Topology Discovery
Correlating different network topology layers in heterogeneous environments

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Introduction

What?

Why?

How?

Topology Discovery
Research question

What are the challenges with the correlation of physical topology information based on LLDP and logical topology information?

Working hypotheses

- LLDP is mature enough and widely implemented, which makes it a useful protocol for topology discovery in heterogeneous network environments
- All information needed to correlate the different network topology layers is available in the Management Information Base
Link Layer Discovery Protocol

- LLDP Data Unit
  - Chassis ID
  - Port ID
  - Time to Live
  - Optional fields
  - End of LLDPDU

- Operation modes
  - Send only
  - Receive only
  - Send and receive
Topology based on LLDP

![Topology Diagram]

- E
  - Gi0/1
  - Gi0/3
- D
  - Gi0/4
  - Gi0/2
  - Gi0/5
- C
  - Gi0/6
  - Gi0/3
  - Gi0/4
- A
  - Gi0/3
  - Gi0/5
- B
  - Gi0/4
  - Gi0/1
- F
  - Gi0/1
  - Gi0/6
- G
  - Gi0/1
  - Gi0/5
- H
  - Gi0/1
VLANs
Complete Topology
Implementation

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Topology Discovery

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Findings

- Maturity of LLDP at SURFsara
  - 124 devices
  - **83%** supports LLDP
  - 9% does not support LLDP
  - 8% unknown

- NOT all relevant information for topology discovery can be retrieved from standardized management information base objects
  - Not all standardized MIB objects are supported by all vendors
  - Some information can only be retrieved from proprietary MIB objects

- Device IDs (ChassisID, IP address) must be unique

- Layer two path finding might be needed to create a correct IP layer topology
Challenges of topology discovery

LLDP is mature enough and widely implemented, which makes it a useful protocol for topology discovery purposes in heterogeneous network environments.

All information needed to correlate the different network topology layers is available in the management information base.