



Allot Virtual TDF/PCEF Drives Real Data Monetization

Solution Brief



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1 Virtualization to Save Costs; Generate Revenue

Broadband carriers and service providers are looking to NFV to help them lower the cost and increase the revenue from the network services they offer.

One of the major barriers to fast and cost-effective new service deployment is the need to install and integrate myriad hardware, software and management systems to get services up and running. Moreover, managing and updating these diverse systems involve significant operating expenditures that raise operators' total cost of ownership (TCO).

Network Function Virtualization (NFV) defines a new network architecture designed to overcome these challenges by decoupling network applications from the underlying hardware, and enabling services to run on standard, off-the-shelf hardware with greater flexibility and efficiency and at far lower cost. NFV also automates and simplifies the deployment and management of multi-tier network services. As a result, a service deployment cycle that would traditionally take months can now be completed in a matter of days at much lower cost and risk.

In addition to reductions in capex and opex, the most important benefit that mobile operators expect to achieve with NFV is faster time-to-market and time-torevenue for new service deployment. For example, when trial testing a new service before rollout, NFV reduces the risk by making it easy to adjust the offering according to early adopter feedback and thereby assure its success. NFV also enables new kinds of complex services that were previously impossible to support. For example, customers could be allowed to change their services or buy new ones in real-time via a self-service portal because the network will be able to update the relevant functions automatically. The increased service agility and substantial cost savings promised by NFV translate into both immediate and long-term advantages for network service providers.

While NFV promises compelling benefits, it also introduces daunting challenges for network operators. NFV migration will not happen overnight. How should operators manage this transition? What network functions should be virtualized first and how will operators reap the greatest ROI from virtualization?

As functions are virtualized, they must be able to work seamlessly with physical network functions that are still in place. Likewise, as operators save money on hardware and operational costs, they must be able to harness the benefits of NFV to make it easier to monitor, analyze, control, and charge for network services.

Allot's virtual TDF/PCEF solution, carrier deployment know-how, and commitment to interoperability in NFV-SDN ecosystems, advances network operators toward these goals.

2 Allot Virtual TDF/PCEF

Allot vTDF/PCEF solutions comprise a number of virtualized functions, including encrypted traffic classification, network analytics, policy control, policy enforcement and real-time charging. This virtual platform has the same capabilities as Allot's traditional TDF/PCEF, which is currently deployed in Tier-1 carrier networks worldwide.

Like its physical counterpart, Allot's vTDF/PCEF connects and coordinates the data and control planes to enable efficient and personal service delivery. Allot's superior traffic classification, based on DPI and other proprietary technologies, identifies subscriber-application traffic and enables granular policy enforcement and charging actions to be applied to the traffic flows in real time. Enforcement actions include traffic management, congestion control, online/offline charging, traffic steering to value added services, as well as application-aware service chaining, which becomes more flexible and efficient when implemented in a virtual environment.

Allot's vTDF/PCEF can be deployed anywhere from the core network to the operator's cloud infrastructure. This transition from proprietary equipment installed in a specific topology location, to Virtual Network Functions that can be distributed throughout the network and uniformly managed, enables operators to:

- Simplify and automate TDF/PCEF deployment, provisioning and configuration.
- Add elasticity to the network for more fluid and efficient allocation of TDF/PCEF resources.
- Leverage the operator's distributed cloud infrastructure to implement complex use cases with ease.

For example, if a TDF/PCEF platform is installed in the core network upstream from the Packet Gateway, and the operator wants to deploy another POP, a new TDF/PCEF system or a complete vEPC (virtual Evolved Packet Core) can be onboarded with a single click, rather than physical installation of on-site systems. Clearly, virtual *instantiation* is more agile and cost-effective than traditional methods involving complex projects with hardware deployment and manual provisioning.

2.1 Compliant with ETSI

Allot is one of the key leaders working on the Virtual Network Functions Architecture standard that is currently being defined by the European Telecommunications Standards Institute (ETSI) NFV ISG (Industry Specification Group). This ETSI document defines TDF as a virtualized network function (VNF) within the virtual evolved packet core (vEPC) architecture. As a virtualized network function, Allot vTDF/PCEF complies with the ETSI NFV blueprint for VNF deployment and includes the following main components:



- Virtual Network Function Components (VNFC). The VNFCs may scale up and scale out independently and may have different high-availability schemes depending on the function they perform.
- Element Management System (EMS) to manage the lifecycle of Allot virtual components (VNFCs) that comprise the vTDF/PCEF; and to communicate with the NFV cloud infrastructure and the NFV Orchestrator. While the role and responsibility may vary, providing Allot EMS as part of our virtualized architecture will ease and accelerate the transition from traditional to virtual service deployment.

	NFV MANO								
Network Control	k Control Allot Virtualized Multiservice Platform and Service Functions								
FIGHE VINES	Control Plane Integration	Network Intelligence	Secu Servi	rity ces	Policy Control & Charging		NFV		
Policy		Traffic Management	DDoS	ection	Value Added Services		Urchestrator		
Charging		Traffic Classification		Policy Enforcem	ent/Metering	llot E	Vi-Vnfm		
		Data Collection and Mediation		Traffic Steering		SM	VNF Manager		
СЕМ		Network Anomaly Detection		Multi-tenancy					
		Ve-Vnfm							
	Virtualized Infrastructure Manager (VIM)								

In full compliance with the ETSI-NFV blueprint, Allot's virtualized multiservice platform drives agile service delivery in NFV-SDN environments

2.2 Enabling Smooth Migration

Given the compelling benefits of NFV, operator investment in virtualization of the network is growing fast, as operators determine which part of the network to tackle first; how to approach the migration; and how to demonstrate at every step along the way that the intended benefits are being realized.

Allot solutions are uniquely poised to operate seamlessly in hybrid environments where some network functions are virtualized and others are physical to ensure interoperability with existing network infrastructure during the NFV migration process. Most importantly, virtualization should not impact the delivery of existing services, regardless of whether the underlying mechanism is a physical or virtual function. Standards for high service availability should be maintained throughout the migration process.

2.3 Know How

NFV migration is fraught with unknowns and is not without risks. Virtualization is only part of the goal. The other important goal is to maintain all existing functionality and to be able to leverage the virtualized cloud infrastructure to implement more complex use cases that advance the operator's business. Allot is a solution partner who has implemented hundreds of successful use cases involving



Policy and Charging Control integration in demanding carrier environments. Allot starts in the lab and with proof of concept trials conducted in the customer network. Then we apply our know-how and experience to translate success in the lab to success in the operator's production network.

Allot's experience in use case implementation is directly applicable to the virtual world, which is much more flexible and agile and enables complex uses cases to be implemented with greater ease and cost effectiveness. For example, Allot vTDF/PCEF supports context-aware traffic steering and service chaining. Rather than follow a linear chaining path that is dependent on hardware location, NFV allows virtualized service to be located anywhere in the network. Chaining decisions are based on the granular application-awareness that Allot vTDF/PCEF delivers to the PCRF in real-time. This allows the PCRF to make intelligent decisions and to route only the relevant subscriber-application traffic through a particular service chain. Allot has field-proven interoperability with most PCRF vendors accelerates deployment of end-to-end use cases.

Unlike many virtualization vendors whose expertise is only in the control plane or only in the data plane, Allot solutions have always operated in both control and data planes of the network, and we have years of experience in successfully integrating these two worlds to deliver revenue-generating services and optimize user quality of experience.

2.4 Seamless Interoperability

Allot vTDF/PCEF platform includes the standard interfaces that make the ecosystem work. Allot has powered numerous PCC integrations and innovative use case deployments based on standard Diameter Gx, Gy, Gz and Sd, Sy, interfaces to other network functions.





Allot end-to-end PPC solutions support standard interfaces to other network functions in virtualized and traditional network architectures

Allot's vTDF/PCEF provides advanced features to support the "distribution" in NFV environments where virtual machines and functions may be distributed across the network.

Allot supports native distributed DPI and distributed QoS in which meta data synchronization is used to ensure that each IP flow will be correctly identified, the subscriber information and policy will be propagated to relevant software instances and appropriate QoS will be applied, no matter what appliance, or virtual appliance the traffic passes through and even in cases of asymmetric traffic flow where one side of the connection may pass through one VNFC and the other side through another VNFC. Knowing how to efficiently synchronize communication between multiple instances of the same function is critical to operating in a virtualized environment.



3 Benefits of Allot vTDF/PCEF

NVF promises to deliver higher return on capital investment in the near term and to lower long-term operating expenses. As part of the NFV landscape, Allot vTDF/PCEF provides essential, virtualized functions that will make it easier for carriers to create, deliver and monetize data services as they:

- Accelerate time to market by shortening the procure-design-integrate-deploy cycle.
- **Lower capex and opex** by reducing dependence on hardware deployed at specific points in the network; reducing the need for hardware redundancy and the rack space it requires; and reducing the need for skilled manpower to manage and maintain proprietary hardware.
- **Increase revenues** by making it easier to implement complex new use cases such as application-based charging and others.



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