SDN + NFV Seminar

Lecture 1

• Objective of Seminar
• Overview on SDN and NFV
• Schedule

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Objective of Seminar

Overview on SDN and NFV

Schedule
Seminar Objectives

• Generic
  – How to read/review/write/present a technical paper
  – More details on course home page

• Specific to SDN & NFV
  – Confidence to work on research problems in SDN+NFV
Course Requirements

• Write a **report** (about 7-8 – details next week)
  – page count does not include references, title page, toc, and blank pages

• Make an **oral presentation** (about 20 minutes)

• Actively **participate** in the seminar
  – Try to use the time allocated for the seminar for reading/discussing the papers and writing outline of the report and slides.
What is in a report?

- Why is the topic important?
- The main approaches in the literature
- The main idea/argument of the papers
- Possible directions
Grading Policy

• Report 40%
• Oral Presentation 30%
• Peer Review of Reports 20%
• Seminar Participation 10%
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SDN

• Still Don't kNow?
Software Defined Networking

- Design and manage computer networks

MANDATORY READING

[1] The Road to SDN: An Intellectual History of Programmable Networks

15 min. to read the underlined text of paper available at http://goo.gl/Kn5gck
Discussion: Road to SDN

- What is the control plane and what is the data plane?
- What is a Network Operating System?
- What are the common myths concerning SDN?
- What is Network Virtualization?
If $f(x) = x$ then we call $f(.)$ an identity function. Now what is a network function?
Why Virtualize Network Functions?
Objective of Seminar
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Schedule
Schedule

- Period 1: 02.09.2015-14.10.2015
  - Topic Selection
  - Detailed outline of report

- Period 2: 28.10.2015-09.12.2015
  - Submit reports
  - Peer review of reports
  - Presentation

Detailed schedule on course webpage
Course Outline

• Period 1
  – 30 minutes to see a talk on paper not selected for reports
  – 15-30 minutes discussion on talk
  – 45 minutes to discuss topic(s) selected for report

• Period 2
  – For first two weeks (Tentative)
    • Elevator pitch on report (5 minutes)
    • Submit report
  – Long Talk (20 min.) on report + 10 min. for reviews+Q&A
## Sample Papers

<table>
<thead>
<tr>
<th>Category</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>API</td>
<td>A Clean Slate 4D Approach to Network Control and Management</td>
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<tr>
<td>API</td>
<td>Ethane: Taking Control of the Enterprise</td>
</tr>
<tr>
<td>API</td>
<td>Enforcing Network-Wide Policies in the Presence of Dynamic Middlebox Actions using FlowTags</td>
</tr>
<tr>
<td>Application (WAN)</td>
<td>B4: Experience with a Globally-Deployed Software Defined WAN</td>
</tr>
<tr>
<td>Application (IXP)</td>
<td>SDX: A Software Defined Internet Exchange</td>
</tr>
<tr>
<td>Application (Cloud)</td>
<td>Ananta: Cloud Scale Load Balancing</td>
</tr>
<tr>
<td>Control plane</td>
<td>Onix: A Distributed Control Platform for Large-scale Production Networks</td>
</tr>
<tr>
<td>Control plane</td>
<td>CoVisor: A Compositional Hypervisor for Software-Defined Networks</td>
</tr>
<tr>
<td>Data Plane</td>
<td>ClickOS and the Art of Network Function Virtualization</td>
</tr>
<tr>
<td>Data Plane</td>
<td>Forwarding Metamorphosis: Fast Programmable Match-Action Processing in Hardware for SDN</td>
</tr>
<tr>
<td>Middleboxes</td>
<td>OpenNF: Enabling Innovation in Network Function Control</td>
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<tr>
<td>Middleboxes</td>
<td>Rollback-Recovery for Middleboxes</td>
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<tr>
<td>Implementations</td>
<td>The Design and Implementation of Open vSwitch</td>
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<tr>
<td>Languages</td>
<td>Frenetic: A Network Programming Language</td>
</tr>
<tr>
<td>Scalability</td>
<td>Scalable Flow-Based Networking with DIFANE</td>
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More Papers

SDN Reading List
https://sites.google.com/site/sdnreadinglist/

Give Preference to papers published in
- SIGCOMM / MOBICOM / NSDI
- OSDI / SOSP
- IEEE/ACM TON

Use sample papers to get titles of interesting papers and use google (scholar) to search for papers
How to read a paper?

15 minutes to read and discuss

"How to read a paper"
Task for Next week

• Perform 1st pass on the papers in the seed papers list
  – All papers available on the course home-page
• Select interesting papers in references
• Read abstract, introduction, and conclusion of interesting papers
• Discuss shortlisted topics
Logistics

• Office hours:
  – on demand for period 1 & preferably before/after class
  – TBD for period 2
• Please send an email
  – To: ashwin.rao@helsinki.fi (note it is only helsinki.fi)
  – Subject: Student seminar SDN+NFV
• Course webpage (URL will be shared by email)
• Plagiarism detection tool will be used on the reports
Objective of Seminar

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Schedule

See you next week (09/09/2015) same time (12:00 to 14:00), same place (C220)!