

A Common Configuration Language for Network and Application Services in the Internet.

Motivation

The majority of the Internet network services (DHCP, DNS, E-Mail, etc) have already some form of redundancy mechanism that sets their resilience to a certain level. At the moment, each standard network or application service has its own redundancy mechanism and no configuration language defined, that is, each service has defined its own strategy for implementation of redundancy, although some share common features, and none of them mandates the use of a standard configuration language, being this implementation dependent.

One of the most important responsibilities for the network services management staff is to insure an acceptable level of resilience for each network or application service installed and maintained. This task mandates significant knowledge about each installed service and its methods of implementing redundancy through mirroring, load balancing or replication strategies. Additionally, each service could have several alternative software implementations with their specific features, configuration languages and database formats.

A Common Redundancy and Backup System for Network and Application Services on the Internet would have an important impact on the current network management activities and practices since it would provide a unique methodology for implementation of redundancy and a backup feature for all these services, eliminating the need for knowledge of several systems and the use of a different software implementation for each service.

Also, this would permit separate development and implementation of the productive functions of the services and the redundancy and replication aspects.

Some of the costs associated with the planning and installation of standard network and application services could be diminished if these could use similar strategies and common configuration languages and/or runtime database formats.

Objectives

The use of a unique configuration language for a Common Redundancy and Backup System for Network and Application Services on the Internet is a mandatory requisite. Although a common runtime database format should be also a requisite, it should be not the emphasis of this work.

The first goal of this work would be to study and analyze the configuration issues of all the major TCP/IP network services and applications and to discover common properties, features and semantics. Also, present proprietary and standard configuration languages and state of the art distributed configuration management applications should be studied. This should lead to the identification of the major limitations of present proposals.

The major goal of this research work should be the definition of a common configuration, generic language for use with all major TCP/IP network and application services. This language would be used on the Common Redundancy and Backup System but should be defined in such a way to permit its use on configuration aspects of all the TCP/IP services, like, for example, email systems and routing domains. This language should provide the means to a network manager to configure a service based on its functional objectives and not be dependent on specific hardware or software

implementations. For example, the configuration file needed to configure the standard TCP/IP network services and protocols of a router should be independent of its hardware manufacturer or its operating system.

This new configuration language should also be capable to represent policy rules or topology relationships for TCP/IP network services and applications. It should be service oriented and not device oriented.

The research work should be complemented with the development of a prototype compiler or interpreter for the proposed language so it could permit to test its use with existing network devices and software implementations that already use a specific configuration language.

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