Network-as-a-Service (NaaS): going beyond connectivity for enterprise revenue growth

Highlighting the top three requirements for a successful NaaS deployment

Network-as-a-Service (NaaS) is a new digital business technology approach that is redefining how organizations create, consume and adapt connectivity and network capabilities. By streamlining internal operations, it enables service providers to transform the experience they offer to their enterprise customers. NaaS can be used by service providers both **internally** to expose network services for the IT department to consume whilst streamlining internal operational processes (as for example at Telstra); and **externally** to offer enterprise customers the ability to buy network resources and connectivity as a service which they can manage and adapt to their own specific needs (as for example at Globe). NaaS means optimizing resource allocation by considering network and computing resources as a unified whole.

NaaS, with a complementary marketplace, enables value-added services and infrastructure to be ordered and managed via an enterprise self-service portal. This provides a single unified view, in near real-time, of on-demand connectivity to clouds, data centers, applications and services as well as of virtual network functions (VNFs) from the full range of vendors in the third-party ecosystem.

NaaS is now changing the traditional network experience offered to enterprises into a transformed business and customer experience that delivers the choice, agility and control to match rising enterprise customer business needs, enabling them to engage and interact with employees, partners and their own end customers in new, diverse ways.

What's in it for the service provider and the enterprise customer?

With NaaS, service providers can offer their enterprise customers not only network capacity or access speed, but also a network that they can manage and adapt to their specific needs. By exposing their network to be consumed as a service, service providers are empowered to elevate themselves in their enterprise customers' value chain, thereby increasing "stickiness" through service bundling.

Key benefits for service providers include:

- Increased enterprise revenue opportunities
- Shorter time to market for network and business service bundles
- Elimination of manual fulfillment and approval activities via automation

From the enterprise customer's perspective, NaaS offers a consumer-like experience with choice, scalability, visibility and control. Furthermore, it makes networking easy with simpler and faster on-demand provisioning of network services that can be customized to better serve the enterprise's own end-customers. This means, for example, that the enterprise IT manager can instantly and independently order, provision, monitor and manage new and existing services for branch offices within the virtual private network (VPN) without the need to call or wait for a technician's visit (Telus' approach is a good example of this).

3 things you need for a successful NaaS deployment

A NaaS offering typically consists of three main components, which are critical to ensuring a successful deployment:

1. Connectivity – This component centers around providing network links with predefined QoS and bandwidth. Since NaaS is agnostic to underlying backhaul technology it can be based on wireline (fiber/copper), wireless (microwave), IP/MPLS, SD-WAN or even mobile 5G. According to IDC, the software defined wide area network (SD-WAN) infrastructure market is poised to reach $4.5 billion in 2022.

2. Self-service portal – The enterprise self-service portal is a key capability that enables enterprises to connect or update a branch office or access the ecosystem of virtual network functions (VNFs) in near real-time. Once connectivity has been established, the enterprise IT or network operations manager can manage their own network services and value-added-services (VAS) via the NaaS portal and integrated VNF marketplace – all at the click of a button. The NaaS solution provides full automation, including settings and policies for each application, allowing the user to modify, adapt and scale their network as needed. Additional options, like redirecting traffic to the most efficient route with SD-WAN technology or configuring a local internet breakout for a specific branch office, can all be done using the self-service portal. The result is that the need to call the service provider or wait for a technician to arrive is removed.

3. VAS and VNF Marketplace – This component enables the purchase of value-added services and VNFs as well as dynamic allocation of storage, computing and networking resources by the NFV orchestrator (NFVO). The marketplace solution supports ongoing service delivery through integration with other applications such as CRM, CPQ, billing, network inventory and the service catalog. For a good example, see Telstra's VNF marketplace.

In the digital era, NaaS is empowering service providers to enhance and quickly adapt the user experience they offer their business customers, user experience that is more consumer-like in its flexibility and immediacy. Deployed correctly and strategically, the three components mentioned above will result in network and value-added services that are:

- **Easy to manage and fully automated:** Intuitive, experience-driven user interface based on design-led-thinking, with full automation of the entire order-to-care process across hybrid network and cloud domains
- **Configurable in real-time:** Providing live services on-demand and as-a-service, and which can be tailored and configured according to differing business needs. This eliminates the need to acquire, install and maintain specialized hardware at the enterprise's premises.

  Furthermore, it enables modular and virtualized networks to act as business accelerators that allow services to be rolled out in a phased manner and support freemium-to-pay models, consumption-based pricing, service experimentation and other innovative approaches.
- **Dynamic and scalable:** Supporting elastic and flexible resource allocation capable of self-healing, as well as performance optimization based on analytics and machine learning. Raising, provisioning and monitoring orders is agile and configurable, and can be controlled by the enterprise itself.

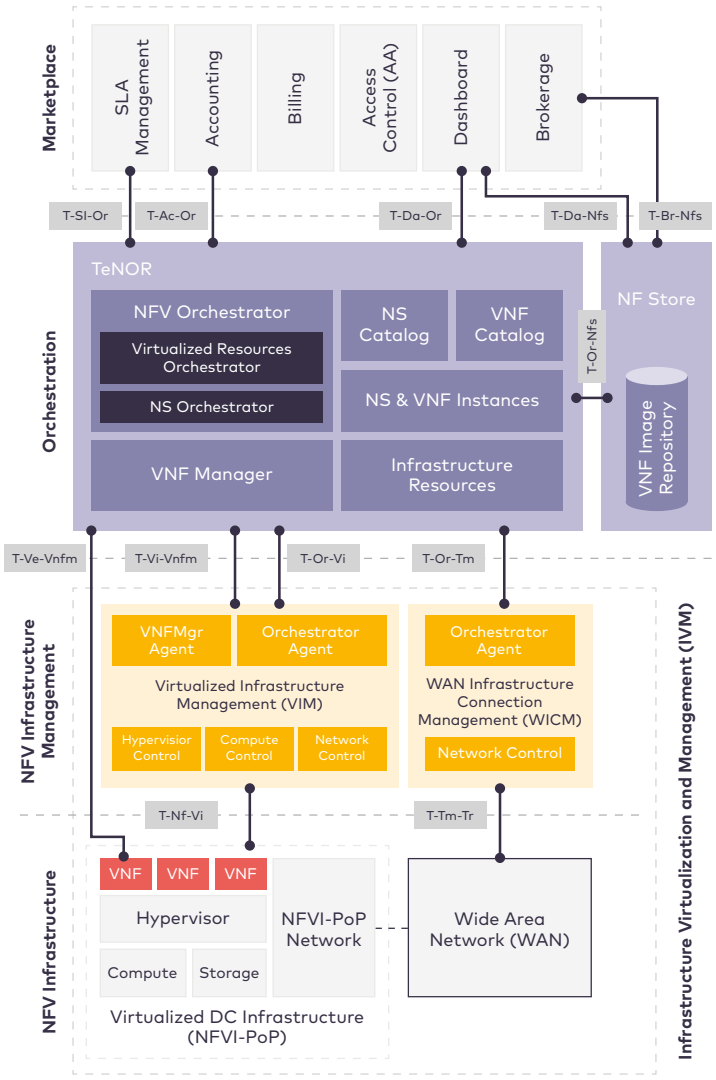
Architectural framework

The architectural framework behind a successful NaaS deployment is still being developed by the industry. One of the early proposed NaaS frameworks was published as open source by T-NOVA and part of it is still available on Github.

T-NOVA's aim was to design a management/ orchestration platform for the automated provision, configuration, monitoring and optimization of network functions-as-a-service (NFaaS) over virtualized network and IT infrastructures.

From T-NOVA's reference architecture, it is clear that successful NaaS deployment requires tight integration and seamless workflow automation between the different modules. Starting from the top of the diagram, the architecture includes the marketplace with its sub-modules (e.g. SLA management, billing, brokerage), the NFV orchestration and NFV infrastructure layers, all the way down to configuring the actual physical and virtual elements in the network.

An efficient NaaS platform leverages and enhances cloud management architectures for the elastic allocation and provision of IT resources. It should also be able to extend SDN platforms for efficient management of the network infrastructure.



Operational challenges

Gartner's Strategic Roadmap for CSP NaaS and VNF Marketplace Platform Operations[1] report, outlines the gaps between the current state of service providers' digital platform business operations, and the desired state. These gaps include:

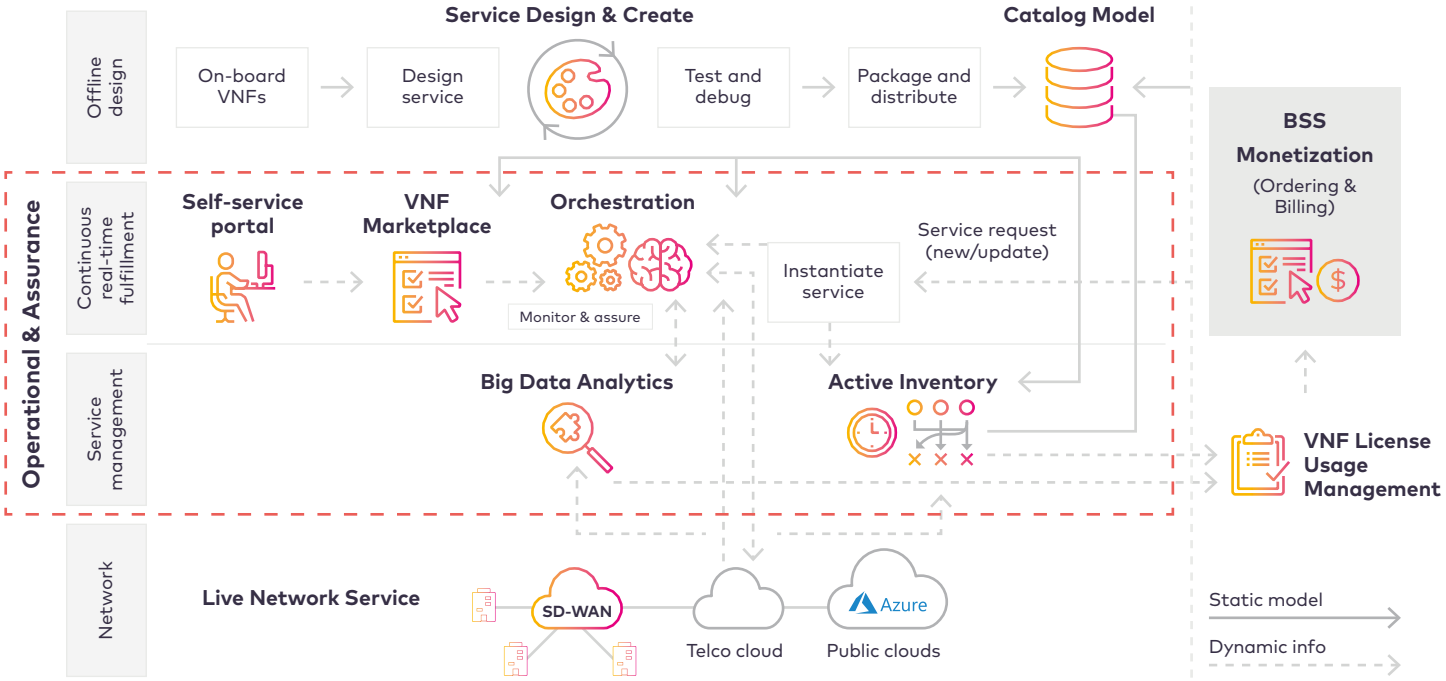
- **Few NaaS solutions** with limited self-service and marketplace capabilities
- **Low level of automation** for the entire service lifecycle resulting in complex and manual VNF testing and onboarding
- **Closed systems** with limited proprietary VNFs
- **Fragmented** service factory challenged by simultaneous orchestration of hybrid physical and virtual network and IT resources
- Inefficient **VNF license management** to support a dynamic and real-time marketplace, while missing a consistent VNF licensing model
- Lack of **standardization** due to significant variations in vendors' VNF management (VNFM) and issues with compatibility with existing network management platforms. This is preventing the realization of efficient VNF lifecycle management and a marketplace from becoming scalable

The above challenges and gaps create the need for an integrated NaaS solution that addresses the offering, deployment and management of VNFs over hybrid physical and virtual infrastructures. Such a NaaS solution should implement an integrated management architecture that incorporates NFV orchestration, while leveraging cloud computing and SD-WAN management of network resources. Furthermore, it should include an open VNF marketplace with a set of associated, pre-onboarded third-party VNFs, sourced from an open, multi-vendor ecosystem.

1. Amresh Nandan, 08 June 2018

Amdocs' NaaS approach

Amdocs' modular and programmable NaaS solution enables service providers to rapidly design, deploy and monetize on-demand NaaS offerings for their enterprise customers, combining virtualized network infrastructure and services with cloud and business applications. It automates, orchestrates and simplifies the design, ordering and management of both network services and value-added services for faster time to market, increased efficiency and a transformed customer experience.



Anatomy of NaaS Service Lifecycle Management

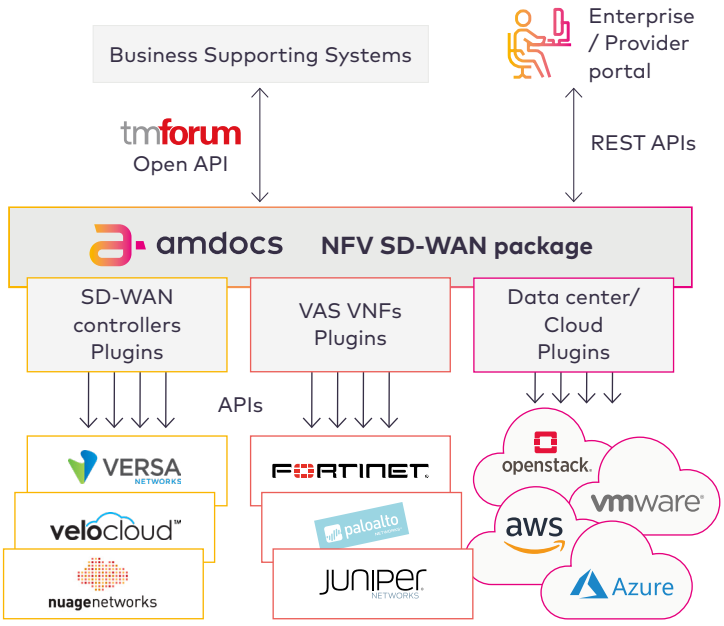
Key features of Amdocs NaaS solution include:

- End-to-end programmable and modular service lifecycle automation and orchestration
- Core functions package (SD-WAN, security and more) for rapid, low-cost deployment of cloud-based network and value-added services
- Experience-driven, design-led enterprise self-service portal with network configuration capabilities supporting automated service lifecycle workflows
- Value-added-services and VNF marketplace capable of monitoring and charging usage
- Open ecosystem of pre-integrated third-party VNFs
- Innovative VNF license usage management using blockchain to simplify the management of multiple VNF licenses from many vendors
- Automated service factory that handles the entire service lifecycle from service design and VNF onboarding through service fulfillment, VNF instantiation and orchestration, all the way to ongoing closed-loop assurance and maintenance.
- Integration with master catalog, customer management and billing systems for end-to-end automation of the order-to-care process

Here is a more detailed look at the modules that make up Amdocs NaaS solution:

- **Network connectivity core functions package:** Pre-integrated solution for quickly creating, deploying and monetizing managed SD-WAN and security services. It includes NFV Orchestration, plugins for integration with SD-WAN, VNFs, SDN controllers, VIMs and clouds as well as predefined use cases, service models and configurable service parameters. In addition, this module is integrated with both the BSS and network inventory via TMF Open APIs for real-time feeds on the live state of the network.

  For more information watch this video on Amdocs NFV SD-WAN package.

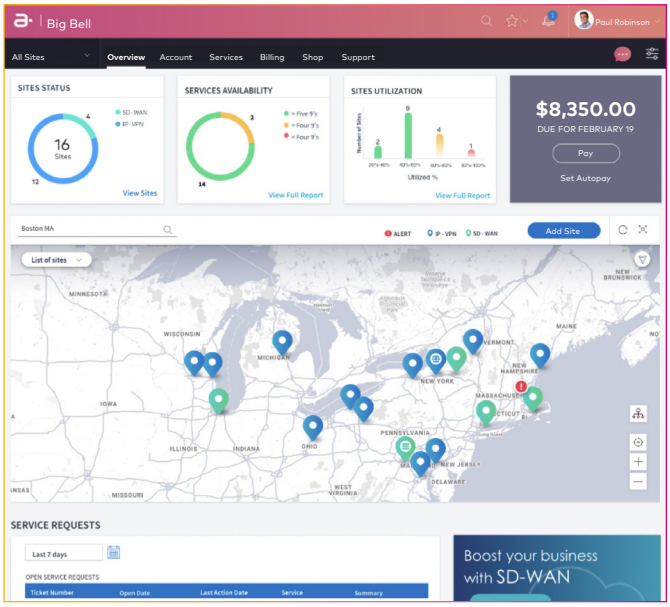


- **Self-service portal and VNF marketplace:** Together, Amdocs' self-service portal and VNF marketplace enable service providers to offer their enterprise customers choice, scalability, visibility and control through ease of access to on-demand connectivity services and a personalized digital marketplace.

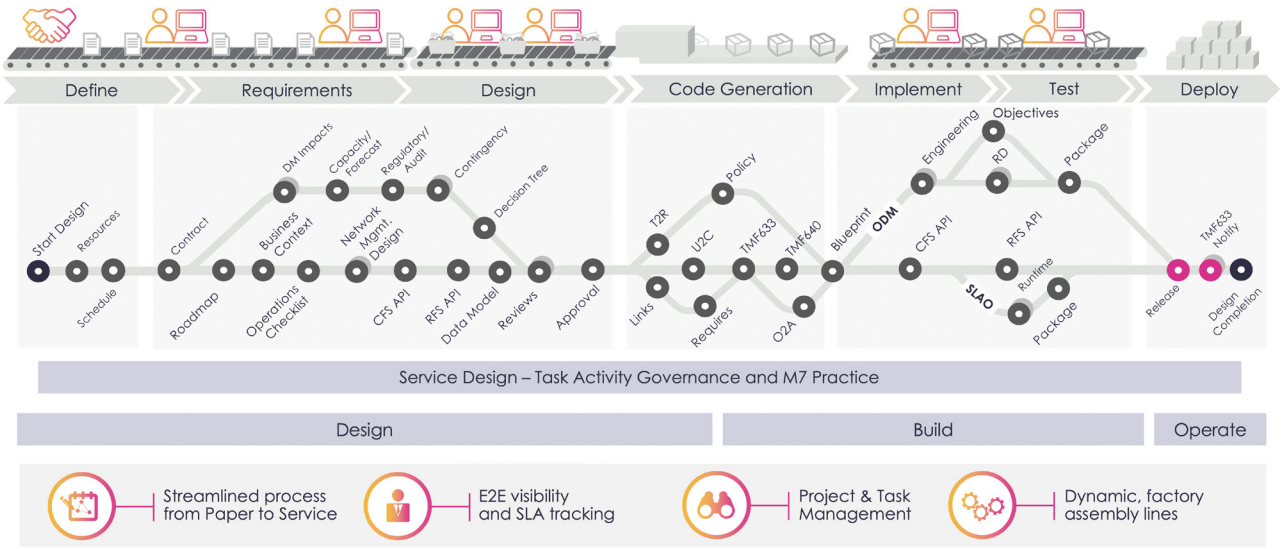
  Amdocs' self-service portal is an experience-driven digital frontend. It transforms the user experience via its user-friendly interface with enhanced usability and control, thereby reducing dependency on customer support.

  The portal is being constantly improved through a design-led-thinking process using methodology developed by Projekt202, a company acquired by Amdocs. For more information on enterprise communication services portals see this Heavy Reading video.

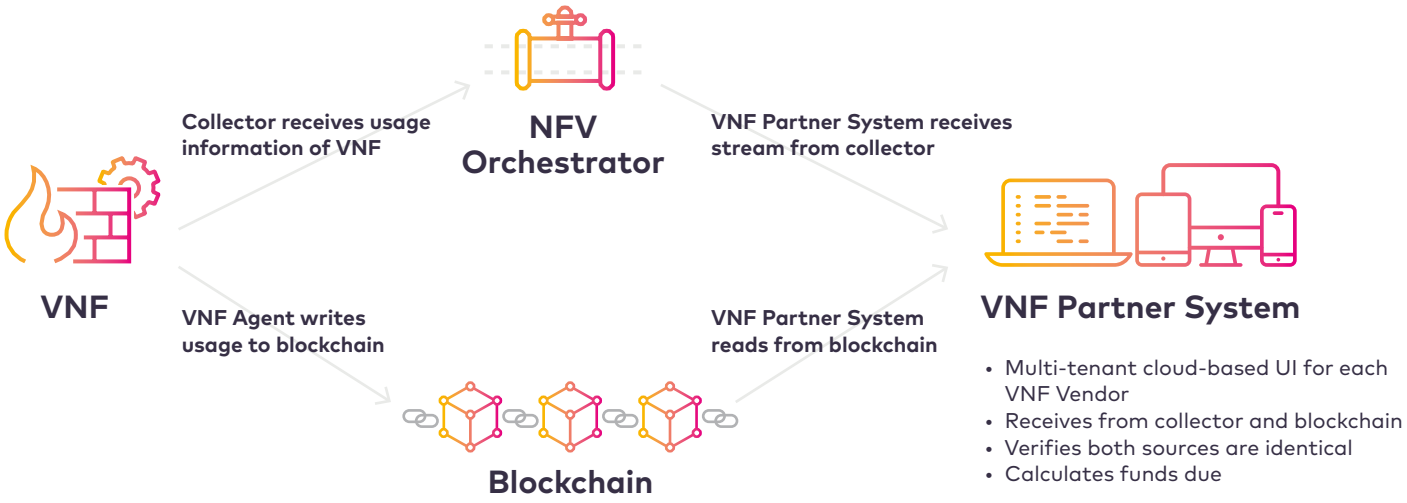
  Amdocs' VNF marketplace includes pre-onboarded services comprising VNFs from Amdocs' multi-vendor, open NFV ecosystem. Users can buy VNFs and instantiate them on their premises, in the service provider's cloud or on public clouds.



- **Service factory:** Amdocs' efficient service factory is an important part of service lifecycle management. It includes design time and runtime tools which work together seamlessly. This module transforms unscalable, manual, resource and document intense processes (as shown in the diagram) to agile, optimized and controlled processes, increasing self-service efficiency across IT and network teams.



- **VNF license usage management:** This module provides a 'single pane of glass' for all partners (i.e. service providers, vendors and enterprises). Amdocs has worked closely with service providers and VNF vendors to automate and simplify the VNF licensing process in order to automate the logging of VNF usage and to rate it in real-time for all parties. Amdocs' partner management and BSS expertise form the basis of a cloud-native solution that enables all parties to view the status of VNF usage in real-time. Combined with Amdocs' expertise in billing and charging, this module provides business users with a single, consistent view of the results of complex contractual settlements.



Accepting settlement is based on the complex licensing arrangements enabled by the transition to virtual networks requires complete transparency for all sides. **Blockchain** technology offers an innovative mechanism for ensuring trust between all parties. This enables VNF vendors to rely on the accuracy of VNF usage reports and confidently move to accepting settlements based on reported VNF usage.

For more information on innovative VNF license management based on blockchain technology visit www.amdocs.com/NaaS

Globe Telecom – NaaS in action

Globe Telecom is accelerating their enterprise business growth by directly addressing their customers' needs for highly-flexible and scalable cloud-based network services. The objective is to enable customers to easily configure, customize and monitor these services independently, to better serve their end-customers. Amdocs NaaS solution will enable Globe to transform the enterprise customer experience by automating operations and management of their NaaS offering for a wide range of network services.

> *"The flexibility and scalability of NFV will streamline the way we can interact with our enterprise customers. It will allow us to empower our enterprise customers with simpler and faster on-demand provisioning of network services that they can customize to better serve their end-customers."*
>
> Gil B. Genio, Globe Telecom Chief Technology and Information Officer

For other NaaS case studies and information on the Amdocs NaaS solution, visit www.amdocs.com/NaaS. Also, read our press releases announcing the Globe and Comcast projects.

References

- T-NOVA
- Projekt202: Experience-driven transformation
- Telstra: Programmable Network
- Telus: Network-as-a-Service: Making networking easy
- Gartner: 2018 Strategic Roadmap for CSP NaaS and VNF Marketplace Platform
- Heavy Reading

About Amdocs

Amdocs is a leading software and services provider to communications and media companies of all sizes, accelerating the industry's dynamic and continuous digital transformation. With a rich set of innovative solutions, long-term business relationships with 350 communications and media providers, and technology and distribution ties to 600 content creators, Amdocs delivers business improvements to drive growth.

Amdocs and its 25,000 employees serve customers in over 85 countries. Listed on the NASDAQ Global Select Market, Amdocs had revenue of $4.0 billion in fiscal 2018.

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