Network infrastructure made simple
AT&T FlexWare devices and applications

Networks are catching up to digital expectations
Today’s digital economy requires businesses to move fast. Server virtualization, cloud computing, and software as a service (SaaS) have already gone a long way to give businesses the agility they need, enabling them to spin up new applications and compute resources on demand.

At the same time, the acceleration of network infrastructure deployments hasn’t come quite as far. Many organizations still wrestle with the time-consuming task of configuring diverse and proprietary, application specific networking equipment when adding or changing network functionality. The inability to build and scale network infrastructure quickly has hindered enterprises’ attempts to be more nimble in responding to business and customer demands.

That situation is about to change, however.
Like server and application software in data centers, functions that typically reside in wide area networks are now also being virtualized. This approach, based on standard network function virtualization (NFV) technology, is creating significantly faster and simpler ways to deploy and manage network infrastructure. In the future, with industry-standard hardware and a few clicks, you’ll be able to deploy routing and other more complex network functions to handle today’s rapidly growing volumes of data traffic and dynamically changing IT and business requirements.

Transform how you build and scale your infrastructure of the future
Using NFV-enabled solutions in the enterprise wide area network, you’ll no longer have to buy, manage, and maintain a stack of specialized network appliances – such as routers, firewalls, and WAN accelerators. Instead, you can simply run these, and virtually any other network function, as software on industry-standard, high-volume servers. Each virtual network function, or VNF, can be easily deployed, configured, and moved in the network as required.

A closer look at NFV
NFV is an industry-standard technology that enables you to quickly add network functions to your infrastructure without having to add specialized equipment for each function. NFV separates software functionality from its underlying hardware and lets you host those functions instead on virtual machines (Fig. 1).

Each software instance that is virtualized becomes a virtual network function (VNF). For example, functions like routing or WAN acceleration, and security services, such as firewalls and intrusion detection, can all be virtualized as separate VNFs. Multiple VNFs can operate on a single industry-standard server, and in the near future, it will only take a few clicks on a management portal to upload VNFs onto this server that can be located anywhere in a network. You will have the ability to easily deploy, mix, and match the functions as needed in a centralized and streamlined fashion. Your deployment times can be dramatically improved. And you’ll likely be able to reduce your total cost of ownership, too, particularly as the number of VNFs used on each server grows.

Deployment models
It’s generally possible for VNFs to reside on customer premises, in data centers, in network points of presence, including cloud locations, or in a combination of these areas.
Eventually, virtual instances of routing, security, and other infrastructure capabilities will run in the network segment that makes the most sense for a particular function. For example, WAN acceleration is typically best supported on premises, because it optimizes bandwidth and application performance across the slowest segment of the network, the last mile. On the other hand, distributed denial of service (DDoS) threat mitigation might be better suited to a cloud deployment, because it enables visibility into traffic spikes and anomalous behavior before it reaches – and possibly impacts – your company’s servers.

**AT&T FlexWare**

We are providing the benefits of NFV to our customers in the form of AT&T FlexWare, a key component of the AT&T Network on Demand platform (Fig. 2).

Our solution is offered in conjunction with AT&T VPN service and supports Juniper and Cisco virtual routers, Fortinet virtual security, and Riverbed virtual WAN accelerator. These AT&T-certified FlexWare Applications can be deployed on either small or medium industry-standard FlexWare Devices and come with flexible AT&T or customer management options (Fig. 3).

We install an FlexWare Device on your premises, bring it online and manage it, just as we would a traditional managed network device, except that the FlexWare Device has the flexibility to be virtually any kind of network appliance – or appliances – that you want. Once online and activated, the FlexWare Device connects to the AT&T SDN-enabled cloud to receive the necessary software and thereafter assumes the identity of the installed FlexWare Applications. Because the FlexWare Device can house multiple FlexWare Applications on a piece of hardware, it replaces the need for multiple specialized hardware appliances, likely reducing your total cost of ownership in comparison to what you would spend to buy and operate traditional proprietary equipment.

**Open ecosystem delivers technology choice**

The FlexWare Applications you choose won’t be one-size-fits-all. We are building AT&T FlexWare with an eco-system of best-in-class vendors, so you can pick the technology and features you prefer for the functions you want to run. We have already announced alliances with Juniper, Fortinet, Cisco, Riverbed, and Brocade, for example. AT&T FlexWare will continue to expand as we bring more vendors, more functions, and additional connectivity options on board.

**Network infrastructure made simple**

The next wave of networking technologies will transform how you manage your infrastructure. With AT&T FlexWare, you’ll be able to gain significant benefits that will let you make your business more agile and responsive.

For more information contact an AT&T Representative or visit att.com/FlexWare

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**Fig. 2. AT&T FlexWare**

- Next Gen Infrastructure
- Service Chaining
- Orchestrated Management

Software-defined, automated, virtual

Seamless integration of best-of-breed FlexWare Applications

Orchestration across network, devices, and functions

**AGILITY and FLEXIBILITY**
- Easy to deploy and scale
- Multiple FlexWare Device options

**SCALE and VALUE**
- Best of breed FlexWare Applications
- Improved TCO

**PERFORMANCE and SECURITY**
- Integrated with AT&T VPN network
- Multiple access and management options

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**Fig. 3. AT&T FlexWare Device**

- Virtual Router
- Virtual Security
- Virtual WANx
- KVM Hypervisor
- x86 Hardware
- SDN Orchestration

- Medium and small FlexWare Device
- Up to 4 VNFs on medium FlexWare Device and up to 2 VNFs on small FlexWare Device
- FlexWare Applications run as virtual machines on top of the hypervisor
- SDN orchestration for FlexWare Application provisioning and management

AT&T FlexWare is easy to phase into your network and is more efficient in multi-site, mixed-vendor environment than proprietary equipment. Customers who have expiring network equipment contracts across multiple locations or those who have gone through acquisitions, for example, will benefit particularly from the NFV-enabled FlexWare approach as they attempt to simplify their infrastructures or integrate many disparate hardware platforms.