amdocs NEO: service & network automation platform

A key priority for service providers is to have comprehensive and unified systems that enable efficient and effective service management across siloed domains and hybrid networks – spanning multiple dimensions: physical + virtual; on-premises + cloud; and legacy connectivity + new services. Service providers are also under pressure to reduce TCO and improve agility through modular, cloud-native deployments of network automation and management systems across all flavours of public, private and hybrid clouds.

The Amdocs NEO platform supports all aspects of service design, inventory and orchestration across physical, logical and virtual elements for all lines-of-business (LOBs), including enterprise/B2B, mobile, consumer broadband, as well as NFV and 5G-based services.

The cloud-native solution can be implemented on public cloud environments, providing the benefits of better experiences, faster deployment, reduced upgrade cycle time and cost, accelerated service introduction and innovation, and optimized operations. Constituent components and technology have previously been implemented and proven on leading public clouds, including on AWS for a Tier 1 CSP in APAC, and on Microsoft Azure for SES, a leading satellite communications and business services provider. The modular microservices based platform also enables end-to-end service orchestration spanning NFV, hybrid networks, separate domains, distributed infrastructure and heterogeneous environments. It is also aligned with the ONAP suite of tools and components in several areas.
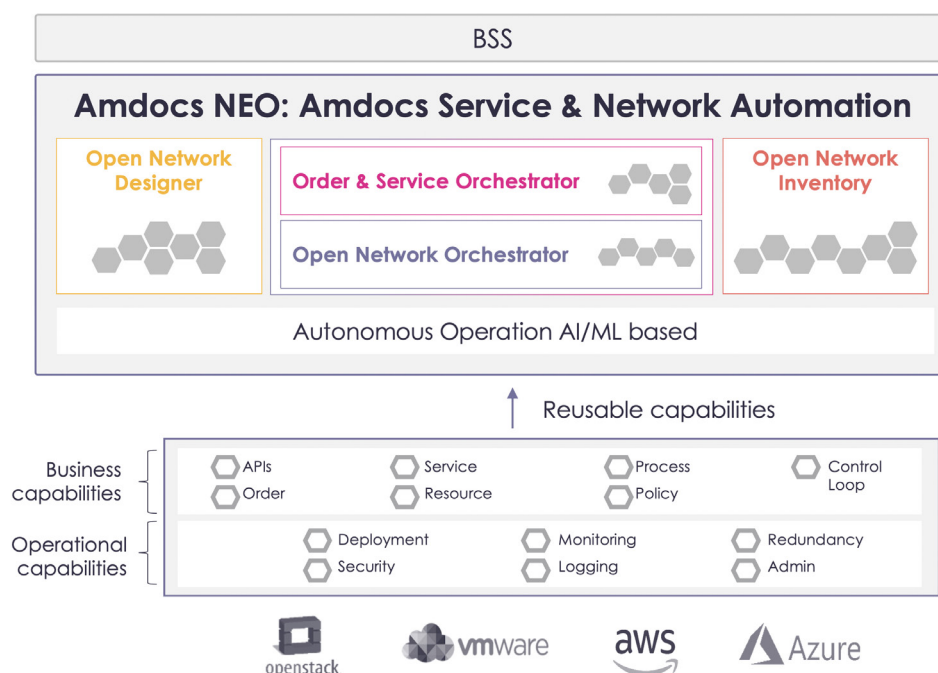
Fig. 1 – Amdocs NEO: Service & Network Automation Platform

amdocs NEO offers the following advantages:

- Full service and network orchestration, network monitoring and control loop to execute the full service management lifecycle across hybrid virtual and physical networks
- Comprehensive set of design tools and development SDKs to support multiple service types Cloud-native, microservices based – deployable in both public and private clouds
- Carrier grade platform, with high availability, advanced logging, self-monitoring and self-healing
- Highly extensible and configurable platform with plugin and customization support
- Aligned with and based on industry leading standards including, ETSI, TMF, ONAP and 3GPP
- Widely deployed system successfully automating multiple enterprise services and mobile core services today in production

amdocs NEO illustrative use-cases / solutions

Amdocs NEO is the platform for the end-to-end service lifecycle management of network and cloud services, from design and creation to, orchestration, continuous monitoring and operation. The platform assures the end-to-end services and network traffic by orchestrating network service-related operational activities and policy management. Below are two examples for leading use cases in the telecom industry.

SDWAN / NaaS with multiple xNFs

SD-WAN and Network-as-a-service (NaaS) are game-changers in the race for enterprise revenues, redefining how connectivity is created, consumed and controlled. By combining on-demand connectivity with a self-service portal and a digital VNFs/CNFs marketplace for value-added services, service providers can offer B2B customers consumer-like choice with scalability, visibility and control.

Amdocs' modular and programmable SD-WAN / NaaS solution, enabled by NEO, automates, orchestrates and simplifies the design, ordering and management of network and value-added services for faster time to market, increased efficiency and a transformed customer experience.

- Perform full-service lifecycle management from creation to healing and scaling
- Easily add sites and subscribers to an existing service or orchestrate new service in minutes
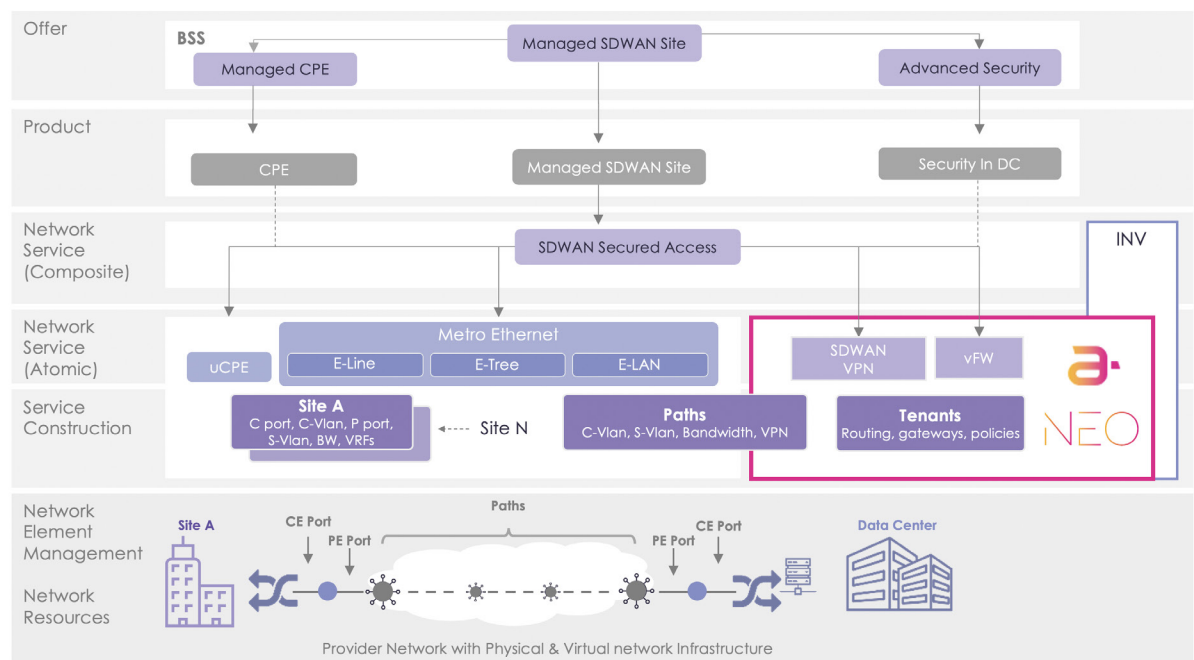- Pre-integrated with SD-WAN vendors and leading xNF providers

Fig. 2 – Amdocs NEO for SD-WAN / NaaS with multiple xNFs

5G Network Slicing

5G brings new and exciting monetization opportunities for CSPs as they continue to transform on their journey to the future of open cloud networks. Moving from the traditional 3G/4G 'one size fits all' approach to a business model based on network slices spanning the network end-to-end from the core to the cloud is revolutionary. Services can be configured to the specific needs of disparate customers, applications and industry verticals. This opens up innovative revenue streams with targeted customer experiences but at the same time introduces significant complexity in managing slices, services and network resources end-to-end across network domains and multiple vendors.

Amdocs 5G Slice Manager, enabled by Amdocs NEO, helps service providers address these operational challenges through:

- Business and customer-centric slice segmentation
- End-to-end lifecycle automation for cross-domain, multi-vendor network slicing
- Adaptive network and processes, responsive in real-time

Amdocs' end-to-end network slice lifecycle management and monetization solution, integrated with ordering and charging, helps service providers achieve operational efficiencies and optimized return on investment as well as cutting time to market and reducing the cost and risk of innovation.
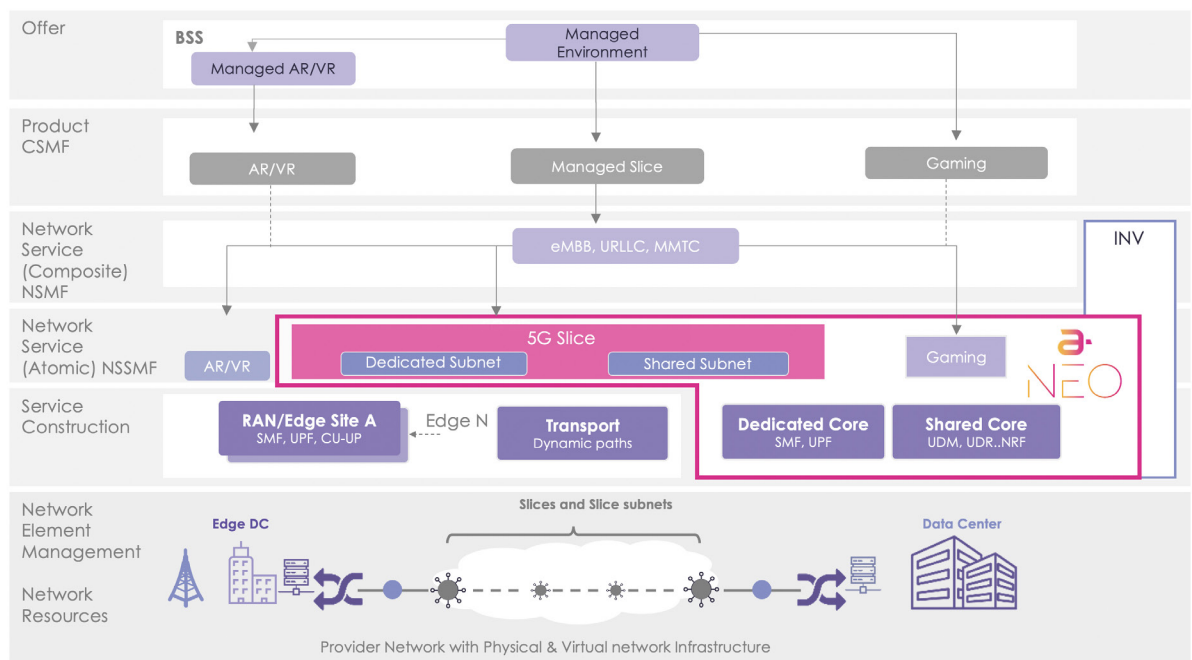

Fig. 3 – Amdocs NEO for 5G network slicing

key capabilities of amdocs NEO

Amdocs is enabling service providers to realize and operate an open programmable network that helps accelerate service innovation and drive business growth. To this end, Amdocs NEO provides a service lifecycle management solution that empowers service providers to rapidly define, launch, fulfil, operate and assure new offerings that combine organic capabilities (e.g. connectivity) with ecosystem elements.

Open Network Designer (OND)

Open Network Designer is a graphical design and configuration environment for use by network, IT and business personnel to design services, product specifications, service workflows and orchestration processes. In the Open Network Designer CSPs can design and maintain network service models. These models can be used as components in other service models. The models are then used by the orchestrators to deploy/provision actual service instances on the live network. Key capabilities include:

- Based on SDC module from ONAP, and extended with additional capabilities from Amdocs
- Support for the complete service design lifecycle
- Creation and composition of service designs is carried out via an intuitive UI
- PNFs/VNFs/CNFs can be onboarded using standard structures and information models
- The catalog is controlled and managed using the TMF's 633 API
- TOSCA native approach with full version control

VNF Onboarding

A user can import VNF Descriptors (VNFD) to accelerate the process of function adoption. These VNF-D can be aligned to HEAT (for OpenStack) or ETSI SOL001 (TOSCA 1.1) definitions. Models are validated for correctness before being made available as a part of service design. Once VNF-Ds are validated and onboarded, the user can employ Service Designer to enrich the VNF model with workflow, monitoring, deployment artifacts and more.

Design Studio

- Services can be created and broken into service components (VNFs and sub-services). Each service component and characteristic can be created, modified and maintained using the drag and drop canvas UI. The same can be done for the relationships, paths and flows which form both static and dynamic life cycle behavior
- Workflow design for creation of workflows for association with service or function operations such as Create, Modify, Heal or Upgrade
- Monitoring design to define VNF and service metrics for use during monitoring
- License design provides the capability to model vendors and license agreements
- Design validation is a framework and a predefined set of plugins to validate the syntax of the model and its related artifacts. This is easily extended to include specific business validation rules

Service Catalog and Distribution

- Service, function and resource model catalog accessible through the TMF 633 aligned or native APIs
- Newly designed or updated service model versions are distributed to Service Orchestration & Service Inventory
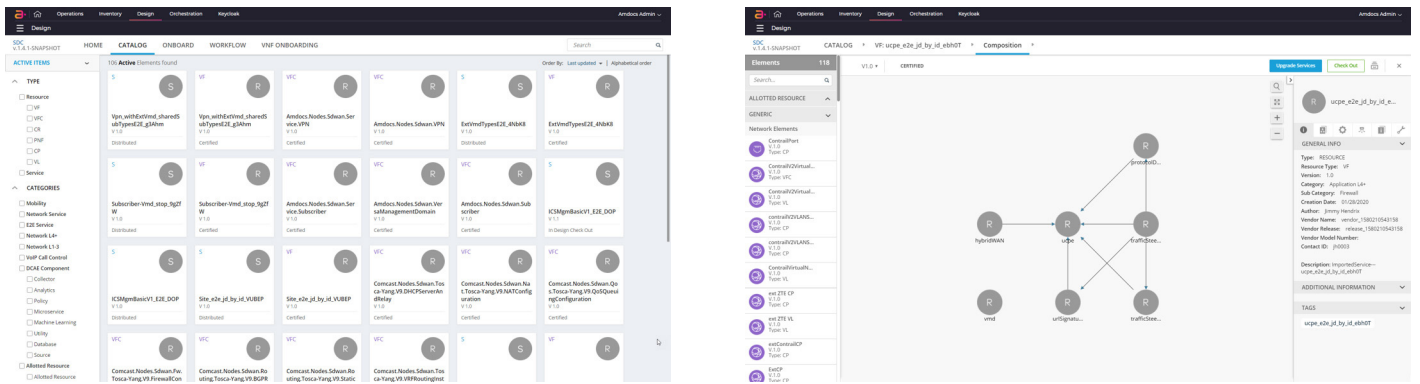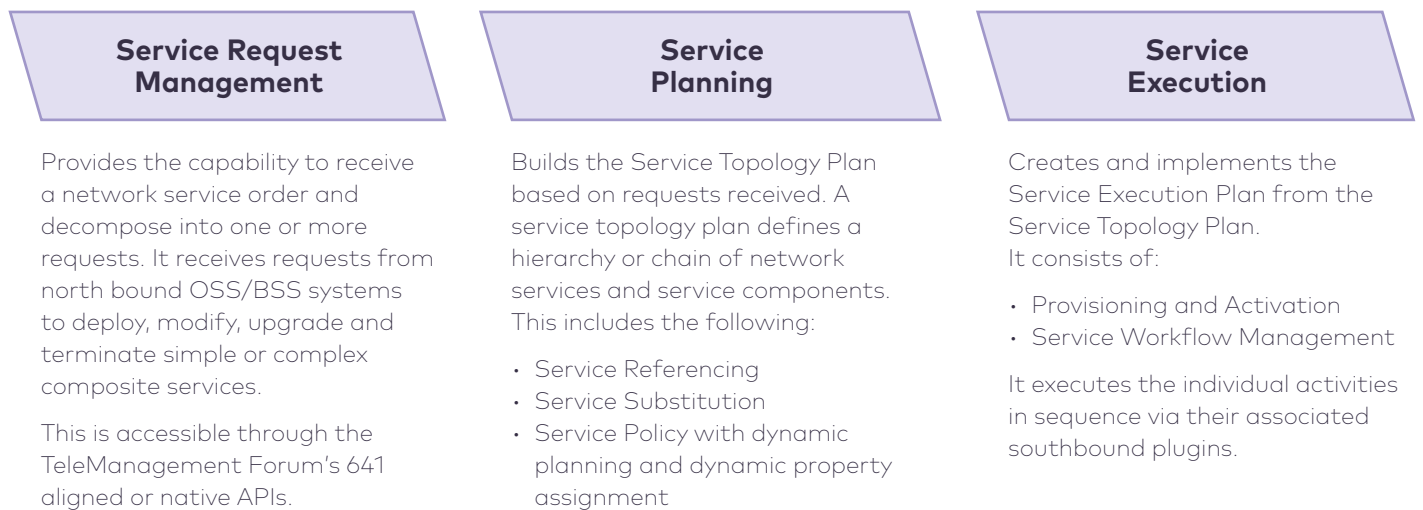
Fig. 4 – Amdocs Open Network Designer

Open Service & Network Orchestrators

Amdocs NEO: Service & Network orchestrators supports a wide variety of use cases, from orchestrating the lead to cash process of complex enterprise services, to consumer multi play, EPC, and 5G core orchestration. The Open Service & Network Orchestrators uses the network order and network service model to implement the service in the network. It understands the current state and service policy and maintains this despite unforeseen events, such as network or data center resource outages or bottlenecks. These orchestrators controls and manages the lifecycle of Network Services instances according to model and policy. Key capabilities include:

Open Service & Network Orchestrators uses the network order and network service model to implement the service in the network. It understands the current state and service policy and maintains this despite unforeseen events, such as network or data center resource outages or bottlenecks.

Service Request Management

Provides the capability to receive a network service order and decompose into one or more requests. It receives requests from north bound OSS/BSS systems to deploy, modify, upgrade and terminate simple or complex composite services.

This is accessible through the TeleManagement Forum's 641 aligned or native APIs.

Service Planning

Builds the Service Topology Plan based on requests received. A service topology plan defines a hierarchy or chain of network services and service components. This includes the following:

• Service Referencing
• Service Substitution
• Service Policy with dynamic planning and dynamic property assignment

Service Execution

Creates and implements the Service Execution Plan from the Service Topology Plan.
It consists of:

• Provisioning and Activation
• Service Workflow Management

It executes the individual activities in sequence via their associated southbound plugins.

OSO: Supports the instantiation and fulfillment of services across multiple LOBs

ONO: Supports the provisioning and configuration of network elements in network operational domains
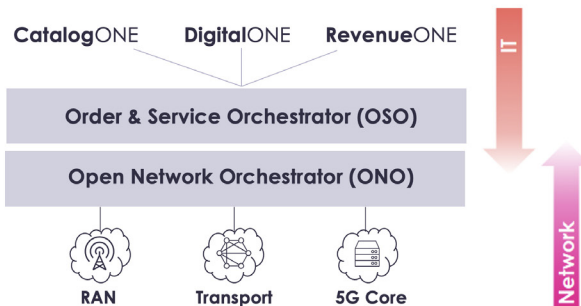
Fig 5 - Amdocs NEO: Open Service & Network Orchestrators

Service Lifecycle Management – Controls and manages the lifecycle of Network Services instances according to model and policy.

Network Monitoring and Control Loop

Control loop is a set of features that can detect problems raised from monitoring and take automatic corrective action to resolve them.

During the lifecycle of a service there is a need to perform both active and passive monitoring for the purposes of scaling and fault management. Monitoring agents monitor services and their resources based on KPI and threshold definitions.

Operations UI & Dashboard

This UI focuses on the key users of the system – operational teams. It provides a holistic view of services, and of operations on the services. Users can examine the composition of a service and the network that supports it. The UI includes:

- Dashboard – shows service creations, errors and reports at login
- Unified Search – service aware real-time, search capability with sophisticated data inspection function
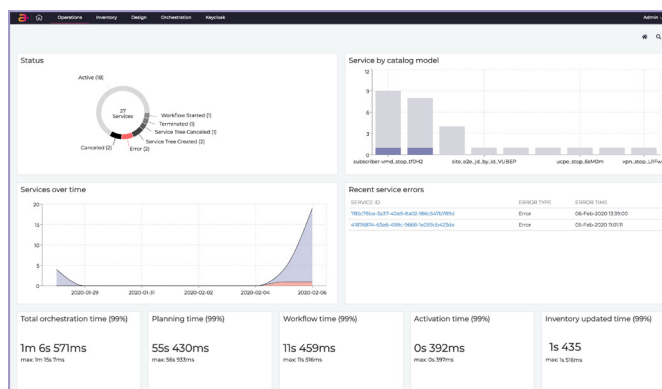- Entity Views – shows the details of a selected entity, including services, operations, or resources

Fig 6 – Amdocs Open Service & Network Orchestration dashboard

Open Network Inventory (ONI)

Hybrid inventory solution that supports inventory management and visualization of physical, logical, cloud and virtual network functions, including support of federated network views across both Amdocs and 3rd-party inventory systems.

- Inventory federation enables end-to-end hybrid (PNFs/VNFs/CNFs) operations without a big-bang inventory transformation
- Enrich locally stored data with additional live data from external inventory systems
- Store services relationships & topology views, inventory objects, attributes, and dependencies

The inventory stores instances of services, VNFs, interfaces, VNF infrastructure – with its behaviour and content defined by the shared network service & resource model.

Services, Relationships & Topology

Planned and current views of inventory objects, attributes, and their relationships (e.g. topology, containment, dependency) are managed within the inventory, and made available to client systems and the UI.

Live Data Enrichment

Provides the capability to enrich locally stored data with additional live data from external sources of truths such as other inventory systems or management systems (virtual infrastructure managers, network management systems).
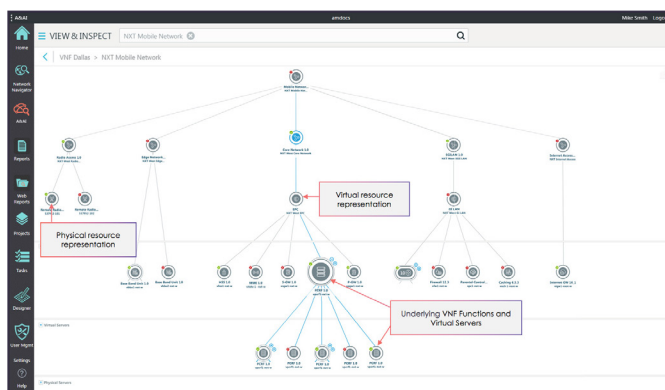
Fig. 7 – Amdocs Open Network Inventory

Cloud-native NEO: Cloud-native

Cloud-based deployment infrastructure has many potential advantages. It deploys quickly, scales easily and with minimal upfront investment in public cloud. Amdocs NEO foundation is microservices-based, cloud-native architecture, supporting multi-vendor cloud environments and is essential part of Amdocs CES20 pre-integrated BSS-OSS suite.

Deployment

The platform is composed of both docker-based microservices and Infrastructure components that are deployed on VMs.

High Availability & Geo-redundancy

All Microservices are deployed in a highly available configuration. Two options are provided for geo-redundancy:

- Active-Active
- Active Hot-Standby

Portal

The portal is a single point of access and navigation to all Open Network applications.

The selection of applications accommodated in the portal is customizable, in addition to the displayed landing page.

Administration

Self-monitoring – SNAP has a flexible self-monitoring function that understands the application, system and hardware on which it is deployed. Alerts, assisted flows and automated actions are triggered to ensure continuity with minimal operations involvement.

Logging – the platform uses a standard set of open source technologies to create a logging sub-system used by all the components.

Upgrade – the upgrade process is based on an industry pattern of blue-green deployment. The principle is to prepare the new version of the software in the production environment and then to 'manage' a cut over from the old to the new.

Security

Provides a common scheme that controls the access to Microservice APIs using user authentication and role-based authorization. It is easily integrated with existing enterprise tooling at customer installations. It includes:

- An example integration pattern and tool-set for re-use in customer specific scenarios
- Predefined roles including Designer, Tester, Governor and Operations
- Administration roles allow full control and inspection of logs and tracing

Internally all component communication is secured using the latest transport layer security (TLS) standards and all data deemed to be secret (such as access credentials) are held within security vaults.

Extensibility (SDK) / Plugin Management

End-to-end extensibility to cover all aspects of configuration, extension and integration.

Plugin framework which incorporates:

- Validation plugins for custom TOSCA and YANG validators to parse service designs
- Southbound plugins for cloud management systems, VNFM or network/domain controllers
- Policy plugins to drive modelling, orchestration planning and enrichment
- Notification plugins to streamline integrations with other systems

External Interfaces

Standard aligned external interfaces for control, management and usage of the solution.

| **TMF 633 Service Catalog Management** | **TMF 641 Service Ordering Management** | **ETSI SOL001 VNF Onboarding** | **ETSI SOL003 Or-Vnfm** |

Additional external APIs:

- Service Management API interacting with Service Orchestrator
- Dynamic load, modify and execute Service Inventory enrichment adapters
- Augmentation of Service Inventory Schema
- Read only access to reference data from Service Orchestrator
- Southbound provisioning of Service Orchestrator Plugins
- Version Management API
- Object Storage within the Service Orchestrator
- External Stimulus (Notification) Ingestion API

Learn more about the Amdocs NEO: Service & Network Automation Platform

"Amdocs has an extensive service design and orchestration offering, and in addition to being the market leader in products category, the company also holds leading positions in engineering systems and order management sub-segments.

Amdocs continues to invest in adapting its portfolio for NFV/SDN and telco clouds, which is now becoming increasingly critical for vendors to support as service providers globally are starting to turn to cloud-native networks in the 5G era."

Anil Rao, Principal Analyst, Analysys Mason.

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