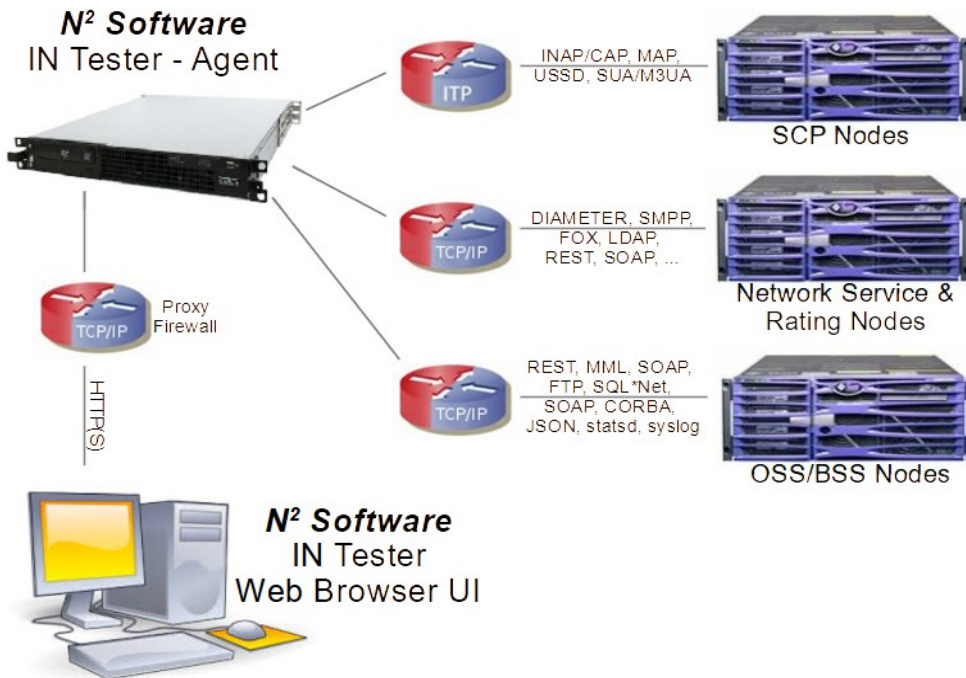## Summary

The *N-Squared Intelligent Network Tester* provides a modern, interactive platform for the structured testing of Telephony Rating and Call-Control Services. The solution implements an extensive range of protocols in a single, integrated end-to-end test framework with a fully graphical point-and-click guided test designer.

Key Features:

- **Graphical User Interface**
- **Voice Call Testing**
- **IVR Interaction**
- **Data & SMS Billing**
- **Short Message Delivery**
- **LDAP, MML, SOAP, CORBA, REST, ...**
- **Direct Database Query/Update**
- **Pre/Post-Call Set-Up & Checks**
- **Import/Export/Versioning**
- **Dashboard/Traffic Lights**
- **Multi-User Shared Tests**
- **On-Demand or Scheduled**
- **Load Testing**

Test Coverage

The *Intelligent Network Tester* from *N-Squared Software* supports test coverage of the most common scenarios implemented within any mainstream Telecommunications environment:

- **Usage Scenarios:** INAP/CAP, DIAMETER, MAP charging for Voice, Data, SMS, MMS, *etc*.
- **Call Rating Verification:** Automated cost-of-call verification through pre/post call balance difference.
- **IVR/USSD Self-Management:** Validate PIN, language, voucher, top-up, pre/post-call notifications, *etc*.
- **Subscriber Management:** Integrate and validate tests for BSS subscriber management services.

Test Flows & Test Execution

Test Flows within the *N-Squared Intelligent Network Tester* are defined using the web-based GUI for Test Design, Management & Execution.

Test Flows can be assembled into Test Groups for batch-running. Advanced features include variable parameters, branching/looping, random and rule-based attribute generation, pattern-matching, and vendor-specific variants.

Other Test Execution/Display/Management features:

- **Split-Screen Organiser, Folder and Tagging features.**
- **Comparison of Actual vs. Expected results per operation.**
- **Green/Orange/Red indicators for Pass/Warning/Fail.**
- **Built-In Protocol Analyser for DIAMETER & ASN.1 Messages.**
- **Calls Per Second Graph (in Load Testing mode).**

Message Flow		
For General/Voice announcement 2		
0	IDP (1) 4410001003 → 0800123000	
1	CTR	2
2	PA (123)	1 1
3	SRR	
4	DFC	1
5	ReleaseCall (31)	1

Key Benefits of Automated Testing

Manual testing of Telecommunications Services is repetitive, error-prone, and prohibitively time-consuming.

Modern test tools such as the *N-Squared Intelligent Network Tester* offers extensive benefits:

a) Exact tracing and automated validation of detailed message parameters.

b) Ability to simulate exact call durations. Ability to simulate overseas calls to any country.

c) Reduce risk by running complete regression test suites after system upgrades or configuration changes.

d) Retain a complete Test Execution Record, ideal for demonstrating ISO9000 or other QA compliance.

e) Integrated Test Management system. Tests are easily grouped, named and annotated.

f) Scheduled Tests. Load Testing. User Access Control. Configurable Parameter Defaults.

Feature Packs

The *N-Squared Intelligent Network Tester* offers licensing flexibility through extensible Feature Packs:

Feature Packs	
Base Features • Test Creation Interface & Repository w/ Import/Export. • Scheduled & On-Demand Test Execution Daemon. • Test Reporting & Protocol Analysis. • Stacks: SIGTRAN, SUA, M3UA, ASN.1, SCCP, TCAP. • INAP (excluding Charging & SRF interaction).	**DIAMETER Protocol Pack**
	Short Messaging (MAP) & USSD Interaction Pack
	Short Messaging (SMPP) Pack
	Load Testing Pack
	LDAP Queries Pack
INAP Voice Interaction Pack	**Oracle OCNCC Subscriber & Balances Pack**
INAP CAMEL Charging Variants Pack	**Oracle OCNCC Open Services Development (OSD) Pack**

Hardware & Operating System

The *N-Squared Intelligent Network Tester* runs under most 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.

Protocol Specifications
ETSI INAP (ETS 300 374-1) CAMEL Phase 2+ (ETSI TS 101 046) SCTP/IP (IETF RFC 2960) M3UA (IETF RFC 4666) SUA (IETF RFC 3868) ITU-T SCCP (ITU-T Q.713) ITU-T TCAP (ITU-T Q.771-775) DIAMETER (RFC 6733) Genband "Refinement 1" XML/HTTP/REST/SOAP/SMPP 3.4
Note: Protocols are supported to the extent necessary to support test actions.

Web: http://www.nsquaredsoftware.com/

Email: info@nsquaredsoftware.com