



SDN Standards: What and Whatnot

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We should leave this session with a common understanding of...

- ONF's progress
- ONF's growth and momentum
- ONF's position in standards community
- Where we go from here

ONF: Commercialization

Vision:

Make Software-Defined Networking ubiquitous

Mission:

Foster a vibrant market for SDN products, services

User Driven

Board of world's largest networking customers

66+ member companies & organizations



Google™



YAHOO!

verizon

NTT Communications

ONF: Standardization

Unique Power in the board

Standards developed by implementors

Standardize as little as necessary

Rapid, relevant, real-world

Innovate like a Silicon Valley startup

What We Do

Standards Development

Customer-relevant standards

'Agile' standards development process

Drive SDN on switching platforms

Initial focus on OpenFlow protocol

Architecture & Framework

Abstractions

Interfaces

Services

Market Education

Drive common definition and lexicon for SDN

Evangelize SDN

Vendor neutral ("it's us, not me")

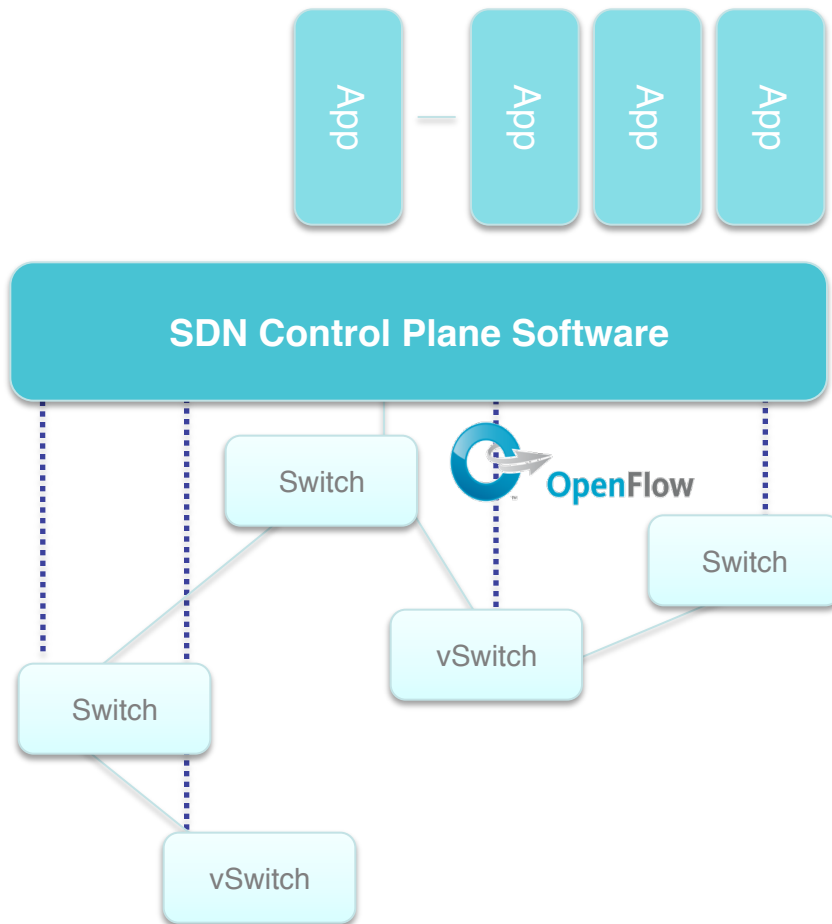
Intellectual Property

Automatic cross-licensing of OpenFlow-related IP across members

RAND-Z royalty-free use of protocol, trademarks, etc.

No IP owned by ONF

SDN Framework



Application tier:

Virtual network overlays, network slicing (delegation), tenant-aware broadcast, application-aware path computation, integration with other software packages, policy, security, traffic engineering

Control plane tier:

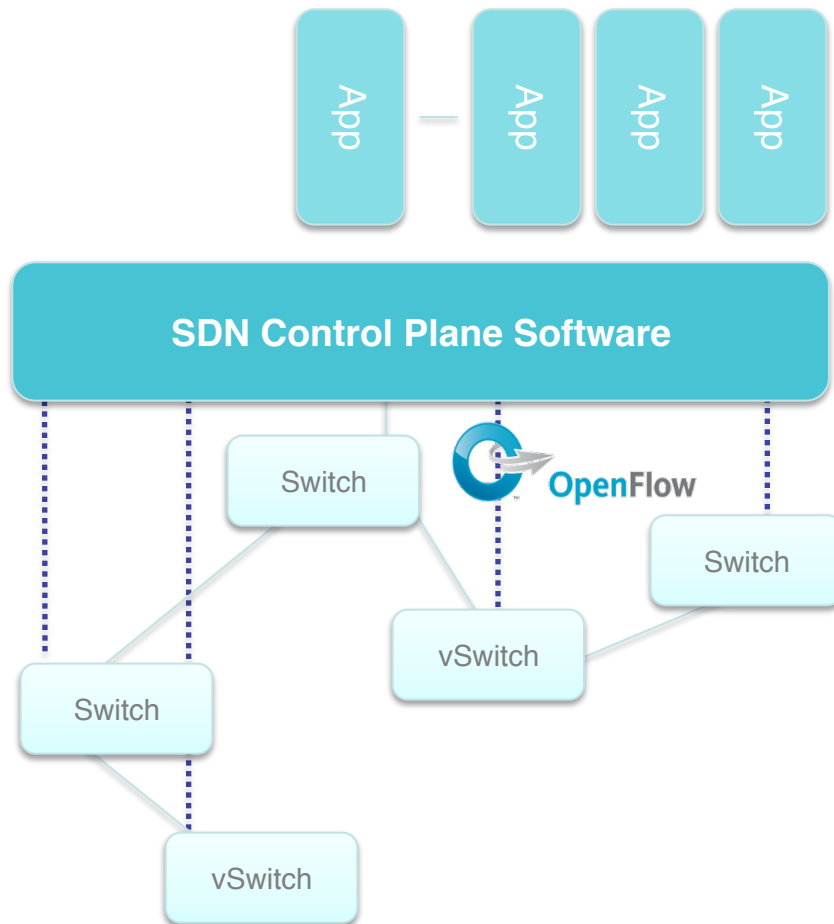
Data plane resource marshaling, common libraries (e.g., topology, host metadata, state abstractions)

Data plane tier:

Packet forwarding (as per flow table), packet manipulation (as per flow table), statistics collection



SDN Framework



Programmable Interfaces

Communications interfaces to the network

ONF: exploring appropriate level of standardization

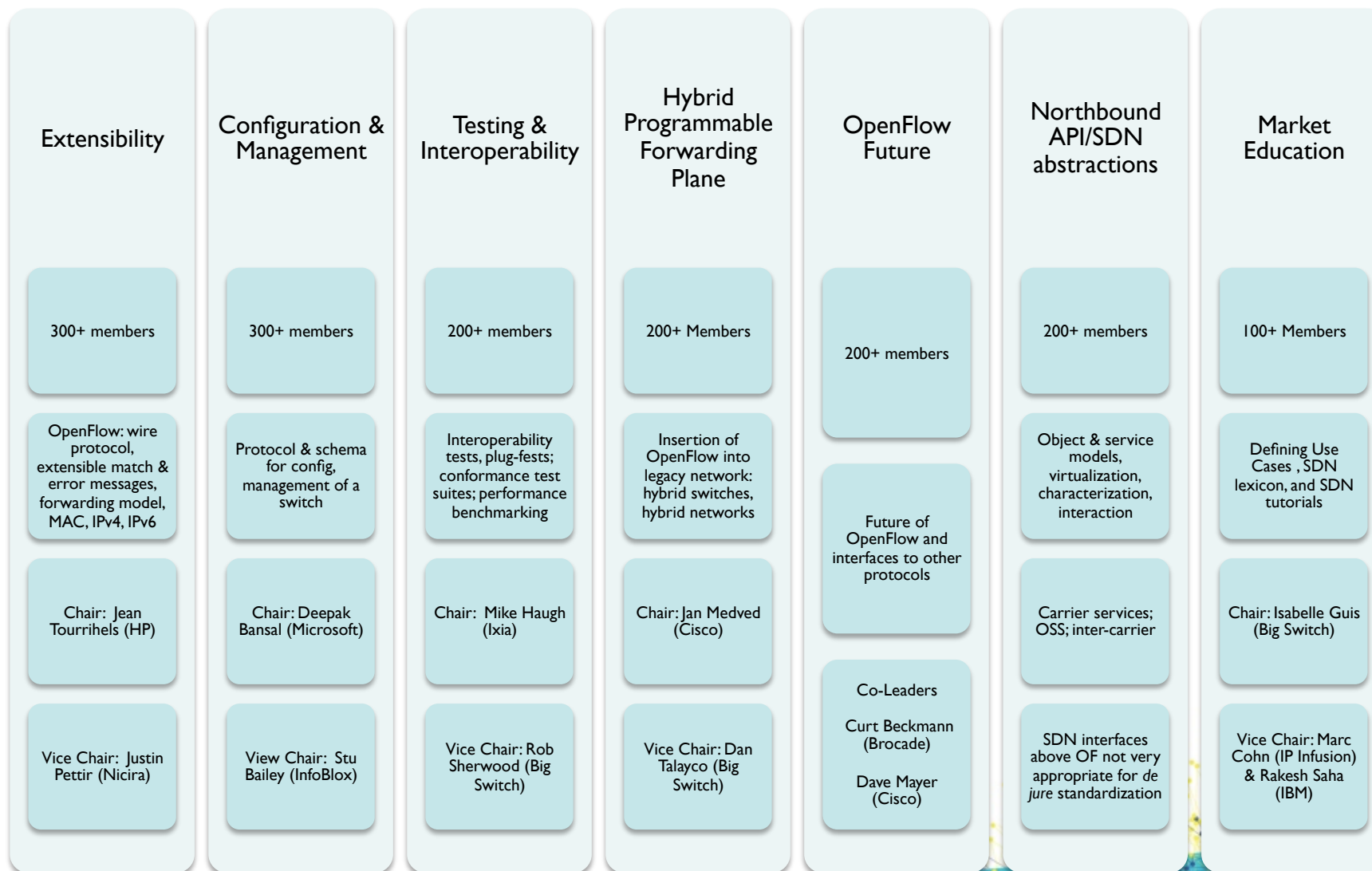
Standardized Protocols

Communications protocols within the network

ONF: standardizing



Working Groups & Committees



OpenFlow Progress

OF 1.0, 1.1
(03/2010-02/2012): Most widely used version, MAC, IPv4, single table, MPLS tags/tunnels, multiple tables, counters

OF 1.2
(12/2011): IPv6, extensible expression

OF-Config 1.0, 1.1
(01-04/2012): Basic configuration: queues, ports, controller assign, capability discovery, error handling, tunnel config

OF 1.3.0
(04/2012): Flexible table miss, per flow meters, PBB support

OF-Test 1.0
(07/2012) Interoperability test processes, test suites

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66 Members and Counting

A10 Networks
 Argela Software
 Big Switch Networks
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 Brocade
 Ciena
 Cisco
 Citrix
 Colt
 Comcast
 CompTIA
 Cyan Optics
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 Deutsche Telekom
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 Oracle
 Pica8
 Plexxi
 Radware
 Riverbed Technology
 Samsung
 Spirent
 Tencent
 Texas Instruments
 Vello Systems
 Verizon
 VMware
 Yahoo!
 ZTE



2012 Focus

Extend the technology

- Releases of OpenFlow 1.x, planning for beyond
- Auxiliary components
 - OF-Config, OF-Test
- SDN abstractions, services

Encourage implementation, deployment

- Interoperability testing,
- Conformance testing
- Plug fests, trade shows

Evangelize SDN / OF

- Market education
- Public appearances
- ONF is about the benefits

Collaboration between Standards Bodies

- Coordination dialogue with IETF/IANA, ITU-T, MEF
 - Leverage existing standards where applicable
- Peer on “New-Work” mailing list
 - ONF, IETF, IEEE, ITU-T, W3C, OASIS

Key Takeaways

- ONF's progress: market-relevant
- ONF's growth and momentum: beyond prediction
- ONF's position in the standards community: pivotal

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