



Network Monitoring and Management

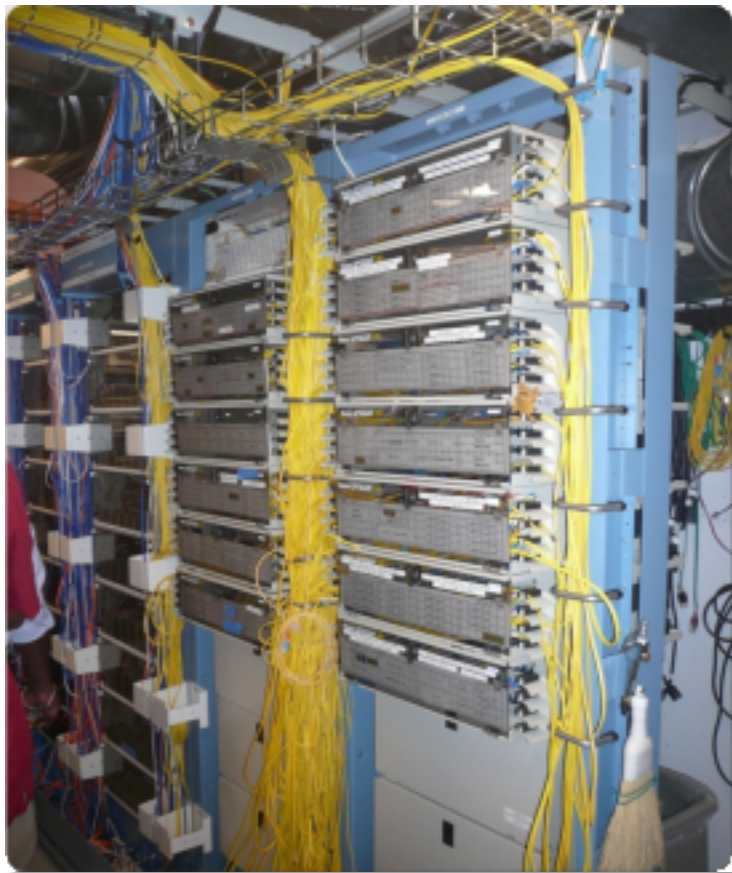
Network Documentation



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Documentation

Maybe you've asked, "*How do you keep track of it all?*" ...



**Document,
document,
document...**

Updated Documentation is essential

- So that you can remember what you did 6 months ago
- So that others in your team can troubleshoot problems quickly
- Think about these questions:
 - What would happen to the network if the main engineer moves to another job?
 - How would your team deal with problems if you were sick? Or on vacation?

Documenting is hard

It's tedious

- “I'm so busy, I don't have time right now”

It's difficult to keep organized

- You need to have an established methodology that everyone can follow
- Otherwise it becomes crazy with time

It becomes outdated very quickly

- Old information is useless and can be even dangerous!

Guidelines

Create a documentation policy

- What's the responsibility of each person?
- What is the process? Order of tasks?
- How to verify completeness/quality?
- Methodologies
 - Consistent naming schemes
 - For devices, cabling, etc.

Guidelines

Label EVERYTHING

- Devices: routers, switches, servers, access points, etc.
- Cabling
- Network jacks
- Racks

Documentation

Basics, such as documenting your switches...

- What is each port connected to?
- Can be simple text file with one line for every port in a switch:
 - health-switch1, port 1, Room 29 – Director's office
 - health-switch1, port 2, Room 43 – Receptionist
 - health-switch1, port 3, Room 100 – Classroom
 - health-switch1, port 4, Room 105 – Professors Office
 -
 - health-switch1, port 25, uplink to health-backbone
- This information might be available to your network staff, help desk staff, via a wiki, software interface, etc.
- Remember to label your ports!

Documentation: Labeling

Nice... 😊



Network Documentation

More automation might be needed. An automated network documentation system is something to consider.

- You can write local scripts to do this.
- You can consider some automated documentation systems.
- You'll probably end up doing both.

NOCs: Network Operation Centers

Where documentation, monitoring and management can all come together:

- Links to monitoring tools
- Ticketing systems
- Documentation systems
 - Diagrams
 - Databases
 - Wikis

The Network Operations Center

NOC = Network Operations Center

- Come in many forms and depend on the size of your organization and your goals.
- “One or more locations from which control is exercised over your network.”
- NOCs can be:
 - Virtual
 - Located at the core of your network
 - With your help desk
 - Built in pieces
 - Etc.

A BIG NOC



There are even bigger NOCs out there...

A small NOC



In the same room there is a desk with a phone, another computer and a monitor. This acted as the group's Help Desk.

Many network problems could be detected and solved on the spot!

Automated Documentation Systems

There are quite a few automated network documentation systems. Each tends to do something different:

- **Netdot:**

- <https://netdot.uoregon.edu/>

- IPplan:

- <http://iptrack.sourceforge.net/>

- Netdisco:

- <http://netdisco.org/>

- Rack Tables:

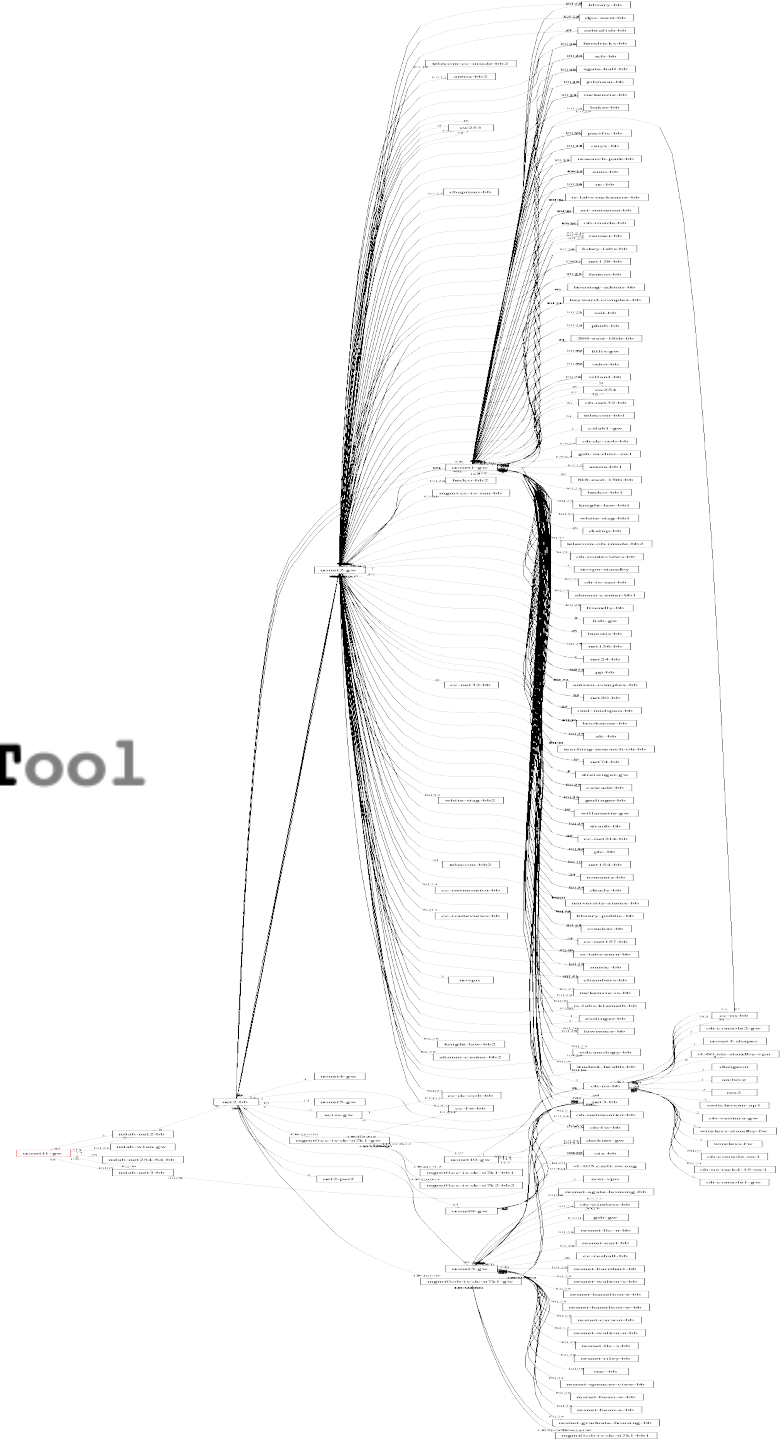
- <http://www.racktables.org/>



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NETwork DOcumentation Tool





NETwork DOcumentation Tool

It's a very comprehensive tool:

- Device discovery via SNMP
- Layer2 topology discovery and graphing, using:
 - CDP/LLDP
 - Spanning Tree Protocol
 - Switch forwarding tables
 - Router point-to-point subnets
- IPv4 and IPv6 address space management (IPAM)
 - Address space visualization
 - DNS/DHCP config management
 - IP and MAC address tracking

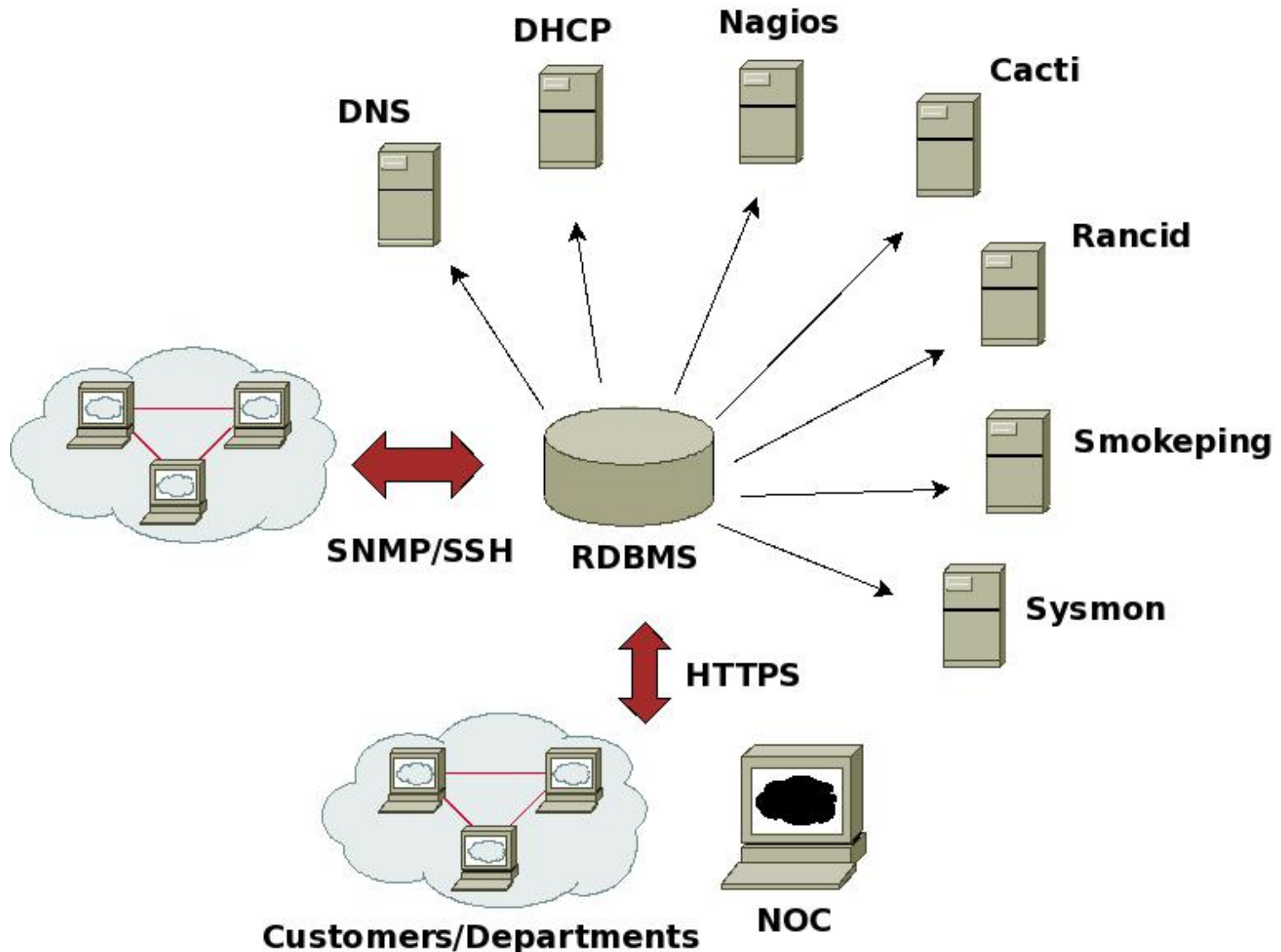
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Functionality continued:

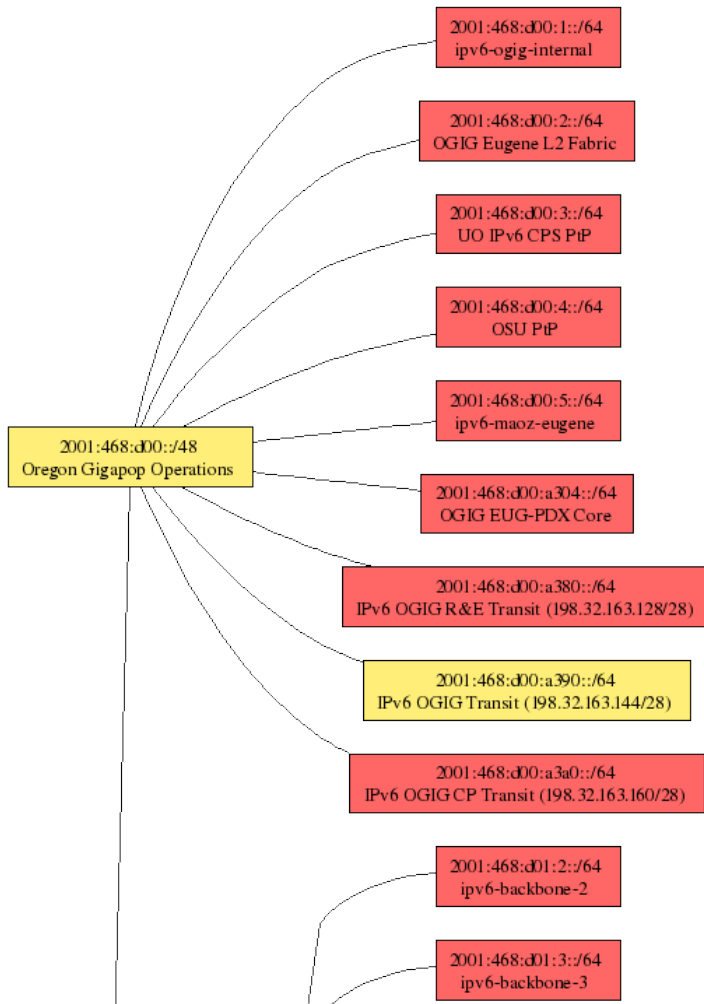
- Cable plant (sites, fiber, copper, closets, circuits...)
- Contacts (departments, providers, vendors, etc.)
- Export scripts for various tools (Nagios, Sysmon, RANCID, Cacti, etc)
 - I.E., how we could automate node creation in Cacti!
- Multi-level user access: Admin, Operator, User
- It draws pretty pictures of your network

The screenshot displays the Netdot web interface. At the top, there is a navigation bar with tabs: Management, Contacts, Cable Plant, Advanced, Reports, Export, and Help. Below this is a secondary bar with tabs: Devices, VLANs, Address Space, DNS Records, DNS Zones, and DHCP. The main content area is titled 'Device Tasks' and includes a sub-section 'Find Devices'. This section contains a text input field labeled 'Name/IP/MAC:' and a 'search' button. In the top right corner of the 'Device Tasks' section, there are links for '[new]' and '[hide]'. At the bottom of the page, a footer indicates the copyright: '© GPL. Netdot: NETwork DOcumentation Tool v.0.9'.

Netdot: NETwork DOcumentation Tool



Netdot Topology example



Netdot can draw the topology of a network or a segment of a network dynamically.

Questions

