

Distributed subscriber data for public multimedia networks

ir. Rogier Noldus and prof. dr. ir. Piet Van Miegheem (Network Architectures and Services)

Mission

Multimedia communications through public communications networks is increasingly dependent on the internet, not only for media transport (user plane) but also for signaling (control plane). Contemporary Multimedia communications networks, including the IP multimedia subsystem (IMS), use server nodes and proxies for serving subscribers when communication service is requested. A subscriber is typically allocated to a specific proxy node and a specific server node.

Challenge

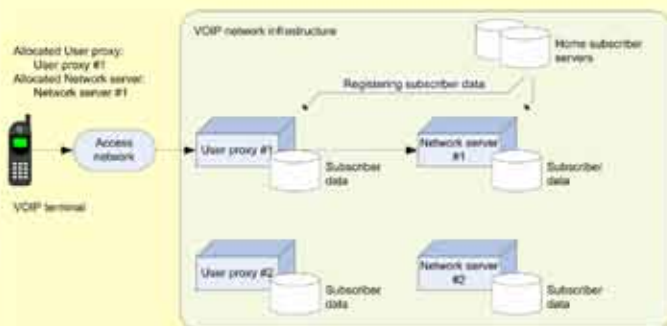
Availability of allocated proxy node and allocated server node is essential for receiving service from the Multimedia communications network. Temporary outage of such node may hamper service availability. Operators aim for 99.999% service availability. Therefore, effects of temporary outage of network nodes and links need to be minimised.

Approach

Subscribers are registered with *virtual proxy* and *virtual server*. A virtual proxy/server is built from a pool of n proxy/server nodes with shared subscriber registration data. Session establishment messages and in-session control plane messages may be steered through to 1 of n proxy/server nodes from the pool. The former requires synchronisation of subscriber registration data. The latter requires synchronisation of call state model instance data. Aim is to develop a generic traffic distribution model.

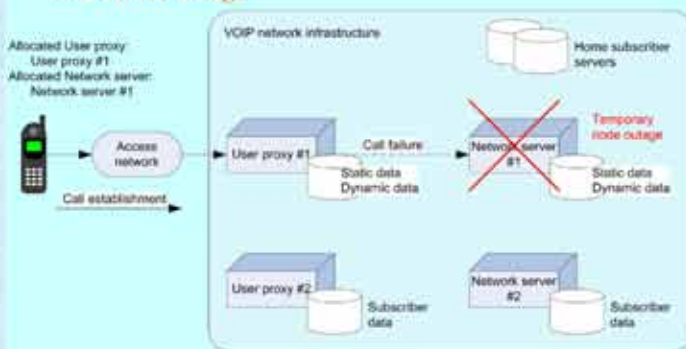
Subscriber registration in VOIP network

- Subscriber data is persistently stored in Home subscriber server
- Subscriber is registered with user proxy (static selection)
- Subscriber is registered with network server



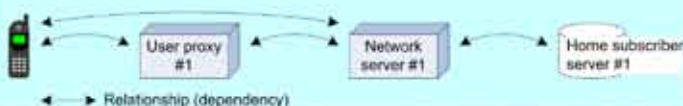
- User proxy and network server receive data from subscriber terminal and from Home network server

How to make network robust with respect to temporary traffic node or link outage

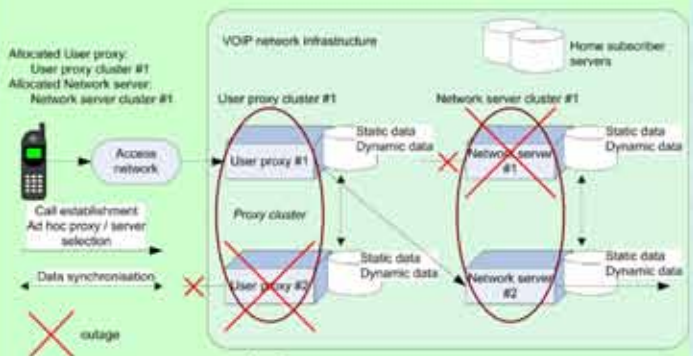


- VOIP / Multimedia calls are not dynamically allocated to available (operational, below maximum load) user proxy and network server
- Due to static allocation of user proxy & network server to user, temporary outage of single node results in call failure

Now there is strict dependency between subscriber terminal and allocated proxy & server. In addition, there is relation between Home subscriber server and specific network server.



Increased robustness through shared user data for VOIP servers

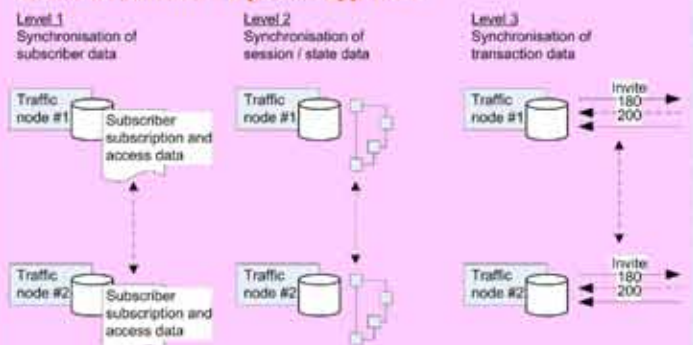


- Synchronisation of static and dynamic user data between nodes within cluster
- Dynamic (ad hoc) selection, at session establishment, of user proxy and network server within respective cluster
- Dynamic DNS update, reflecting node availability, for optimum ad hoc node selection

Goal:

- Improved load distribution over available proxies and servers
- Increased network reliability (proxy and server available)

Network resilience – a phased approach



- Synchronising subscriber data for improved quality of service (session establishment)
- Synchronisation of session / state data for session continuation in the case of node outage
- Calculating optimum level of data synchronisation
- Estimating optimum dynamic DNS adjustment (weight factors; cache timeout) for optimum ad hoc node selection
 - Weighing-off between improved resilience and additional overhead due to synchronisation