Centralized network management at Arnes

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Workshop on Network Management and Monitoring
Copenhagen, 2019-10-21
Needs

- ~1.600 members
- Majority of those are small
- No or less experienced IT staff
Centrally managed

- Long tradition at Arnes
- Managing the last mile circuit
- ~1,600 members, 650 routers, 1,300 switches
Centralized network services

- Member’s routing device and aggregation L2 switch
- Security filters (ACLs)
- Traffic prioritization (QoS for videoconferencing)
- LAN provisioning
- Coordinating circuit provisioning and troubleshooting for member
Other self-service applications

- Identity management portal
- DNS record management
- E-mail
- Web hosting
- VMs
eduroam

- Offered as a managed service
- Includes:
  - DHCPaaS
  - RADIUSaaS
  - Service portal for local admins
  - Must manage APs themselves
WLAN2020 project

• Centrally managed WiFi in every primary and secondary school
• Need to manage local network from router to APs
• Procurement by Arnes, single vendor for each equipment type (wireless system, L2 PoE switches, routers)
• Building physical infrastructure
• Going deeper into member’s local networks
## WLAN2020 in numbers

<table>
<thead>
<tr>
<th></th>
<th>as of April 2019</th>
<th>as of October 2019</th>
<th>by end of 2020 (estimated)</th>
</tr>
</thead>
<tbody>
<tr>
<td>WLCs</td>
<td>14</td>
<td>20</td>
<td>~25</td>
</tr>
<tr>
<td>Access points</td>
<td>10.500</td>
<td>15.550</td>
<td>~20.000</td>
</tr>
<tr>
<td>Switches</td>
<td>1.200</td>
<td>1.700</td>
<td>~2.000</td>
</tr>
<tr>
<td>Routers (TSPs)</td>
<td>270 (65)</td>
<td>323 (65)</td>
<td>~450 (65)</td>
</tr>
<tr>
<td>Campus networks</td>
<td>470</td>
<td>711</td>
<td>~955</td>
</tr>
</tbody>
</table>
ANSO stack
People

- Operations by existing NOC team (5 people)
- 2 people manage and review technical docs
- Tools development by 4 person team
- Equipment owned by member
- Contractors build infrastructure and install equipment, turn-up under Arnes supervision
Challenges

- Brownfield deployment at most members
- Building and integrating monitoring into a centralized multi-tenant system takes huge development efforts. Doing one instance per tenant seems easier.
- Hosted of self-managed services?
- Hosted for only some service components
Thank you. Questions, comments?

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