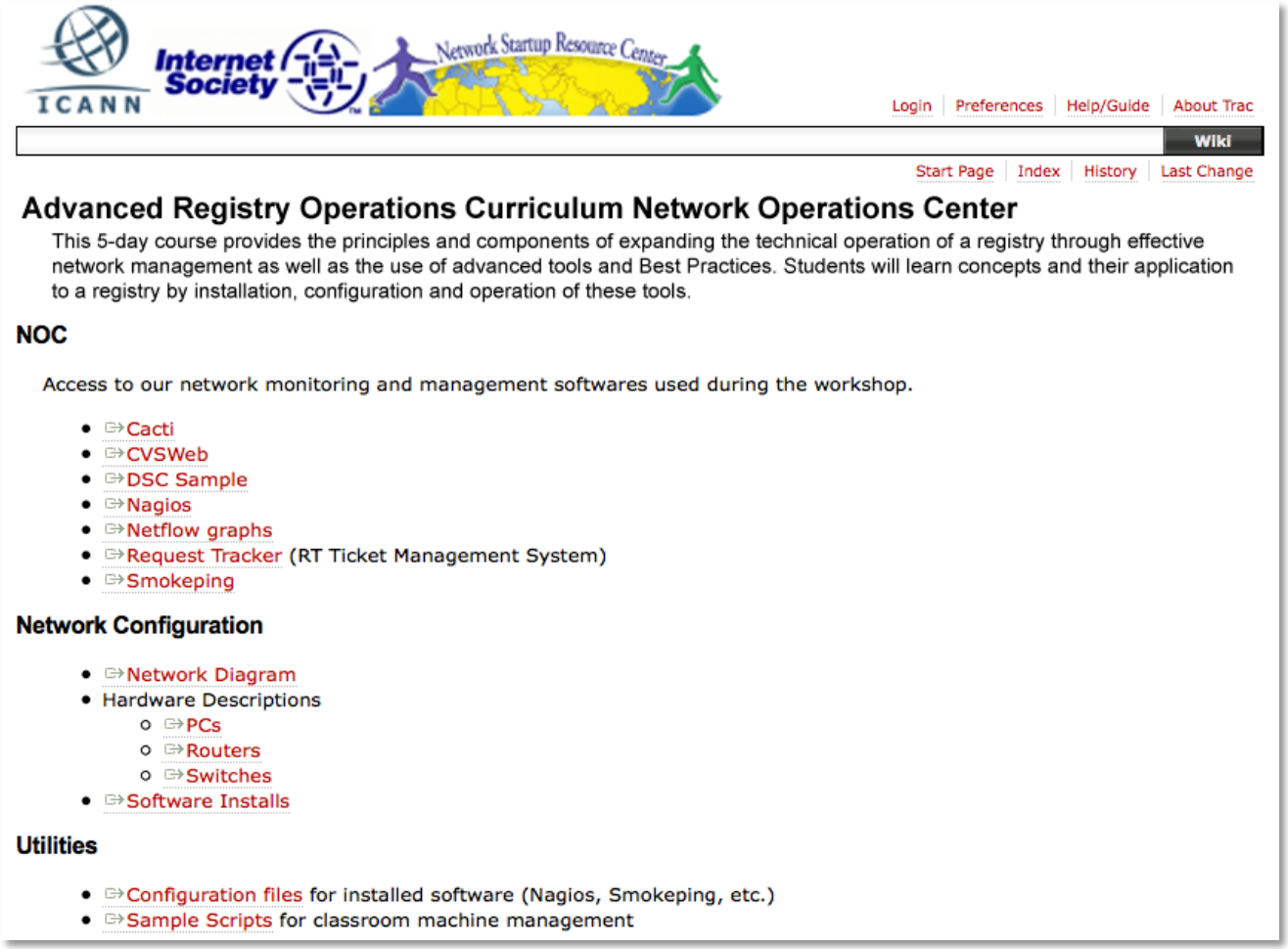
Advanced Registry Operations Curriculum

Completing Your NOC

Our Virtual NOC

Do you remember this slide? Are you there?



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Advanced Registry Operations Curriculum Network Operations Center

This 5-day course provides the principles and components of expanding the technical operation of a registry through effective network management as well as the use of advanced tools and Best Practices. Students will learn concepts and their application to a registry by installation, configuration and operation of these tools.

NOC

Access to our network monitoring and management softwares used during the workshop.

- Cacti
- CVSWeb
- DSC Sample
- Nagios
- Netflow graphs
- Request Tracker (RT Ticket Management System)
- Smokeping

Network Configuration

- Network Diagram
- Hardware Descriptions
  - PCs
  - Routers
  - Switches
- Software Installs

Utilities

- Configuration files for installed software (Nagios, Smokeping, etc.)
- Sample Scripts for classroom machine management

Your Assignment During the Week

Document your network!

- After each software install and configuration link to the new software.
- Create an entry for your PC, local router, switch, and other PCs, routers and switches in the classroom.
- Create or copy a classroom network diagram.
- Consider using Trac's Timeline and ticket features for outstanding issues and projects.
- Create a repository of configuration files and link to this.

Your Assignment cont.

Documenting your network…

- Make note of what software is installed and versions.
- Document anything else that you think will make managing and monitoring your network easier.
- By now you should have a Trac instance similar to or better than the instance installed and configured on the workshop NOC machine:

  http://localhost/trac/

Reviewing the Week

What we've done:

- Day One
  - Welcome
  - Introducing Your NOC
  - Student Presentations
  - Resilient, Reliable and Robust Registry Operations
  - Network Monitoring and Management Introduction
- Day Two
  - Network Performance Definitions
  - Network Measurement
  - Nagios
  - SNMP

Reviewing the Week cont.

- Day Three
  - Ticketing Systems (Request Tracker)
  - Nagios with RT+Mailgate
  - Cisco Configuration Elements
  - NetFlow and NFSen
- Day Four
  - CVS and CVSweb
  - RANCID
  - Smokeping
  - Antigua!

Reviewing the Week cont.

- Day Five
  - Cacti
  - Log Management (Syslog-NG and Swatch)
  - Network Documentation with Netdot
  - DSC: A DNS Statistics Collector demo
  - Change Control (Puppet)
  - *Completing Your NOC*
  - Summary
  - Q&A
  - Exam
  - Certificates

Putting it All Together

The tools we have presented build upon each other. They are:

- Heavily interconnected:
- Uses data from one application in another.
- Give us a more comprehensive view of our networks.
- Allow us to plan for future expansion or changes.
- Allow us to respond, in some cases, before there are serious problems.
- Allow us to respond intelligently to problems.

Taking Advantage of This

Having all this information in one place makes it *much easier* to take advantage of all this functionality and interconnection.

To keep your Virtual NOC up-to-date you will need to have processes in place.

- Changes to hardware must be recorded.
- Changes to the network must be recorded.
- Changes to software must be recorded.

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.

Automated Systems

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

- IPplan:
  http://iptrack.sourceforge.net/
- Netdisco:
  http://netdisco.org/
- Netdot:
  https://netdot.uoregon.edu/

IPplan: [[IPplan]]

From the IPplan web page:

"IPplan is a free (GPL), web based, multilingual, TCP IP address management (IPAM) software and tracking tool written in php 4, simplifying the administration of your IP address space. IPplan goes beyond TCPIP address management including DNS administration, configuration file management, circuit management (customizable via templates) and storing of hardware information (customizable via templates)."

Lots of screenshots:

http://iptrack.sourceforge.net/doku.php?id=screenshots

Netdisco:

- Project launched 2003. Version 1.0 released October 2009.
- Some popular uses of Netdisco:
  - **Locate** a machine on the network by MAC or IP and show the switch port it lives at.
  - **Turn Off** a switch port while leaving an audit trail. Admins log why a port was shut down.
  - **Inventory** your network hardware by model, vendor, switch-card, firmware and operating system.
  - **Report** on IP address and switch port usage: historical and current.
  - **Pretty pictures** of your network.

Netdot: {net.} NETwork DOcumentation Tool

Includes functionality of IPplan and Netdisco and more. Core functionality includes:

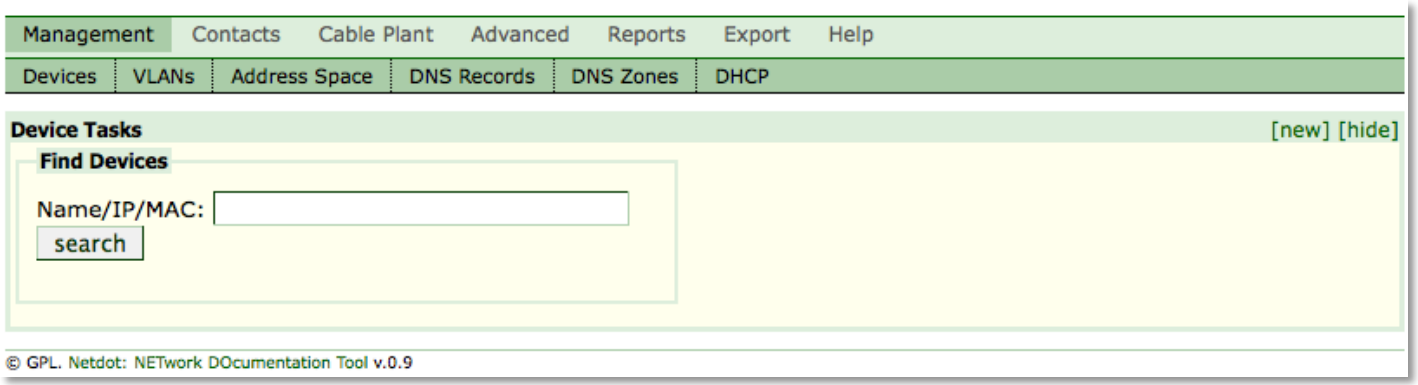
- Device discovery via SNMP
- Layer2 topology discovery and graphs, using:
  - CDP/LLDP
  - Spanning Tree Protocol
  - Switch forwarding tables
  - Router point-to-point subnets
- IPv4 and IPv6 address space management (IPAM)
  - Address space visualization
  - DNS/DHCP config management
  - IP and MAC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

Continued ➔

Netdot: {net.} NETwork DOcumentation Tool

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



Finishing our NOC

At this point let's use our last session to finish up exercises, network documentation, ask questions, etc.

Before we do exercises…

Questions?