Flexible Enterprise Campus Networks

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HP Networking

OpenFlow / SDN

An exciting, emerging technology

Data plane control was disbursed and fragmented…

OpenFlow

- Consolidates
  – into a general purpose, dynamic flow control API
- Complements
  – open standards for discovery, configuration, and monitoring
- Centralizes
  – data plane control

Service Provider
Research
Public Cloud
Campus
Networks
Private Cloud
Traditional
Data Center

HP and OpenFlow Research

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2012   Solutions

2011   Over 60 Deployments

2010   Research Publications

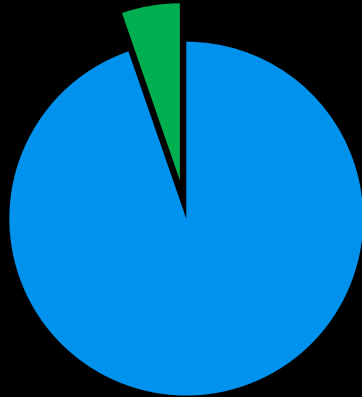**2009**   Stanford Deployment

2008   SigComm'08 Demo
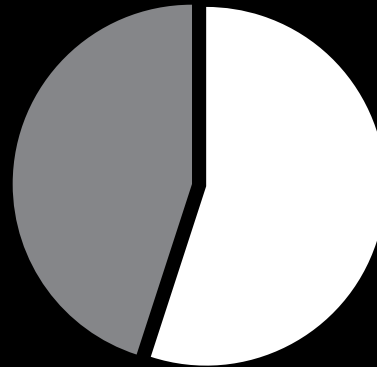
2007   OpenFlow Switch

Research Survey Deployments

Mostly test beds, few
production networks

Mix between pure
OpenFlow and Hybrid

Research Survey Requests
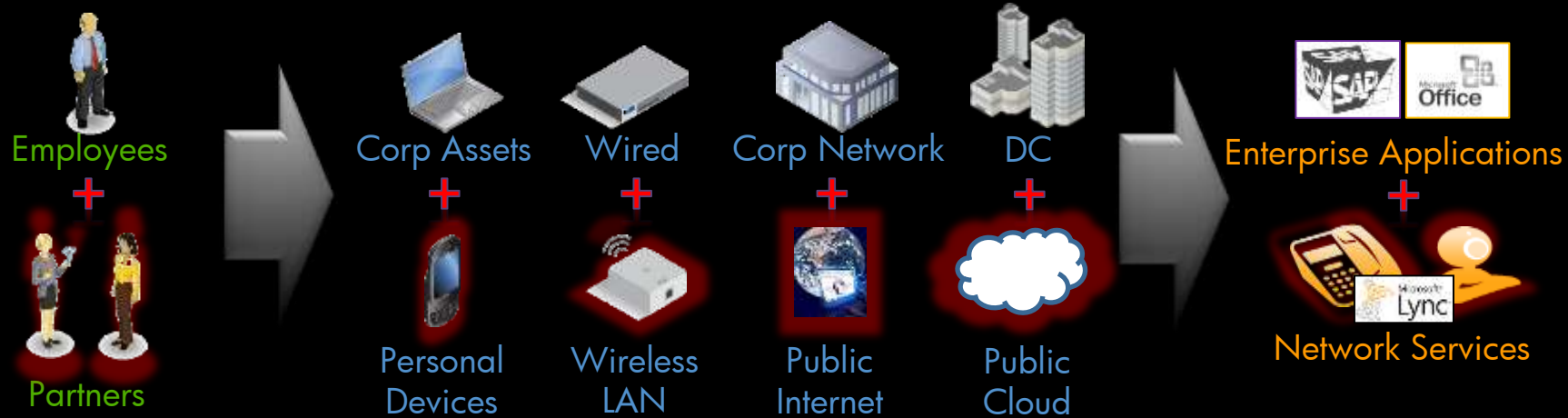
Capabilities Missing

- IPv6

- MAC-in-MAC, Q-in-Q, IP-in-IP

- More QoS, traffic shaping

- Match and actions on application layer

- Fault tolerance and scalability

Problems Encountered

- Loop avoidance with non-hybrid switches

- Benchmarking for release testing

- Differences in multi-vendor switch capabilities

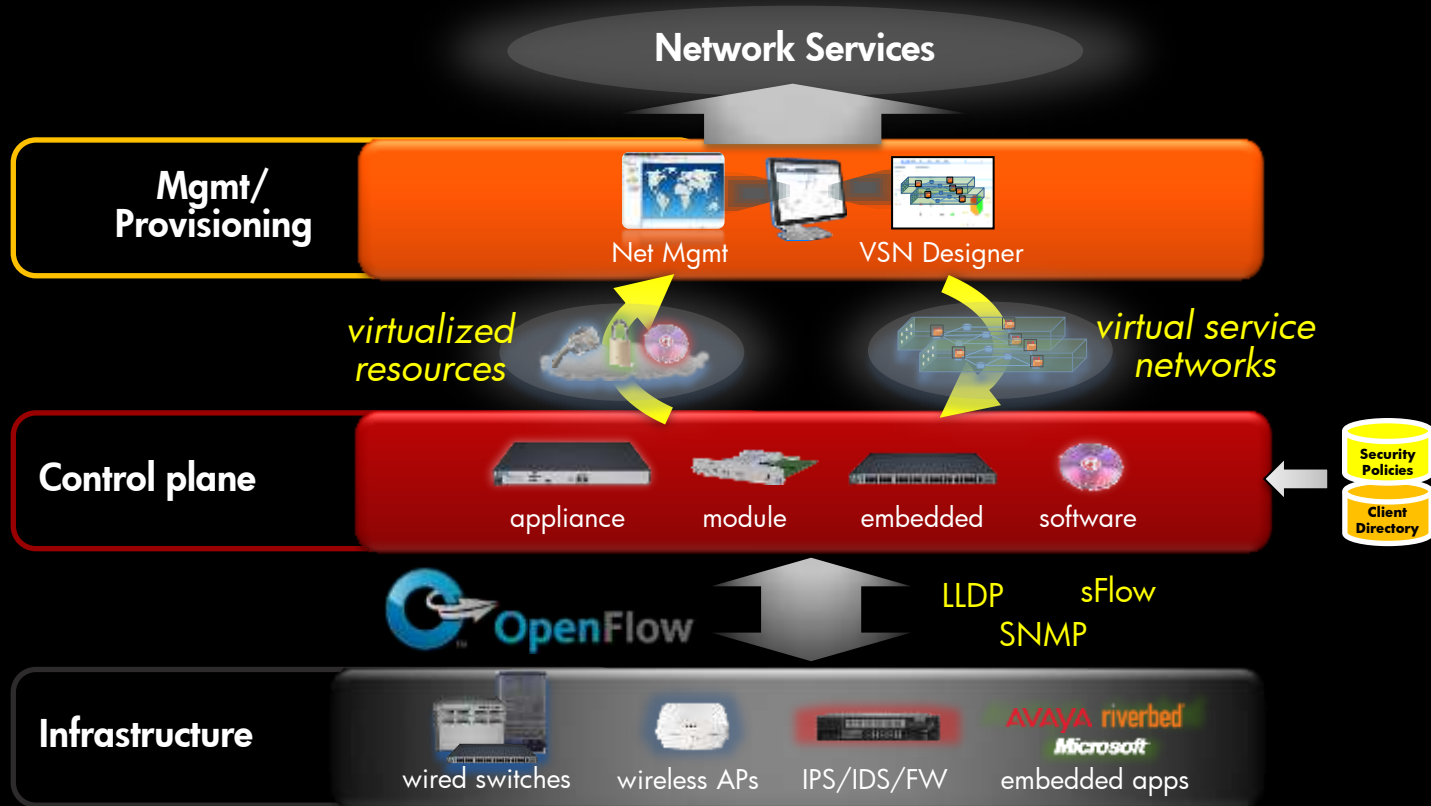- Troubleshooting of controller, switch and topology

Challenges of the **NEW** Enterprise Network

Employees + Partners → Corp Assets + Personal Devices | Wired + Wireless LAN | Corp Network + Public Internet | DC + Public Cloud → Enterprise Applications + Network Services

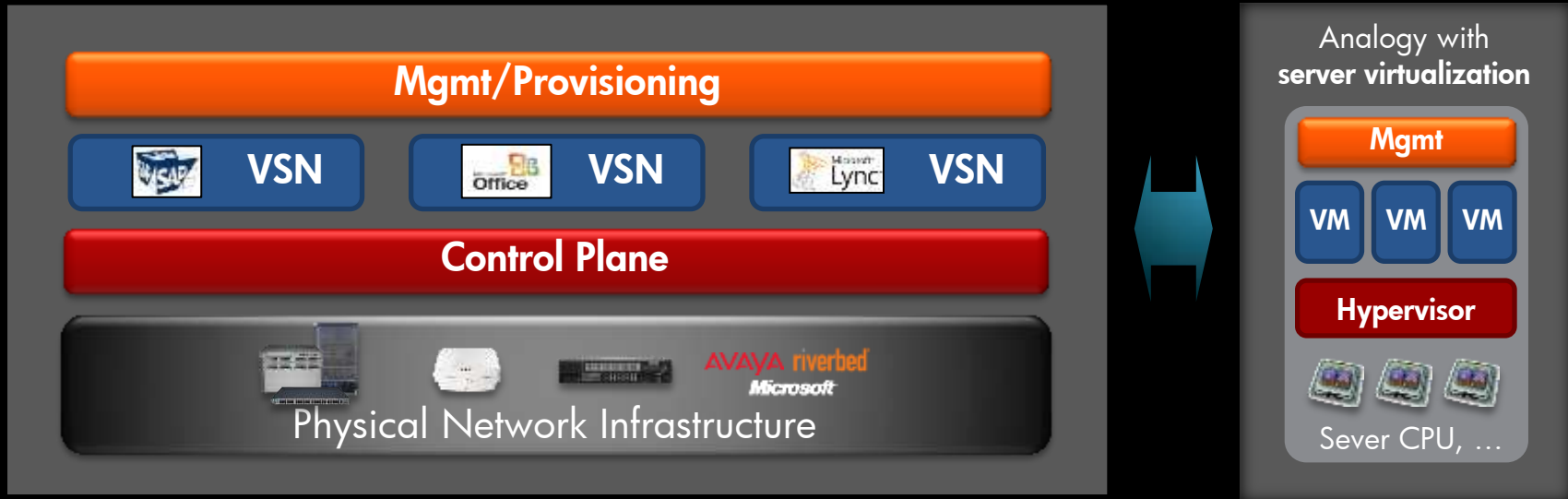**Diverse USERS** + **Fragmented PERIMETER** + **New SERVICES** = **Uncertainty**

The **NEW** Reality: Complexity & Risk

HP Network Enterprise Architecture Vision

HP Enterprise Network Virtualization

Virtualize the network with a control plane, logically provision physical resources into purpose-built virtual service networks

Mgmt/Provisioning

VSN   VSN   VSN

Control Plane

Physical Network Infrastructure

AVAYA riverbed
Microsoft

Analogy with server virtualization

Mgmt

VM   VM   VM

Hypervisor

Sever CPU, ...

Challenges for Emerging Technology

As OpenFlow evolves, the technology needs to remain relevant

Not Greenfield

No Forklift Upgrade

Phased deployment

Co-existence with existing technology

Hybrid switches

Forward Normal action

Selective control

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