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Operator Determined Barring (ODB)
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Foreword

This Technical Specification has been produced by the 3GPP.

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

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where:

- x the first digit:
 - 1 presented to TSG for information;
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- Y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
- z the third digit is incremented when editorial only changes have been incorporated in the document.

1 Scope

The present document describes the network feature Operator Determined Barring (ODB).

This allows the network operator or service provider to regulate, by means of an exceptional procedure, access by the subscribers to services (both Circuit and Packet Oriented), by the barring of certain categories of outgoing or incoming calls/Packet Oriented Services or of roaming. ODB shall take effect immediately and shall terminate ongoing calls and bar future calls/Packet Oriented Services.

The purpose of this network feature is to be able to limit the service provider's financial exposure to new subscribers, or to those who have not promptly paid their bills. It may only be applied to the service provider's own subscribers.

1.1 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

- [1] GSM 01.04: "Digital cellular telecommunications system (Phase 2+); Abbreviations and acronyms".
- [2] TS 22.088: " Call Barring (CB) supplementary services – Stage 1".
- [3] ITU-T Recommendation E.164 : "Numbering plan for the ISDN era".
- [4] TS 22.082: " Call Forwarding (CF) supplementary services – Stage 1".
- [5] TR 21.905: "Vocabulary for 3GPP Specifications".
- [6] 3GPP TS 22.234: "Requirements for 3GPP system to wireless local area network (WLAN) interworking".

1.2 Definitions and abbreviations

In addition to the following definitions, abbreviations used in the present document are listed in GSM 01.04 [1] and TR 21.905 [5].

Premium rate call: A telecommunications network, possibly but not necessarily a PLMN, may make available certain services, for which the tariff is comparable to, or may exceed, International Call rates. Examples of such premium rate services might be information and entertainment services. The exact definition of what constitutes a premium rate call is the responsibility of the VPLMN operator, possibly subject to inter-operator agreements.

2 Description

Application of Operator Determined Barring is controlled by the Service Provider, by administrative interaction with the HLR; this interface is not standardized.

With the exception of the barring of roaming, the HLR affects Operator Determined Barring in a similar manner to Service Provider – activated use of the Call Barring Supplementary service. Consequently, the VLR and MSC also execute the relevant Barring Conditions in similar manners. It is noted that there is no password usage. Roaming is

barred by the HLR when the MS is in a PLMN other than the Home PLMN or not in the Home PLMN Country as applicable.

In addition to ensuring the barring integrity for future calls, the HLR, and consequently the MSC and VLR, shall provide means to terminate the calls of a user that have been established prior to the application of the ODB service and which are still ongoing.

3 Applicability to Basic Services (BS)

This network feature is applied to all Teleservices and Bearer Services except as noted below. The Operator Determined Barring feature shall not be applied to Teleservice-Emergency Call. It is not possible to apply Operator Determined Barring independently to individual Basic Services.

4 Applicability to Supplementary Services (SS)

Operator Determined Barring is a network feature and hence applies to Supplementary Service aspects of subscriptions.

Operator Determined Barring is applied independently from Supplementary Services. Nevertheless the following interactions occur:

Call Barring:

Calls will be denied if either Operator Determined Barring or Subscriber Controlled Barring determine that the call should be barred.

If a call is barred due to both Operator Determined Barring and Subscriber Controlled Barring, then the message or notification returned towards the caller will be the same as if the barring was due solely to Operator Determined Barring (see Section 5).

There is no other interaction.

Call Forwarding:

If a call forwarding programme is in contravention of an Operator Determined Barring Category, when the latter is activated, then the activation shall result in making call forwarding quiescent. If the subscriber attempts to activate a new call forwarding programme in contravention of an Operator Determined Barring Category, then the activation shall be denied, and the subscriber informed of the denial. There is no other interaction.

Closed User Group:

CUG restrictions must be met in addition to Operator Determined Barring restrictions for a call to proceed.

If a call is barred due to both Operator Determined Barring and CUG restrictions, then the message or notification returned towards the caller will be the same as if the barring was due solely to Operator Determined Barring (see Section 5).

There is no other interaction.

Call Transfer:

If the subscriber attempts to invoke a call transfer in contravention of an Operator Determined Barring category, then the invocation shall be denied, and the subscriber informed of the denial. There is no other interaction.

Multi-Party, Advice of Charge, CLIP, CLIR, COLP, COLR, Call Wait, Call Hold:

There is no interaction.

Call Completion to Busy Subscriber, User to User Signalling, Malicious Call Identification, Mobile Access Hunting:

For further study.

The application of a Barring of Roaming category (see subclauses 3.1 and 3.2 below) will, if the Mobile Station is roaming appropriately, prevent the Mobile Subscriber from undertaking any form of Supplementary Service management.

5 Normal procedure

5.1 Circuit Oriented Services

As described in the following categories, the Service Provider may at any time activate this feature and this shall terminate any relevant calls in progress, including forwarded calls, and bar future calls covered by the barring category:

Independently, one of:

- 1.1 Barring outgoing calls;
- or: 1.2 Barring outgoing international calls;
- or: 1.3 Barring outgoing international calls except those directed to the home PLMN country;
- or: 1.4 Barring of outgoing calls when roaming outside the home PLMN country;
- or: 1.5 Barring of outgoing inter-zonal calls;
- or: 1.6 Barring of outgoing inter-zonal calls except those directed to the home PLMN country;
- or: 1.7 Barring of outgoing international calls except those directed to the home PLMN country AND barring of outgoing inter-zonal calls.

And/or one of:

- 2.1 Barring incoming calls;
- or: 2.2 Barring incoming calls when roaming outside the home PLMN country;
- or: 2.3 Barring incoming calls when roaming outside the zone of the home PLMN country.

And/or one of:

- 3.1 Barring of Roaming outside the home PLMN;
- or: 3.2 Barring of Roaming outside the home PLMN country.

And/or one or more of:

- 4.1 Barring of outgoing Premium Rate Calls (Information);
- 4.2 Barring of outgoing Premium Rate Calls (Entertainment);
- 4.3 Barring of outgoing Premium Rate Calls (Information) when roaming outside the home PLMN country;
- 4.4 Barring of outgoing Premium Rate Calls (Entertainment) when roaming outside the home PLMN country.

And/or one or more of:

- 5.1 When registered in the HPLMN, Operator Specific Barring (Type 1);
- or: 5.2 When registered in the HPLMN, Operator Specific Barring (Type 2);
- or: 5.3 When registered in the HPLMN, Operator Specific Barring (Type 3);
- or: 5.4 When registered in the HPLMN, Operator Specific Barring (Type 4).

And/or

6.1 Barring of Supplementary Services Management, which prevents user control of any supplementary service (registration, erasure, activation, deactivation, user invocation, interrogation, password registration and mobile initiated USSD). However, this does not prevent invocation by other action – e.g. an existing call forwarding or barring state will remain.

And/or one of:

7.1 Barring of registration of any call forwarded-to number;

or: 7.2 Barring of registration of any international call forwarded-to number;

or: 7.3 Barring or registration of any international call forwarded-to number except to a number within the HPLMN country;

or: 7.4 Barring of registration of any inter-zone call forwarded-to number.

Or: 7.5 Barring of registration of any inter-zone call forwarded-to number except to a number within the HPLMN country;

Note: The definition of an international call is based on the equivalent definition of an international call in TS 22.088 [2]. The principles for deciding whether a forwarded-to number is international or inter-zonal are the same as those given in TS 22.082 [4] to determine the interactions between call forwarding and call barring.

And/or one of:

8.1 Barring of invocation of call transfer;

or: 8.2 Barring of invocation of call transfer where at least one of the two calls is a call charged to the served subscriber; i.e. the call is either an outgoing call or an incoming call when the served subscriber roams outside the HPLMN;

or: 8.3 Barring of invocation of call transfer where at least one of the two calls is a call charged to the served subscriber at international rates, i.e. the call is either an outgoing international call or an incoming call when the served subscriber roams outside the HPLMN country;

or: 8.4 Barring of invocation of call transfer where at least one of the two calls is a call charged to the served subscriber at inter-zonal rates, i.e. the call is either an outgoing inter-zonal call or an incoming call when the served subscriber roams to a VPLMN in a different zone from the HPLMN.

And/or:

9 Barring of invocation of call transfer where both calls are calls charged to the served subscriber, i.e. both calls are either outgoing calls or incoming calls when the served subscriber roams outside the HPLMN;

and/or:

10 Barring of further invocation of call transfer if there is already one ongoing transferred call for the served subscriber in the serving MSC/VLR.

"User invocation", as it relates to ODB, consists of the following action:

- invocation of the call hold supplementary service.

"Zone" is as based on the first digit of their international dialing code as defined in ITU-T Recommendation E.164 [3].

Note: For the purposes of this TS, zone 3 and zone 4 are treated as one zone.

Note: If control of Supplementary Services Management is barred, then the control of call forward will be barred as a consequence, so explicit barring of call forward activation is not necessary.

If a mobile subscriber attempts to use a mobile initiated service which is barred as described above (categories 1, 4, 5, 6, 7, 8, 9, and 10), an appropriate message shall be returned to the Mobile Station or alternatively (categories 1, 4, and 5), if located in the HPLMN, the mobile subscriber can be automatically connected to a destination address determined by the HPLMN operator. It is necessary for the message to indicate that the barring is due to Operator Determined Barring.

It is not necessary to indicate the categories which are barred. For ongoing, or transferred calls, that are terminated due to ODB, the network operator may give an appropriate indication to the barred party.

A notification (announcement or ITU-T#7 cause value) may be returned to callers attempting to call a mobile subscriber who is appropriately barred incoming calls. It is not necessary to indicate to the called mobile station that an incoming call has been barred.

Only the HPLMN Operator can activate, change or deactivate application of this network feature.

In order to provide this feature securely when a subscriber roams to another network, the visited network needs to support the feature to ensure that the roaming subscriber cannot use a service which has been barred to him.

5.2 Packet Oriented Services

Packet Oriented Services, particularly data services, are different in nature to Circuit Oriented Services, and therefore have different requirements for Operator Determined Barring.

As described in the following categories, the Service Provider may at any time activate this feature and this shall terminate any relevant services in progress, and bar future requests for service covered by the barring category:

- It shall be possible to bar subscribers completely from the Packet Oriented Services.
- Network shall be able to allow a subscriber to access some specific APNs while barring the subscriber from the other Packet Oriented Services.
- It shall be possible to bar a subscriber from requesting Packet Oriented Services from access points that are within the HPLMN whilst the subscriber is roaming in a VPLMN.
- It shall be possible to bar a subscriber from requesting Packet Oriented Services from access points that are within the roamed to VPLMN.

The term 'access point' is used to indicate the GGSN or part of the GGSN that is specified by a particular APN.

5.3 Interworking WLAN

Aspects of ODB related to interworking WLAN are addressed in TS 22.234 [6].

5.4 IMS Oriented Services

5.4.1 IMS Multimedia Telephony Services

As described in the following categories, the Service Provider may at any time activate this feature and this shall terminate any relevant communications in progress, including diverted communications, and bar future communications covered by the barring category:

Independently, one of:

- 1.1 Barring outgoing communication;
- or: 1.2 Barring outgoing international communications;
- or: 1.3 Barring outgoing international communications except those directed to the home PLMN country;
- or: 1.4 Barring of outgoing communications when roaming outside the home PLMN country;

and/or one of:

- 2.1 Barring incoming communications;
- or: 2.2 Barring incoming communications when roaming outside the home PLMN country;

and/or one of:

3.1 Barring of Roaming outside the home PLMN;

or: 3.2 Barring of Roaming outside the home PLMN country.

and/or one or more of:

4.1 Barring of outgoing Premium Rate Communications (Information) for E.164 international premium numbers and for premium numbers located within the home PLMN;

4.2 Barring of outgoing Premium Rate Communications (Entertainment) for E.164 international premium numbers and for premium numbers located within the home PLMN;

Note 1: outgoing communications to non E.164 international premium numbers located outside the home PLMN are barred at interconnection between networks based on bilateral agreements.

and/or one or more of:

5.1 When registered in the HPLMN, Operator Specific Barring (Type 1);

or: 5.2 When registered in the HPLMN, Operator Specific Barring (Type 2);

or: 5.3 When registered in the HPLMN, Operator Specific Barring (Type 3);

or: 5.4 When registered in the HPLMN, Operator Specific Barring (Type 4).

and/or

6 Barring of Supplementary Services Management, which prevents user control of any supplementary service (registration, erasure, activation, deactivation, user invocation, interrogation and password registration). However, this does not prevent invocation by other action - e.g. an existing communication diversion or barring state will remain.

and/or one of:

7.1 Barring of registration of any communication diverted-to address;

or: 7.2 Barring of registration of any international communication diverted-to address;

or: 7.3 Barring of registration of any international communication diverted-to address except to an address within the HPLMN country;

and/or one of:

8.1 Barring of invocation of communication transfer;

or: 8.2 Barring of invocation of communication transfer where at least one of the two communications is a communication charged to the served subscriber; i.e. the communication is either an outgoing communication or an incoming communication when the served subscriber roams outside the HPLMN;

or: 8.3 Barring of invocation of communication transfer where at least one of the two communications is a communication charged to the served subscriber at international rates, i.e. the communication is either an outgoing international communication or an incoming communication when the served subscriber roams outside the HPLMN country;

and/or:

9 Barring of invocation of communication transfer where both communications are communications charged to the served subscriber, i.e. both communications are either outgoing communications or incoming communications when the served subscriber roams outside the HPLMN;

and/or:

10 Barring of further invocation of communication transfer if there is already one ongoing transferred communication for the served subscriber.

If a mobile subscriber attempts to use a mobile initiated service which is barred as described above (categories 1, 4, 5, 6, 7, 8, 9 and 10), an appropriate message shall be returned to the Mobile Station or alternatively (categories 1,4 and 5), if

located in the HPLMN, the mobile subscriber can be automatically connected to a destination address determined by the HPLMN operator. It is necessary for the message to indicate that the barring is due to Operator Determined Barring. It is not necessary to indicate the categories which are barred. For ongoing, or transferred communications, that are terminated due to ODB, the network operator may give an appropriate indication to the barred party.

A notification (announcement or appropriate SIP response) may be returned to callers attempting to communicate with a mobile subscriber who is appropriately barred for incoming communications. No indication is provided to the called mobile station that an incoming communication has been barred.

Only the HPLMN Operator can activate, change or deactivate application of this network feature.

6 Exceptional procedures

If a VPLMN does not support an operator determined barring category which an HPLMN requests it to apply, the VPLMN shall notify the HPLMN. The HPLMN may then request the VPLMN to apply a substitute operator determined barring category, or take any other action required by the HPLMN operator.

7 Alternate procedures

None identified.

8 Interworking considerations

None identified.

Annex A (informative): Change history

| Change history | | | | | | | | | | | |
|----------------|-----------|-----------|-----------|------|-----|--------|-----|--|--------|--------|--------------|
| TSG SA# | SA Doc. | SA1 Doc | Spec | CR | Rev | Rel | Cat | Subject/Comment | Old | New | WI |
| Jun 1999 | | | GSM 02.41 | | | | | Transferred to 3GPP SA1 | 7.0.0 | | |
| SA#04 | | | 22.041 | | | | | Transferred to 3GPP SA1 | | 3.0.0 | |
| SP-05 | SP-99479 | S1-99616 | 22.041 | 001 | | R99 | D | Editorial changes for alignment | 3.0.0 | 3.1.0 | |
| SP-05 | SP-99441 | S1-99850 | 22.041 | 002 | | R99 | B | Addition of explicit requirements for Packet Oriented Services | 3.0.0 | 3.1.0 | |
| SP-10 | SP-000532 | S1-000852 | 22.041 | 003 | | R99 | F | Operator Determined Barring of Packet Oriented Services | 3.1.0 | 3.2.0 | |
| SP-10 | SP-000532 | S1-000853 | 22.041 | 004 | | Rel-4 | B | Operator Determined Barring of Packet Oriented Services | 3.2.0 | 4.0.0 | TEI4 |
| SP-11 | SP-010041 | S1-010019 | 22.041 | 006 | | Rel-4 | F | Corrections of the ODB categories for Packet Oriented Services | 4.0.0 | 4.1.0 | ODB Enh. |
| SP-11 | SP-010042 | S1-010174 | 22.041 | 008 | | Rel-4 | A | CR on Operator Determined Barring – Zonal Barring to 3GPP TSG SA WG1 | 4.0.0 | 4.1.0 | TEI |
| SP-16 | SP-020267 | S1-021043 | 22.041 | | | Rel-5 | | Updated from Rel-4 to Rel5 | 4.1.0 | 5.0.0 | |
| SP-20 | SP-030327 | S1-030490 | 22.041 | 009 | 1 | Rel-6 | B | ODB in WLAN – Requirement | 5.0.0 | 6.0.0 | ODB, WLAN-CR |
| SP-21 | SP-030464 | S1-030901 | 22.041 | 011 | - | Rel-6 | B | ODB in VPLMN for WLAN user | 6.0.0 | 6.1.0 | ODB |
| SP-21 | SP-030464 | S1-030915 | 22.041 | 010 | - | Rel-6 | C | WLAN access point terminology clarified | 6.0.0 | 6.1.0 | ODB |
| SP-23 | SP-040101 | S1-040261 | 22.041 | 012 | - | Rel-6 | D | Extraction of redundant WLAN related ODB text – now in WLAN TS22.234 | 6.1.0 | 6.2.0 | WLAN |
| SP-35 | SP-070118 | S1-070251 | 22.041 | - | - | Rel-7 | B | Raised to version 7.0.0 as a result of approval of CR 0014r1 for Rel-8 | 6.2.0 | 7.0.0 | - |
| SP-35 | SP-070118 | S1-070251 | 22.041 | 0014 | 1 | Rel-8 | B | ODB for IMS | 7.0.0 | 8.0.0 | MTSI-REQ |
| SP-36 | SP-070353 | S1-070800 | 22.041 | 0015 | 2 | Rel-8 | B | Selective application of ODB to International & Premium Rate Services whilst roaming | 8.0.0 | 8.1.0 | TEI-8 |
| SP-46 | - | - | - | - | - | - | - | Updated to Rel-9 by MCC | 8.1.0 | 9.0.0 | |
| 2011-03 | - | - | - | - | - | - | - | Update to Rel-10 version (MCC) | 9.0.0 | 10.0.0 | |
| 2012-09 | - | - | - | - | - | - | - | Updated to Rel-11 by MCC | 10.0.0 | 11.0.0 | |
| SP-58 | SP-120869 | S1-124362 | 22.041 | 0016 | 2 | Rel-11 | B | Addition of APN to the condition of the ODB judgment | 11.0.0 | 11.1.0 | TEI11 |
| SP-59 | SP-130123 | S1-131295 | 22.041 | 0017 | 1 | Rel-11 | F | Barring of Premium Rate Numbers | 11.1.0 | 11.2.0 | TEI11 |
| SP-61 | SP-130411 | S1-134130 | 22.041 | 0018 | 1 | Rel-11 | A | Removal of IMS Operator Determined Barring Outgoing Premium Rate requirements | 11.2.0 | 11.3.0 | TEI8 |
| 2014-10 | - | - | - | - | - | - | - | Update to Rel-12 version (MCC) | 11.3.0 | 12.0.0 | |
| 2015-12 | | | | | | | | Update to Rel-13 version (MCC) | 12.0.0 | 13.0.0 | |
| 2017-03 | - | - | - | - | - | - | - | Updated to Rel-14 by MCC | 13.0.0 | 14.0.0 | |
| 2018-06 | - | - | - | - | - | - | - | Updated to Rel-15 by MCC | 14.0.0 | 15.0.0 | |
| SA#88e | - | - | - | - | - | - | - | Updated to Rel-16 by MCC | 15.0.0 | 16.0.0 | |
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