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The Benefits Of Leveraging Multi-Vendor Orchestration To Achieve True Service Agility

A Technical Paper prepared for SCTE•ISBE by

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Introduction

Operators need an easy but comprehensive solution that transitions their operations from providing traditional services to offering a hybrid of physical and virtual services. In this environment, innovative services are not only delivered to customers on demand but must be able to respond to surrounding dynamics in real time. Customer provisioning must move from weeks to minutes and Service Level Agreements must be measured and enforced.

As Operators transform to meet these needs, enabling automated orchestration of available resources at scale is foundational. To accomplish this, operators are shifting their focus from implementation of Operation Support Systems "stacks" made of vertical fulfillment or assurance silos with heavy reliance on System Integration services, to a simplified pre-integrated horizontal architecture that can be readily configured to support specific service offerings including those that leverage VNFs. This need goes well beyond what ETSI Management & Orchestration (MANO) Network Function Virtualization (NFV) Orchestrators and NFV Managers can offer.

Multi-Vendor Orchestration answers the call through a flexible and modular service orchestration solution that fully automates the multiple layers of complex processes for service creation, delivery and assurance. It provides rapid validation of VNFs, onboarding of new services, resource management, service design and configuration, and closed-loop policy-based service assurance for Service Level Agreement compliance. It also supports capacity management to provide the right level of resources in real time.

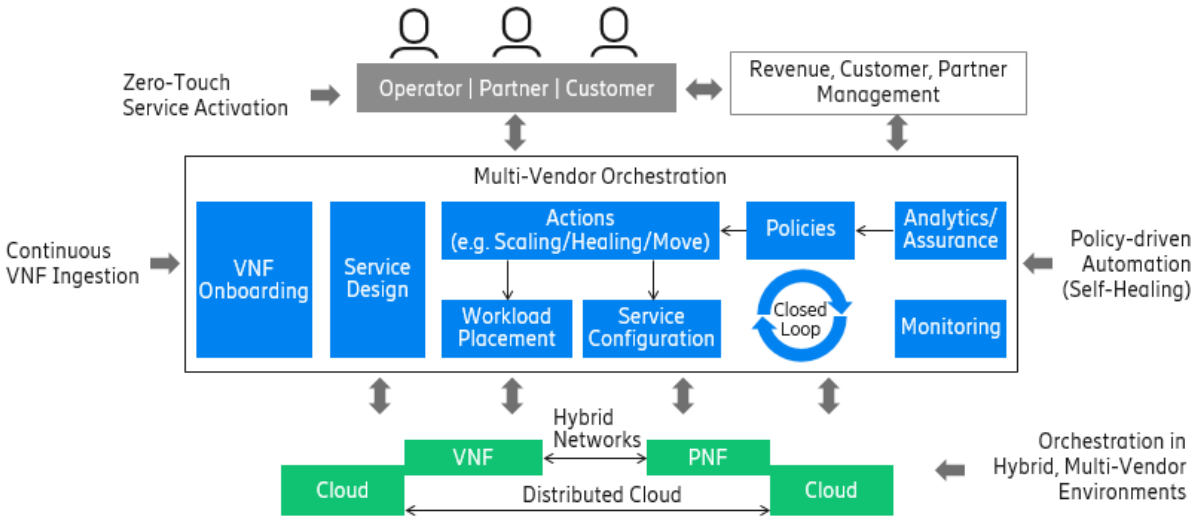

Figure 1 - Approach to Multi-Vendor Orchestration

Content

Operators are under increasing pressure to deliver services faster and more flexibly at the lowest cost possible. This may have created interest in adopting cloud architectures and network functions virtualization (NFV). However, managing virtual applications and resources in the cloud requires a structured, disciplined approach.

- Speed Time to Market

- Zero-Touch Automation
- Visualize End to End Services
- Maximize Resource Usage
- Benefit from Hybrid Orchestration
- Gracefully Transition Operations
- Eliminate Vendor Lock-In
- Increase Business Agility

1. Key Business Challenges

- Minimizing up-front investments – finding the right level of leverage to keep risk at comfortable levels.
- Minimizing operational (recurrent) costs – adopting cloud technologies while keeping outsourcing, energy and data center expenses at bay.
- Maximize resource utilization – having the kind of operational visibility to recover stranded resources, identify underutilized resources, and to determine the impact of the level of resource utilization on service quality.
- Create compelling service offerings – introducing new services that fully exploit the elasticity of virtual resources.
- Become more agile without compromising service quality – acquiring operational speed and flexibility while maintaining consistent levels of service quality.
- Differentiate from over-the-top competitors – identifying the kind of role the network should play to dramatically improve the customer experience.
- Guarantee security – devising the right mix of security features to deal with regulations and the shared nature of cloud implementations.

2. Key Operational Challenges

- Manual configuration and troubleshooting individual network segments for each End to End Network Services
- Manual and paper hand-offs among different isolated network segments
- Lack of End to End Network Services automation
- Network service / device modeling based on open standards is nonexistent.
- Current assurance processes are mostly manual for Virtual Network Functions
- Many different incompatible EMS systems between silo's, CLI's, scripts, templates, cookbooks
- Lack of Automated testing framework

3. Primary Drivers For NFV

- Service Agility resulting in quicker timer to revenue. Operators can quickly add, drop and change the services and applications they offer by using Software Defined Networking control software and Network Function Virtualization on virtual machines or containers on commercials servers
- Operation Efficiency to provide a global view of the network for provisioning multi-vendor network and multiple layers. The fine-grained control offered by Software Defined Networking Control Software to enable carriers to utilize network equipment better, thereby minimizing the amount of equipment they need and reducing capex costs.

Operators must be agile to deliver services on a global scale in an era when speed and governance are essential. Stimulated by the advances in IT networking and driven by the migration to NFV, services are

becoming more and more cloud-based. In this environment, innovative services are not only delivered to customers on demand but must be able to respond to surrounding dynamics in real time. Customer provisioning must move from weeks to minutes and Service Level Agreements must be monitored and enforced. As operators transform to meet these needs, enabling automated orchestration of available resources at scale is foundational.

4. NFV Deployment Drivers

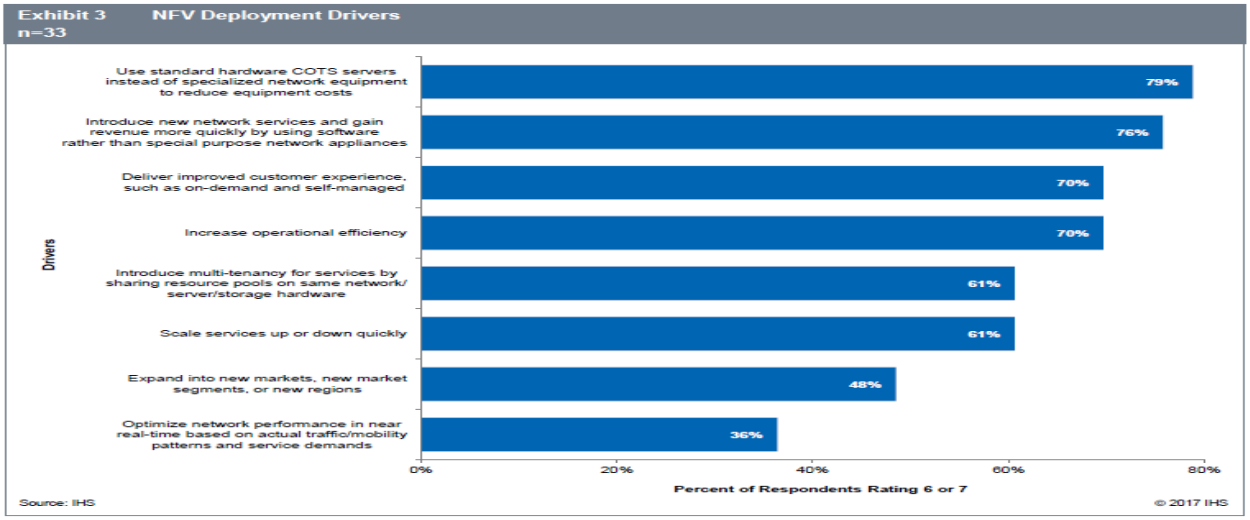

Figure 2 - NFV Deployment Drivers

5. Top Barriers For NFV Deployment

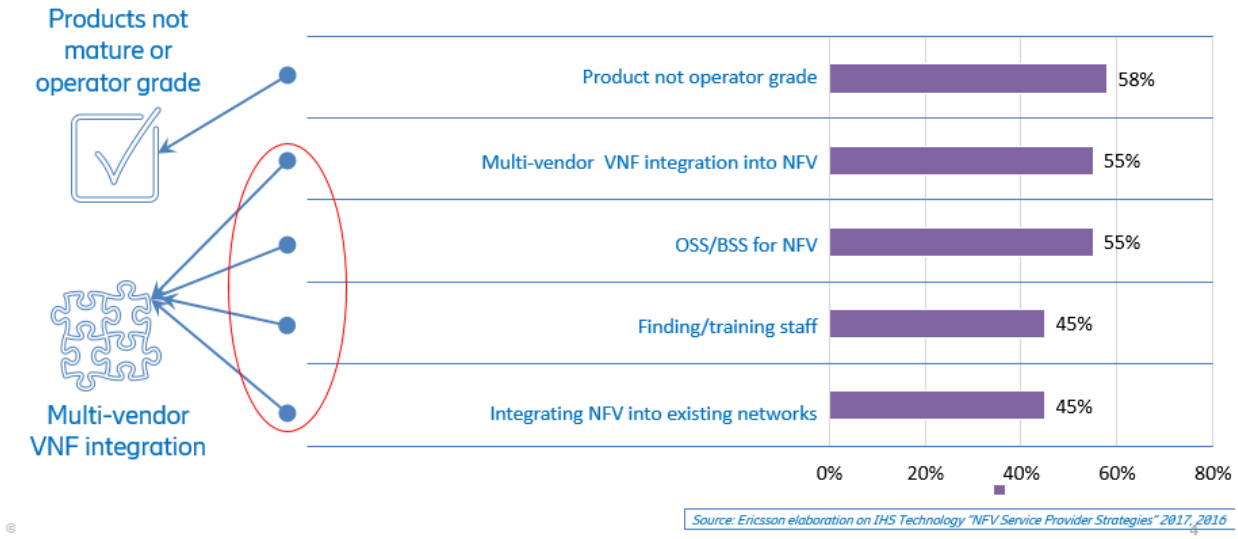

Figure 3 - Top Barriers For NFV Deployment

6. Key Benefits Of Multi-Vendor Orchestration

Operators should consider Multi-Vendor Orchestration if they want to:

- Speed time to market. Quickly create and package new service bundles that can be offered to consumers and businesses via self-service.
- Achieve zero-touch automation. Enable closed-loop orchestration for flawless provisioning, configuration and assurance. The solution has been proven to reduce customer service delivery time from days to minutes.
- Visualize end to end services. Let system users and end customers alike see across multiple domains, including the cloud domain.
- Maximize resource usage. Load balance cloud-based assets for better data center utilization.
- Benefit from hybrid orchestration. Seamlessly orchestrate across physical and virtual network domains in a consolidated solution for lower TCO.
- Gracefully transition operations. Evolve naturally from Ericsson or other vendors' systems to Dynamic Orchestration.

7. Architectural Principles For Multi-Vendor Orchestration:

Model & Catalogue Driven: Network Service introduction should be catalog and Model driven.

- Use of open standards: End-to-End Network service modelled with TOSCA
- Programmability: Transaction-safe, model-driven APIs, Publish/subscribe approach for real-time synchronization
- Transactional: Ensures consistent state, automatic recovery from failed configurations
- Consistent State: Mapping between service and devices in real-time
- Modularity: Components must be reusable, modular, loosely coupled and self-contained

8. Multi-Vendor Orchestration Value Proposition

Table 1 - Multi-Vendor Orchestration Value Proposition

		Multi-Vendor Orchestration					
		Optimize Utilization & Quality	Faster Innovation	Minimize Risks	Smooth Integration	Multi-vendor	Enforce Security
Business Challenges	Minimize up-front investment	X		X	X		
	Minimize operational costs	X		X	X	X	
	Maximize resource utilization	X	X	X		X	
	Create compelling services	X	X		X	X	X
	Become more agile without compromising quality	X	X		X	X	
	Differentiate from OTT	X	X		X		X
	Guarantee security			X	X		X

9. Key differentiators of Multi-Vendor Orchestration

- Simplicity, flexibility, and automation
- Comprehensive, built-in features
- Vendor independent and cross-domain orchestration
- Secured management of distributed clouds
- Policy-driven resource handling

Simplicity, Flexibility, and Automation

Multi-Vendor Orchestration combines the simplicity and flexibility of IT activities with the scale of telecom operations to configure, coordinate and manage VNFs and associated services across highly distributed cloud environments. This is made possible by a closed-loop orchestration that flexibly adapts to the changing environment. With it service providers can manage the lifecycle of services and resources as the underlying VNF capabilities evolve. Its comprehensive workflow automation engine executes both predefined and user-defined workflows. By having a flexible catalog driving its workflow engine, Multi-Vendor Orchestration can enforce the consistent execution of workflows within and across domains to expedite the rollout of new products, services and VNFs.

Comprehensive, Built-in Features

Multi-Vendor Orchestration comes with a complete set of configuration/activation, fault management, performance, accounting and security features for the end-to-end operation of cloud platforms.

Multi-Vendor Orchestration allows service providers to reduce their OPEX significantly in managing large scale, distributed Clouds by providing a cohesive platform that reduces the operational fragmentation of current solutions.

Vendor Independent and Cross-domain Orchestration

Multi-Vendor Orchestration can work with any domain managers to coordinate virtual applications and their resources in hybrid cloud environments across virtualized and physical domains. In addition, Multi-Vendor Orchestration includes open APIs, workflow design tools and a software development kit to facilitate the integration with third-party infrastructure and systems.

Secured Management of Distributed Cloud

Multi-Vendor Orchestration is designed to configure, coordinate and manage applications, services and their underlying virtual and physical infrastructure in highly-distributed cloud environments connected over one or more networks.

Multi-Vendor Orchestration supports virtual data centers (VDCs) and virtual applications (vApps). A VDC logically groups distributed compute, storage and networking resources across data centers and geographical boundaries. The deployments of vApps within a VDC inherently utilize the distributed resources across multiple physical data centers, including the network(s) connecting them. As a result, distributed cloud environments require a more granular level of security than what traditional cloud management solutions can offer. Multi-Vendor Orchestration can handle multi-tenancy by partitioning the data at every level. In addition, Multi-Vendor Orchestration includes audit features specifically designed to monitor and enforce security policies throughout distributed cloud environments. In also provides encryption with key management to control the access to the handling of physical and virtual resources.

Policy-driven Resource Handling

Given the levels of automation and dynamicity typical of cloud environments, resource handling becomes more of a challenge, when it comes to:

- optimizing resource and workload allocation while meeting required quality of service.
- reducing stranded capacity and containing the virtual machine sprawl typical of self-service provisioning.
- forecasting resource utilization because of expected business growth or configuration changes.

Multi-Vendor Orchestration addresses these operational challenges with policy-driven resource/workload management and what-if analyses to identify the most viable scenarios.

10. Tranformation Journey

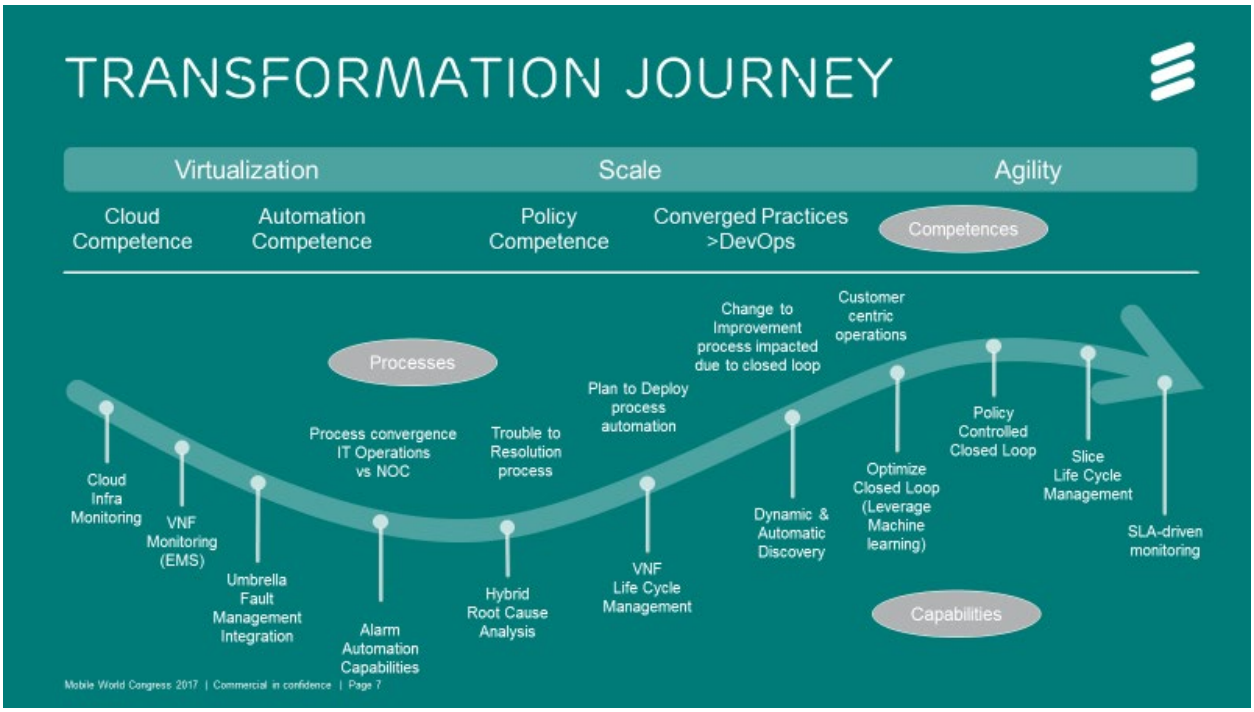

Figure 4 - Tranformation Journey

Conclusion

To Achieve the Service Agility, Orchestration is the KEY.

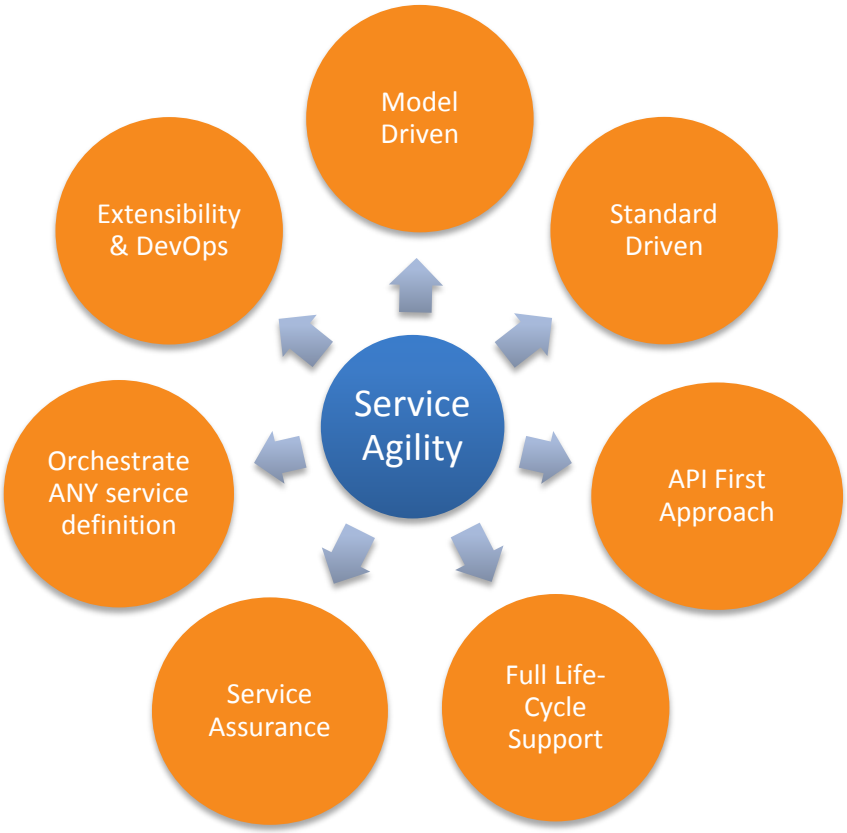

Figure 5 - Multi-Vendor Orchestration

Abbreviations

NFV	Network Function Virtualization
MANO	Management and Orchestration
ETSI	European Telecommunications Standards Institute