

# SDN Workshop - Aug 2015

UNINETT Trondheim, August 27 2015

Otto J Wittner



# Program

- 12:30-13:30 Lunch
- 13:30-14:00 Welcome and round of introductions
- 14:00-16:00 Reports from participants
  - Facts about current network operations at UNINETT (Håvard/Trond)
  - An update from ACM SIGCOMM 2015 and GEANT4's JRA2 SDN activity (Otto)
  - Latest news from Transpacket (Steinar)
  - Summary of submitted PhD thesis on SDN (Aryan)
  - Ongoing work at Dep of Telematics (Gianfranco Nencioni, PostDoc)
- 16:00-17:00 General discussion in search of collaborative action

# Facts about UNINETT network operations

- Provisioning for a new network equipment from unboxing to complete operation.
- Configuration management:
  - Where configuration are store?
  - How are they sanity checked?
  - How are they pushed down to devices?
  - Any common model exists for storing and processing configuration?
- Status management/monitoring:
  - How individual devices are monitored for status changes? SNMP? home-brewed scripts? Vendor specific tools?
  - Are retrieved status stored in a common model?
  - What do you monitor?
    - Physical/Virtual devices e.g. Port, Link, etc.
    - Logical models e.g. IP header, IP payload, L2

# Facts about UNINETT network operations

- Policy enforcement:
  - ACL enforcement at the edge/core/distributed?
  - ACL granularity
  - QoS mechanisms
  - QoS granularity
- What do you feel is the most set of missing features for day-to-day operation?

# ACM Sigcomm 2015

- General impressions

- A majority of work presented where by or funded by Google, Microsoft og Facebook
- Hardly no «crazy» new ideas in main track, some in poster session
- Many papers presented results from system already in operation in production systems
- Many papers involved optimization
- Papers are openly available online  
<http://conferences.sigcomm.org/sigcomm/2015/program.php>

- Best paper award to SDN paper

- «Central Control Over Distributed Routing»
- Top controller adds fake nodes to a network controlled by IGP-controller, and monitors changes.
- 0.8ms increased convergence per added fake node

# ACM Sigcomm 2015

- Policy languages
  - High level, user «friendly», graph based conflict resolution
- Bidding for resources
  - Client behavior analysis and operator optimization
- Data centres
  - Optimal placement/design of resources, scheduling of jobs and managing network delays
  - Measurements (active and passive) and monitoring
  - Congestion control and alternative TCPs
  - Walk through of Google centre history
- Wireless
  - Positioning, backscatter systems and challenges

# ACM Sigcomm 2015

- Video streaming
  - Centralized CDN, rate control
- Mapping physical network
  - Physical shared conducts of US ISPs
- Posters
  - Free space optics and mirrors to enable optical multicast in DCs
  - Mininet clusters in Python
  - Bit pattern matching to classify traffic

# GEANT4

- What is GEANT?
  - GEANT Association (earlier Terena): Coordination body for NRENs
  - GEANT Network: Operator of European backbone interconnecting NRENs
  - GEANT EU Project: Research, innovation and development of the GEANT Network
- Year 1
  - A “boot-up” year to help transission form GEANT3 to 4 ?
- GEANT4 Research
  - *Open calls* will be available, i.e. anyone (including academia) may suggest projects
  - Rumours say there will be less funding for JRAs (with mostly NREN participants) and more for Open Calls



# GEANT4 year 1 - JRA 2

- SDN usecase to be studied and proofs of concepts made
  - Many participants (40+)
- The current use case list
  - Advanced path computation based on traffic demands (TE with SDN)
  - Infrastructure and Network as a Service (SDNized datacentres, improved customer services)
  - Network in the Campus (network resource control for users via SDN)
  - OpenFlow Enabled Switches For NRENs and GÉANT (supplement Juniper MX-480 with SDN sw)
  - OpenFlow in Optical Layer (intelligent management of large flows by SDN)
  - SDN-based Bandwidth on Demand services (make AutoBAHN handle SDN domains)
  - SDN-IP and SDX Layer 3 (SDN based internet exchange points)
  - SDX Layer 2 Use Case (user friendly layer 2 patching for users in exchange points)