Solution Brief

Virtual Slice Selection Function (vSSF)

A More Profitable Network Any Way You Slice It

The Challenge

Mobile data traffic. It's a growing challenge for mobile network operators (MNOs), and not just in terms of volume. The variety of mobile data traffic entering networks today is unprecedented: voice, video, social media, smart meters, connected cars, online gaming, etc.

In that variety, MNOs also have an unprecedented opportunity to monetize data traffic in their networks—provided they create new services around those opportunities and optimize their networks to deliver those services profitably.

MNOs are competing with the over-the-top (OTT) providers to make money from the new wave of mobile data traffic. For the most part, MNOs are constrained by cumbersome networks that lack the flexibility to capitalize on this opportunity. If they want to implement network slicing in their networks today, MNOs are largely limited to allocating network resources by APN (Access Point Name). That's like having an option of A, B, or C to handle a whole alphabet of possibilities. This approach is both time consuming and highly-inefficient, requiring configuration across multiple network elements and does not offer fine-grained control of network resources.

The Solution: Network Slicing... Now

Much of the 5G revolution is built around the idea of network slicing enabling operators to configure virtual network instances that are optimized to the specific functional requirements of a customer or application. This can be done more quickly and at lower cost than building traditional dedicated networks, which basically opens up the network to handling all kinds of use cases. But here's the thing: MNOs don't need to wait for 5G to monetize and optimize differentiated mobile services. They can begin doing it right now with their existing network—legacy, virtualized, multi-vendor, using Affirmed's Virtual Slice Selection Function (vSSF).

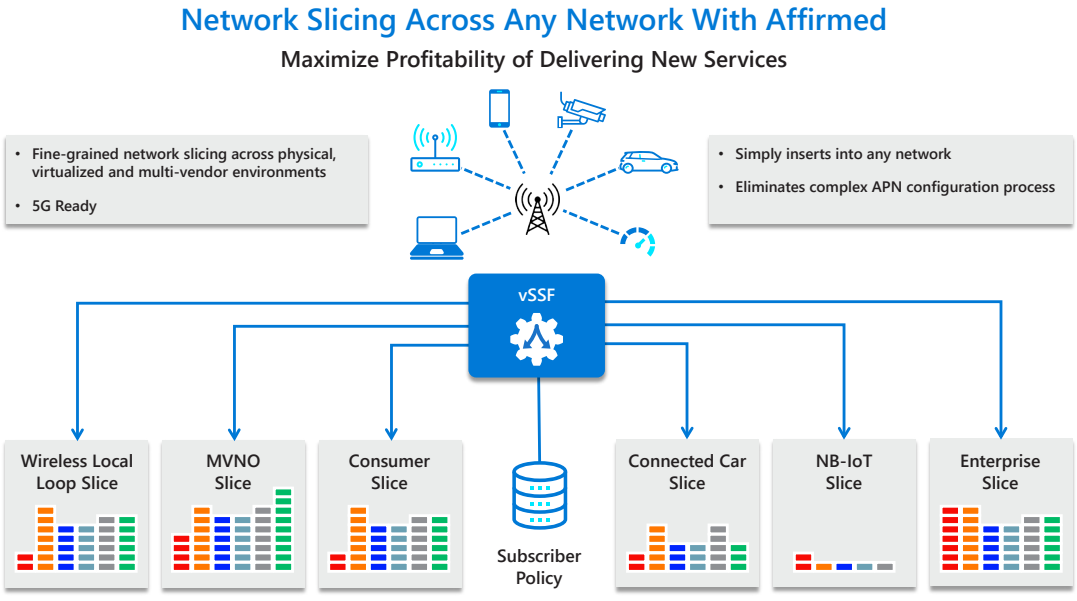

Figure 1. Affirmed Virtual Slice Selection Function (vSSF)

Affirmed Virtual Slice Selection Function (vSSF)

The Affirmed vSSF provides fine-grained slicing of network resources enabling mobile operators to easily segment traffic and direct it to network slices that are optimized for the services they are delivering. This centralized function is a single touch point, using policy driven controls to manage resource allocation for both physical and virtual gateways in the network. Traffic can be steered based on a variety of criteria, such as device type, location, loading, time of day or external policy, enabling easy segmentation of network traffic into customized slices.

This is in sharp contrast to the way most MNOs "slice" traffic today using APNs which requires the operator to configure multiple network elements and coordinate the activities across different organizations. This has created a complex error prone process increasing the overall time and cost required to create slices in the existing network.

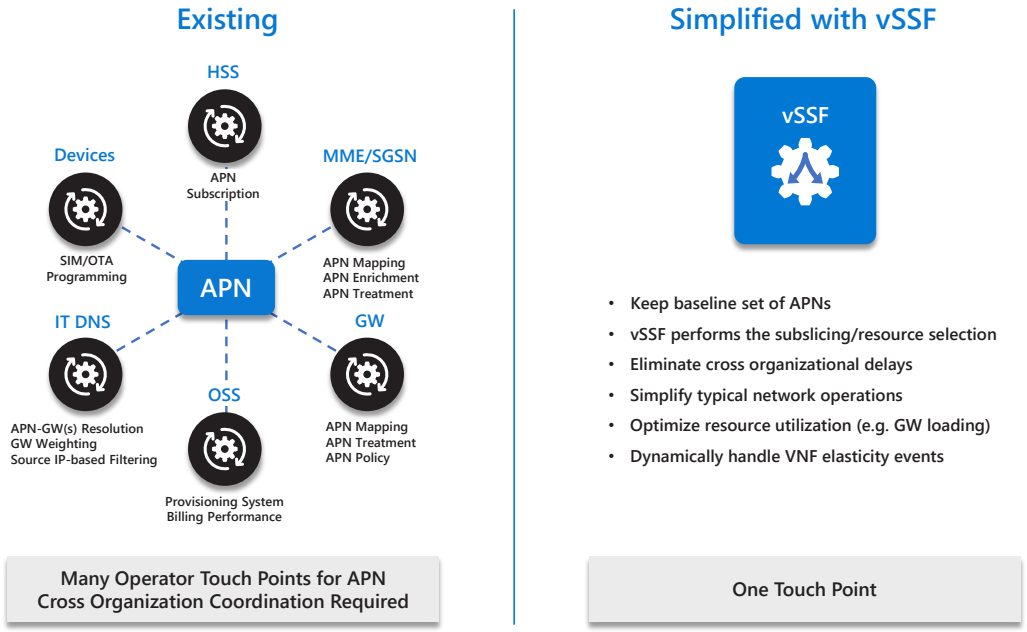

Figure 2. Comparison of complex APN configuration process to vSSF centralized function

The Perfect Slice, Every Time

Think about the new kinds of data services that are entering the mobile network: smart meters, social media-only plans, connected cars, mobile medical applications, online gaming. All of these different service types have very different characteristics. Some may require ultra-low latency, others may require high bandwidth, and all of them have their own pricing models. Trying to accommodate different variables by creating an endless array of APNs is time-consuming and, more importantly, cost-consuming. The inevitable result is that MNOs end up generalizing rather than optimizing their services, and so they lose money on some services or miss an opportunity altogether.

The Affirmed approach unwinds the native complexity of mobile networks by replacing it with a centralized, single touch method that allows operators to automatically select specific slice resources based on the end user and operator configured policies. Need a high-bandwidth, low-latency slice for infotainment/connected car services? Affirmed vSSF can easily identify and steer this segment of traffic to a customized slice or multiple slices without making changes to your existing APN configuration.

And Did We Mention It'll Slice Your Operating Costs By 70%?

The Affirmed vSSF eliminates the complex, time consuming APN process and replaces it with a "one touch" function that inserts into existing operator networks. Operators can save up to 70% in time and effort using the vSSF over the current APN process.

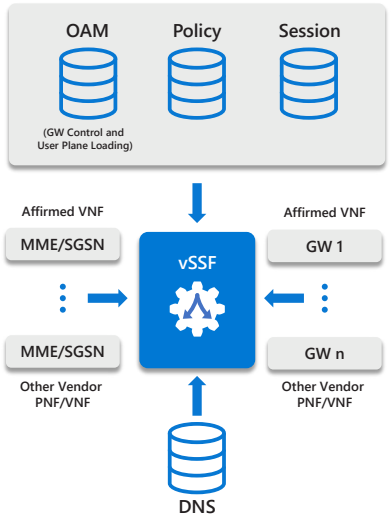

Figure 3. Affirmed vSSF simply inserts into existing networks

Target Use Cases for the vSSF

Accelerate Transition to Virtualization

- Physical Network Function (PNF) -> Virtual Network Function (VNF) Migration
  - Ease of managing fixed size PNFs and elastic VNFs
- VNF Elasticity
  - Arbitrate existing static DNS weighting system and dynamic VNF scaling
- New Service/Feature Velocity
  - Add new Gateways for new services
  - Isolate a Gateway for new feature testing before larger rollout

Operational Maintenance

- Gateway Maintenance
  - Remove G/S/P-GW from service for upgrade
  - Capacity Modification
- APN Migration (to different Gateway)
  - Move specific users within APN
  - Real-Time distribution adjustments
- Sandboxing
  - Move specific UE to a GW for troubleshooting
  - New device production testing

New Service Rollout

- Fine Grain Sub-Slicing
  - Complement to APN, MOCN and DECOR routing
  - Device Type, IMSI, Group, etc.
- Gateway Innovation
  - Easily add new Gateways (multi-vendor)
  - No need for new APN
- Network Slice Selection Function (5G)
  - vSSF evolves to standalone NSSF

Combining Affirmed Innovations

Combining the vSSF with other Affirmed innovations, such as the Affirmed vEPC, operators can rapidly deploy network slices and new revenue generating services reducing the time-to-market and operational costs significantly. Adding the Affirmed Virtual Probe, operators receive real-time analytics on individual slices and services, enabling them to improve service quality, reduce network support costs and identify new service opportunities.

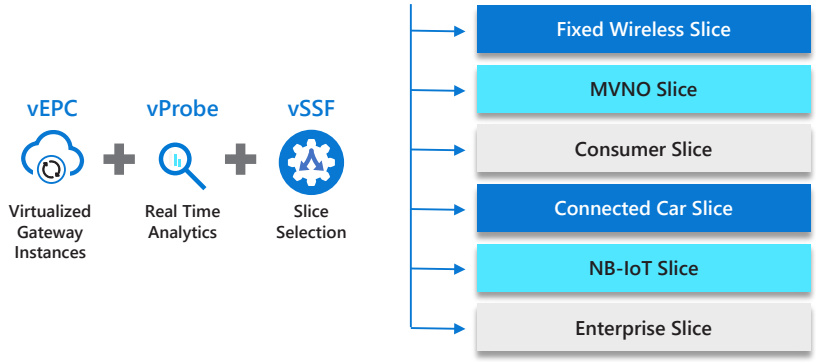

Figure 4. Optimize the costs, time-to-market, and performance of service delivery

vSSF Features and Benefits:

Cloud Native

- Stateless Operation
- VNF, Containers, Micro Services

Ease of Introduction and Simple Operation

- No MME/SGSN changes required
- No SGW/PGW/GGSN changes required
- Single Stateless VM—independent operation and placement
- MME/SGSN and GWs unaware of the vSSF

Advanced Steering Criteria (local and external)

- IMSI (-Range), IMEI, Source Node, APN, RAT, GW Loading, GW Maintenance, UE Location and more

Simplify Operational APN/GW Selection

- Single point of managing all GW selection
- Visual view of GW distribution/loading

Unlock the Power of Virtualization

- Easy migration of traffic from physical elements to newly instantiated Virtual Instances

Low Cost

- Minimal product introduction Cost—No Peer changes
- Operational cost reduction—simplify network operations, shorter maintenance windows
- No stranded investment—vSSF will evolve to the 3GPP Network Slice Selection Function (NSSF)

Summary

Through the use of vSSF, operators can now automate the creation of new network slices, select and steer traffic based on very granular criteria, and monitor the slice performance in real time—delivering a high quality of experience, the right level of security, and the ability to spot new service opportunities. So don't wait for 5G to grab your slice of the mobile data services market. Talk to Affirmed today and start making money now.

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