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**CHARGING AND ACCOUNTING
IN INTERNATIONAL TELECOMMUNICATION
SERVICES**

**PRINCIPLES FOR CHARGING AND BILLING,
ACCOUNTING AND REIMBURSEMENTS
FOR UNIVERSAL PERSONAL
TELECOMMUNICATION**

ITU-T Recommendation D.280

(Previously "CCITT Recommendation")

FOREWORD

The ITU-T (Telecommunication Standardization Sector) is a permanent organ of the International Telecommunication Union (ITU). The ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The World Telecommunication Standardization Conference (WTSC), which meets every four years, establishes the topics for study by the ITU-T Study Groups which, in their turn, produce Recommendations on these topics.

The approval of Recommendations by the Members of the ITU-T is covered by the procedure laid down in WTSC Resolution No. 1 (Helsinki, March 1-12, 1993).

ITU-T Recommendation D.280 was prepared by ITU-T Study Group 3 (1993-1996) and was approved under the WTSC Resolution No. 1 procedure on the 20th of March 1995.

NOTE

In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

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**PRINCIPLES FOR CHARGING AND BILLING, ACCOUNTING
AND REIMBURSEMENTS FOR UNIVERSAL
PERSONAL TELECOMMUNICATION**

(Geneva, 1995)

1 Scope

This Recommendation covers the principles for charging and the associated billing, as well as the accounting and reimbursements for Universal Personal Telecommunication service (UPT), which is described in the F.850-Series Recommendations.

Included in this Recommendation is guidance on:

- 1) the charging principles and options;
- 2) the traffic accounting principles;
- 3) the principles for the billing of UPT calls; and
- 4) the requirements for reimbursements among service providers, which are applicable to the various call types which may be encountered in UPT.

Charging principles related to UPT service profile management functions are also provided.

2 Terms and Definitions

For the purposes of this Recommendation, the following definitions apply:

2.1 UPT Customer: The individual or entity who or which obtains, by having specifically subscribed to a UPT service provider, UPT services to be used by one or more UPT users. The customer is responsible for payment of all charges and rentals due to that UPT service provider. The UPT customer may also be the UPT user.

Other terms and definitions applicable to UPT may be found in Recommendation F.851.

3 General considerations

3.1 The Universal Personal Telecommunication (UPT) service is defined in the appropriate F.850-Series Recommendations.

3.2 UPT customers will register with (a) UPT service Provider(s) for national and/or international personal mobility.

3.3 UPT users may roam (Note) within their UPT service provider's area or to other service areas nationally and/or internationally. The range of capabilities available to UPT users may be subject to bilateral agreements between their UPT service provider(s) and other service providers.

NOTE – The term "roam" is used in this Recommendation to denote personal mobility.

3.4 The UPT service provider will know the location of its roamed UPT users based on the information provided by those users.

3.5 Networks will be able to identify and record the necessary details of calls made and received by the UPT user for billing and settlement purposes.

3.6 UPT customers are billed by their service provider(s).

3.7 As part of a bilateral agreement, a UPT service provider will undertake to reimburse other service provider(s) for the charges incurred by its roamed UPT user.

3.8 Charging implications in a number of charging scenarios make it necessary that a UPT number is uniquely identifiable to callers and to service providers.

4 Principles for charging

4.1 General

4.1.1 The charges in any country are a national matter.

4.1.2 Arrangements for charging and collection of charges may be flexible according to the service option(s) offered by the UPT service provider and selected by the UPT customer.

4.1.3 The UPT service provider is responsible for billing its UPT customer for all applicable charges, and charging structures should be understandable by the calling party and the UPT customer.

4.2 Service provider charging

The charges billed to the UPT subscriber should be such as to cover the payment due to other networks providers or service providers plus any handling charges which may be applicable.

The charges applied by a UPT service provider would normally consist of:

4.2.1 Subscription charges (service access component)

- Registration (non-recurring);
- Periodic charge or rental (recurring).

These charges are independent of utilisation.

4.2.2 Call charges (utilisation component)

- Utilisation charges (national and/or international as appropriate);
- Any supplementary service charges.

4.2.3 Charges for call related signalling network usage (for further study)

Such signalling network charges may be covered in the subscription charges and/or the call charges described above. Charging requirements for other possible call related usage of the signalling network for UPT-related service features are for further study.

In addition, the UPT service provider may apply:

4.2.4 Service profile management charges

- Service profile establishment;
- Service profile maintenance;
- Service profile updating by service provider;
- Service profile updating by customer.

Service profile management charges may, for example, be periodic and/or per update, which may be based on function, duration and/or volume.

Alternatively, they may be covered by the subscription charges and/or the call charges described above.

4.3 Visited network charging (for further study)

The charges applied by other service providers to the visiting UPT user will normally include one or more of the following:

- Roaming registration charges (recurring and/or non-recurring);
- Charges to update the service profile;
- Utilisation charges (i.e. call charges);
- Any supplementary service charges.

4.4 Charges for calls To UPT users

4.4.1 The charge for an international call to a non-roamed UPT user should be based on the appropriate charge for a call to any non-UPT user in the same relation (see Annex A, Case A1, and Annex. B, Case B 1), but also see 4.4.3 and 4.4.4 below.

4.4.2 In cases where the called UPT user has roamed internationally, a number of charging options may be possible and these are indicated below. Initially only option i) may be possible in some cases, as options ii) – iv) involve direct routing of the call to the roamed location, which requires more advanced network capabilities:

- i) The caller pays for the call to the “home” or non-roamed location of the called UPT user (via which the call is routed). The called roamed UPT user pays for the onward routed call from the non-roamed location to the roamed location (see Annex A, case A2 and A5, and Annex B, case B2).
- ii) The caller pays the appropriate charge for the call to the location to which the UPT user has roamed. (See Annex A, case A3, option a) and case 5, option a), and Annex B, case B3, option a) – *the caller paid charge option.*)
- iii) The caller pays the charges for a call to the non-roamed location in principle irrespective of where the called UPT user has roamed; any residual balance of charges which may be applicable due to the called UPT user having roamed are paid by the called UPT user (*the split charge option*). [For further details, see Annex A, case A3, option b) and Annex B, case B3, option b)]. This option will require special arrangements (see 6.3).
- iv) The called roamed UPT user pays for the call based on the charges applicable in the country of origin for the outgoing call (see Annex A, case A3, option c) and Annex B, case B3, option c) – *the called number billed option*). The called number billed option must be registered by the called roamed UPT user, and would be applicable to all calls.

4.4.3 Charges for calls to UPT users may be postalised; e.g. they may be distance or destination independent.

4.4.4 In cases where the called UPT user has roamed to the country of the caller (Annex A, case A4), or where both the calling and called UPT users have roamed to the same country (Annex B, case B4), and the call is routed as a national call, the charge should be based on a national call. Initially, however, two international calls may be involved. This should be handled according to Annex A, case A2.

4.4.5 Where bilaterally agreed between service providers, and the call details for the established call can be identified, operator handled reverse charged calls may be available as follows:

- a) when the call terminates at the called UPT user’s non-roamed location;
- b) when the called UPT user has roamed, and the call is made to the non-roamed location.

The call to the non-roamed location will be charged as if the call was made in the reverse direction.

Additional reversed charge applications require more advanced network capabilities, and are for further study.

4.5 Charges for calls made by a roamed UPT user

Other than where a reversed charge facility has been agreed and made available between service providers, the utilization charges for outgoing calls made by a roamed UPT user should be based on those of the visited service provider. See clause 6 for billing and reimbursement aspects. (Also see Annex B, cases B 1, B2 and B3).

5 Principles for international traffic accounting

5.1 International traffic accounting will be in accordance with the connection established, using the normal accounting rate applicable to that call, and be effected through normal traffic accounts.

5.2 The use of the visited service provider's UPT facilities should not form part of normal international accounts, but is covered in clause 6.

6 Billing and reimbursement

6.1 Outgoing calls made by a roamed UPT user

6.1.1 The visited network or service provider will prepare a statement of charges payable by the customer's UPT service provider for its roamed UPT user for services used, calls made, database(s) accessed, etc.

6.1.2 The format and frequency of statements will be agreed between UPT service providers (for further study).

6.1.3 The statement in 6.1.1 will be expressed in the national currency of the visited network or UPT provider, or in Special Drawing Rights (SDRs), or in another currency, as agreed between the UPT service providers. Any conversion rate used shall also be indicated.

6.1.4 Statements should be prepared for each roaming UPT user, and should include the following:

- Period covered by the statement;
- UPT number;
- Any registration fee(s);
- For each call and each database access (as appropriate):
 - date and start time;
 - complete number called;
 - destination country, if not indicated by the number called;
 - duration in minutes and seconds;
 - any supplementary services used;
 - charge for the call and currency.

6.1.5 The UPT service provider will bill its UPT customer on the basis of the data provided by the visited network or service provider.

6.1.6 The visited network or service provider will be reimbursed by the user's UPT service provider on the basis of the statements. In the absence of agreed alternative procedures, settlements will be effected in accordance with the provisions of the International Telecommunication Regulations (Melbourne, 1988).

6.2 Outgoing calls made by a non-roamed UPT user

These calls will be billed by the user's UPT service provider, based on the UPT service provider's charges.

6.3 Calls to a roamed UPT user

6.3.1 Caller paid option

Normal billing applies to this option, and reimbursements are not involved.

6.3.2 Split charge option (for further study)

The call origination network will provide the roamed UPT user's UPT service provider with, at a minimum, a statement of the balance of the charges for the call made (but not billed to the calling party), which are to be reimbursed to it by the called party's UPT service provider. Such statements should include the relevant information from the statements described in 6.1.4. The roamed UPT user's UPT service provider will bill its UPT customer on the basis of the data provided by the call originating network or service provider.

It should be noted that this option can only be implemented following bilateral agreement between the originating network or service provider and the user's UPT service provider.

6.3.3 Called number billed option

The roamed UPT user's service provider will receive a statement of the call charges from the call originating network in order that the latter may be reimbursed. Such statements should be similar to the statements described in 6.1.4. The roamed UPT user will be billed by its UPT service provider on the basis of the data provided by the call originating network or service provider.

7 Further study

Items for further study include:

- Additional call configurations;
- Additional aspects of visited network charging;
- Unsuccessful call attempts;
- Mobile network issues, if any;
- Charging and accounting for use of the signalling network;
- Standardization of the format and procedures for settlement statements;
- Applications other than telephony;
- Reversed charging aspects;
- Billing to third parties;
- Split charge option.

Annexes

The following annexes contain some examples of possible UPT call routing scenarios and their respective charging, accounting, and billing and settlement aspects. These scenarios are for further study, and other scenarios may be identified. It is also recognized that certain routing scenarios may not be available in early implementations of UPT.

How UPT calls are routed depends, in part, on the UPT numbering scheme used (see Recommendation E.168), and when and where along the path of a UPT call a UPT data base can be accessed to convert the UPT number to a destination terminal number (see Recommendation E.174). Once the actual destination terminal number for a UPT call can be determined, "efficient" routing can be done; that is, a call can be routed on the most direct path available to the indicated destination.

Annexes A and B contain a range of possible scenarios, as indicated below.

It should be noted that some UPT applications may not use a UPT number, and these calls will follow the "traditional" routing as specified in Recommendations E.171 and E.172. (These are shown in cases AI, A2 and B2 in the annexes.)

Index to annexes

Annex A – A non-roamed UPT user (or non-UPT user) to:

- Case A1: A non-roamed UPT user (or non-roamed user);
- Case A2: A roamed UPT user, forwarded via the "home" country ("traditional" routing);
- Case A3: A roamed UPT user routed via the most direct route;
- Case A4: A UPT user roamed to the country of the caller, routed as a national call;
- Case A5: A UPT user of the same country as the caller, when roamed to another country.

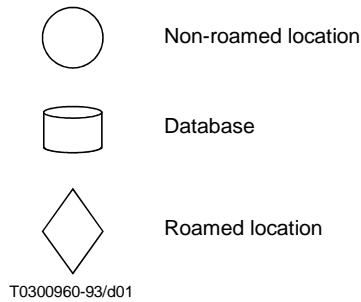
Annex B – A roamed UPT user to:

- Case B1: A non-roamed UPT user (or non-UPT user);
- Case B2: A roamed UPT user, forwarded via the "home" country ("traditional" routing);

- Case B3: A roamed UPT user, routed via the most direct route;
- Case B4: A UPT user roamed to the same country to which the caller has roamed, routed as a national call.

Glossary

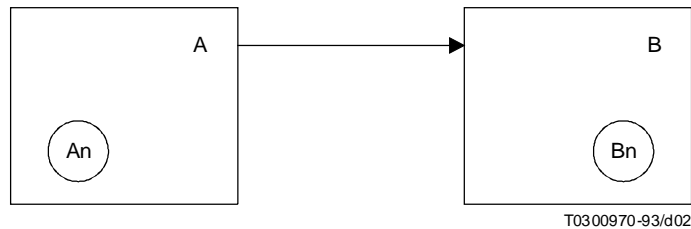
An Non-roamed UPT user of country A
 Ar Roamed UPT user of country A
 “Home” country: Billing reference point/non-roamed location



Annex A

(This annex forms an integral part of this Recommendation)

Case A1 – Non-roamed UPT user (An)¹⁾ in country A calls non-roamed UPT user (Bn) in country B



Charging

A to B (paid by An, A’s charges apply).

Traffic accounting

A accounts A to B.

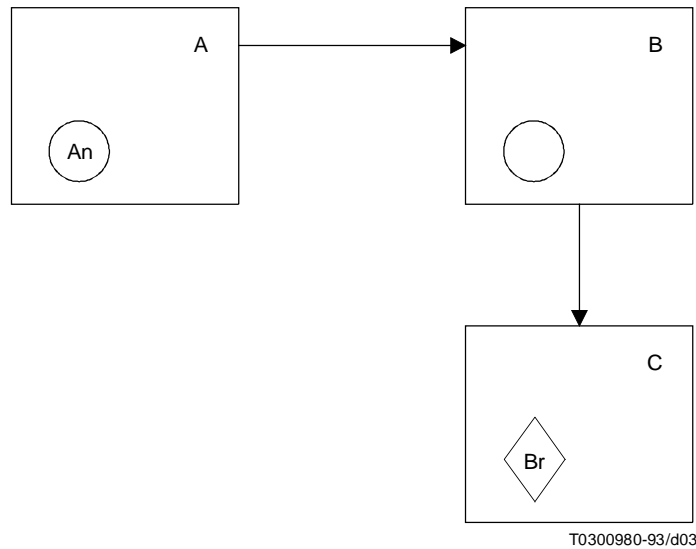
¹⁾ Or a non-UPT user.

Billing and reimbursement

A bills An.

The above principles also apply where the called party is not a UPT user.

Case A2 – Non-roamed UPT user (An)²⁾ in country A calls roamed UPT user (Br) who has roamed to country C. Call is forwarded via country B to country C. This results in two calls (A to B, B to C)



Charging

A to B (paid by An, A’s charges apply), and B to C (paid by Br, B’s charges apply).

Traffic accounting

A accounts A to B.

B accounts B to C.

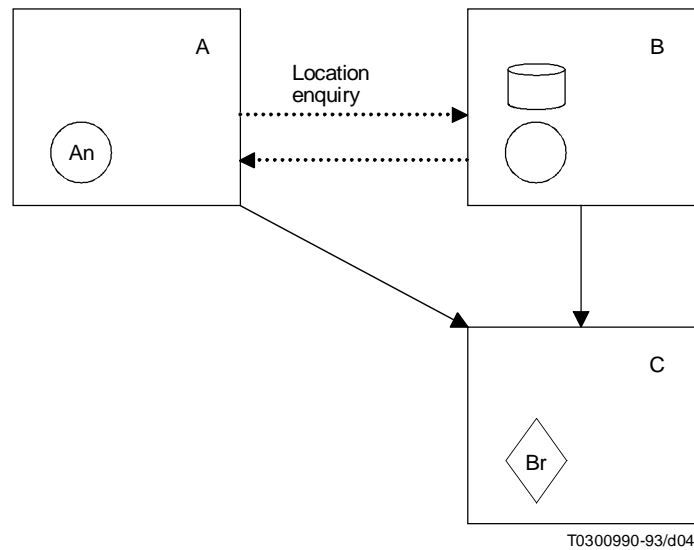
Billing and reimbursement

A bills An for call A to B, B bills Br for call B to C (no interchange of data is required).

NOTE – The above principles would also apply when Br has roamed to country A.

²⁾ Or a non-UPT user.

Case A3 – Non-roamed UPT user (An)³⁾ in country A calls roamed UPT user (Br) who has roamed to country C. Call is established directly between country A and country C as a result of the location enquiry to database in country B



Charging options

- a) Caller paid.
- b) Split charge.
- c) Called number billed.

Traffic accounting

A accounts A to C (all cases).

Charging

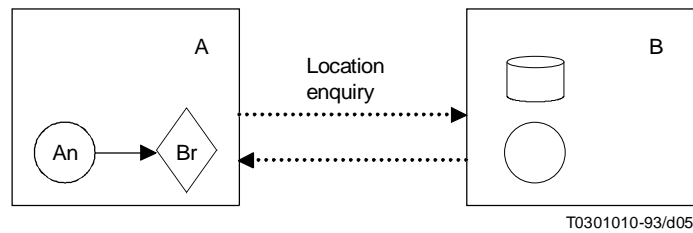
- a) A to C – paid by An, A's charges apply.
- b) A to C – paid by An, A's charges apply – when equal or less than A to B. If more than A to B, Br pays the balance of the A to C charge.
- c) A to C – paid by Br, A's charges apply.

Billing and reimbursement

- a) A bills An for call A to C.
- b) 1) A bills An for call A to C; or
2) A bills An for call A to B. B bills Br for balance A to C based on data supplied by A. B reimburses A with balance due.
- c) B bills Br for call A to C, based on data supplied by A. B reimburses A.

³⁾ Or a non-UPT user.

Case A4 – Non-roamed UPT user (An)⁴ in country A calls roamed UPT user (Br) who has roamed to country A. The call established is a national call in country A as a result of the location enquiry to the database in country B



Charging options

- a) Caller paid.
- b) Split charge.
- c) Called number billed.

Charging

- a) A’s domestic charges apply, paid by An.
- b) Not applicable.
- c) A’s domestic charges apply, paid by Br.

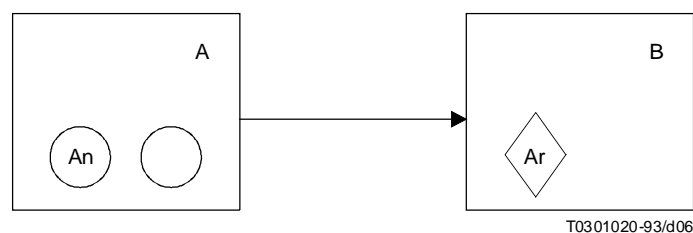
Traffic accounting

None.

Billing and reimbursement

- a) A bills An.
- b) Not applicable.
- c) B bills Br based on data supplied by A. B reimburses A.

Case A5 – Non-roamed UPT user (An)⁴ in country A calls roamed UPT user Ar who has roamed from country A to country B. Case applies regardless of routing



⁴) Or a non-UPT user.

Charging options

- a) Caller paid.
- b) Split charge.
- c) Called number billed.

Charging

- a) A to B – paid by An, A's charges apply.
- b) A to B – paid by An, A's charges apply when equal to or less than domestic charge. If more than domestic charge, Ar pays the balance of A to B charge.
- c) A to B – paid by Ar, A's charges apply.

Traffic accounting

A accounts A to B in all cases.

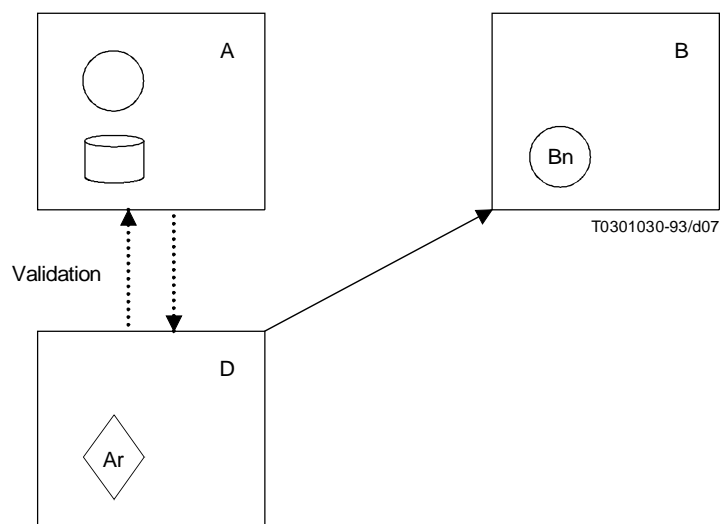
Billing and reimbursement

All billing and settlements occur within country A and there are no international implications.

Annex B

(This annex forms an integral part of this Recommendation)

Case B1 – Roamed UPT user (Ar) in country D calls non-roamed UPT user (Bn) in country B



Charging options

- a) Caller paid.
- b) Split charge.
- c) Called number billed.

Charging

- a) D to B – paid by Ar – D’s charges apply.
- b) Not applicable.
- c) D to B – paid by Bn – D’s charges apply.

Traffic accounting

D accounts D to B (all cases).

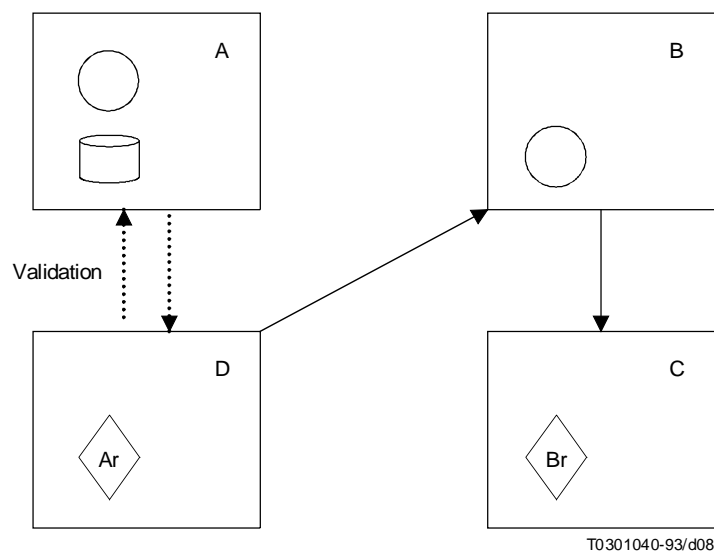
Billing and reimbursement

- a) A bills Ar for call D to B based on data supplied by D. A reimburses D.
- b) Not applicable.
- c) B bills Bn for the call D to B, based on data supplied by D.

The above principles also apply where the called party is not a UPT user.

The called party could be a non-roamed user in country A, as well.

Case B2 – Roamed UPT user (Ar) who has roamed to country D calls roamed UPT user (Br) who has roamed to country C. Call is forwarded via country B. This results in two calls: D to B and B to C



Charging

D to B (paid by Ar, D’s charges apply).

B to C (paid by Br, B’s charges apply).

Traffic accounting

D accounts D to B.

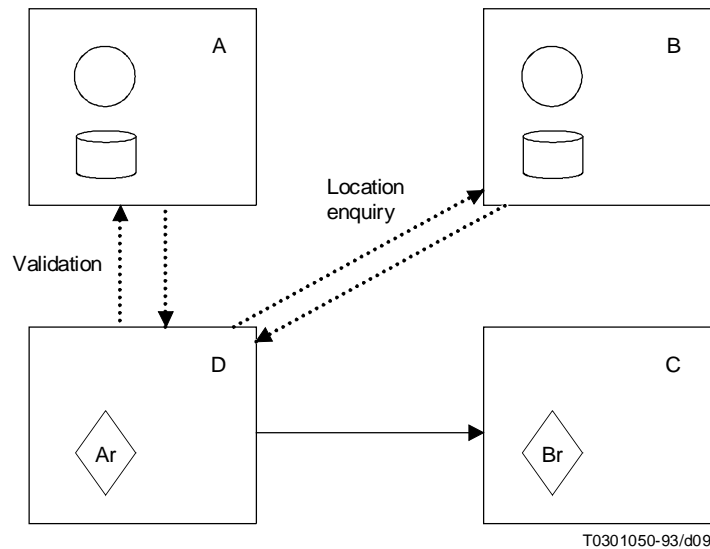
B accounts B to C.

Billing and reimbursement

- 1) A bills Ar for call D to B based on data supplied by D. A reimburses D. B bills Br for call B to C.

The above principles apply to all possibilities of international roaming of both the calling and called user, including where they have both roamed to the same country. The roamed calling and roamed called parties can be from the same or different countries.

Case B3 – Roamed UPT user (Ar) in country D calls roamed UPT user (Br) in country C. Call is established directly between country D and country C as a result of a location enquiry to the database in country B



Charging options

- a) Caller paid.
- b) Split charge.
- c) Called number billed.

Charging

- a) D to C – paid by Ar, D’s charges apply.
- b) D to C – paid by Ar, D’s charges apply – if equal to or less than D to B. If more than D to B, Br pays the balance of the D to C charge.
- c) D to C – paid by Br, D’s charges apply.

Traffic accounting

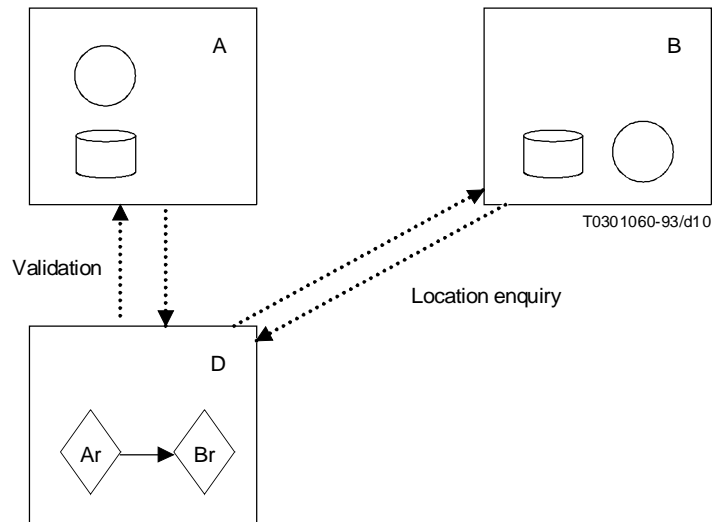
D accounts D to C (all cases).

Billing and reimbursement

- a) A bills Ar for call D to C, based on data supplied by D. A reimburses D.
- b) 1) A bills Ar for call D to C based on data supplied by D. A reimburses D; or
2) A bills Ar for call D to B. B bills Br for balance D to C based on data supplied by D. B reimburses D with balance due.
- c) B bills Br for call D to C based on data provided by D. B reimburses D.

NOTE – In the example shown, the called party Br has roamed to C, but could equally have roamed to A. Further, Br could be from the same country as Ar.

Case B4 – Roamed UPT user (Ar) who has roamed to country D calls roamed UPT user (Br) who has also roamed to country D. The call established is a national call in country D as a result of a location enquiry to the database in country B



Charging options

- Caller paid.
- Split charge.
- Called number billed.

Charging

- D's domestic charges apply, paid by Ar.
- Not applicable.
- D's domestic charges apply, paid by Br.

Traffic accounting

None.

Billing and reimbursement

- A bills Ar for D's domestic charges based on data supplied by D. A reimburses D.
- Not applicable.
- B bills Br for D's domestic charges based on data supplied by D. B reimburses D.

NOTE – These principles also apply to the case where both the roamed caller and the roamed called user are from the same country. They also apply when the called user is a non-roamed user in the same country as the caller.

Annex C

(This annex forms an integral part of this Recommendation)

TABLE C.1/D.280

Calls from a non-roamed UPT subscriber

Calls to	Billing option	Calls from/to	Subscriber charged to	Tariff charged at	Account Administrations	Notes
B at home	Caller pays	A to B	A	A's	A with B	
B at home	Called number	A to B	B	A's	B with A	
B in home country	Caller pays	A to B B to B1	A B	A's B's national	A with B	
B in home country	Called number	A to B B to B1	B B	A's B's national	B with A	
B in home country	Caller pays	A to B1	A	A's	A with B	Efficient routing
B in home country	Called number	A to B1	B	A's	B with A	Efficient routing
B at international location	Caller pays	A to B B to C	A B	A's B's	A with B B with C	
B at international location	Called number	A to B B to C	B B	A's B's	B with A B with C	
B at international location	Caller pays	A to C	A	A's	A with C	Efficient routing
B at international location	Called number	A to C	B	A's	A with C	Efficient routing B reimburses A
B at international location	Split bill	A to C	Split between A and B	A's	A with C	Efficient routing B reimburses A
B in A's home	Caller pays	A to B B to C	A B	A's B's	A with B B with C	
B in A's home	Called number	A to B B to C	B B	A's B's	A with B B with C	
B in A's home	Caller pays	A to B2	A	A's national	N/A	Efficient routing
B in A's home	Called number	A to B2	B	A's national	N/A	Efficient routing B reimburses A

NOTES

- 1 Billing options (Column 2) are described in 4.3.
- 2 Scenarios are described in Annexes A and B.

TABLE C.2/D.280

Calls from a UPT subscriber who has roamed to an International Location (C)

Calls to	Billing option	Calls from/to	Subscriber charged to	Tariff charged at	Account Administrations	Notes
B at home	Caller pays	C to B	A	C's	C with B	A reimburses C
B at home	Called number	C to B	B	C's	B with C	
B in home country	Caller pays	C to B B to B1	A B	C's B's national	C with B	A reimburses C
B in home country	Called number	C to B B to B1	B B	C's B's national	B with C	
B in home country	Caller pays	C to B1	C	C's	C with B	Efficient routing A reimburses C
B in home country	Called number	C to B1	B	C's	B with C	Efficient Routing
B at international location	Caller pays	C to B B to D	A B	C's B's	C with B B with D	A reimburses C
B at international location	Called number	C to B B to D	B B	C's B's	B with C B with D	
B at international location	Caller pays	C to D	A	C's	C with D	Efficient routing A reimburses C
B at international location	Called number	C to D	B	C's	C with D	Efficient routing B reimburses C
B at international location	Split Bill	C to D	Split between A and B	C's	C with D	Efficient routing B reimburses A A reimburses C
B in A's home	Caller pays	C to B B to A	A B	C's B's	C with B B with A	A reimburses C
B in A's home	Called number	C to B B to A	B B	C's B's	B with C B with A	
B in A's home	Caller pays	C to B2	A	C's	C with A	Efficient Routing
B in A's home	Called number	C to B2	B	C's	C with A	Efficient routing B reimburses C
B in C's location	Caller pays	C to B B to C1	A B	C's B's	C with B B with A	A reimburses C
B in C's location	Called number	C to B B to C1	B B	C's B's	B with C B with A	
B in C's location	Caller pays	C to C2	A	C's national	N/A	Efficient routing
B in C's location	Called number	C to C2	B	C's national	N/A	Efficient routing B reimburses C