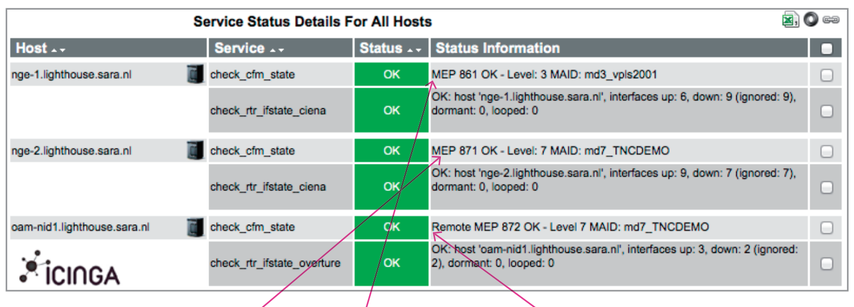
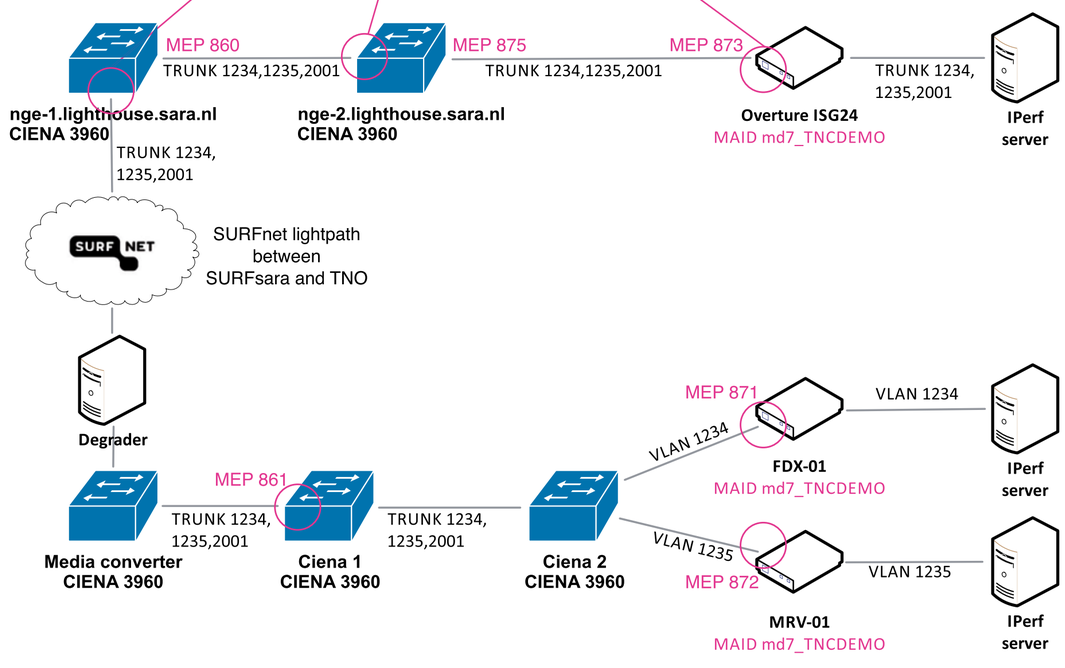
ETHERNET OAM MONITORING IN ICINGA AND CACTI



1.

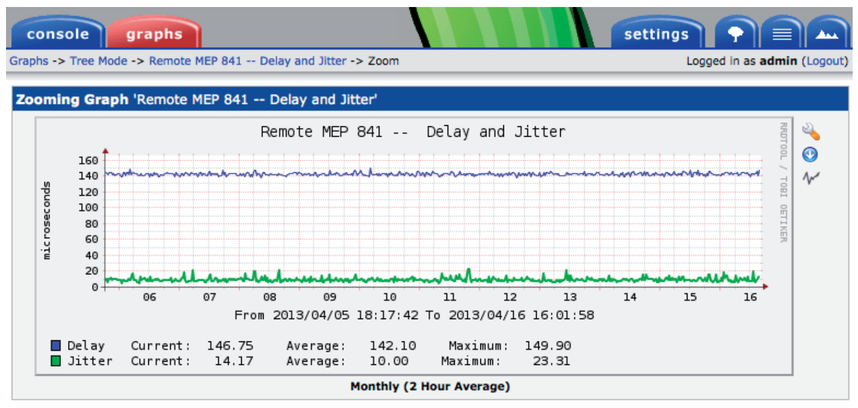


2.

```
bash$ ./check_cfm_state_8021ag.py --help
Usage: check_cfm_state_8021ag.py [options] hostname

Options:
  -h, --help            show this help message and exit
  -v SNMP_VERSION, --version=SNMP_VERSION
                        Use specific SNMP version default = 1
  -p PORT, --port=PORT  SNMP port default = 161
  -c COMMUNITY, --community=COMMUNITY
                        SNMP community
  -m LIST, --mep=LIST   comma separated list to specify remote MEPs to
                        monitor, (all = all available MEPs)
```

3.



4.

Icinga and Cacti are two widely used monitoring applications that normally focus on layer three devices. Without too much effort SURFsara wrote some extensions that can be used in these applications. This proves that it is not necessarily to have a separate application for Ethernet OAM. This saves the time and resources when deploying Ethernet OAM.

One benefit of Ethernet OAM is the possibility to monitor Ethernet switches which have no IP connectivity. The 802.1ag CFM standard provides a standardized SNMP MIB which allows monitoring of Maintenance End Points (MEP). This makes it easy to implement it on commonly used monitoring applications like Icinga and Cacti. These applications are open source and widely used. SURFsara developed a plugin for Icinga and Cacti to be able to use this MIB. This was tested on an Ethernet OAM testbed between TNO, SURFnet and SURFsara.

1. Icinga CFM plugin

Icinga is a webbased monitoring tool used which can be used for monitoring events. The Icinga plugin monitors remote MEP's as services. Each MEP, or a set of MEP's can be assigned to the service. In this screenshot 3 MEP's are monitored. The associated remote MEP and MAID are displayed in the status information field. Any failures will be displayed as well.

2. Ethernet OAM testbed

The TNO/SURFsara testbed uses multiple multiple OAM Maintenance domains using switching devices from different vendors like Ciena, Overture and MRV. Both testbed locations are connected through a lightpath provided by SURFnet.

3. Icinga plugin usage

The Icinga plugin monitors the CCM state of a MEP and report changes in the CCM status. Specific MEP's can be queried with a 'MEP list' parameter. Currently there are two implementations:

- check_cfm_state_8021ag.py: This uses the 802.1ag standard MIB. It has been tested on the ISG24 from Overture, but should work on any device that supports the MIB.
- check_cfm_status_ciena.py: This uses the Ethernet OAM MIB from Ciena. It has been tested on a Ciena 3960.

4. Cacti delay and jitter measurements

Cacti is a webbased graphing tool making use of RRDtool charts. Data can be polled using SNMP or custom made scripts. SURFsara has developed a Cacti template to monitor DMM/DMR messages to be able to graph L2 two-way delay and jitter statistics between two MEP's. Above screenshot shows an example of this template. The template is based on the Ciena 3960 SNMP MIB. It can easily be added into Cacti using the template import function.

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Conclusion

Ethernet OAM support is becoming more mature on various switching platforms, however Ethernet OAM is not yet widely supported on monitoring applications.

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The used scripts and templates can be found at:
https://github.com/sara-nl/eth-oam

SURFsara supports researchers in the Netherlands and works closely with the academic community and industry. For over 40 years we provide an integrated ICT research infrastructure including expertise, services and support in the field of high performance computing, data storage, visualization, networking, cloud and Big Data and develop innovative ICT solutions.

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