Technical Specification Group Services and System Aspects
Meeting #5, Kyongju, Korea, 11-13 October 1999

TSGS#5(99)406

Source: **GSM Association**

Title: **Liaison Statement on Inter PLMN Handover principles**

Document for: **Consideration**

Agenda Item: **4.2**

Also to: SMG6 and SA5, subject to SA discussion

Summary:

This document contains a Liaison Statement from the Billing and Accounting Rapporteurs Group (BARG) within the GSM Association on possible Impact of the principles for Inter PLMN Handover as discussed during summer 1999 in various 3GPP fora.

Its main purpose is to provide further information to 3GPP on implementational aspects on Billing and Charging principles and mechanisms in relation to the proposed/agreed handover principles in 3G and 2G/3G.

Its main conclusions and questions are:

1) That in certain GPRS type of scenarios the general principles might not be practical, which 3GPP/SA are asked to verify, and

2) that modifications to charging mechanism in GSM 12.05 and its 3GPP/3G equivalent will be required, and GSMA/BARG requests 3GPP/SA to initiate this work accordingly.

Meeting Number **BARG 46**
Meeting Date **14th – 16th Sept 99**
Meeting Location **Washington DC, USA**

BARG Doc 136/99 rev1

Title

Liaison statement to 3GPP SA: Impacts of the proposed Principles for Inter PLMN handover

Source **BARG 3GWP**
Date **18th August 1999**

Security Classification Category*:		
Restricted - Members		
Restricted – Associate Members		
Restricted – Rapporteurs		

Information Category	3rd Generation

Summary

We have studied the proposed principles for inter PLMN handover and their impacts on inter operator accounting.

As far as we understood the results of the Inter PLMN Handover workshop (Sophia Antipolis, June 9/10), the decision whether or not a call is handed over and to which network the call is handed over shall be completely at the discretion of the 'Serving PLMN' i.e. the PLMN, where the subscriber has been registered at connection setup.

Our considerations are based on **the assumption that the responsibility for *all* handovers which occur during the connection will stay with this Serving PLMN** i.e. the Serving PLMN will not only the control the first handover during the connection but also any further handovers.

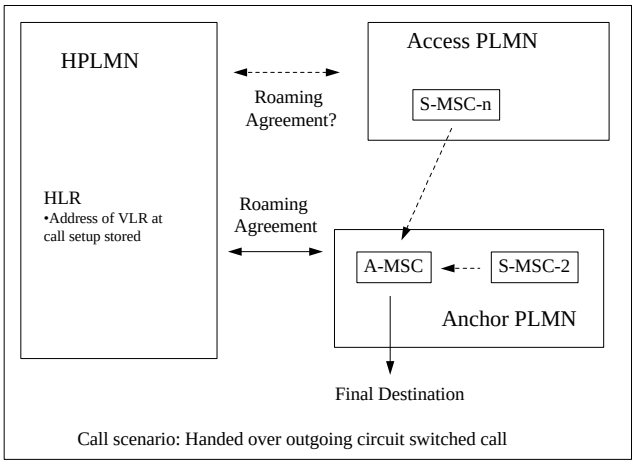
Please confirm that this assumption is valid.

We think that the described handover architecture is **only applicable, if an anchor network element (i.e. MSC for GSM) exists which controls the entire connection**. Within a GSM phase 2+ environment this would be applicable to **circuit switched connections only**. For packet switched connections (i.e. GPRS) a genuine SGSN handover implies a full location update which in turn would enable the HPLMN to deny registration within a 'forbidden' PLMN.

We ask you to specify more precisely to which type of scenarios the principles for inter PLMN handover as described above are actually applicable.

For the consideration of handover scenarios 3 types of PLMNs need to be considered:

1. The HPLMN which owns the subscription of the served subscriber
2. The Anchor PLMN, where the anchor network node controlling the connection is located (this is the VPLMN at connection setup or 'Serving PLMN')
3. The Access PLMN which provides the actual radio access to the served subscriber



Call scenario: Handed over outgoing circuit switched call

As neither the served subscriber nor the HPLMN has a means of influencing whether a handover takes place and to which Access PLMN the call is handed over, charging responsibility for the entire connection shall stay with the Anchor PLMN.

This principle impacts inter PLMN relationships as follows:

- Relationship between the Anchor PLMN and the HPLMN

This relationship is governed by a contractual Roaming Agreement. For inter operator accounting between both PLMNs the IOT principles as set by the GSM Association will apply.

As handover is transparent to the served subscriber and the HPLMN, the fact that a call has been handed over shall *not* influence the price.

Any additional interconnection costs due to a handover of the call to an Access PLMN therefore need to be covered by the published IOT of the Anchor PLMN for incoming and outgoing calls.

- Relationship between the Anchor PLMN and the Access PLMN
  This is considered as an inter carrier relationship which is out of scope for the GSM Association, similar to relationships between a PLMN and external long distance carriers to which the PLMN interconnects.
- Relationship between the Access PLMN and the HPLMN
  As pointed out to us there might be no contractual relationship between these PLMNs at all. In fact it is even possible that the Access PLMN is a 'forbidden PLMN' from the HPLMN perspective (e.g. a national competitor). Again, this relationship is out of scope for the GSM Association.

Finally, we would like to point out that the current charging mechanisms as defined for GSM ciricuit switched services (see ETSI TS GSM 12.05) are not suitable to cover handover scenario due to the following facts:

1. Inter-MSC handover is currently not noted within the charging tickets which are created by the anchor MSC.

This means that the Anchor PLMN has no possibility of performing inter carrier accounting with the Access PLMN by means of standardised GSM call records.

2. At the MSC to which a call was handed over, no charging records will be created for the handed over call.
   This implies that the Access PLMN has no possibility of performing inter carrier accounting with the Anchor PLMN by means of standardised GSM call records.

We therefore think that the standard GSM charging architecture should be enhanced to cater for inter-MSC and inter PLMN handover appropriately, in order to support inter carrier accounting between the Anchor and the Access PLMN.