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Title:	**Not covered roaming situations**
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Following the ad-hoc meeting on "UE in idle mode" which was held in Helsinki in February (i.e. cell selection and PLMN selection - CN1 was involved), France Telecom looks further on some roaming situations and thinks that some of them are not yet covered by 3GPP R'99 specifications as explained here after.

Indeed, France Telecom has identified at least the following 3 situations for which it is difficult to find which procedures apply and which error cause shall be sent to the MS at registration or at LA update attempt (for instance outside a shared area for national roaming):

1. Roaming Restriction on GSM network when same PLMN code is allocated to both GSM and UMTS networks of one operator

- Operator A has the same PLMN code for its GSM and UMTS networks.
- A subscriber of this operator has only subscribed to access GSM network
(he shall be rejected from Operator A's PLMN when he is under UMTS coverage).
This subscriber, with a SIM card, uses a dual-mode terminal GSM/UMTS.
He may try to register under UMTS coverage of his home operator network, the registration shall be rejected.

Which rejection cause should be used by the network ?

The different possible rejection causes are (in Location Updating Response):
- # 11: PLMN not allowed; - this error cause cannot be used because roaming on 2G network (same PLMN code) is still allowed.
- # 12: Location Area not allowed; - this error cause cannot be used because the MS, at reception of this rejection cause, will not perform any PLMN selection, until the MS changes of Location Area (LA).
- # 13: Roaming not allowed in this location area. - this is sent in case of a not supported feature in the MSC/VLR

As a conclusion, currently none of this error cause can be used.

2. International Roaming agreement between operators

- Operators A and B operate in different countries
- Operators A and B have a roaming agreement for GSM only
- Operator A has GSM and UMTS networks with the same PLMN code
- Operator B may have GSM network only or both GSM and UMTS networks with the same PLMN code
A GSM subscriber of Operator B goes abroad under Operator A's network and uses a dual mode GSM/UMTS terminal.
Which error cause should be used by Operator A's network to forbid the access on its UMTS network to this subscriber ? (access to its GSM network shall still be allowed)

With the same analysis as for the previous case, France Telecom doesn't see which error cause can be used.

3. National roaming agreement on a shared zone only
        - Operators A and B operate in the same country
        - Both operators have GSM and UMTS networks.
        - GSM and UMTS networks of one operator have the same PLMN code
        - On a defined zone, only Operator A operate UMTS network (shared zone among operators because it corresponds to a remote location)
        A UMTS subscriber of Operator B shall have access to UMTS Operator A's network only in this shared zone.
        Outside this shared zone, Attach / LA update attempt from this MS should be rejected.

With the same analysis as for the previous case, France Telecom doesn't see which error cause can be used.

France Telecom considers that it is very important to find technical solutions to these problems and the aim is to anticipate roaming problems as the one concerning GPRS has recently been solved.

Consequently, as several CN working groups may be involved in the discussion, TSG CN is invited to study the identified problems and to discuss the following issues:

- Are there any standard solutions with R'99 specifications to handle the described situations?

- Does TSG CN agree that it is very important to find technical solution to these potential situations ?

Conclusion:

If no technical solutions are found with the existing R'99 specifications, France Telecom would like TSG CN to give mandate to TSG CN1 and TSG CN4 to make the relevant CRs in their R'99 specifications with the less impact on R'99.

After discussion, if there are any identified technical preferences in the definition of solutions for those cases (i.e. addition of new error cause if none is usable in those cases, addition of indication of the subscription type in the HLR or enhancement of 'Network Access Mode', …), TSG CN shall indicate them to the Working Groups.