# BLOX FEST

Infoblox

# Infoblox NFV and SFV Theory Meets Real World

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# Introduction - ETSI and NFV

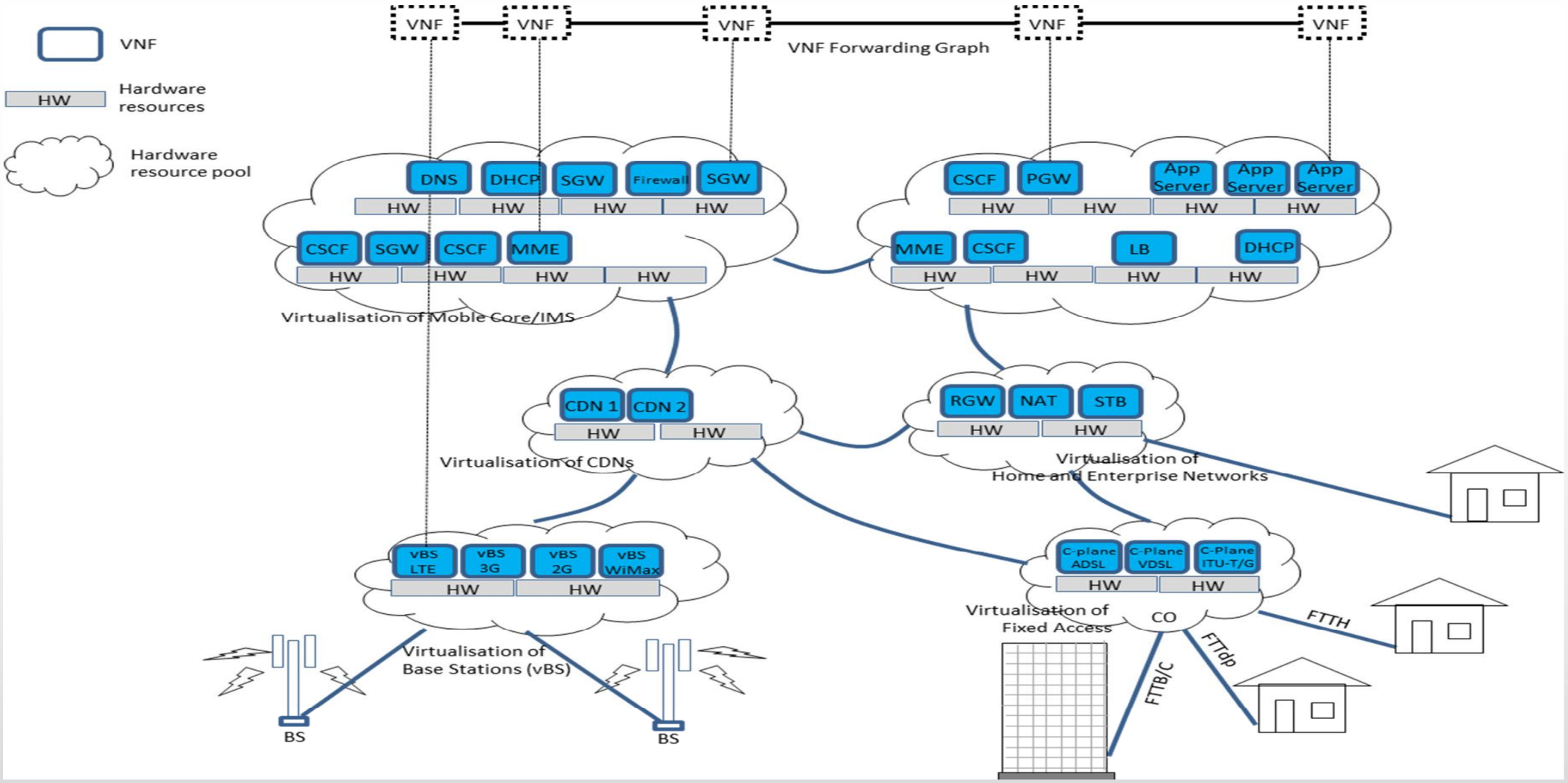
- In November 2012 published 1st NFV Whitepaper
  - AT&T – BT – CenturyLink - China Mobile – Colt - Deutsche Telekom – KDDI – NTT - Telecom Italia – Telefonica – Telstra – Verizon
  - Second draft took 11months, and in 2016 there are over 296 members participating worldwide.

- Promises of NFV
  - Reduced costs, consolidating, economies of scale, Multitenancy to share resources across services and across different customer bases
  - Time to Market - faster innovation HW agnostic software-based development, faster feature evolution, reduce the maturation cycle.
  - Targeted service introduction - geography, customer sets is possible, pay as you go with dynamic workloads
  - Wider Ecosystem - pure software entrants, small players and academia, encouraging more innovation to bring new services and new revenue streams quickly at much lower risk.

- Challenges as outlined by ETSI
  - Managing and orchestrating many virtual network appliances while ensuring security from attack and misconfiguration.
  - Network Functions Virtualisation will only scale if all of the functions can be automated.
  - Ensuring the appropriate level of resilience to hardware and software failures.
  - Integrating multiple virtual appliances from different vendors.
  - Network operators need to be able to “mix & match” hardware from different vendors, hypervisors from different vendors and virtual appliances from different vendors without incurring significant integration costs and avoiding lock-in.

- Questions:
  - How do you manage addresses and DNS changes with dynamic workload?
  - How do you track critical and historical info across multi vendor multi-tenant vendor agnostic, environments?
  - Where are the biggest challenges and delays in the automation of “ALL FUNCTIONS”?

# ETSI – NFV Architectural Overview




PUBLICATION DATE October 15-17, 2013 at the “SDN and OpenFlow World Congress”, Frankfurt-Germany. This white paper is available at the following link: http://portal.etsi.org/NFV/NFV_White_Paper2.pdf

# NFV Implementation Challenges Real World

- Where are the Cost Savings?
  - Implementations typically require parallel investment in Virtual Compute and Storage
  - Staff needs to be trained and in most cases hired…and still trained.
  - Security continues to be a concern especialluy in multi tenant service offerings to the Enterprise
  - Licensing costs for Comercial Hypevisor and Cloud Orchestration is Incremental add
  - Public cloud has attractive lower cost entry points (hmmm, are there hidden costs as I grow)
- Where is the Service Agility?
  - A NAM Tier 1 provider told their entier leadership team, that the end of a two year investment cycle in NFV/SDN would not realize profits until the end of 2017
  - Existing players are laucnhing OTT services already which compete directly with SP offerings
  - Most Providers and their customers need to deploy NEW solutions and different operations models not really simplification.
- Good News Bad News
  - Good news for the customer/enterprise
    - More Choices more competition for your IT dollars
    - Multi vendor and hybrid models such as bursting capacity to AWS
    - Lower costs and more time to focus on Business agility not IT inagility (Make IT someone elses problem)
  - Bad news for devops
    - Network Functions Virtualisation will only scale if all of the functions can be automated.
    - Ensuring the appropriate level of resilience to hardware and software failures.
    - Security Risk vs. Cost

# Infoblox DDI Solution: Secure By Default

Secure Hardened Virtual Systems

No External DB / Guest OS Mgmt

VRRP System High Availability

Embedded System and Protocol
High Availability (DNS DHCP etc.)

Near Real Time GRID DB Sync (Data Replication)

*Compatible with TSIG & external Zone Transfer systems (IXFR/AXFR)

Patented GRID™ - Centralized Policy Enforcement

Robust, Scalable, Secure, DDI Services Delivery and Control

Restful Web API: Orchestration Freindly DNS/IPAM provisioning programming

http://www.infoblox.com/solutions/service-providers/cloud-service-providers

Richly supported plugin ecosystem (Neutron (openstack), vRealize/vCAC, etc..)

openstack™ CLOUD SOFTWARE

vmware PARTNER TECHNOLOGY ALLIANCE

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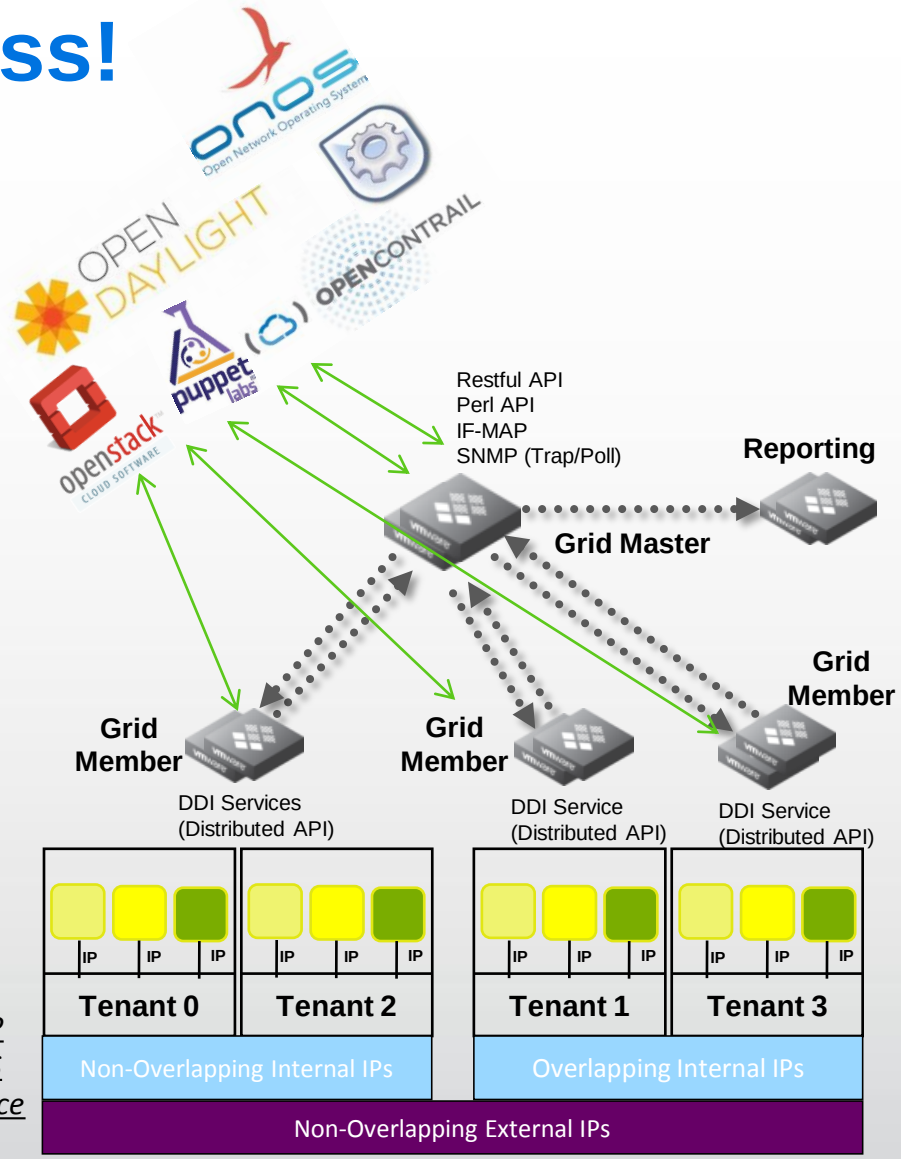
# Three Infoblox Use Cases:


- SDN/M2M Orchestration of DNS / IPAM
  Cloud Friendly Programmability
- vEPC - IMS DNS Traffic Controller
  Intelligent namespace delivery, MME selection
- vSecure – Gi / Gn “GRIDaaS”
  Secure, Scalable, Automated DNS SDN Infrastructure

# Infoblox Use Case 1:

- SDN/M2M Orchestration of DNS / IPAM
  - Cloud Friendly Programmability
  - Operations Visibility and Control
  - Service Instantiation Automation
  - Real time Reporting and vIntegration

# 1. Infoblox Orchestration - The NFV M2M possibilities are endless!




*Subject to orchestration platform proxy/offload capability of DNS/DHCP Infoblox DHCP fingerprinting and DNS Firewall require direct end point service interaction for proper functionality*

**Description**

Integrate Infoblox "Grid" based automation for secure, scalable, centrally managed, distributed control plane of DNS policy enforcement and change control.
*Full lifecycle SFV/NFV Orchestration demands DNS Control*
*Leverage Grid and/or External Non Grid SDN elements*

Infoblox Grid

- Creates/Deletes networks via Restful APIs
- Allocates/De-allocates IP addresses and DNS RR's when VMs are created or floating IPs are assigned
- Creates/Deletes DNS host records or A/AAAA/PTR/CNAME records for allocated IPs
- *Provides DNS and IPAM Services For Provisioned Objects
- Manage/Maintain/Enforce DDI internal, external, tenant project relationships

**Benefits**

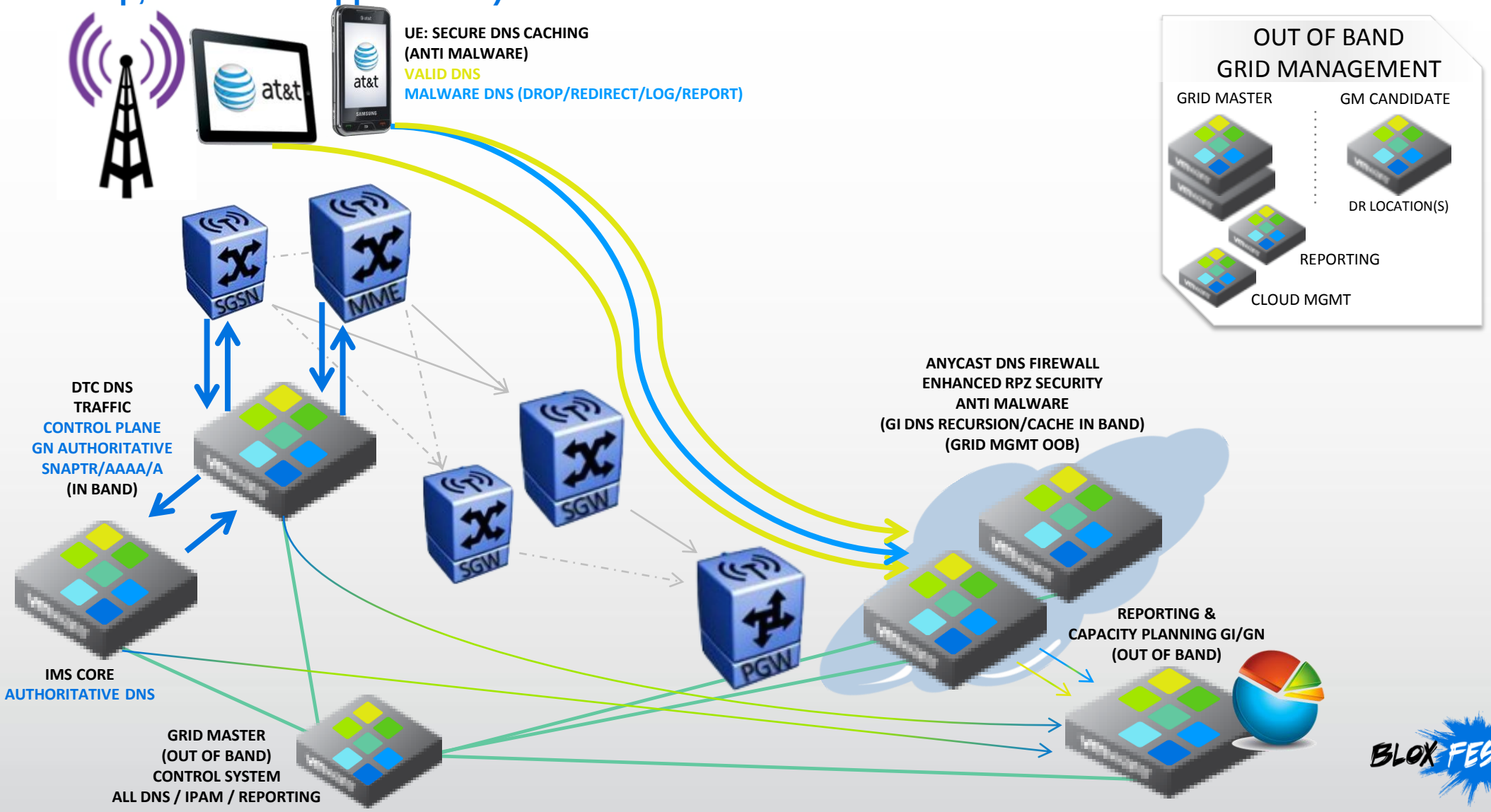
Centralized Robust Cross Platform DDI Service (KVM – vmware - Microsoft or embedded platforms)
High Availability, Operational Efficiency, Extensibility
DNS, DHCP, IP Automation and Visibility IPv4/IPv6

# Infoblox Use Cases 2:

- vEPC –
- IMS DNS Traffic Controller Intelligent namespace delivery, Gateway selection
  - DTC DNS Traffic
  - Control plane
    gn authoritative SNAPTR/AAAA/A
- GI DNS recursion/cache in band
  - Anycast DNS Firewall
  - enhanced RPZ Security
  - Anti malware
  - Service Protection vSecure

# 2. Infoblox DNS for Gn/Gi vEPC

## (Flow, Relationship, Gn/Gi DNS applications)



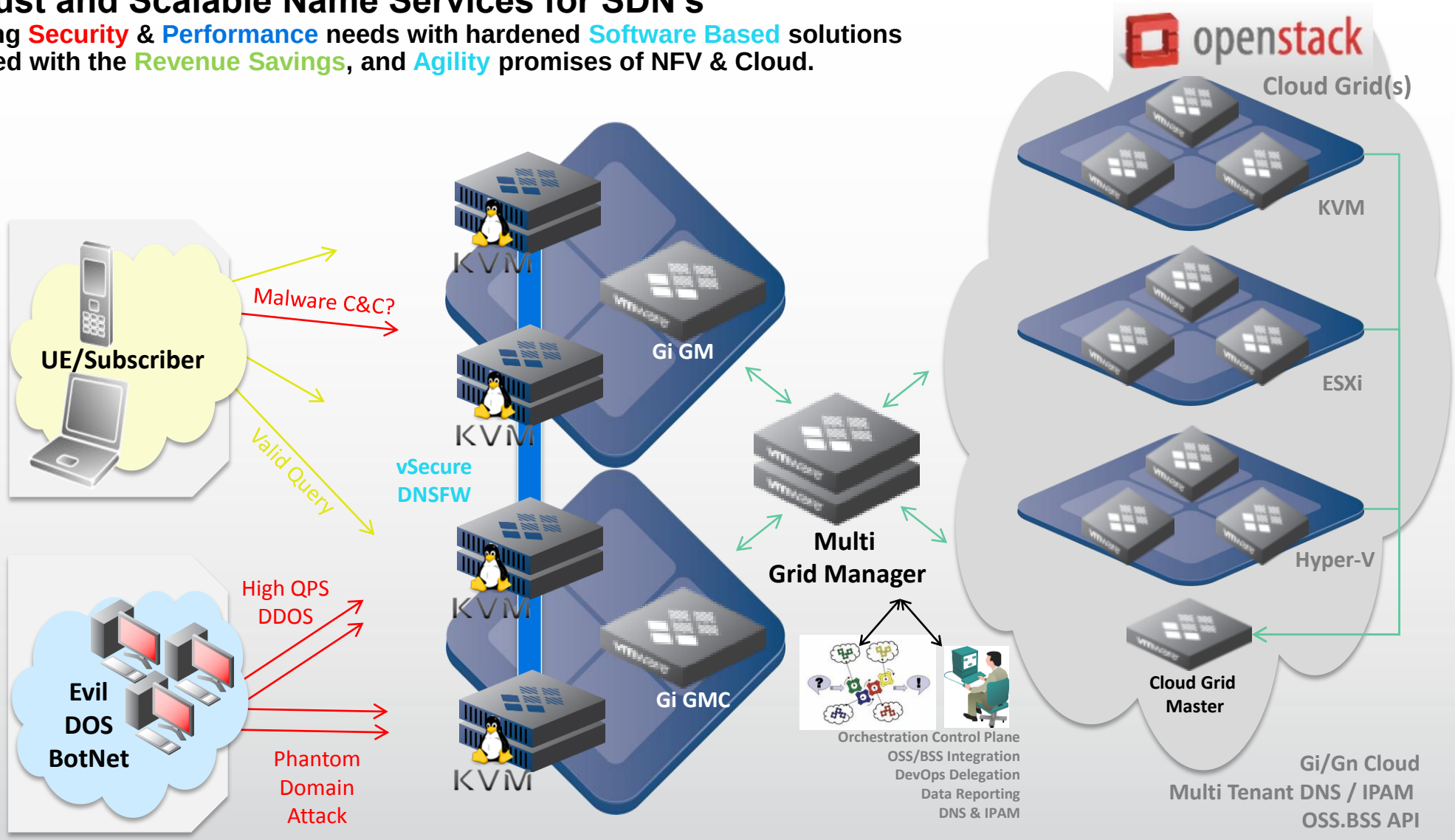
# Infoblox Use Case 3:

- vSecure – Gi / Gn “GRIDaaS”
  - Secure, Scalable, Automated DNS NFV/SFV Infrastructure
  - Autoscaling
  - Management across network planes
  - VRF Discovery
  - IPAM and vDiscovery
  - Reporting
  - Dynamic Workloads
  - Private Cloud
  - Hybrid Clloud

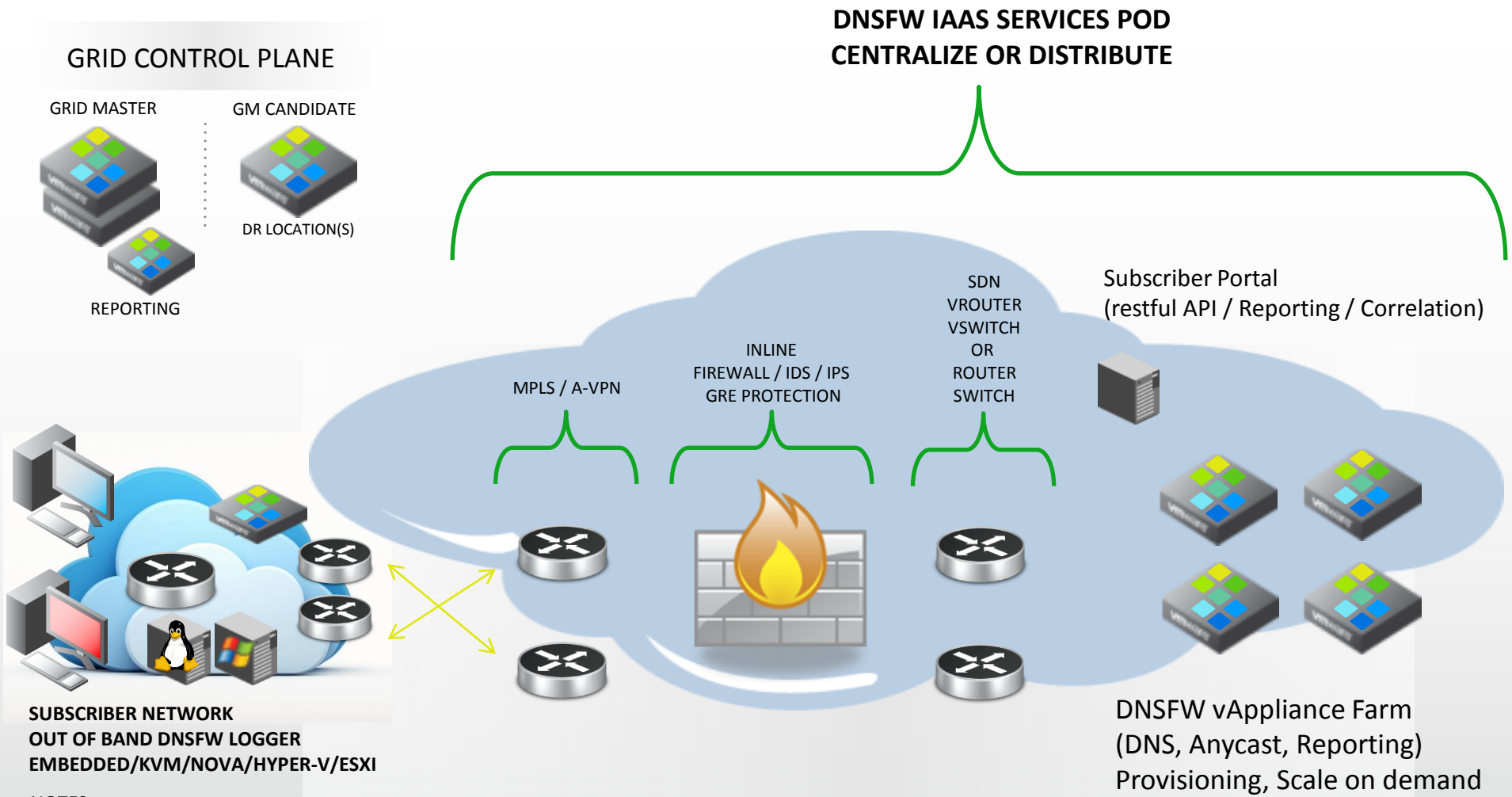
# 3. vSecure Grid Topology

## Robust and Scalable Name Services for SDN's

**Meeting Security & Performance needs with hardened Software Based solutions coupled with the Revenue Savings, and Agility promises of NFV & Cloud.**

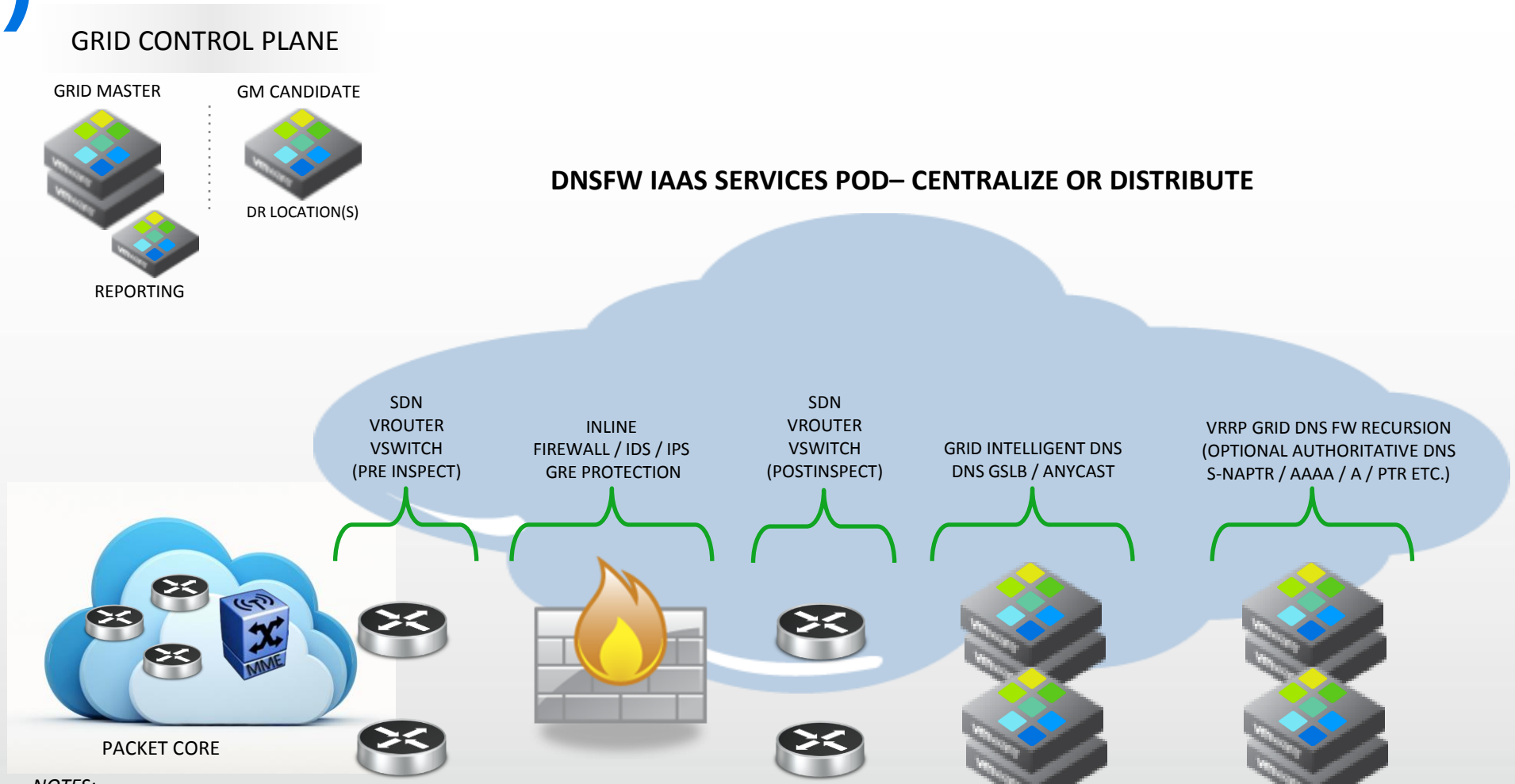


# Infoblox DNS FW Sample Tenant




*NOTES:*
*DNS FW ADDRESSES RECURSION TRAFFIC*
*ADDITIONAL CONTROL PLANE / USER PLANE DNS SERVICE GENERATES AUTHORITATIVE QUERIES*
*WHERE POSSIBLE, LEVERAGE GRID FOR ADDITIONAL SECURE INFRASTRUCTURE FOR ALL DNS NEEDS*
*ALL RELEVANT GRID MECHANISMS LEVERAGE REPORTING FUNCTION FOR INCREASED ACTIONABLE VISIBILITY*

# Infoblox DNS Firewall (Sample SDN POD)

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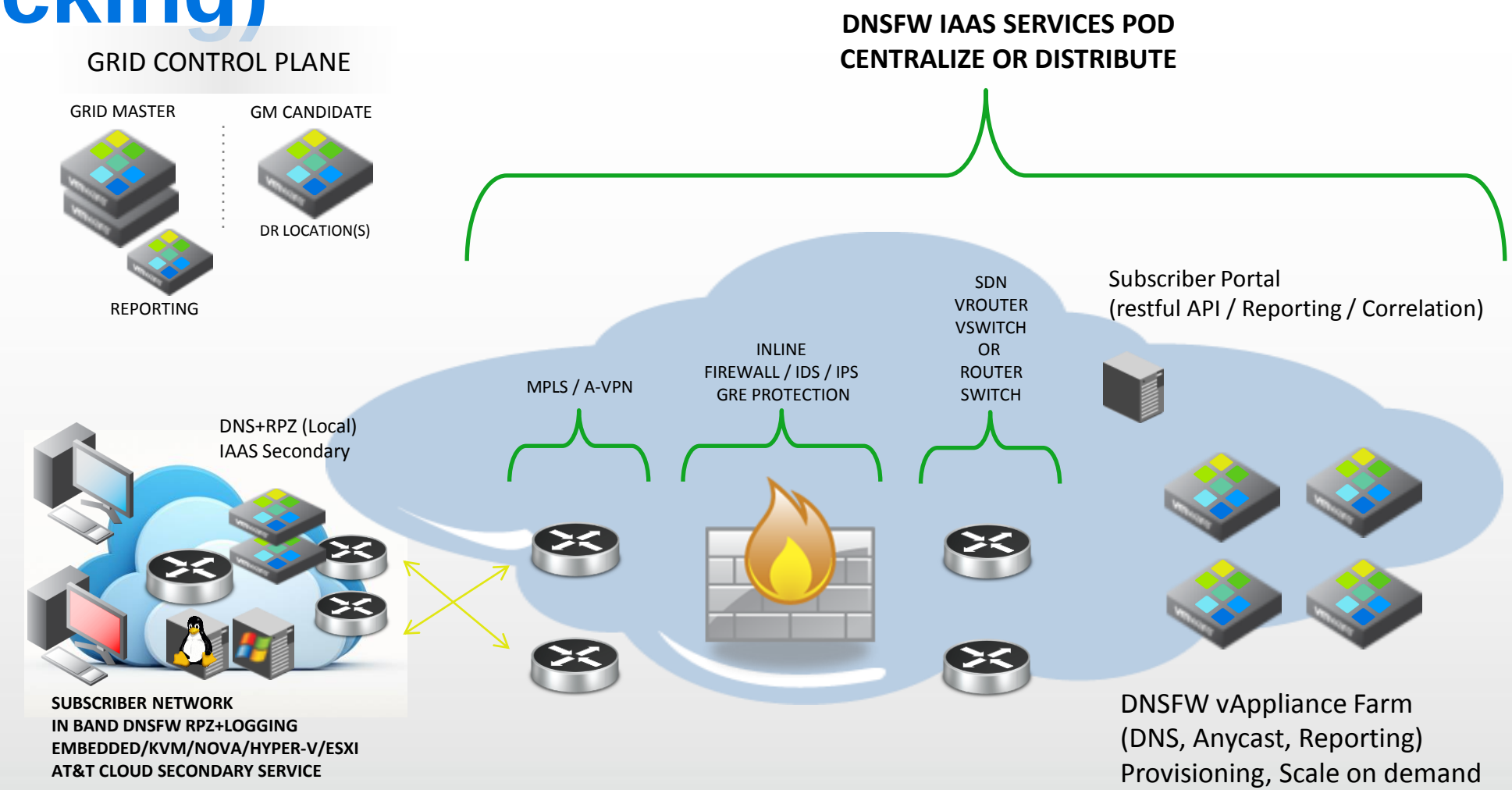
# Infoblox DNS FW Sample Tenant (blocking)

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# Demo

- vDiscovery
- Template Based Provisioning - Heat
- Service Instantiation – autoscaling
- Real time Visibility and Control – Smart Folders
- Built-in Reporting
- Security Enforcement – Reporting