Monitoring and Management Workshop - summary

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End institution management

- 10 years ago – "absolutely no way we are going to do this"
- CNaaS initiative from SUNET and UNINETT - NRENs started to plan/offer the service to manage the university campus networks – Campus Network management as a Service
- CNaaS – a subtask of GN4-3 WP6T3 (Monitoring and management)
- But also…
  - SURFnet is a pioneer among NRENs in automated management infrastructure
  - ARNES, CARNET, AMRES, KIFU/Hungarnet are managing parts of the school infrastructures and/or WiFi infrastructures in the end institutions
  - FUNET with the leased equipment concept
- And we heard other NRENs are investigating whether they should go into that direction…
- Why did NRENs start to think about and do this?

Tech talent shortage

Sixty-three percent of senior execs indicated that a talent shortage was a key concern for their organization.

Figure 1. Top Five Risks by Overall Risk Score: 1Q18, 2Q18, 3Q18, 4Q18

Rank	Q1 2018	Q2 2018	Q3 2018	Q4 2018
1	Cloud Computing	Cloud Computing	Accelerating Privacy Regulation	Talent Shortage
2	General Data Protection Regulation	Cyber Security Disclosure	Cloud Computing	Accelerating Privacy Regulation
3	Cyber Security Disclosure	General Data Protection Regulation	Talent Shortage	Pace of Change
4	Global Economic Slowdown	AI/Robotics Skill Gap	Cyber Security Disclosure	Lagging Digitization
5	Social Engineering	Global Economic Slowdown	AI/Robotics Skill Gap	Digitization Misconceptions

AI = Artificial Intelligence
Source: Gartner (January 2019)

New (cool) skills needed

A retiring baby boomer generation, a deficiency in STEM graduates, and an increase in millennials' lack of interest in technical careers or a career path

The tech talent gap is even larger than you thought

Over 1,500 chief information officers agree there's a deficit, which means massive demand for those with the right skills.

"Nearly half of the IT workforce is in urgent need of developing skills or competencies to support their digital business initiatives. Skill requirements to keep up, such as artificial intelligence (AI), machine learning, API and services platform design and data science, are changing faster than we've ever seen before."
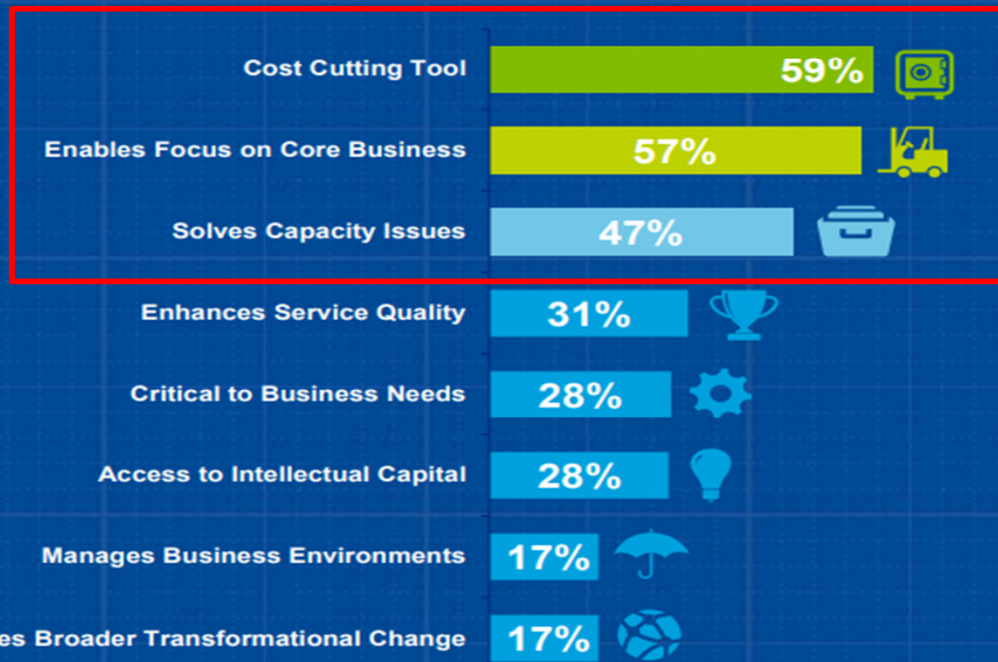
Today, the Tech Talent Shortage is Everybody's Problem

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So, what could be the solution

Why do companies outsource?

Cost, enabling core business functions, and solving capacity issues are primary drivers to outsource. Leading practice organizations use outsourcing to drive transformational change and improve business results

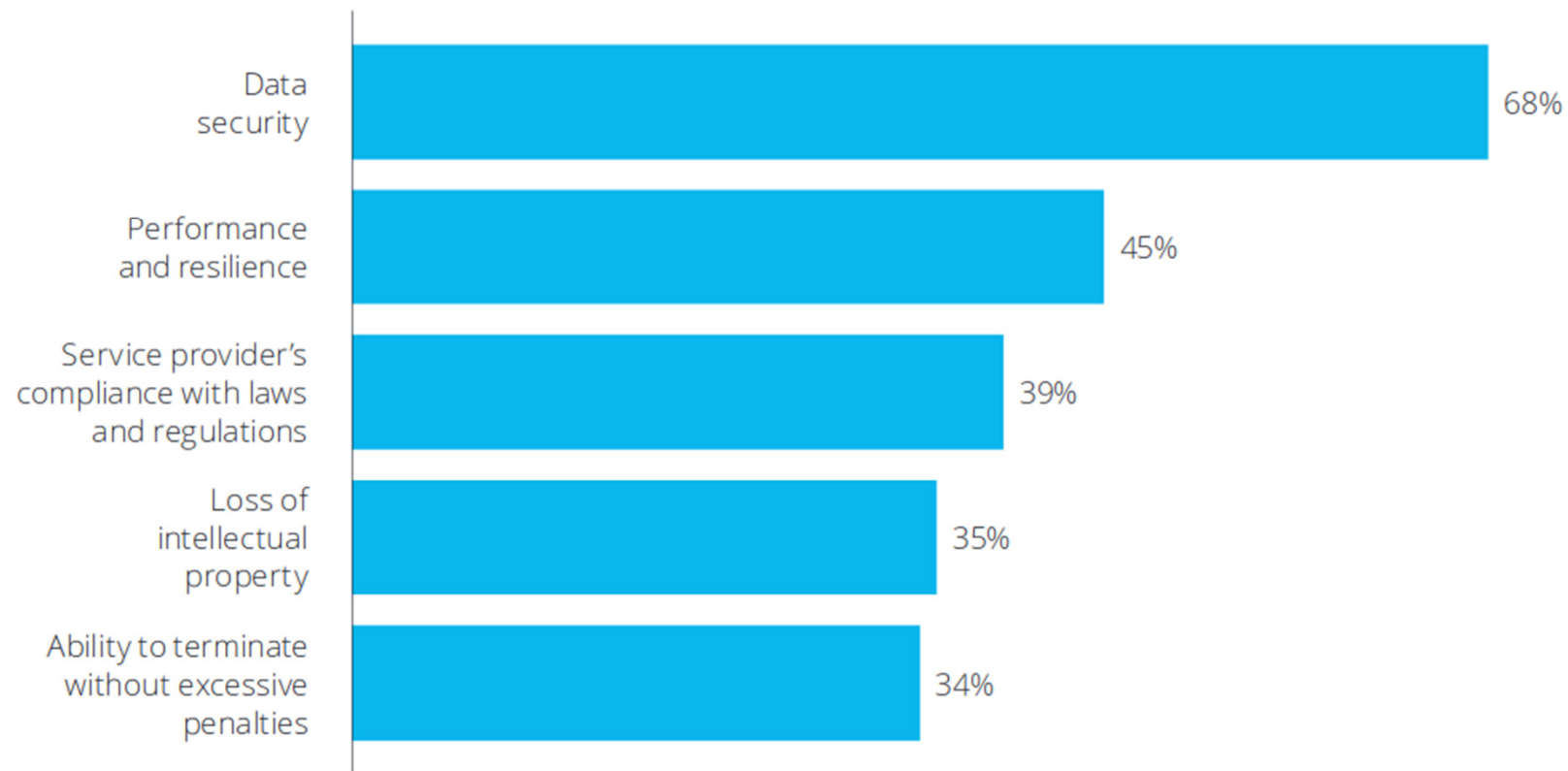|	
Cost Cutting Tool	59%
Enables Focus on Core Business	57%
Solves Capacity Issues	47%
Enhances Service Quality	31%
Critical to Business Needs	28%
Access to Intellectual Capital	28%
Manages Business Environments	17%
Drives Broader Transformational Change	17%

Companies seek innovation from outsourcing agreements, but many are unsure how to define, motivate, and track it (65% do not currently measure the value created through innovation)

Yes 35%   No 65%

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And cloud is not perfect

Top five concerns with cloud services contracting

Concern	Percentage
Data security	68%
Performance and resilience	45%
Service provider's compliance with laws and regulations	39%
Loss of intellectual property	35%
Ability to terminate without excessive penalties	34%

Source: The Deloitte Global Outsourcing Survey 2018.

- End institutions are losing tech people
  - NRENs are here, we know them, let's ask them…(The same regulation, data privacy rules, no issues as with cloud services)
- Pressure from the other NREN stakeholders (government)
- Adding new services in a situation with tech talent shortage
- So the NRENs are pushed to do more, while suffering from the same problems as end institutions
- Automation is one of the solutions

- Hence, this workshop… (38+13 participants, 28 NRENs/countries)

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- UNINETT (Vidar Faltinsen),
  - part of the digitalization strategy 2017-2021,
  - CNaaS package: management and monitoring, but also DHCP, NAT, RADIUS, VPN
  - planning FW, DNS, IDS
  - 2020: 3 campuses

- SUNET (Dennis Wallberg)

  - MDH.SE - first customer (early 2020), equipment procured

  - Building the NMS/automation architecture
- FUNET (Asko Hakala),
  - Started in 2012 with CPE management - 17 customers
  - FUNET Kampus service started in 2019
    - 2 big and 7 small deployments
    - FUNET leases the equipment to the customers
- SURFNET (Peter Boers),
  - Outsourced a part of management to Quanza
  - Shared the SURFnet software automation and architectural vision

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Session 1

- ARNES (Matej Vadnjal),
  - Centrally managed WiFi in every primary and secondary school
  - expect to manage up to 20.000 APs, 2000 switches, 450 routers, 955 campus networks by the end of 2020
  - working a lot on ansible based automation software stack
- CARNET (Darko Parić/Bojan Schmidt),
  - eschools: 35.000 APs, LANs, laptops,
  - GDPR 360
  - Looking for solutions for school LAN managment
- KIFU/HUNGARNET (Attila Gyürke),
  - 7000 monitored CPE devices
- AMRES (Bojan Jakovljević)
  - School WiFi - 2020: 15.000 APs, 2021: 24.000 APs (1.500 institutions)

Session 2

- CNaaS service definition/checklist (Maria Isabel Gandia, CSUC)
  - what do you need to think about beyond technical stuff
    - roles
    - service delivery mode
    - SLA
    - responsibility demarcation
    - GDPR!
- Software architectures
  - SURFNET network management outsourcing architecture and automation (Peter Boers, SURFNET)
  - Outsourcing automation software architecture in SUNET (Johan Marcusson, SUNET) - nornir/NAPALM
  - Outsourcing service Management architecture in FUNET (Asko Hakala, FUNET) - Ansible based

Session 3

- Monitoring probe in the fixed network (Tsotne Gozalishvili, GRENA)
- Monitoring probe in the WiFi network (Nikos Kostopoulos, GRNET/NTUA)
- Monitoring and alert aggregation (Morten Brekkevold, UNINETT)

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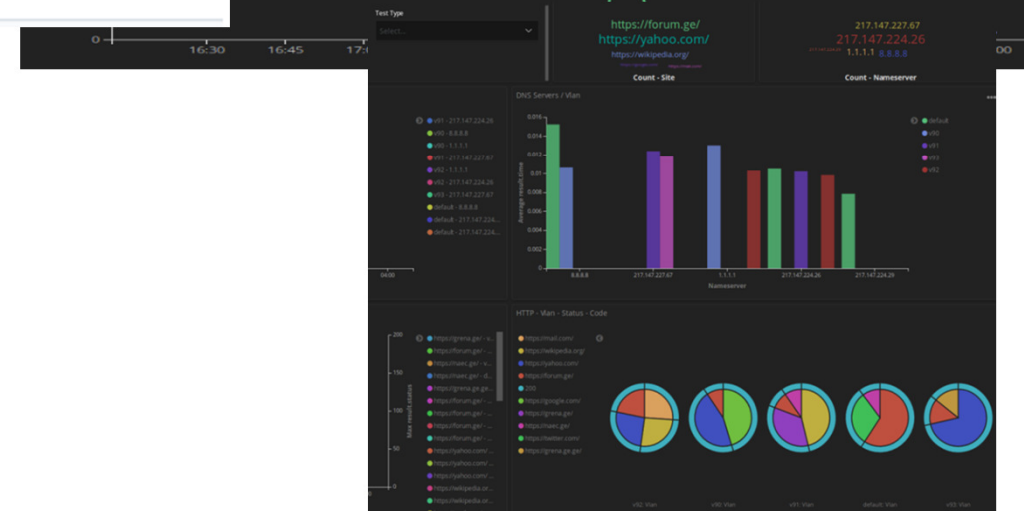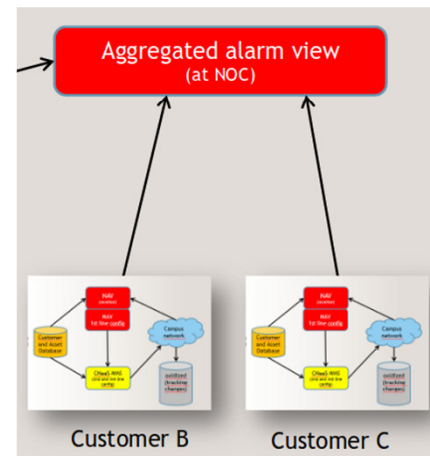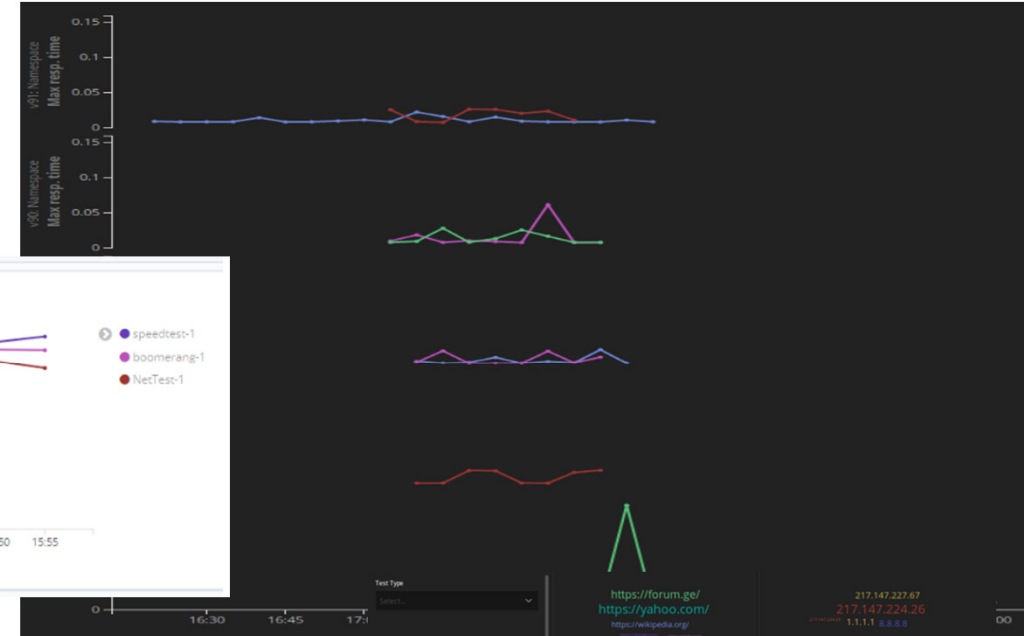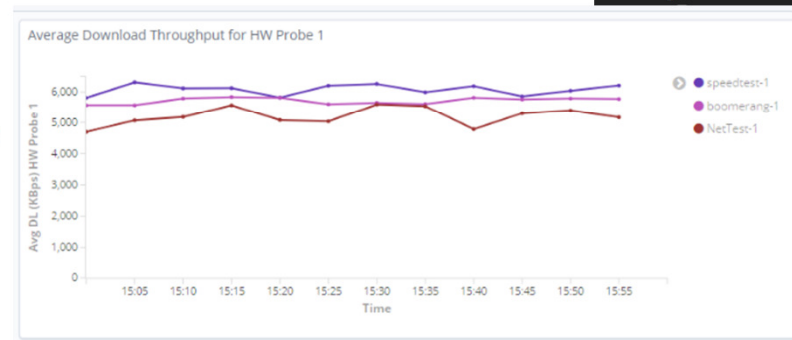
- NMaaS as a platform for management service outsourcing (Lukasz Lopatowski, PSNC)

  - Kubernetes/docker platform for providing per-tennant management apps

- RENATER's White Box CPE in Normandy Regional network (Xavier Jeanin, RENATER)

  - First two schools being connected today

  - Dell VEP 4600 servers, FRRouting

  - Ansible based automation

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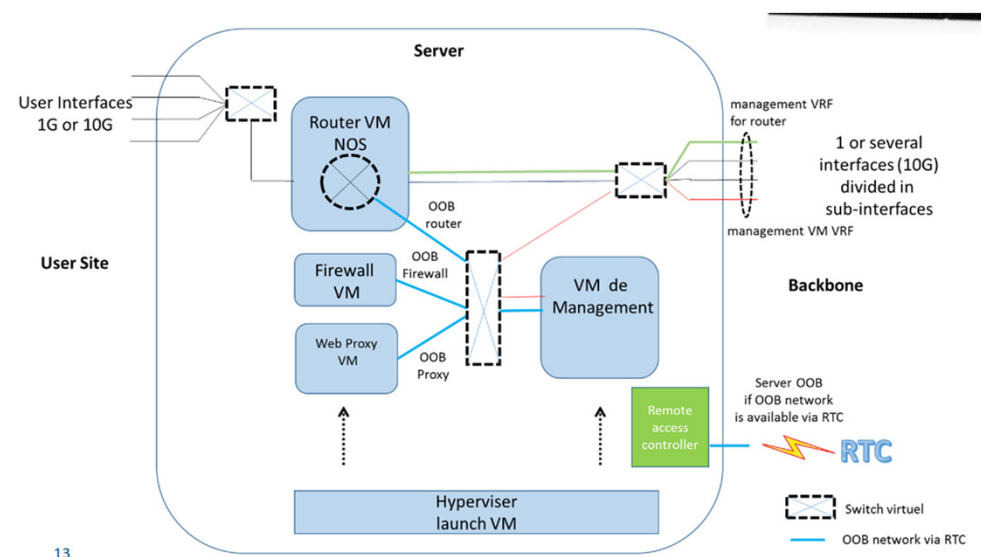
Conclusions

- Organise more of meetings like this
- NRENs are helping each other with sharing their stories and how-tos
- WP6 events do not clash with SIGs as SIGs are specific per topic while in WP6 events different aspects and topics are covered
- user groups define the functionalities of a service - a service can differ per user group
- CNaaS has overlap with several other areas of our work that we are trying to bring together - OAV, monitoring tools, white box
- contributions from multiple persons (including students' work) is managed through fully integrated CI/CD, code audits, well defined and regularly executed tests
- Kubernetes/docker based multi-tenant app provisioning seems to be the way forward (NMaaS)
- a very lightweight perfSONAR (on rPi)

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Thank you

Any questions?

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