



CSC

ICT Solutions for
Brilliant Minds



Funet Kampus Service

07.10.2020 Asko Hakala



Background

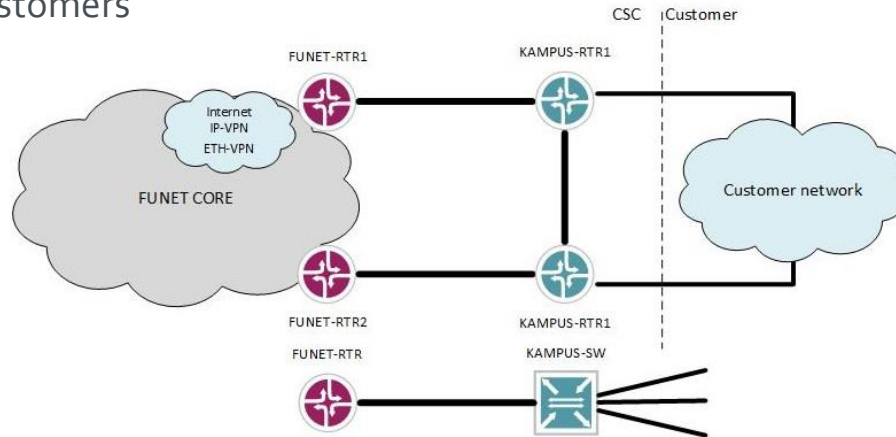
- Replaces old Funet Router Service
 - CPE routers to connect to Funet network
 - Started in 2012
 - 12 customers 31 routers (Juniper MX5, MX40, MX104, MX480)

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

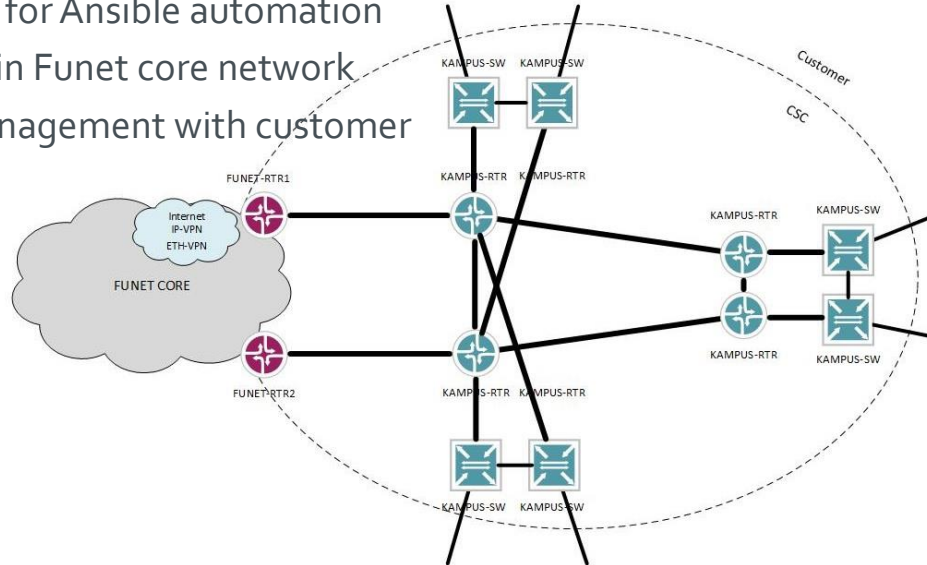
Use case: CPE

- 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



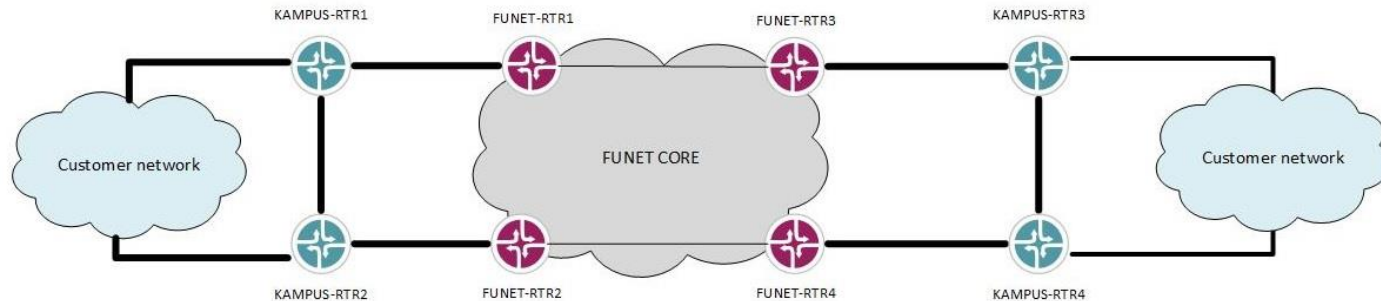
Use case: core network

- 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



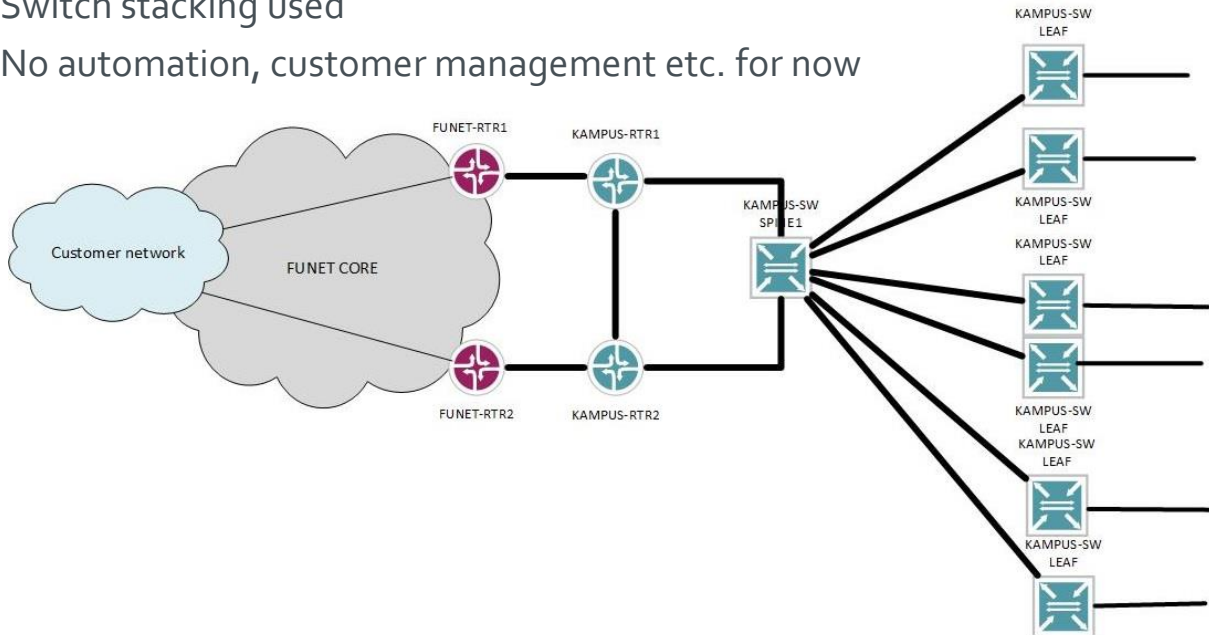
Use case: Campus Interconnection

- Connecting customers' separate campus areas
 - 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

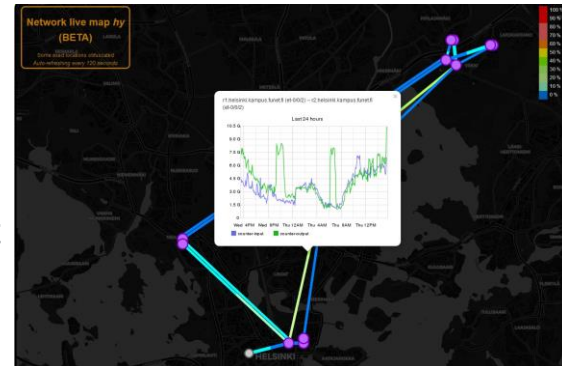
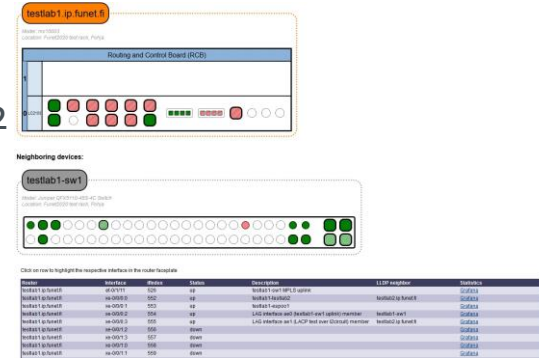


Service Delivery

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

Configuration and monitoring

- All MX and QFX configuration is done using Ansible and Jinja2 templates
 - Based on tools developed for Funet 2020
 - Clean, standardized configuration
 - Routers can be pre-configured before sending them to customers
 - Configuration is stored in YAML files
- Routers and switches are added to monitoring using Ansible during the provisioning
 - 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
 - Lot of changes -> workload
- Configuration changes by customer
 - All configuration is managed by Ansible
 - 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



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