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The Simple Times is an openly-available publication devoted to the promotion of the Simple Network Management Protocol. In each issue, *The Simple Times* presents technical articles and featured columns, along with a standards summary and a list of Internet resources. In addition, some issues contain summaries of recent publications and upcoming events.

In this Issue:

Configuration Management

Editorial	1
Configuration Management Services for the Large Enterprise Network	2
Policy-Based Configuration Management: A Perspective from a Network Management Vendor	5

Featured Columns

Questions Answered	10
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Miscellany

Book Reviews	12
Standards Summary	13
Recent Publications	17
Calendar and Announcements	18

Publication Information 18

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Editorial

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This issue of *The Simple Times* focuses on configuration management, which is still considered an important and insufficiently solved problem in many networked environments. Of course, configuration management is not a new problem. So why is there again so much interest in effective configuration management?

The movement from a simple best-effort Internet towards an Internet which supports multiple service levels is currently the main driving force. The technologies which have been developed to implement QoS in the Internet require much more configuration data to be effective. It is therefore of key importance to solve the configuration management problem in order to deploy an Internet which provides multiple service levels.

The articles in this issue of *The Simple Times* discuss various aspects of the configuration management problem. The authors address questions such as whether SNMP can be used to effectively address configuration management problems or whether policy-based configuration management solutions can address the problem appropriately.

An important aspect is the role standards can play to reduce the amount of time and money spent on configuration management. Some people believe that commonly accepted and implemented configuration management standards are the only way to solve the problems. Others believe that device vendors have little interest to support common configuration management standards in order to differentiate their products and because it takes too long to define configuration management standards for new emerging technologies. You may want to keep these different views in mind while reading the articles in this issue.

In the last issue of *The Simple Times*, we asked our readers to fill out an online survey since we considered to publish the first twenty issues of *The Simple Times* as a reference book. A total of 144 readers completed the form. A majority of 77 percent expressed their interest in such a book and the amount of money they were willing to pay was more or less evenly distributed in the range US \$10-\$50.

Comparing the survey results with the page hit rates for the last issue of *The Simple Times* (18,500 HTML, 7,750 PDF, 700 PostScript), we concluded that only a minority actually participated in our online survey. Of course, the online HTML version is frequently reloaded by the same group of people. Hence, we believe that the PDF and PostScript page hit counts provide a better base for an estimation of the size of *The Simple Times* readership. We also know that some people continue to distribute paper copies of *The Simple Times*. So a reasonable estimate of the size of *The Simple Times* readership is perhaps 10,000. This, however, implies that our survey only reached about one percent of the total readership and thus we concluded that the interest is not big enough to bundle the first twenty issues of *The Simple Times* in a reference book.

Configuration Management Services for the Large Enterprise Network

John Roesse, Enterasys Networks

The need for more robust and effective configuration management tools has always been a pressing issue within the enterprise networking space. Network administrators continue to be under tremendous pressure to make their network infrastructure provide more robust and timely services to more users.

Compounding this pressure is the fact that enterprise IT organizations continue to face growing shortages of qualified staff as well as budgets that are not growing at the same pace as the scale of their systems. Examining these trends, it becomes clear that in order to deliver the services required, with the limited resources available, more intelligent management services are needed.

First Some History...

While network management has been part of the overall network solution for over a decade, beyond basic fault isolation the real value of network management tools has been very limited.

Vendors offer many "configuration management" tools and services, but most have failed to provide real cost versus contribution value. What is clear by looking at which tools are used and which tools are put idle after purchase (whether due to inadequate design, limited device support or excess complexity), is that the vast majority of configuration management tools and services have failed to provide real value. This failure is sometimes due to a disconnect between the management

interfaces supported by the tools, e.g. MIB modules, and the management interfaces supported by the devices under their management.

Many configuration tools operate on the flawed principle that the configuration action can be manually configured on a device-by-device basis. Most web-based configuration tools fall into this category. They might be interesting when configuring a single switch in a lab environment, but they do not provide value when used to configure an enterprise consisting of thousands of switches.

The tangible result of the inadequacy of configuration management tools can be seen in the development of the preferred configuration interface, the Command Line Interface (CLI). The fact that most seasoned and technical networking professionals prefer to use the cryptic and non-intuitive CLI versus external software based configuration tools defies logic until you look at the historical record of the effectiveness of configuration management tools. This is a simple but valid observation of the current state of configuration management tools.

We need to look at how we might correct this situation as we move into the next generation of configuration management architectures. A deeper analysis shows that a few specific issues come forward as an explanation of what has gone wrong and how we might correct them as we move into the next generation of configuration management architectures:

- *Too much detail.* Building a huge monolithic configuration management service that offers a direct interface into every attribute of a device will overwhelm the network administrator. Too many tools present raw data without converting it into useful management information.
- *Single Manager Assumption.* Because the CLI is commonly used, and split horizon management concepts are becoming the rule of the day, any assumption that one management interface will have absolute control over a device configuration is incorrect. Configuration Management services that assume exclusive control of the systems under management are destined to failure.
- *Lack of support for standard management interfaces.* Many vendors require customers to learn and to use that vendors proprietary tools, such as the CLI, for configuring their devices. Even many of the core standards developed by the IETF and IEEE considered network management a secondary concern. Lack of standardized management increases the burden of staff training, and increases the likelihood of unintended inconsistencies in the