N-Squared Interworking Function

Summary

The N-Squared Inter-Working Function (N2IWF) is a multi-protocol gateway that maps 3G and 4G network-side call-control and short-message protocols into a concentrated real-time Diameter charging message channel for an Online Charging Server (OCS).

Built on Linux and commodity hardware (including VMs), the N2IWF solution combines easy and flexible service design with modern management features.

Protocols & Integration

The N2IWF integrates network channels (interfaces A-E) to a common charging channel (interface i).
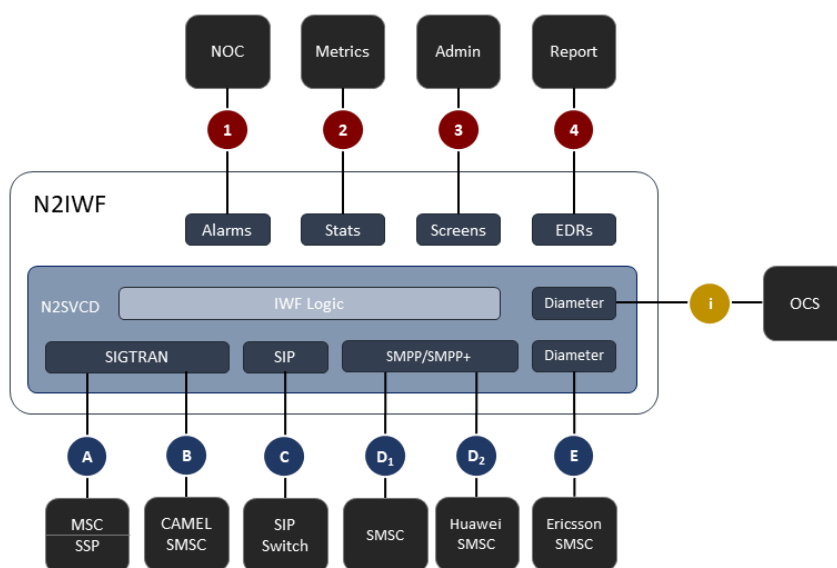

Figure 1: N2IWF Integration Points

Network-facing Voice interfaces:

- **INAP/CAP** InitialDP including CAP1
- **SIP** (RFC 3261)

Network-facing SMS/MMS interfaces:

- **SMPP** including Huawei SMPP+
- **CAMEL** InitialDPSMS
- Ericsson **SCAP AAA**

Supported charging-side interfaces:

- **Diameter Credit-Control** (RFC 4006, RFC 8506)
- **Diameter Base** (other AAA message implementations)

Supplementary Features

In addition to duration control, network sessions can be processed with controllable release/reject values or SIP/CAMEL redirection (e.g. to customer care).

Notifications may be sent to subscribers over SMPP or USSD.

For voice protocols, integration with a compatible announcement platform such as the N-Squared N2IVRS, allows pre-call and post-call announcements to be performed.

Both announcements and notifications may include variable parts such as account state, account balance, etc. with information sourced via the OCS over Diameter or other sources (via DB query, REST, SOAP, etc.).

Site-Custom Logic Scripting

Site-custom service logic can be added using the sandboxed, memory-efficient, user-friendly Lua scripting language. All service features have full access to the documented N-Squared Lua library APIs, including Network Control, Charging Control, and supplementary integration via Relational DB, MongoDB, Diameter, REST, and SOAP call-outs.

OSS & BSS Integration

Standard Network Operation Centre integration features are built-in – SNMP alarm traps and real-time statistics counters.

Data warehouse or client self-reporting is driven by an extensive set of protocol and service-level Event Data Records published for all key events. EDRs are generated for network, charging, and supplementary service features.

Site-custom scripting APIs can add enriched site-custom alarms, statistics, and event data records.

Platform Management & Control

The underlying N2SVCD service framework supports graphical and API-based management of the running system.

Via web-browser, system administrators may:

- View/modify running configuration.
- Track service statistics.
- Trace in-progress calls.
- Monitor resource usage.
- Activate/Quiesce/Standby nodes.

Figure 2: N2IWF operational GUI

Scalability & Redundancy

Each N2IWF service node is independent, allowing flexible deployment design to meet the relevant operator capacity and geographic distribution requirement.

Support & Maintenance

N-Squared offers ongoing 24/7 platform support and maintenance contracts for all framework solutions.

About N-Squared

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