

Generating Maps and Hosts From Topological Data

... in particular from
Cisco Prime LMS CSV exports

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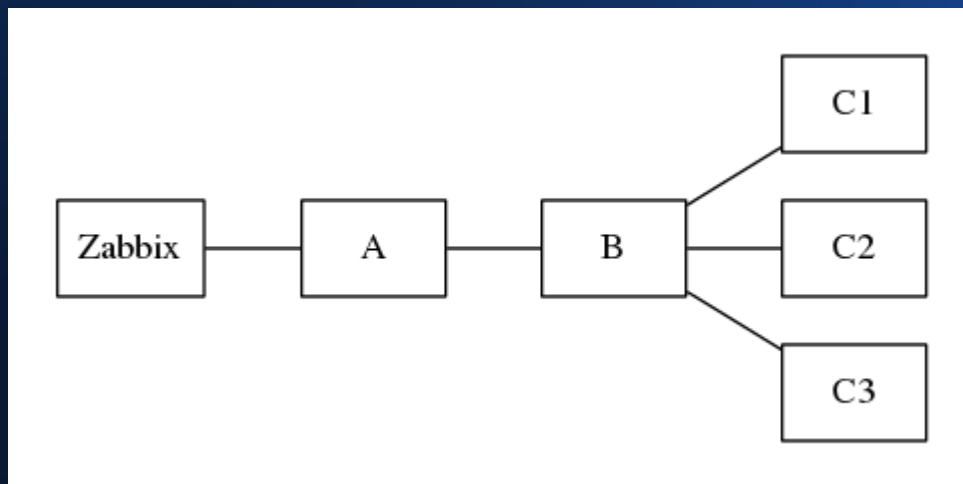


This approach is not bound to Cisco Prime. Any source of topology works.

Goal of Minding Topology

- Prevent pointless notifications
- Locate root cause of an outage
- Identify affected hosts or services

-> Room for improvement in Zabbix



Overview

- Cisco's export format
- <http://www.geofrogger.net/zconf>
- Create a topology graph
- Correct and complete the graph
- Create suitable segments for mapping
- Layout
- How to jam it in

• Cisco's Export Format

- CSV
 - IP address, host name
 - SNMP OID
 - List of neighbors

```
10.120.1.14,  
somehost.meduniwien.ac.at,  
.1.3.6.1.4.1.9.1.875,  
"10.120.1.134, 10.120.1.135"
```

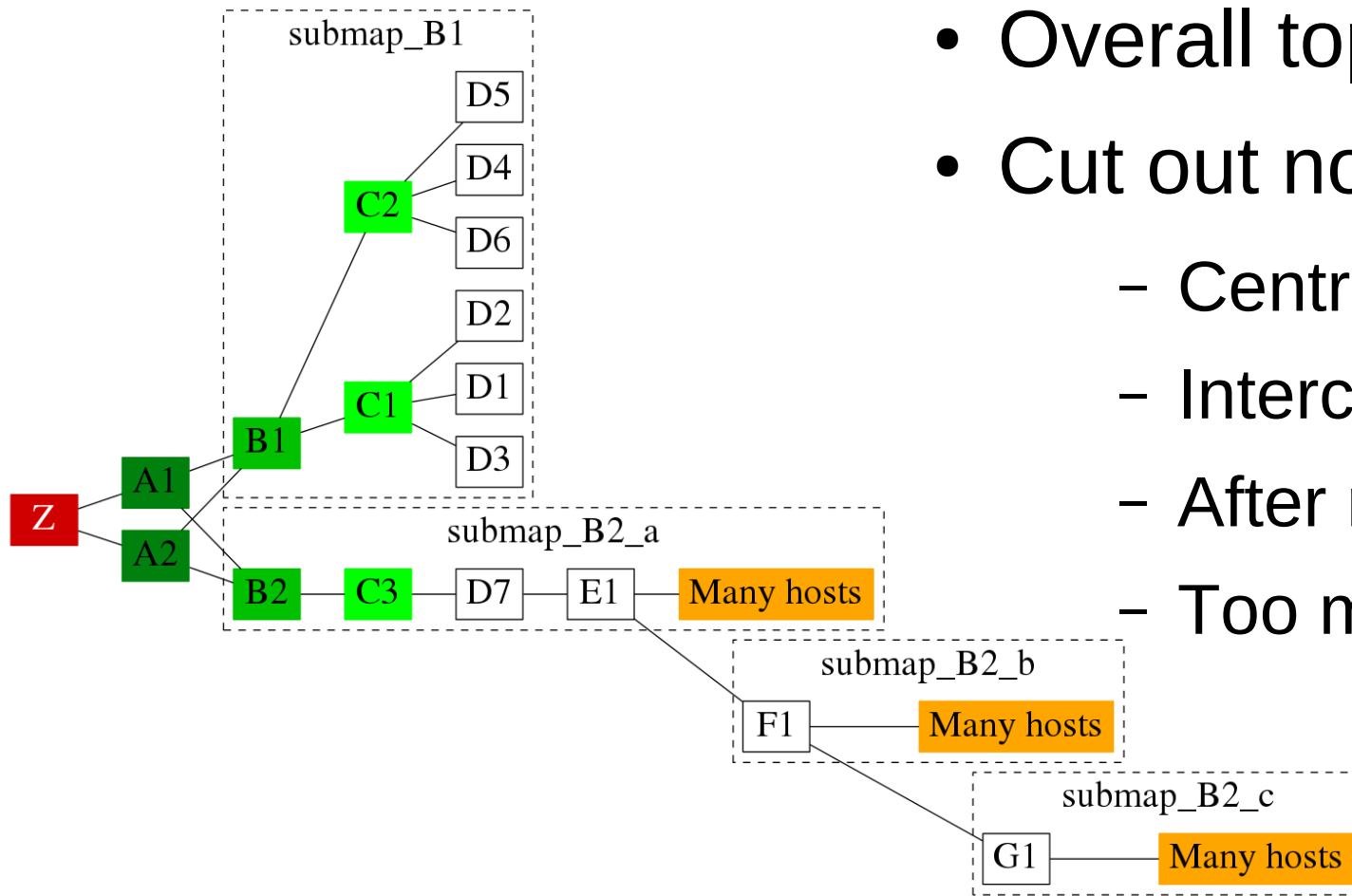
Creating a Topology Graph

- Python module NetworkX
- ~20 lines of code, ~2 seconds for 2,600 nodes
- Nodes and edges carry attributes
- Manipulate and query
 - Connected?
 - Distance?
 - Different paths?

Correct and Complete

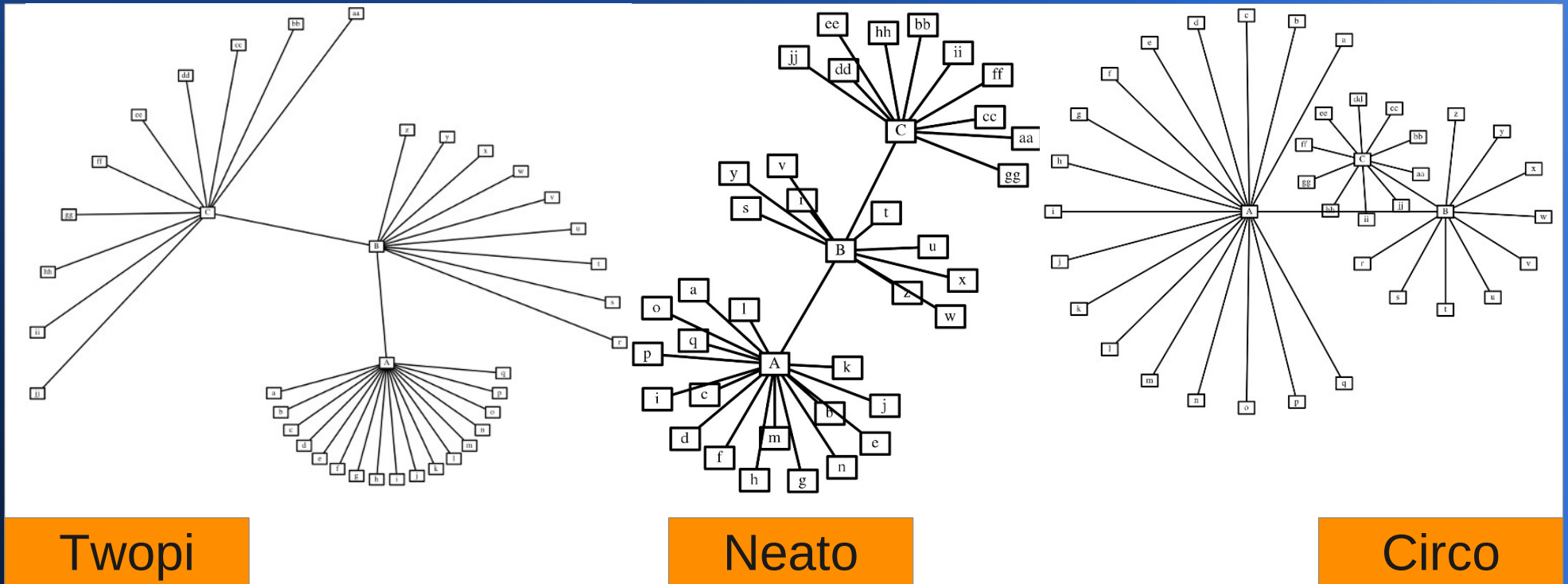
- Bogus connections
- Firewalls are missing
- Non-Cisco equipment
 - LLDP
 - Plans
 - (Traceroute)

Segmenting the Graph



- Overall topology
- Cut out nodes
 - Central
 - Interconnecting
 - After number of hops
 - Too many children

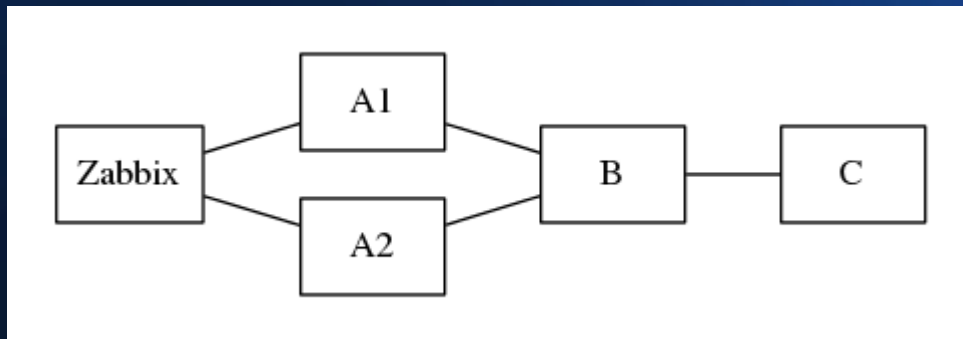
Layout with Graphviz



- Just use the resulting coordinates

Create the Hosts

- IP address
 - Various look-ups (SNMP, name, nmap, ...)
- Host groups, items, triggers, ...
- Relevant neighbors -> Trigger dependencies



Dependency is more than just neighborhood. The graph has to be analyzed to understand the complete situation.

How To Get It Into Zabbix?

- **XML** suitable for initial import
 - Transactional
 - Can't delete hosts, items, triggers
- **API** could be used therefore necessary to keep topology up to date
 - Not transactional in this sense
 - Order is important
 - More difficult to create

Challenge: Keep It Working

- Add
- Delete
- Relocate
- Disable
- Maintenance
- Consistency

I wish I could ...

- Dynamically generate maps
- Locate host on map(s)
 - ZBXNEXT-781
- Visualize dependencies on maps
 - ZBXNEXT-1235
- Notify consecutive faults with the root cause
 - ~~Using special triggers and dependencies~~ allows for this behavior in certain topologies but is unmaintainable

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