

Hybrid networks mean operators must focus on NFV service lifecycle management

For successful commercialisation of NFV, operators must look beyond orchestration and consider all the building blocks that make up service lifecycle management in the hybrid (virtual/physical) world

Although much of the discussion about network functions virtualisation (NFV) so far has focused on orchestration and how to instantiate virtual network functions (VNFs), most of the activity has been confined to proofs of concepts and trials. These have explored how to deploy specific technologies to address new, virtualisation-related capabilities such as orchestration and, for the most part, they have focused on a narrow remit of specific functions.

However, for the full-scale commercialisation of virtualised services on live networks, operators need to implement multiple inter-related processes to achieve holistic end-to-end NFV service lifecycle management.

There are three key process areas that comprise a complete NFV service management approach. These include:

Offline service design, which is what happens before the service is deployed; continuous real-time fulfilment, which addresses the real-time aspects of what goes on when an operator launches a service and continues to manage and assure that service throughout its entire lifecycle; and active inventory, which provides a near real-time view of services and network resources.

OFFLINE SERVICE DESIGN

One of the greatest areas of delay for new service launch today is the offline design process. "It can take nine to 12 months or even more to design, test and debug, and introduce a service, and orchestration has nothing to do with this," says Oren Marmur, head of NFV product portfolio at Amdocs. "Therefore a holistic NFV service lifecycle management approach is needed to accelerate service development in response to over-the-top (OTT) providers launching new services much more quickly."



Oren Marmur, head of NFV product portfolio, Amdocs

"Operators need tools to visualise the service chain with an intuitive and visualised drag and drop approach to onboarding a series of VNFs as well as to automate the service design, test and debug functions, which today consume a significant portion of the overall service launch timeline," he adds. "The service definition should then be packaged and distributed to the relevant network IT components, including the product catalogue, billing system and customer self-service portal, so that it's available for re-use and modification as required."

Marmur fears that insufficient attention is being devoted to the offline design phase. "NFV by itself offers the promise of cutting the service instantiation time from months and weeks to minutes but, if you still have a nine to 12-month service introduction cycle of design, test and

debugging, service agility, which is one of the main drivers for NFV, will not be achieved," he says.

Operators are faced with further challenges because of the absence of fully defined standards. As a result, vendors are developing solutions that have proprietary requirements, although many are attempting to adopt standardised principles. This is creating a fragmented landscape in which VNFs from different vendors will have different attributes and requirements for service providers to manage. The result should not be as fragmented as in the physical networks of the past which were composed of proprietary hardware. However, operators will be faced with the need to take account of the different VNFs that comprise a service and their discrete requirements. "The approach must be vendor neutral because operators need to be able to onboard any virtual network function from any vendor to make a service a reality," says Marmur. "A lot of the VNF managers have their own requirements so this is not a seamless process."

CONTINUOUS REAL-TIME FULFILMENT

Moving further into holistic NFV service lifecycle management, Marmur turns to orchestration requirements. "Orchestration needs to link back to and be very closely integrated to the catalogue and whatever self-service capabilities the operator is offering," he explains.

For example, with a Distributed Denial of Service (DDoS) attack mitigation service, orchestration needs to look beyond service instantiation and address the need for continuous service fulfilment. "When you instantiate a service, you need to be prepared to address service impacting issues such as a DDoS attack," Marmur explains.

"Therefore, orchestration to us means continuous fulfilment, including leveraging policy capability to put protective measures in place very quickly."

"Orchestration goes beyond instantiation to encompass how to predict what is going to happen," he adds. "If you do this right you can make the network self-healing because you can respond to events in real time."

However, the reality of NFV deployments is far from the fully-virtualised vision. As Marmur acknowledges, an additional layer of complexity will face every commercial deployment because operational environments will be a hybrid of physical and virtual architectures.

"In the vast majority of cases the infrastructure will be hybrid for the upcoming decade and probably for longer," he says. "Once we recognise this, the tight connection between a master product catalogue, NFV orchestration and existing OSS becomes critical and makes service orchestration more complex than it would have been."

ACTIVE INVENTORY

That hybrid reality places huge importance on active inventory. Active is an important description here because static inventory isn't able to support the needs of the flexible, on-demand service arena. Think of inventory as a traditional library of books that can be accessed and read; and think of active inventory as a library of books that are being continuously rewritten, the content of which can still be accessed, utilised and adapted while also impacting on the content of the other books in the library.

"Once you've instantiated a service and it's running, you need to be able to capture the service tree, which includes both the service and resources that support it, in your view of the network," explains Marmur. "Traditional inventory systems are static, non-real-time and unable to store virtual resources and this presents challenges for virtualised networks. Operators need to know what the service tree looks like, what resources are required and to bring that together with next generation active inventory."

Operators need both live and historical views of what's happening to support capacity design across both virtual and hybrid networks and to understand the topology of the network at different times and under different levels of service demand. "When it comes to NFV and commercialising services there's a different set of capabilities required in the network and they go way beyond orchestration," adds Marmur.

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No discussion of a service's lifecycle can be complete without turning to how the service will be monetised. "As soon as a service is instantiated in the network, there is a need to understand what the service is from a monetisation perspective," he says. "The service provider needs to decide what the chargeable options are."

Marmur gives the example of a demonstration at Mobile World Congress 2016 in which Amdocs and Vodafone showcased three high-value enterprise use cases including: VPN activation and configuration; real-time, analytics-driven capacity management; security attack detection and mitigation. Both capacity management and the service for DDoS protection are examples of chargeable service elements. A notification is immediately sent to the customer that the operator has expanded service capacity or has detected an attack and has implemented the DDoS protection service so it is an item they will see on their next bill.

"We are proud of this live demo because it showcases services that can have an impact in terms of customer experience as well as the operator's support capability," he says. "Everything was done automatically by the system and reflected immediately in active inventory."

Understanding the complexity of hybrid networks and service providers' need for greater service agility requires a new approach to service lifecycle management. "Once you understand how complex a service lifecycle is, you understand the challenges," Marmur explains. "You're not just replacing hardware with software without changing any aspect of the way you manage the service because that ultimately doesn't result in significantly improved agility. NFV is first and foremost about agility and that requires a substantially different approach."

"We see that as starting with defining how to onboard VNFs, how to create services and test and debug them before storing them in the catalogue, then provisioning and assuring the service through orchestration and continuous fulfilment, and managing the resources available," he says. "Then tying all these aspects back to the monetisation and fulfilment side of the business."

"Hybrid networks will bring a tremendous amount of complexity so new capabilities are required to manage the service lifecycle," he concludes. "These capabilities should all be designed with a focus on accelerating the service lifecycle, introducing automation to help achieve that acceleration or paying close attention to keeping the service up and running." 

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