

Configuration Management



- Network configuration management (NCM) is the process of organizing and maintaining information about all the components of a computer network.
- When a network needs repair, modification, expansion or upgrading, the administrator refers to the network configuration management database to determine the best course of action.
- This database contains the locations and network addresses of all hardware devices, as well as information about the programs, versions and updates installed in network computers.



- Network configuration management tools can be vendor-neutral or vendor-specific.
- Vendor-neutral tools, by far the more common, are designed for networks containing hardware and programs from multiple suppliers.
- Vendor-specific tools usually work only with the products of a single company, and can offer enhanced performance in networks where that vendor dominates.



- Configuration Management is the process of
 - Obtaining data from the network
 - Using that data to manage the setup of all network devices
- Configuration Management steps
 - Gathering information about the current configuration of the network
 - Using that data to modify the network configuration of devices
 - Storing the data
 - Maintaining an up-to-date inventory
 - Producing reports on that data



Collecting Data

- Obtaining data often begins with a manual collection
 - Need to record the devices
 - Serial number
 - Address assignment
 - Store data in a spreadsheet, database etc
 - This can be tedious and error prone for large networks
- Data can be collected automatically
 - Using network management protocol
 - Autodiscovery



Autodiscovery

- Can be implemented using ICMP echo (PING) to every possible address
 - When device answers record details
 - Advantage: will discover every working device on network
 - Disadvantage: wasted bandwidth and time querying non-existent devices.
- Could also find one device and then query it to discover what other devices it has communicated with recently
 - All network devices discovered in a breadth first search manner
 - Advantage: works quickly
 - Disadvantage: May fail to find a device that has not communicated with the network recently
- Can also help produce a graphical map of the current network



Modifying data

- Once configuration management information has been collected it will usually need to be updated and maintained
 - With a 5000 node network even if 1% of those machines required a change once a week that would be \equiv 50 changes per week
- Addresses are only ONE of the parameters that need to be tracked
- Manual system are inefficient and error prone
- Configuration management systems can record these changes **automatically**



Storing Data

- Configuration management should also provide information storage. Centralised storage provide the network engineer with efficient access to configuration data.
- Currently a DBMS is considered the most efficient manner to store this data
 - Advantages
 - Enables large amounts of data to be stored on a single computer
 - Fast searching
 - Automatic sorting of data
 - Restoration of lost data
 - Data relationships
 - Disadvantages
 - Complex administration procedures
 - May use its own language
 - Tends to be platform or OS specific (lack of portability)



Advantages of network configuration management include:

- Streamlining the processes of maintenance, repair, expansion and upgrading.
- Minimizing configuration errors.
- Minimizing downtime.
- Optimizing network security.
- Ensuring that changes made to a device or system do not adversely affect other devices or systems.
- Rolling back changes to a previous configuration if results are unsatisfactory.
- Archiving the details of all network configuration changes.



THANK YOU