RENs deployment activities updates

- 5 institutes connected
- Connecting internal labs of NCTU
- Deploying CORD

New entry: Japan (JGN-X)

Internal dev activities on virtual networks

L2 applications test phase

Castor has been a success and is at its second release!
Feedback

What RENs ask for
● A simple solution that works
● Layer 0/1: Lambda allocation / OTN
● Layer 2: Connect multiple end-points / BoD
● Layer 3: Internal and International BGP Peering

What SPs ask for
● All above..
● Yang, NetConf support
● Simplify / reduce CAPEX/OPEX in Access and Metro Networks

As always...
● HA, High performances
● Being “Carrier Grade”
The deployment (dev) brigade

Goal

- Create a shared, essential, reliable software stack on top of ONOS, easy to deploy and to maintain - to be used in production
- Layer0, Layer 2, Layer 3 functionality
- Integration with widely used standards (MEF, NSI)

Members

- Active participants from all around the world: academia, RENs, vendors
- 19 developers
- 33 ML members

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Action plan

- Ability for both Users and Operators to allocate end-to-end resources.

- International peering - L3 circuits and best-effort

- Broadcast L2 networks on demand

- Optical circuits in the Core and for Users
Current status

Done
- **VPLS** can provide L2 connectivity between multiple host using different VLANs
  - Encapsulation support (MPLS, QinQ)
  - Easy-to-use CLI
- **Castor, SDN-IP, SDX-L3** provide L3 connectivity between peers (also in SDX environments)
- PoC: ONOS running on white-box switch

In progress
- OFDPA intent framework compatibility
- Bandwidth allocation and enforcement (both in the intent framework and SDN-IP)
- Intent framework refactoring

Planned
- Packet-optical integration
Examples: legacy

L2 Switch

L2 switch

L2 switch

L2 switch

Roadm

Roadm

Best-effort L3

SP/MP L2 circuits

Lambda / L0
Examples: migration to ONOS

- Incrementally introduce white-box switches
- ONOS runs on the switch to provide L2 services
- ONOS runs on a centralized cluster
- Routers get removed
- ONOS provides BGP, L3 services using the same switches
- ONOS coherently controls both the packet and the optical layers
Conclusions and takeaways

- The brigade is not only deploying, but developing software that can be deployed in a short term in different networks.
- In ~4 month the deployment brigade did a terrific job:
  - Major modifications to the intent framework
  - VPLS (L2) application
  - Major improvements to SDN-IP (L3)
  - "ONOS in-a-box"
  - Test improvements
  - Field trials
- Missing functionalities that matter:
  - In-service upgrade
  - Local recovery from failures, being able to “survive” without controller
- Start simple!
- The involvement of the operations and engineering teams are fundamental
- Help from the community is very welcome!
References

ONOS

- www.onosproject.org
- wiki.onosproject.org

Global deployment powered by ONOS

- wiki.onosproject.org/display/ONOS/Global+SDN+Deployment+Powered+by+ONOS

The deployment and the northbound brigades

- wiki.onosproject.org/display/ONOS/Deployment+brigade
- wiki.onosproject.org/display/ONOS/Northbound+brigade

The Speaker

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