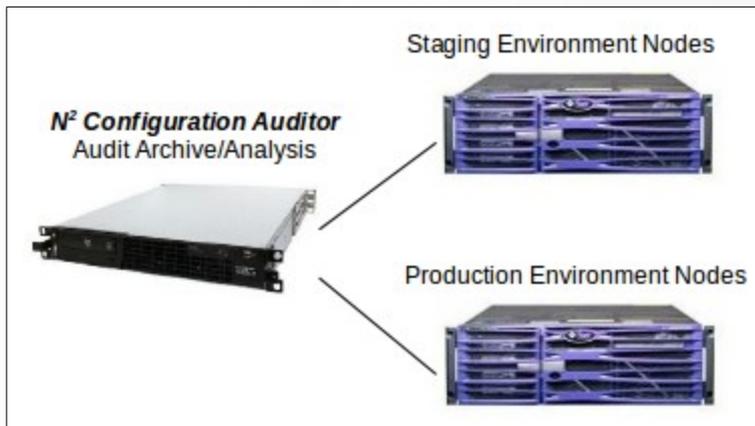


## Summary

Telecommunications Operators and other scalable real-time service providers typically implement multiple staging environments (e.g. Production, Pre-Production, Test, Development), each with many redundant nodes.

In such situations, ongoing Configuration Auditing becomes a significant technical challenge, with service-impacting consequences that can be difficult to identify and resolve.

The *N-Squared Configuration Audit Tool* is a product proposed to directly address these needs. This product is currently in design feedback stage. This white paper is provided to allow potential users to comment on relevance of this solution to their particular needs.



Features of the Proposed Solution include:

- **Full Graphical User Interface**
- **Role-Based Node Management**
- **Checks: File, Database, Package, Binaries**
- **Upstream/Downstream Validation**
- **Peer-to-Peer Cross-Check Validation**
- **Full Archive with Now/Then Validation**
- **Bundled with OCNCC Audit Rules**
- **Easily Extensible via LUA Scripting**

## Background

The *N-Squared Configuration Audit Tool* is unique in the solutions it brings to the Configuration Audit problem.

General-Purpose Configuration Management utilities typically suffer from the following problems, meaning they cannot fully address the needs of complex service providers such as Telecommunications Operators:

- A) They require extensive, ongoing manual maintenance of an independent “master template”.** Ideally, a self-adapting solution would automatically compare upstream/downstream (e.g. Pre-Production vs. Production), and would cross-check between peer nodes (SCP-1 vs. SCP-2).
- B) They do not support database-based configuration/service data.** Many systems (including OCNCC) contain a significant part of their service-management and configuration data in database tables. A suitable system must be able to verify and cross-check structures read from a database.
- C) They perform “uniformed” simple-text analysis of configuration files.** A better solution would actually parse and understand the configuration. Parsing eliminates false positives like comments, irrelevant white-space, and order of unsorted lists, retaining only genuine, significant differences.
- D) They have poor (or non-existent) support for nested, hierarchical configuration.** The flat-file approach used by existing solutions inevitably struggles to handle the complex, abstract configuration required by the sophisticated and highly-flexible services in the Telecommunications arena.

In addition, there are some high-value secondary features which an ideal solution would offer:

- E) Complete Web-Based Graphical Interface.** Most existing systems require their rules to be laboriously hand-written in text files using a domain-specific language. A better solution would offer a web-based point-and-click interface to manage and re-use node, file and check-rule definitions.
- F) Archive/Audit Trail.** A complete solution should archive all configuration snapshots to assist with diagnostic and auditing investigations. This archive must be accessible via the web-based GUI, which should also offer the ability to cross-check between snapshots.

The proposed *N-Squared Configuration Audit Tool* addresses all of these issues. In doing so, it becomes the ideal option for analysis and auditing of multi-level deployments within Telco and other similar domains.

## Real-World Configuration Scenarios

Consider the three most problematic configuration scenarios in multi-node/multi-environments:

1. **New Service Roll-Out:** A new service (with associated database configuration, file configuration and software patches) is created and tested in Pre-Production. The configuration changes are transferred into Production. The configuration transfer is incorrect/incomplete, resulting in loss-of-service. An Upstream/Downstream Audit Check would have detected this problem.
2. **New/Changed Nodes:** A new node instance is created, or changes role(s). Relevant configuration is transferred from another node. The configuration transfer is incorrect/incomplete, resulting in loss-of-service. A Cross-Check Audit would have detected this problem.
3. **Ongoing Supervision:** A configuration change is made but is not correctly documented. A subsequent configuration change is incompatible because is made without full visibility of the first modification. A Now/Then Audit Check would have detected this problem.

## Audit Tool Features

The *N-Squared Configuration Audit Tool* will offer licensing flexibility through extensible Feature Packs:

Feature Packs	
<b>Base Features</b> <ul style="list-style-type: none"> <li>• Create/Manage Node &amp; Node Roles</li> <li>• Create/Manage/Allocate Aspects to Node Roles                             <ul style="list-style-type: none"> <li>◦ Database Configuration</li> <li>◦ File Configuration (XML, User-Defined Formats)</li> <li>◦ Package &amp; Patch Version</li> <li>◦ Binary File Checksums</li> <li>◦ File/Directory Permissions/Ownership</li> <li>◦ Check Patterns/Exceptions/Ignores</li> </ul> </li> <li>• Node Agents (Solaris &amp; Linux)</li> <li>• Web-Based User Interface</li> <li>• Historical Configuration Archive</li> <li>• Audit – Upstream/Downstream, Cross-Check, Historical</li> </ul>	<b>OCNCC – Configuration File Formats</b> <ul style="list-style-type: none"> <li>• “SLEE.cfg” File Configuration Format</li> <li>• “acs.conf” File Configuration Format</li> <li>• “eserv.config” File Configuration Format</li> </ul>
	<b>OCNCC – Advanced Calling Services Plans &amp; Profiles</b> <ul style="list-style-type: none"> <li>• Global Profile</li> <li>• Customer Profiles</li> <li>• Customer Control Plans</li> </ul>
	<b>OCNCC – Charging Control Services Product Types</b> <ul style="list-style-type: none"> <li>• Product Type Parameters &amp; Profiles</li> <li>• Product Type Capabilities</li> <li>• Product Type Rating</li> <li>• Product Type Notifications</li> </ul>

## Hardware & Operating System

The *N-Squared Configuration Audit Tool* supports audit of Solaris and Linux nodes. The central audit database will run under standard Linux distributions.

## Support & Maintenance

Initial licence includes three months of warranty and phone/email support. Subsequent ongoing support is available at 20% per annum of the base list price. A continuous support agreement includes zero-cost upgrades.

## About N-Squared

N-Squared is an Oracle Gold Partner based in New Zealand. We are specialist providers of products and services for the Telecommunications domain.

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### VALIDATION LEVELS

#### 1 – Completely Identical

Configuration is checksum equivalent.

#### 2 – Functionally Identical

Comments and cosmetic differences only.

#### 3 – Ignored Differences

Differences are covered by “ignore” rules.

#### 4 – Unexpected Differences

Differences are not covered by “ignore”.

#### 5 – Missing/Invalid Configuration

Config block is missing or fails to parse.