

### Highlights

- >> Simplifies Routing for Roaming Partnerships
- >> Helps Maximize GSM Coverage Through Increased Roaming Partners
- >> Follows the GSMA Open Connectivity Model
- >> Coexists with Existing Bi-Lateral Agreements
- >> Supports Dual IMSI Roaming Partnerships
- >> Compatible with 2G, 2.5G, and 3G Networks
- >> Built on Industry-Proven STP Platform
- >> Flexible Interconnectivity Options (TDM, HSL, SIGTRAN)
- >> Robust Platform with Full Redundancy
- >> Scalable and Reliable Solution
- >> Operates in Multiple Networks Simultaneously

### Introduction

The Roaming Broker platform enables a GSM carrier to act as a hub for roaming traffic by policing signaling traffic in a centralized location. It functions as an enhanced SCCP gateway with filtering rules tailored for roaming, which enables carriers to act as brokers between roaming partners. It also has additional interoperability and security mechanisms to simplify provisioning, maximize inter-working, and ensure network integrity.

The Roaming Broker platform has been designed to provide the hubbing functionality set out in the GSMA Open Connectivity Roaming Model. The broker service provider uses the platform in conjunction with existing bi-lateral roaming agreements and network infrastructure. Those MNOs that use the broker service will benefit from hubbing through simplified inter-working. The platform also facilitates instant access to more networks and increased roaming, as the mobile operator can now add additional roaming partner networks, including those where direct agreements were previously not available.

Roaming Broker is an additional piece of application software written to run on Performance Technologies' SEGway™ STPs. It is a next-generation, carrier-grade STP node, ideal for those clients who have small to medium signaling network and budget requirements.

### Roaming Broker Overview

Roaming Broker acts as a selective SCCP gateway, which allows or blocks traffic across network boundaries through GTT routing based on provisioned partnerships in the roaming database. The SEGway platform can connect up to eight different networks.

Roaming Broker can also dynamically and transparently create new E164 numbers and HLR/VLR addresses to create "virtual elements" on the roaming hub platform. The roaming traffic appears as if all roaming is coming from the broker because the Roaming Broker's hub creates masking information. It is possible for the Broker to set up, for each MNO that connects to its roaming hub, access to its roaming agreement with other MNOs with which they wish to manage roaming. The service is applicable for voice roaming, GPRS roaming, and seamless SMS.

Roaming Broker can also perform IMSI translation to find the home network but it does not require all IMSIs to be open. Customer networks will continue to operate as if they are trading only with known elements. This is useful if roaming partnerships based on Dual-IMSI technology are being managed.

# Roaming Broker

## SEGway™ Product Overview

### Simplified Connectivity

Today, MNOs traditionally have direct, rather than collective, agreements to facilitate roaming between two operators. The GSMA have noted that this setup has a number of issues, such as:

- Cost of setting up roaming agreements.
- High costs in managing multiple bi-lateral roaming agreements.
- The need for up to 200+ bi-lateral agreements to get good coverage. (GSMA has over 600 member operators.)
- New, smaller GSM operators constantly being added.
- Cost of setting up and maintaining agreements vs. revenue return vs. declining roaming service costs to subscribers.
- Diversification of services and low ROI for new 2.5/3G roaming.
- Increasing number of access technologies used when roaming.

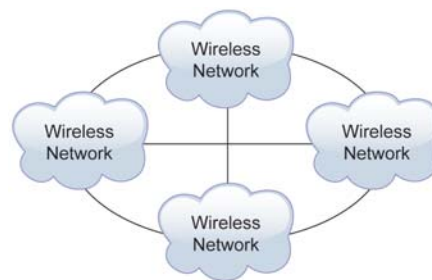


Diagram with many bi-laterals

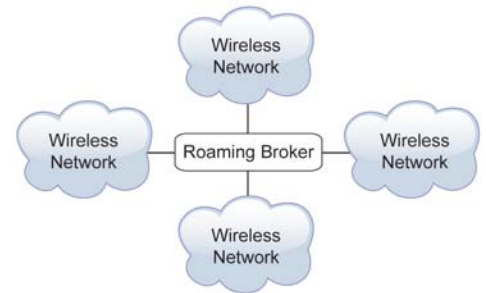


Diagram with HUB

In a Roaming Broker environment, the roaming agreements and network implementations are between the carriers and the Roaming Broker. Rather than the “mesh” of connections in the non-Roaming Broker situation, we have a “hub and spoke” pattern of connections. The figure below outlines the roaming agreements with a broker. Each carrier has only one agreement to negotiate and implement.

This architecture is able to offer connectivity to remote nodes that can be used within individual countries or regions to interconnect multiple MNOs. The roaming traffic would then be aggregated to centralized redundant Roaming Broker units for processing and onward routing. Both traditional TDM and next-generation IP interfaces are available on the Roaming Broker and the remote units.

When the IMSI is not recognized by the MNO, the traffic is assumed to be roaming and is forwarded to the Roaming Broker for processing. For each message, the Roaming Broker is responsible for validating the SCCP message payload, performing entity masquerading (mock address management), GPRS blocking, operator-determined barring general data conversion, operation blocking as per the Black List, DIMSI if enabled, and routing based on Global Title Translation (GTT).

# Roaming Broker

## SEGway™ Product Overview



### Ordering Information

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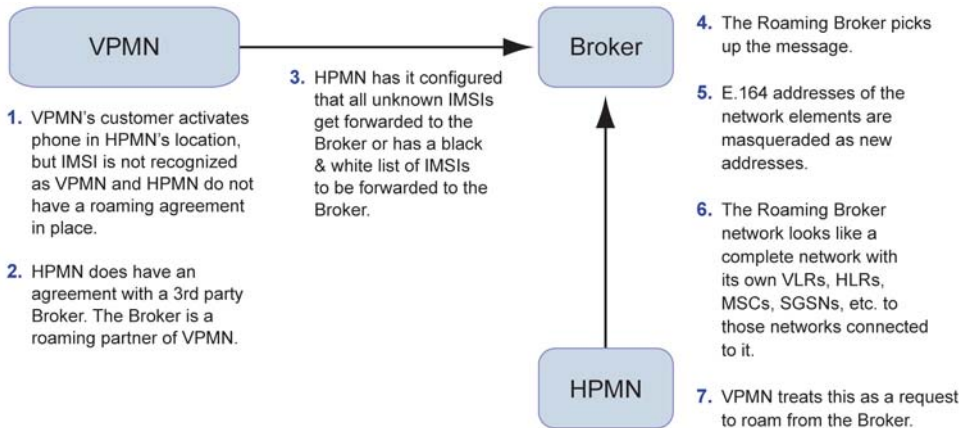
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### Simplified Provisioning

Those parties wishing to set up this agreement with the Broker can set it up so that all "unknown" IMSIs get forwarded to the Broker roaming hub within its network, or they can set up routing within their own HLRs, VLRs, etc., based on IMSI ranges to the Broker network elements within the Roaming Broker unit. When signaling from those parties that wish to use the Broker service reaches the Roaming Broker, the E.164 addresses of the network elements are masqueraded as new addresses. This allows those parties using the roaming hub to treat the Roaming Broker network as a complete network with its own VLRs, HLRs, MSCs, SGSNs, etc. Each of the MNOs that use the Broker services network elements, e.g., HLRs, MSCs, and so forth, appear to be the Roaming Broker.

For example, if the parties that wish to use the Broker service have instead signed direct roaming agreements with other networks, they would have to implement translations within all of their own network elements. They need to complete this configuration for each agreement to be able to communicate with all of their roaming partners, HLRs, MSCs, VLRs, etc. This is required because they need to be able to send traffic to all these nodes in order to offer roaming services to their customers. However, by using the Roaming Broker, this is not necessary, as those will all appear to be HLRs, VLRs, etc., of one partner, i.e., the Broker.

### Combined STP and Roaming Broker Functionality

Normally, the Roaming Broker and the trading partners are all part of one inter-carrier SS7 network. However, it is possible to have the Roaming Broker act as a gateway between two or more networks. In this case, the Roaming Broker platform creates an STP in each of the required networks and is responsible for routing SS7 messages to the correct network (up to eight). The network appearance value is provisioned in the GTT Records to select the proper network for outgoing traffic. This allows an operator to use international, national, or private point codes simultaneously. Under this scenario, the operator can offer similar services to a global SS7 provider.