

3rd Year Project Brief

Name: Simon Chudley

Project Title: Managing network services using abstracted XML configurations

Supervisor: Dr Ulrich Ultes-Nitsche:

Problem:

Establishing and managing network infrastructures between distributed nodes, based on varying operating systems and service types can be time consuming and risk prone. The work involved in changing the underlying operating system of a given node, or converting a node to use another service technology can also raise compatibility problems.

One of the main causes of such problems is the fact that configuration files for individual services differ, especially between operating systems. However, the methodology and operation of such services remain constant across implementations, and hence there is an obvious level of abstraction that can be used to describe them.

Goals:

- Provide a method of allowing users to gather and display structural details about nodes and links on their local area network.
- Allow the specification of network services and configuration for each required node on the network. The actual behaviour will be generalised so that it reflects the various different implementations and versions of that service available on different platforms.
- Store the state of the network layout and the service descriptions of each node to a series of XML files. These give an abstracted description of the system as a whole, allowing it to be restored and analysed at a later date.
- The XML node descriptions can then be parsed and converted into sets of configuration files specific to the required operating system and service types.

The main advantage of having the XML abstracted representation of the system and all nodes within it is that it separates the system level information, such as operating system and service version, from the higher level description of the behaviour of that node. This implies that nodes can be interchanged, and once the XML configuration of that node has been re-applied it will behave the same.

Scope:

This project covers many aspects relating to network service management. Detailed abstracted descriptions of common network services must be created to act as the core of the system, with the ability to convert to and from the base level configuration files. Network analysis and simulation must be carried out to establish the underlying layout, and this will involve low-level inspection of the network itself.