



U.S. DEPARTMENT OF
ENERGY

Office of
Science

Office Advanced Scientific Computing Research

Intelligent Network Infrastructures

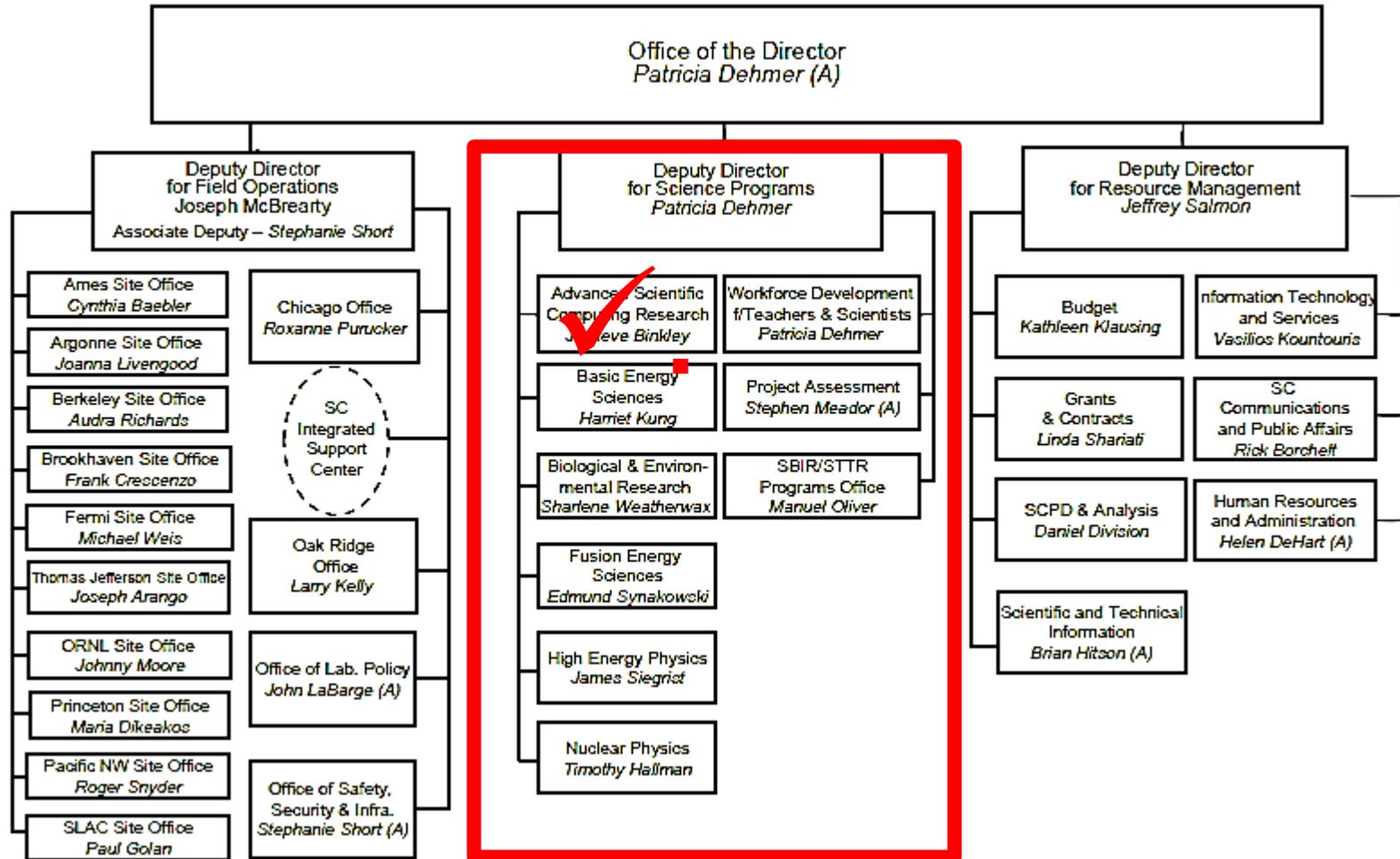
(smart Networks and Middleware Services for Science BigData Infrastructure)

Hilton Hotel Gaithersburg , MD

July 21, 2014

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Office of Science

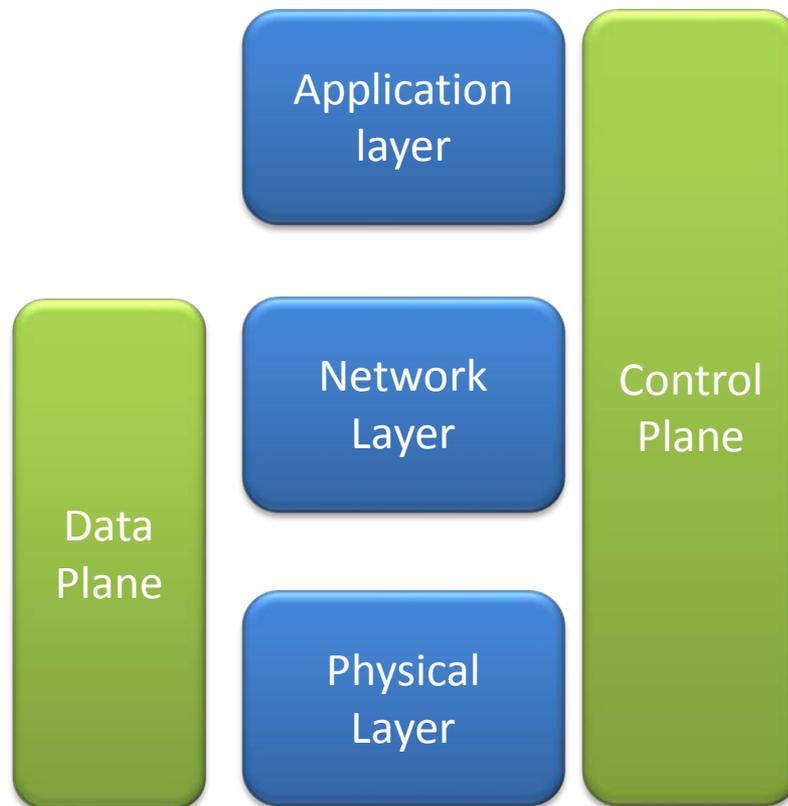


Intelligent Networking

- Why an intelligent networking workshop now?
 - ✓ Big Data (Data-intensive science)
 - ✓ Extreme-Scale Computing
 - ✓ Network complexities



Benefits of SDN/Intelligent Networking



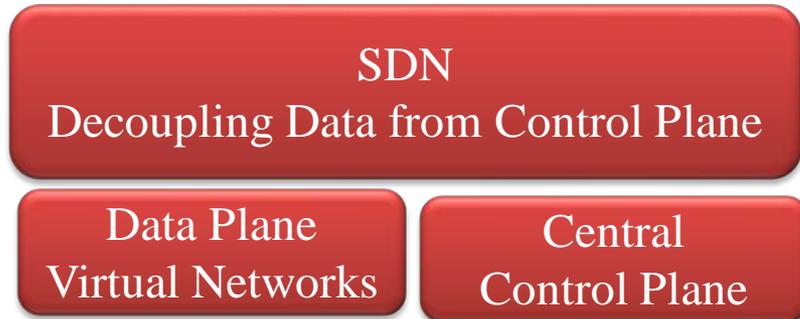
Benefits of SDN

- **Scalability**
- **Application awareness**
- **Service automation**
- **Network Programmability**
- **Load balancing**
- **Self-healing**
- **High availability**
- **Machine learning**
- **Controllability**
- **Service discover**
- **Improved innovations**
- **Multi-vendor solutions**

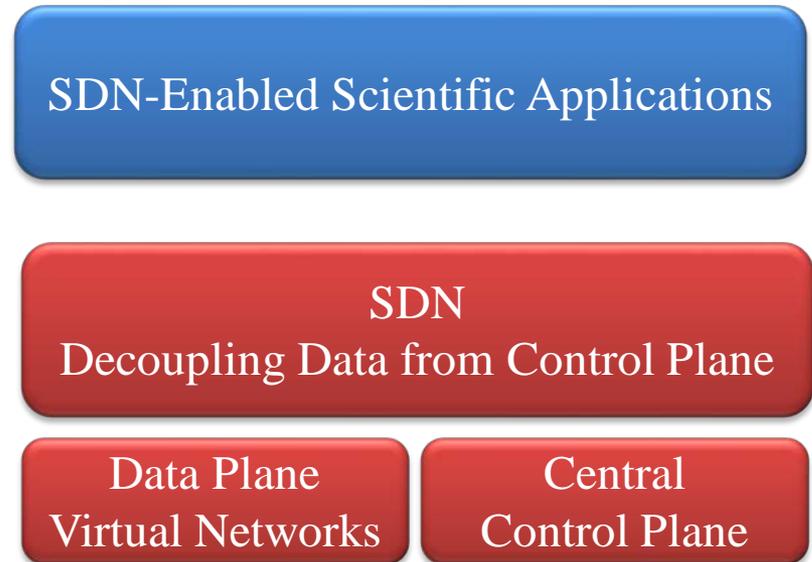


SDN-Enable Science Applications

The Promise of SDN

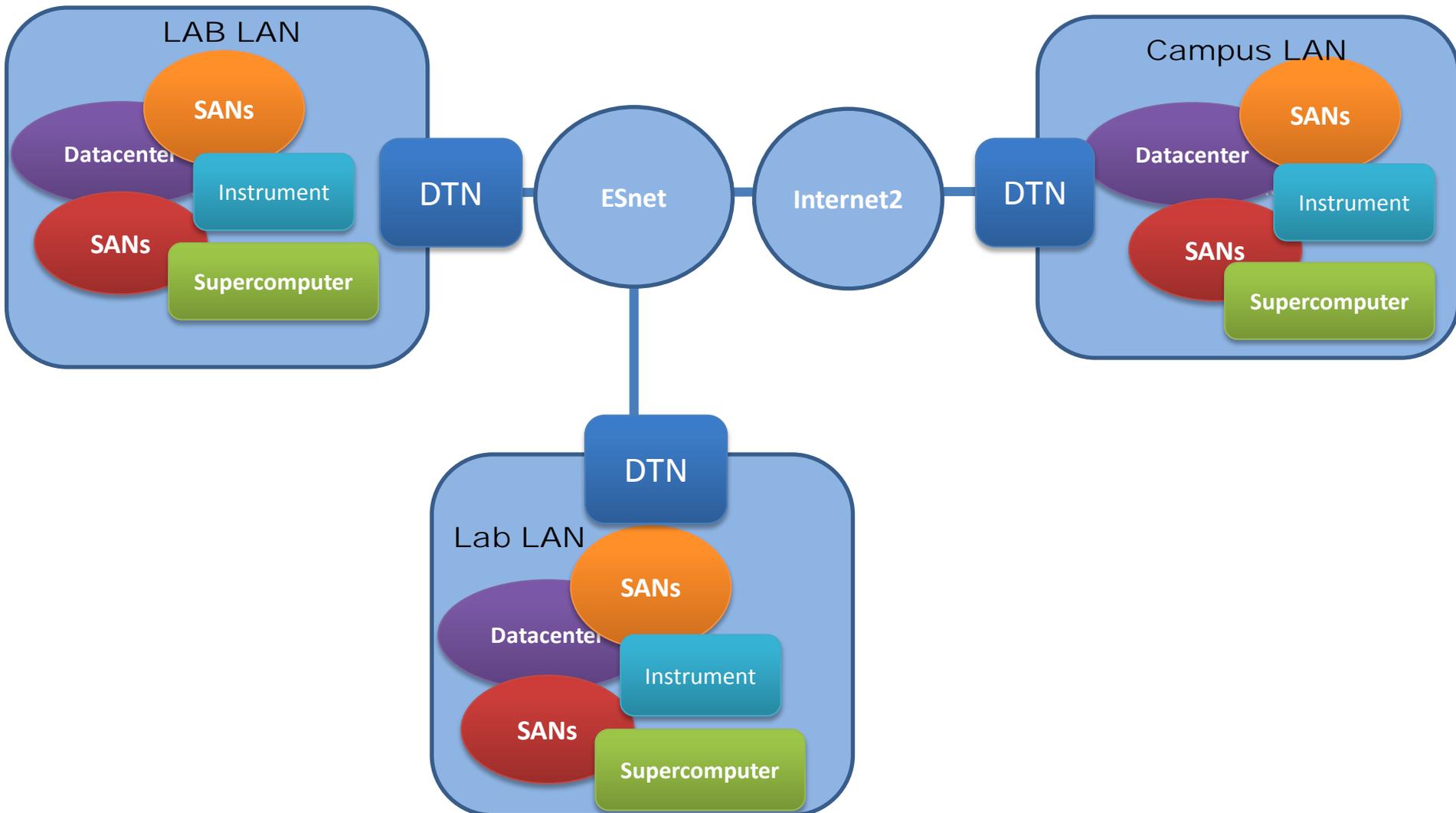


The Benefit of SDN to Application



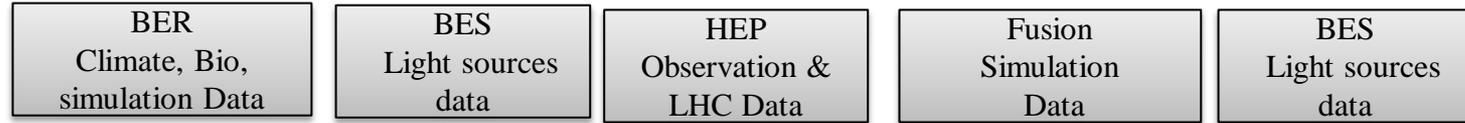
Exploring SDN technologies to build intelligent for complex distributed data-intensive science

E2E SDN-Enabled Internetworking Context



Data View in the Office of Science

Cross-Layer intelligence (SDN)



Apps



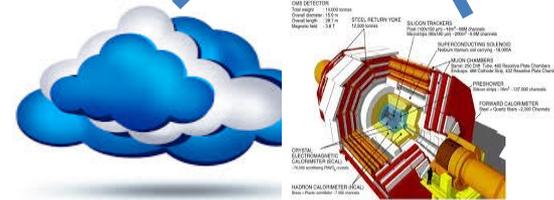
Apps Services



Network Services



Physical networks



Data Facility

E2E Intelligence (SDN)

Workshop Expectations

Workshops Goals:

- SDN-enabled application services – to enable data-intensive scientific applications to explore and exploit the capabilities of SDN technologies
- SDN Networking Services – leverage SDN technologies to enable scientists to maximize the value of high-performance optical networks

Workshops Expectations

- Identify the major challenges to achieve the above goals
- Summarize the challenges in a workshop report