Building a Platform for Networking Innovation

Key Points from Day 1

- Networks complex, slow innovation cycle
- SDN = create abstractions to enable faster innovation - fundamental CS principle
- SDN not just another protocol, entirely new paradigm for building networks
- We're only starting to develop this paradigm

Universities & Innovation

- Core networking innovation
- Application innovation
  - Enabled by investments in cutting-edge, open technology and bandwidth
- Challenging the status quo
  - OSI vs TCP/IP
- Invest in platforms to support innovation

R&E Networks

- Resemblance to commercial networks
  - Fiber, DWDM, Ethernet/IP, MPLS
- Mission to innovate, push the envelope
- Scaled for cutting-edge technologies
- Large community of researchers/students
  - Your next gen. developers, engineers !!

NDDI

- Founding Partners: Internet2, IU, Clean Slate Program at Stanford
- Mission: Create an open, global scale platform based on SDN to enable next-gen of networking innovation and global scientific research
- www.internet2.edu/nddi

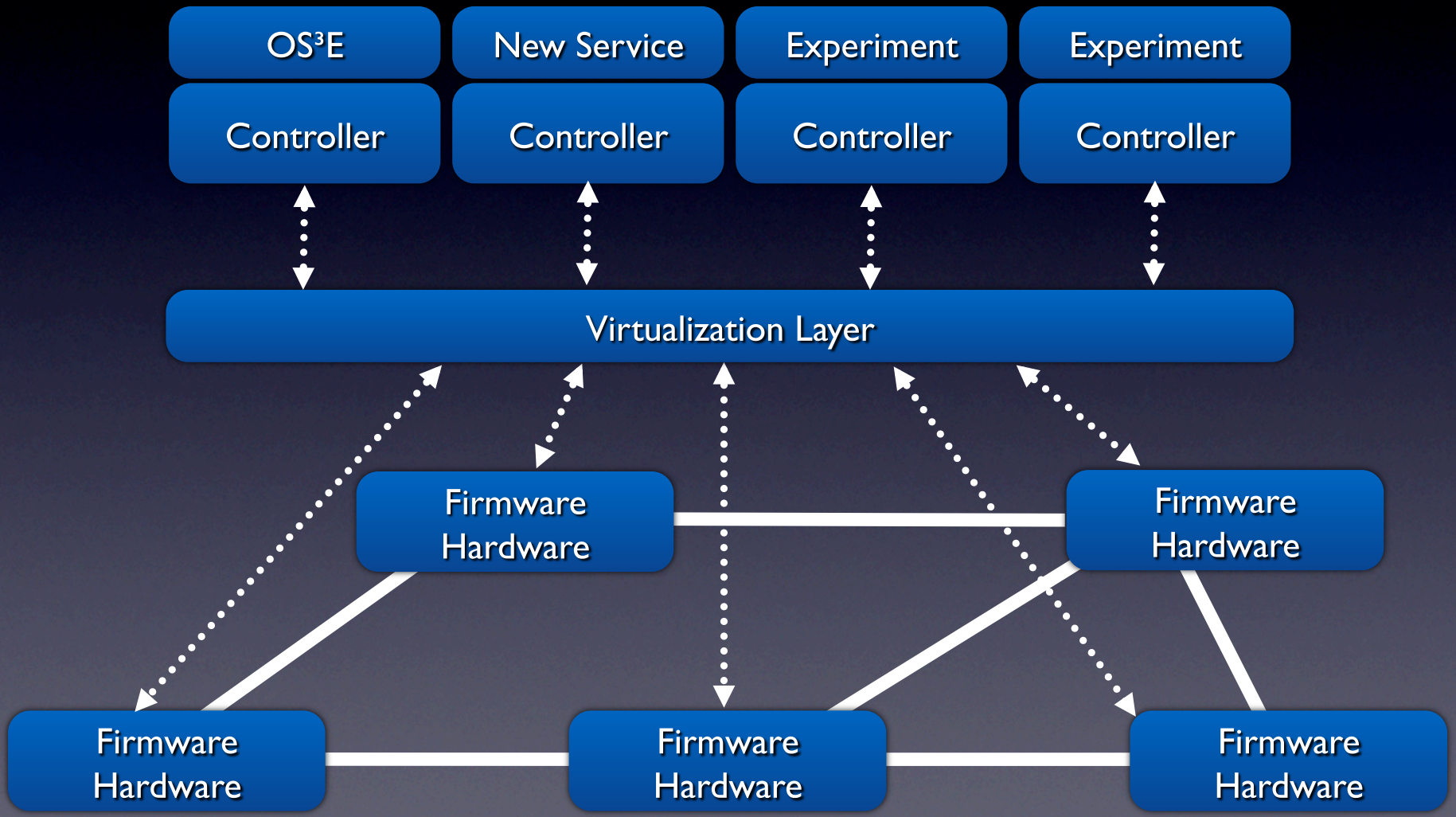
Origins of NDDI

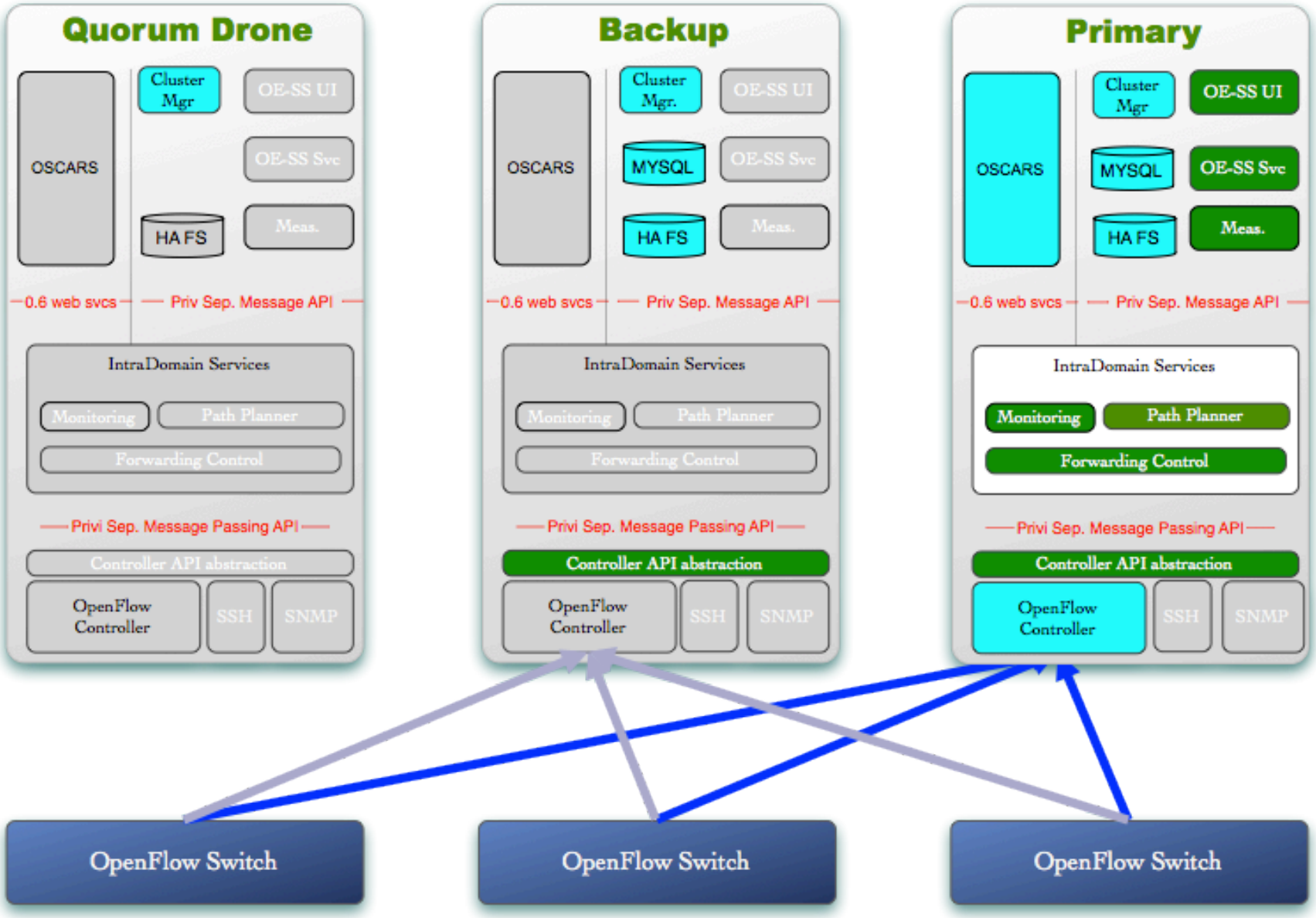
- Internet2 charged by member to build national Ethernet exchange fabric
  - Cost effective Ethernet switching
  - 100% self-service (Web + API)
  - ...and perhaps support OpenFlow
- SDN is ideal architecture also transforms network into platform for innovation

GENI & NDDI

- Unique virtual laboratory for at-scale networking experimentation
- Support at-scale experiments on shared, heterogeneous, highly instrumented infrastructure
- Enable deep programmability throughout the network (sound familiar ?)

NDDI Architecture




Quorum Drone
OSCARS
Cluster Mgr
OE-SS UI
OE-SS Svc
HA FS
Meas.
0.6 web svcs
Priv Sep. Message API
IntraDomain Services
Monitoring
Path Planner
Forwarding Control
Privi Sep. Message Passing API
Controller API abstraction
OpenFlow Controller
SSH
SNMP
Backup
OSCARS
Cluster Mgr.
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NDDI & Innovation

- Evolutionary
  - Existing control-plane functionality, built on open SDN architecture
- Revolutionary
  - Use virtualization layer of SDN to create testbed for large-scale experimentation


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Call for Participation