

The case for SDNi

SDN controller interconnection

(Based on draft-yin-sdn-sdni)

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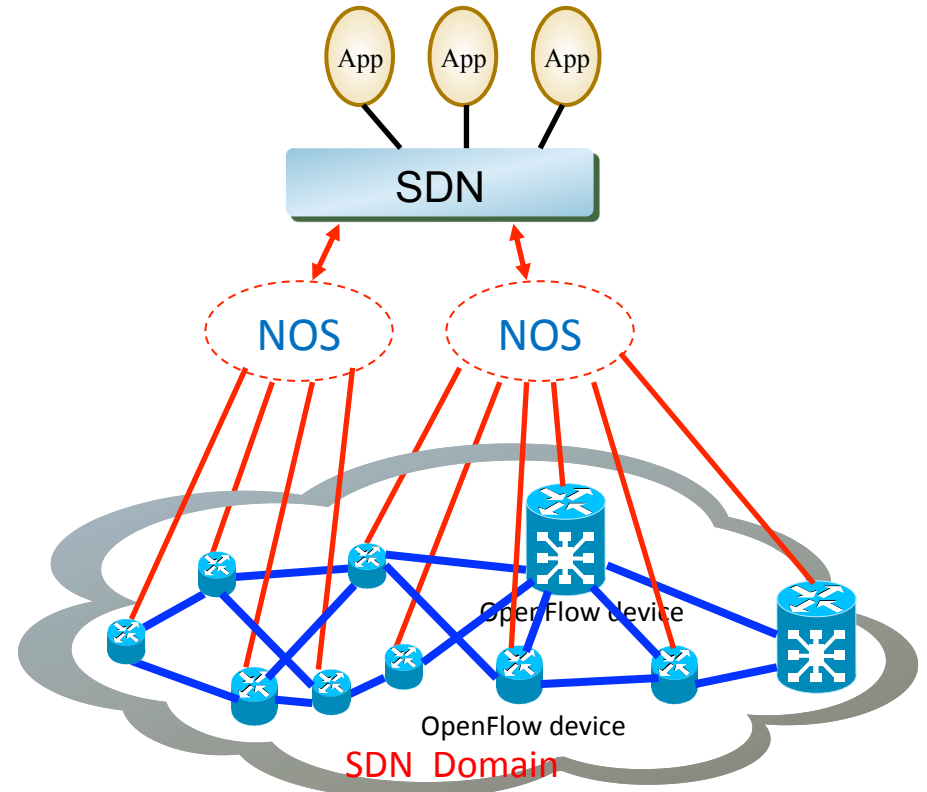
IETF 84, Vancouver

SDN Partitioning

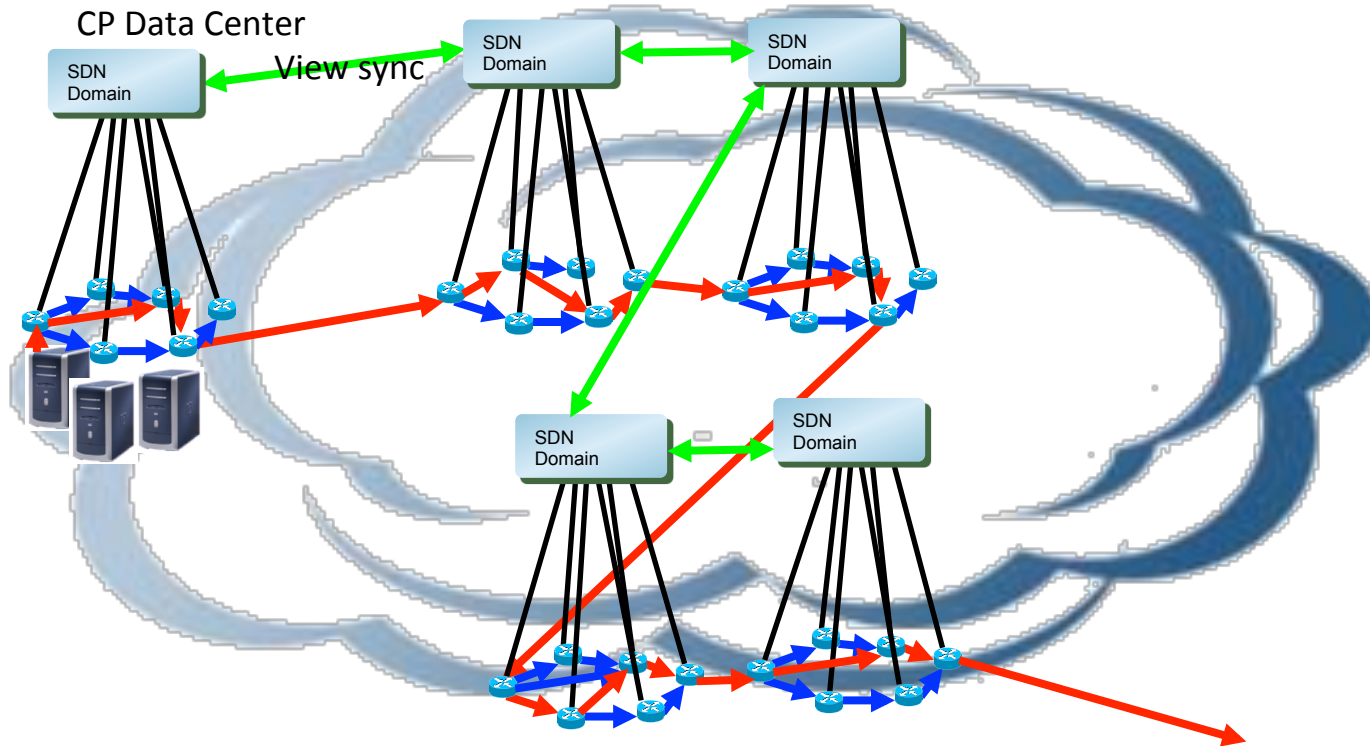
- Note well: Intra-operator partitioning
 - Not a proposal to reinvent peering or redefine network policies
- SDN partitioning is inevitable
 - A large network is likely to be divided into multiple SDN domains
- Because of
 - Scalability
 - The number of devices a controller can manage is limited
 - Manageability
 - Privacy
 - Some sub-networks (e.g., data center networks) are dedicated to certain customers, special privacy policies may be necessary for such sub-networks
 - Deployment
 - Incremental deployment (i.e., only a part of a large network is SDN compatible) is desirable and sometimes necessary
- Partitioning is already a common practice
 - FlowVisor-enabled slices

SDN Domains

- One SDN controller can cover multiple NOS – work with multiple NOS
- The SDN controller is responsible for dispatching and disseminating application requests to corresponding NOS
- One NOS can control multiple network devices
- Some network devices may not be covered by any SDN per operator's configuration
- The network portion covered by one SDN controller is called a SDN Domain



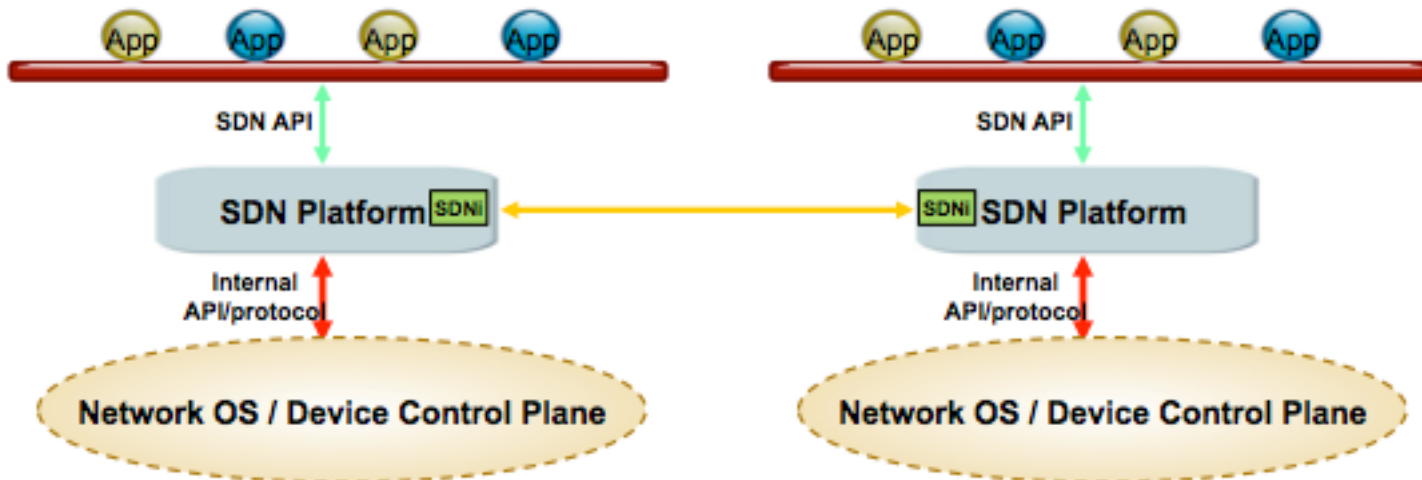
Multidomain SDN



- The whole network can be covered by multiple SDN controllers, e.g. can have multiple SDN domains
- Each SDN controller can communicate with other controllers for
 - Information exchange, e.g., network topology views, network conditions, event reports, SDN failure, etc.
 - Application requirements

SDNi

- SDNi is an interface mechanism between SDN domains
 - SDNi is managed at the SDN controller
- Information exchange between SDN domains
 - Network topology
 - Network events
 - User defined request information
 - QoS requirements from user application request
 - Integral infrastructure status (IT, energy consumption...)
- Semantic network model
 - Extensible and mappable



Some Implementation Choices Discussed so Far...

- Restricted northbound interface
 - We need one, though
- Pub/Sub systems
 - Sharing network events
 - Already reported in HyperFlow
- IGP or EGP based
 - Suitable for topology exchange
- Stream-oriented application protocol
 - XMPP
 - IF-MAP
- And some other thoughts on
 - Extended ALTO
 - Recently, IRS

...And Open Issues

- Semantic network model
 - Ontologies
 - Extensibility
- Transport and syntax
 - Some degree of neutrality possible
- Security model and trust mechanisms
- Discovery and transfer model
 - Push, pull, stream, pub/sub...
- SDN model dependencies
- <Your favorite here>