN digital services
- Leverage closed-loop automation
- Optimize application delivery with network slicing
- Transform legacy resources for seamless service delivery

Virtuora Service Orchestrator Technical Specifications

Virtuora SO is ready for cloud-native servers and/or containers.

- Kubernetes deployment environment
- Northbound REST APIs, including:
  - TMF 633
  - MF 638
  - TMF 640
  - TMF 641
- Domain interfaces
  - ETSI NFV-SOL 005
  - ETSI NFV-SOL 006
  - MEF Presto API
  - REST APIs

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