



Is a Marketplace for NetApps a realistic business perspective ?

G. Xilouris

MediaNetworks Lab, National Centre of Scientific Research "Demokritos" (NCSR)





Network Programmability Potential Benefits

	Essential	Important, But Not Essential	Useful, But Not Important	Not Important at All
Improved resource utilization	35.8%	42%	16%	3.7%
Enabling of service and network innovation	30.5%	46.3%	15.9%	2.4%
Enabling the deployment of lower-cost hardware	36.6%	39%	14.6%	4.9%
Reduced operational cost, especially in maintaining distributed equipment	41.5%	34.1%	18.3%	3.7%
Automation/service orchestration with increased service velocity	36.6%	39%	19.5%	3.7%
Coordination of carrier network resource assignments with IP/MPLS and DC networks	37%	38.3%	17.3%	4.9%
New services and services monetization	39.5%	35.8%	17.3%	2.5%

Note: Arranged in descending order based on percentages of "Essential" plus "Important"

Source: Heavy Reading Study of Network Operators, 2013



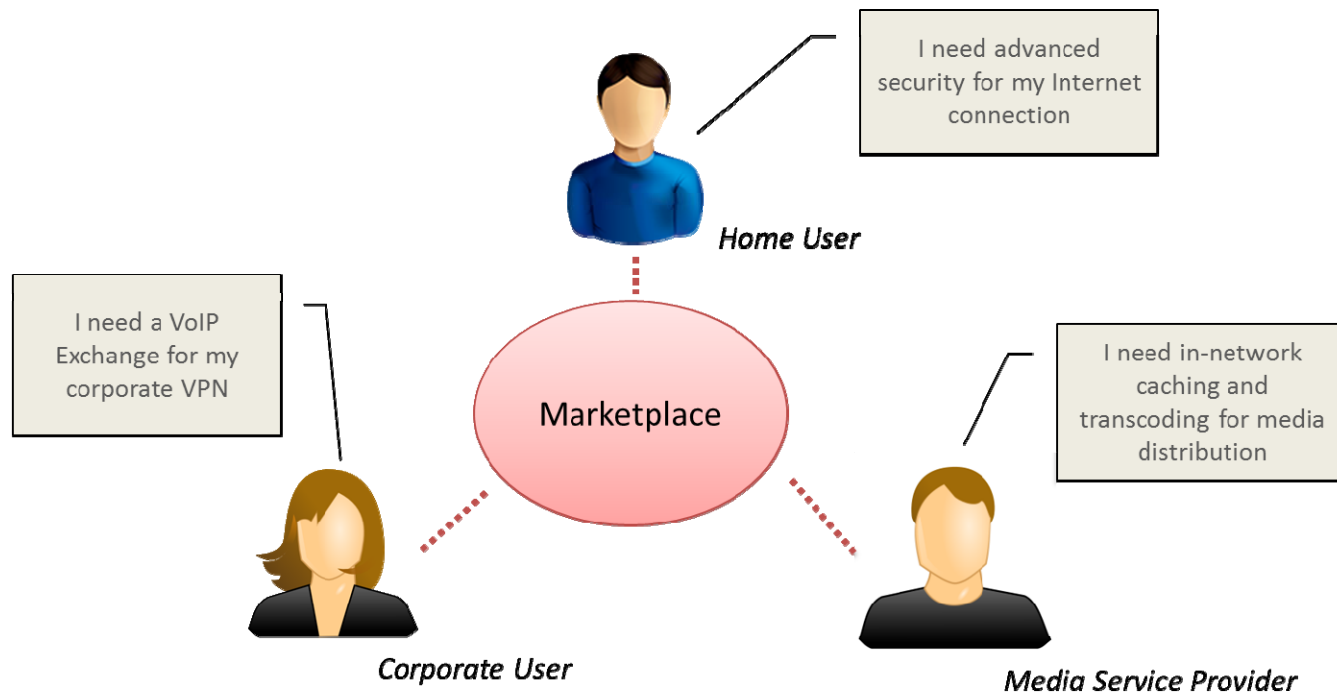


Opportunities for Operators

- **Faster Open Innovation** - embrace broad openness for development and consider creating open marketplaces for the promotion and sale of applications
- **Speedier certification of new applications and services** - support the fast on-ramping of new applications and services (operational wise)
- **Business model innovation and fast introduction of new revenue models** - include third parties, build on top of the ability to collect, analyze, and monetize data to support these new models
- **Use of analytics across the network** - lack of capabilities to process such large volumes of data can be turned into information that points to new monetization opportunities
- **Application and content user-friendliness** - shift towards user-friendliness based on tighter interaction between applications, data, and customers



Marketplace Concept



- Two Marketplace models can be envisaged
 - Customer is owner of the infrastructure – Marketplace offers the application
 - Operator owns the infrastructure – Marketplace offers the composed service (connectivity + VNF)

Marketplace Initiatives

- Initial efforts for NetApp Marketplaces have recently emerged
- Industry Based
 - HP SDN App Store
 - CIENA Agility Matrix and NFV Marketplace
 - Wind River NFV Marketplace
 - Pertino AppScape
- R&D
 - T-NOVA Project
- Other related
 - GSMA Marketplace

The image displays three screenshots of marketplace initiatives:

- HP SDN App Store:** A screenshot of the HP SDN App Store homepage. It features a navigation menu on the left with categories like 'Apps Circle 1 HP', 'Apps Circle 2 Partner', 'Apps Circle 3 Community', 'Concept Apps', 'Controllers', 'Monitoring and Troubleshoot...', and 'Optimization'. The main content area includes a 'Welcome to SDN App Store' banner, 'Featured Apps' section, and an 'Agility Matrix: Components' section. The 'VNF MARKET' section lists various components like vRouter, TCP Cloaking Security, Encryption, WAN Optimization, and Performance Testing, with associated descriptions and logos for Brocade, Certes, and Black Ridge Technology.
- Pertino AppScape:** A screenshot of the Pertino AppScape interface. It shows a navigation bar with 'All', 'Connect', 'Secure', 'Optimize', and 'Manage'. Below are several app cards: 'NameStation', 'ADConnect', and 'iOSConnect', each with a brief description of its functionality.
- GSMA Marketplace:** A screenshot of the GSMA Marketplace homepage. It features a central video player with the text 'Watch the intro video' and 'Buyer'/'Seller' icons. The page includes a 'WELCOME TO Marketplace' message, a 'Quick Search' section, and navigation links for 'For Buyers', 'For Sellers', and 'Research Center'.





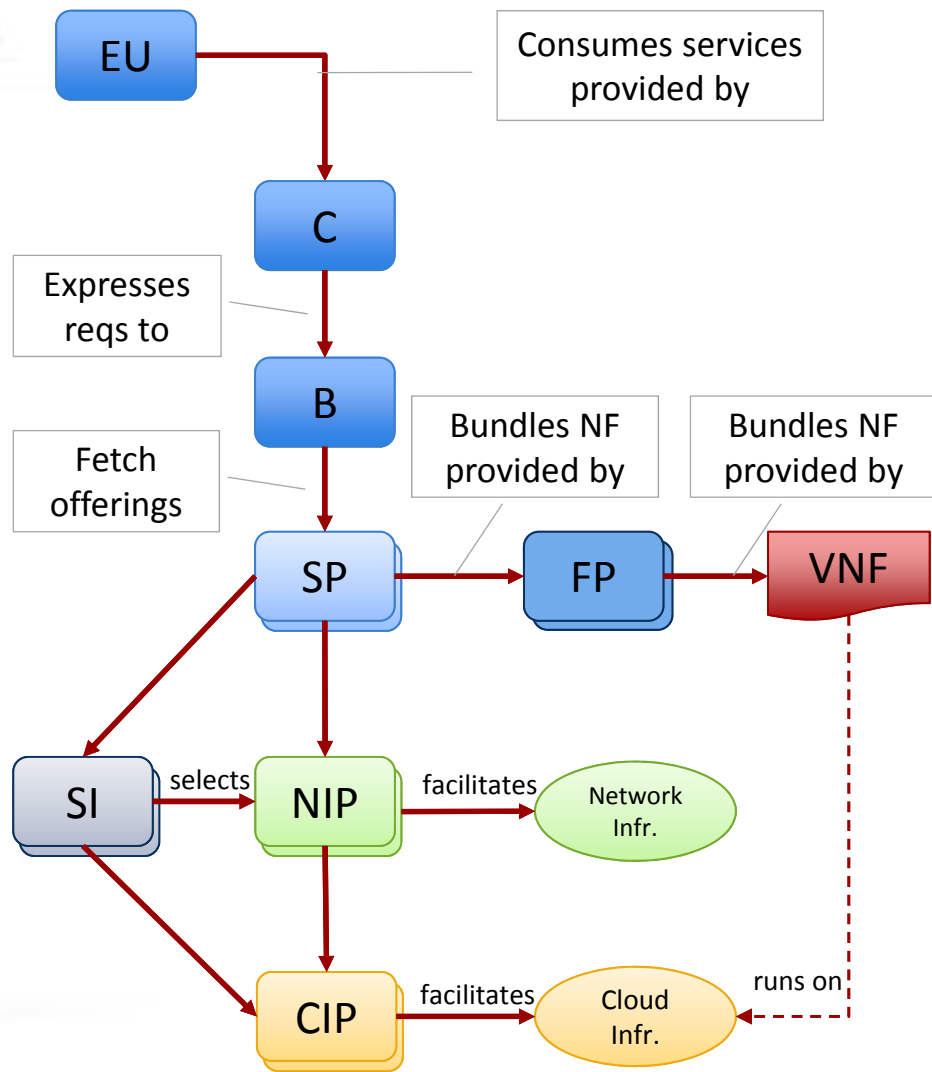
Technical Challenges

- Security and Trust (crucial to accept 3rd party developers)
- VNF Validation and Certification
- NS Verification (dynamic composition of NS by the operator's customer)
- Responsibility resolution
- Monitoring/analytics for billing and auditing
- Support for VNF specific VNFM
- VNF metadata description model (VNFD) and packetisation





VNFaaS marketplace model





VNFaaS Billing Models (Customer – SP)

Pay as you go

- Per volume of traffic processed (depending on flavor)
- E.g. \$0.1 per GB processed/forwarded by a VNF

Flat rate

- Per VNF instance (flavor), for a given period
- E.g. \$250 for a 100Mbps vDPI per month

Tiered rate peak/off- peak traffic

- Flat fee (probably with some traffic cap) plus extra fee for overuse
- E.g. \$250 for a 100Mbps vDPI per month, including 100 GB traffic, then \$0.1 per GB processed





VNFaaS Billing Models (SP – FP)

License

- charge once per perpetual use of the VNF (e.g. annual, or shorter time.)
- the software license the SP purchases from the FP may include, e.g.:
 - authorisation for N customers to use the NF in parallel
 - recommendations concerning efficient deployments.
 - training for SP and/or end customers.
 - rights to new software releases during the term of agreement at no additional cost.

Shared Revenue

- Combination of Pay per use (Customer) and License (FP)
- e.g. the final charge to the customer is distributed and split among different actors





T-NOVA marketplace

- Allow network services and functions by a variety of developers to be published and brokered/traded
- Allow customers to browse the marketplace and select the services and virtual appliances that best match their needs, as well negotiating the associated SLAs and billing models

TNOVA
Marketplace

Menu

VNFs /

+ New VNF

VNFs

Status	Name	Description	Price	Type	SLA Specifications	Requirements	Actions
Published	DPI 1		€4.00 /Month	DPI	Packets in/out 1000-2000packets/sec Errors 2-15errors/sec Packet Loss 1-8%	RAM 256MB CPU 1CORES Hard Disk 3GB	
Published	DPI 2		€8.00 /Month	DPI	Packets in/out 3000-6000packets/sec Errors 0-10errors/sec Packet Loss 0-5%	RAM 512MB CPU 2CORES Hard Disk 5GB	
Published	DPI 3		€18.00 /Month	DPI	Packets in/out 8000-12000packets/sec Errors 0-3errors/sec Packet Loss 0-2%	RAM 2048MB CPU 4CORES Hard Disk 10GB	
3 VNFs							



Thank you!



www.medianetlab.gr

www.t-nova.eu



xilouris@iit.demokritos.gr

