Funet Kampus Service

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Background

• Replaces old Funet Router Service
  o CPE routers to connect to Funet network
  o Started in 2012
  o 12 customers 31 routers (Juniper MX5, MX40, MX104, MX480)
Funet Kampus service

• Launched in 2019
• 3-person virtual team
• Equipment Juniper MX204 and MX10003 routers, Juniper QFX switches and Huawei S5700 and S6700 series switches
• Currently 11 customers with 19 Juniper routers, 10 Juniper switches and 37 Huawei switches
Use case: CPE

- Unified and standardized connection to all Funet services
  - Uplinks up to 100 G
  - Internet, L3VPNs and L2VPNs using the same connections
  - Normally redundant connections and routers. Single switch for some smaller customers
Use case: core network

- Customers’ own core from edge routers to aggregation switches
  - Using QFX instead of Huawei for Ansible automation
  - More L2 features in use than in Funet core network
  - Possibility to have shared management with customer
Use case: Campus Interconnection

• Connecting customers’ separate campus areas
  o L2 VPNs over Funet core to enable single AS and free IP address use e.g. for NSX
Use case: Campus switch fabric

- Campus switch fabric down to access switches (pilot)
  - Switch stacking used
  - No automation, customer management etc. for now
Service Delivery

• Equipment purchased using CSC’s frame agreements
  o Standardized device types which are also used in Funet core and data centers
  o Cost benefits due to the volumes
  o Customer doesn’t need a separate tender process
• Customer is responsible for the device installation
  o Devices located in customer premises
• Configuration, management and monitoring are done by Funet
  o Shared NOC, tools and processes with Funet network
Configuration and monitoring

• All MX and QFX configuration is done using Ansible and Jinja2 templates
  o Based on tools developed for Funet 2020
  o Clean, standardized configuration
  o Routers can be pre-configured before sending them to customers
  o Configuration is stored in YAML files

• Routers and switches are added to monitoring using Ansible during the provisioning
  o Same alert and monitoring tools and processes are used as for the rest of the Funet network
Shared management

• Pilot with Helsinki University

• Managing large customer networks
  o Lot of changes -> workload

• Configuration changes by customer
  o All configuration is managed by Ansible
    o Customer specific management server hosted by Funet

• Almost all configuration changes made by customer

• Template development and consultation by Funet

• Migration completed by end of August 2020
Experiences so far

• Migration projects require expertise and a lot of design work but give an opportunity to implement new functionality
• Shared management works for customers with enough in-house expertise
• Redundant uplinks/CPEs and/or OOB management should be strongly encouraged
• Still a lot of old equipment on old service
• Involved 3rd parties add complexity to projects
• Customer satisfaction at 3.7 on 1 to 4 scale