



ETSI
TECHNICAL
REPORT

ETR 315

September 1996

Source: ETSI TC-NA

Reference: DTR/NA-021108

ICS: 33.020

Key words: UPT, UPTAC, UPTAN, UPT access

**Universal Personal Telecommunication (UPT);
UPT access parameters and identities
for the UPT users**

ETSI

European Telecommunications Standards Institute

ETSI Secretariat

Postal address: F-06921 Sophia Antipolis CEDEX - FRANCE

Office address: 650 Route des Lucioles - Sophia Antipolis - Valbonne - FRANCE

X.400: c=fr, a=atlas, p=etsi, s=secretariat - **Internet:** secretariat@etsi.fr

Tel.: +33 92 94 42 00 - Fax: +33 93 65 47 16

Copyright Notification: No part may be reproduced except as authorized by written permission. The copyright and the foregoing restriction extend to reproduction in all media.

© European Telecommunications Standards Institute 1996. All rights reserved.

Contents

Foreword	5
1 Scope	7
2 References	7
3 Abbreviations and definitions	7
3.1 Definitions	7
3.2 Abbreviations	8
4 Basic requirements	8
5 Access parameters	8
5.1 UPTAN	9
5.2 UPTAC	9
5.2.1 Global standardized UPTAC	9
5.2.2 Alternative European UPTAC	10
5.3 UPT Evolution	10
6 Personal User Identity	10
6.1 Structure and length	11
6.2 Derivation of the global title from the PUJ	11
7 Conclusion	12
Annex A: Example of an evolution in four steps	14
Annex B: Example of use of UPTAC and UPTAN within and between networks during an evolution as indicated in annex A	15
History	16

Blank page

Foreword

This ETSI Technical Report (ETR) has been produced by the Network Aspects (NA) Technical Committee of the European Telecommunications Standards Institute (ETSI).

ETRs are informative documents resulting from ETSI studies which are not appropriate for European Telecommunication Standard (ETS) or Interim European Telecommunication Standard (I-ETS) status. An ETR may be used to publish material which is either of an informative nature, relating to the use or the application of ETSs or I-ETSs, or which is immature and not yet suitable for formal adoption as an ETS or an I-ETS.

Blank page

1 Scope

This ETSI Technical Report (ETR) creates the basics for the standardization of global and European access parameters, Universal Personal Telecommunication (UPT) Access Number (UPTAN) and UPT Access Code (UPTAC), and a Personal User Identity (PUI).

An essential part of the UPT service for the UPT user is to authenticate himself to the networks involved before he can perform any UPT Outcall. The authentication is an issue between the UPT user and the service provider(s) irrespective of where the call originates. The authentication and the following update of the UPT user's service profile can only be done by accessing the service profile within the specific service provider's environment.

Before receiving Incalls the UPT user should inform his service profile about his new location. The parameters used to access and update the service profile to be able to receive Incalls and to generate Outcalls are identical.

The calling UPT users service profile is identified through a global and unique personal identifier.

NOTE: When the revision of ITU-T Recommendation E.168 is finalized and approved, an ETS will be created based on the results of the work.

2 References

This ETR incorporates by dated and undated reference, provisions from other publications. These references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this ETR only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

- [1] ITU-T Recommendation E.164: "Numbering plan for the ISDN era".
- [2] ITU-T Recommendation E.168: "Application of E.164 numbering plan for UPT".
- [3] ITU-T Recommendation E.169: "Application of E.164 numbering plan for universal international freephone numbers for international freephone service".
- [4] ITU-T Recommendation E.212: "Identification plan for land mobile stations".
- [5] ITU-T Recommendation E.214: "Structure of the land mobile global title for the signalling connection control part (SCCP)".
- [6] ETR 144: "Universal Personal Telecommunication (UPT); UPT phase 1 Numbering, dialling and evolution for incall".
- [7] ETS 300 799: "Network Aspects (NA); Universal Personal Telecommunication (UPT); Phase 1 - Service description".

3 Abbreviations and definitions

3.1 Definitions

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

UPTAC (UPT Access Code): A code the UPT user may need to dial, when using certain terminals and networks, in order to access UPT facilities before any UPT procedure can be carried out. The UPTAC does not contain any geographical nor service provider specific information.

UPTAN (UPT Access Number): A number the UPT user may need to dial, when using certain terminals and networks, in order to contact his service profile (provider). The UPTAN contains the necessary network/service provider identity to route the call to the UPT users service profile.

PUI (Personal User Identity): The identity by which the UPT user is known to the UPT service providers and networks supporting UPT. The PUI is used for flexibility and security purposes. It identifies a UPT user unambiguously, and should not be known to third parties.

3.2 Abbreviations

For the purposes of this ETR, the following abbreviations apply:

CC	Country Code
CC(UPT)	Country Code used as international UPT indicator
HDC	Home Database Code
IFS	International Freephone Service
IN	Intelligent Network
MCC	Mobile Country Code
MNC	Mobile Network Code
NDC	National Destination Code
PUI	Personal User Identity
SC	Separator Code
SN	Subscriber Number
UC	User Code
UIFN	Universal International Freephone Number
UPT	Universal Personal Telecommunications
UPTAC	UPT Access Code
UPTAN	UPT Access Number

4 Basic requirements

The access methods should give easy access to the UPT environment, irrespective from where the UPT user tries to activate access to his service profile, whether it is from his home network or from a visited foreign network. The UPT user should not need to know whether he is accessing his own service profile from within his own network or not.

Whenever a UPT user accesses his service profile, the access should not result in any additional charge to the subscriber responsible for the calling terminal, unless the responsible subscriber is also the UPT user.

Locally the network internal or national access procedures may play a major role, but it is highly unlikely that such procedures can be harmonized globally or continentally without major disadvantages to a large number of subscribers, who may not even be interested in utilizing UPT. Therefore we should aim the work at achieving a standardized global access method.

Both access parameters should be E.164 numbers.

In case of weak authentication, the PUI has to be known by the UPT user, since he needs the possibility to signal the PUI from any of the visited terminals. It should therefore not contain hexadecimal characters, e.g. only the decimal digits from 0 to 9.

To find the UPT user's service profile, the network has to send a query to a UPT database. Easy recognition of the "home" database and of the UPT users service provider is a network requirement to simplify the necessary network actions.

To prevent fraud the PUI should not be easy to guess, nor should it be necessary to change in the event of changes in the E.164 Country Codes (CC).

5 Access parameters

Two UPT access parameters have been identified: UPTAC and UPTAN. Both parameters can be used nationally as well as internationally, but UPTAC puts higher demands on the interconnection of international IN-networks than UPTAN and should be considered as a long-term solution. Figure 1 illustrates the use of UPTAC and UPTAN in a situation consisting of multiple isolated UPT environments. From a global perspective this will be the situation for a long time.

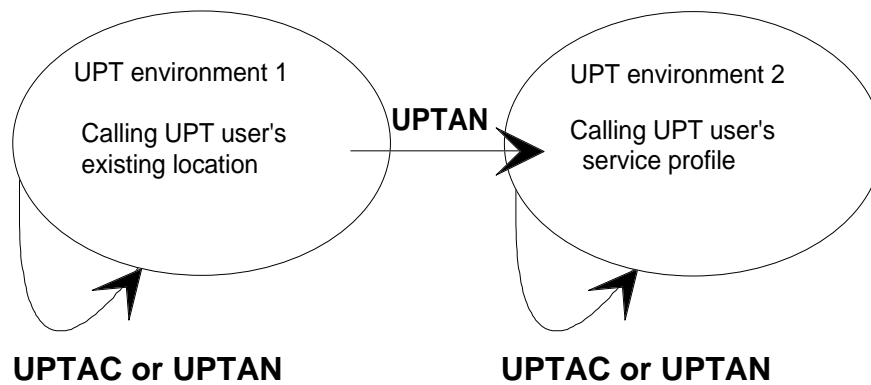


Figure 1: Use of UPTAC and UPTAN in a situation with multiple isolated UPT environments

UPT environment 1 and 2 may each contain one or more networks, service providers and countries. The calling UPT user is located in environment 1, while his service profile is located in environment 2. When the UPT user enters UPT environment 2 he can access his service profile either through UPTAC or UPTAN.

Both UPTAN and UPTAC should be free of charge from the calling terminal.

5.1 UPTAN

Since UPTAN should be an E.164 number free of charge from the calling terminal, it should be taken from the series belonging to the International freephone service, which have two alternative number structures as shown in figure 2.

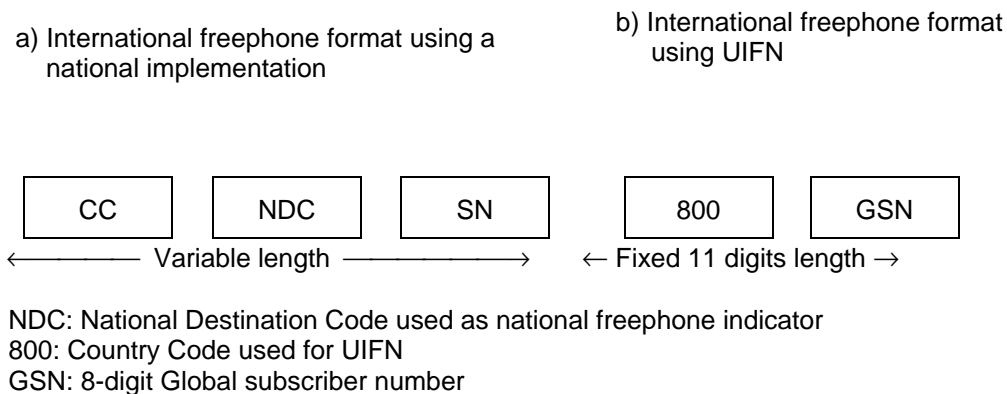


Figure 2: Alternative structures of UPTAN

The international freephone format allows national numbering and dialling formats for UPTAN, while the UIFN format has only one international dialling format. Both will terminate at a UPT serving exchange that can access the calling UPT user's service profile. For the international freephone format the termination is likely to be in the country identified by CC, while for the UIFN format the termination can be at one or more locations decided by the service provider.

Additional benefits can be realized by service providers who utilizes the UIFN format e.g. use of one global number terminated at different locations, and benefits from human factors issues such as the ability to have alpha numeric associations.

5.2 UPTAC

5.2.1 Global standardized UPTAC

As UPT is a global service, the UPTAC should be standardized. This cannot be achieved through harmonization of national numbering schemes due to the wide variances that exists. It is, however, possible to achieve one standardized global UPT access code through the international E.164 format as shown in figure 3.

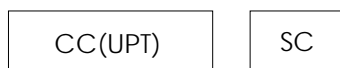


Figure 3: Structure of global UPTAC

CC(UPT) is the same CC as used in ETR NA-21105 as UPT indicator for the Global country based scheme. The SC is used to separate the UPTAC from the global UPT number irrespective of what long-term scenario is chosen for UPT numbering.

Table 2 shows three alternative formats of UPTAC with different number of digits in SC, and some examples of possible SCs.

Table 2: Alternative formats of a global UPTAC

Length of SC	UPTAC format	Examples of SC
1 digit (a)	UPT(CC)+a	a = 0
2 digits (ab)	UPT(CC)+ab	ab = 83
3 digits (abc)	UPT(CC)+abc	abc = 800

a: 1 digit SC
 ab: 2 digit SC
 abc: 3 digit SC

NOTE: The UPT(CC) and the a, ab or abc may be equal.

The 1-digit SC occupies one hundred 3-digit E.164 country codes. A consequence of this will be, that all the country codes with 0 (zero) as leading digit (0xx) can never be assigned to any country/geographical area. The 2-digit SC occupies ten 3-digit country codes, while the 3-digit SC occupies one 3-digit country code (abc) which should either be taken from the series of spare country codes or be one that can never identify an international UPT number e.g. 800.

It is recommended that SC be equal to 800, which means that a UPT user can never be allocated a UIFN for UPT purposes.

Implementation of the standardized UPTAC (CC(UPT)+800) should be mandatory, but maintaining an UPTAN for national purposes in parallel with UPTAC is a national matter. It is further a national matter to create a national UPTAC in addition to the standardized UPTAC.

5.2.2 Alternative European UPTAC

The principles described in the previous section for the global UPTAC will require ITU approval. It is, however, possible to create a European alternative through the use of one standardized European short number. This solution should only be developed as an alternative within the European area, never as a replacement for the potential global standard UPTAC. It may, however, be an attractive European alternative, due to the fact that the number of dialled digits in the short number (3-4 digits) are fewer than the total number of dialled digits with the global UPTAC (6-8 digits inclusive international prefix with a 3-digit country code).

5.3 UPT Evolution

The evolution will take place from a very large number of separate UPT environments (networks) with regional/national coverage to one global UPT environment (network) with worldwide coverage. It will occur through a number of steps and probably expand from the networks that first implement the IN-application part. How the evolution will take place, will, in the end, be a national matter. Annex A illustrates one example of an evolution in four steps, and annex B shows how such an evolution may influence the use of UPTAC and UPTAN.

6 Personal User Identity

PUI is used by networks and service providers to uniquely identify the UPT user, and it is used by a visited network to identify the service provider and the "home" database of a UPT user. It will contain all the necessary information to identify the UPT user and locate his "home" service provider and database, through which all the characteristics of the calling UPT user can be found.

6.1 Structure and length

PUI should consist of decimal digits, and a fixed number of 15 digits. Figure 4 shows the options for a PUI structure. This global PUI can in the authentication process be used after both UPTAC and UPTAN.

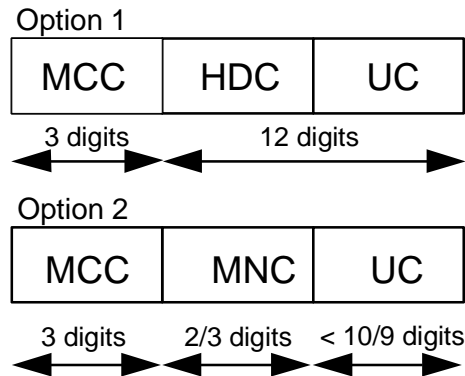


Figure 4: Structure of PUI

MCC is a 3-digit code identifying the country or domicile of the UPT user. Use of MCC will secure that the PUI will not be influenced by the potential changes that might be required for the E.164 Country Codes. Option 2 is identical to the existing format used in E.212.

Since MCC may be used in the identification plans for different services e.g. land mobile stations and UPT, it is the National Numbering Authority's responsibility to create a plan for the sharing and structuring of the number space behind the MCC between all the potential services that will require use of MCC's.

The capacity of the HDC field should cover all the home databases that will exist in the MCC area. The Service provider identity can be derived from the HDC.

A UPT subscriber can in some cases be responsible for a number of UCs spread across international networks. The subscriber identity can be derived from the UCs or be a UC in itself.

The number of digits in each of the HDC, and UC fields is a national matter, but the total number of digits in these two field should always be 12.

With this structure, the UPT serving exchange can extract from the PUI all the information needed.

If the authentication takes place only through use of UPTAN the MCC field is unnecessary. Use of this method is a national/service provider matter. The method can not be used after UPTAC because the access will then normally take place through a serving exchange in a foreign country.

6.2 Derivation of the global title from the PUI

In order to permit the UPT user to move there is a need to transfer information. e.g. the PUI between the networks involved. This transfer of information can be accomplished by the use of Transaction Capabilities and the Signalling Connection Control Part of Signalling System No. 7, or by another method yet to be decided.

The global title contains the E.164 address of the Home database, and this is derived from the two options of PUI as shown in figure 6.

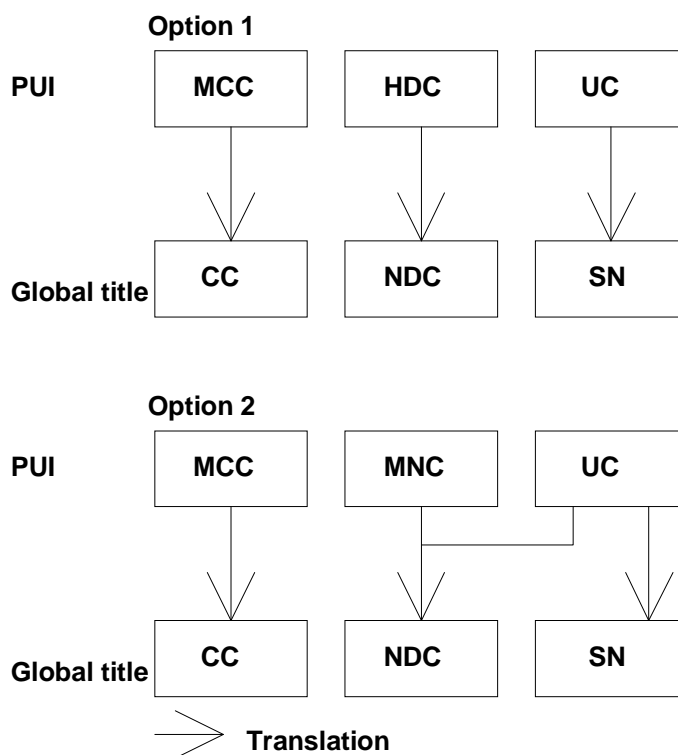


Figure 5: Derivation of the global title from the PUI

Within the global title the CC is derived directly from MCC and the NDC is derived from the HDCs. There could be a many-to-one translation from the HDC to the NDC. All the UCs behind one HDC is translated into one SN.

7 Conclusion

The access methods should give easy access to the UPT environment, irrespective of where the UPT user tries to activate his service profile, whether it is from his home network or from a visited foreign network. The UPT user should not need to know whether he is accessing his own service profile from within his own network or not.

Locally the network internal or national access procedures may play a major role, but it is highly unlikely that network internal or national procedures can be harmonized globally without major disadvantages to a large number of subscribers, who may not even be interested in utilizing UPT. Therefore we should direct the work at achieving a standardized global access method through one standardized global UPT access code (UPTAC) and a service provider dependent UPT access number (UPTAN).

Both UPTAN and UPTAC should be free of charge from the calling terminal.

Within Europe an alternative short number code could be created and standardized without ITU approval. This solution should only be developed as a temporary alternative within the European area, never as a replacement for the potential global standard UPTAC.

UPTAN should be an ordinary E.164 number from one of the access methods to the International freephone service as described in ITU-T Recommendation E.152 preferably using the UIFN.

To be able to achieve one standardized global UPT access code it should be structured as an international E.164 number with two fields; CC(UPT) (Country code used as international UPT indicator) and SC (Separator Code). The SC should be equal to 800.

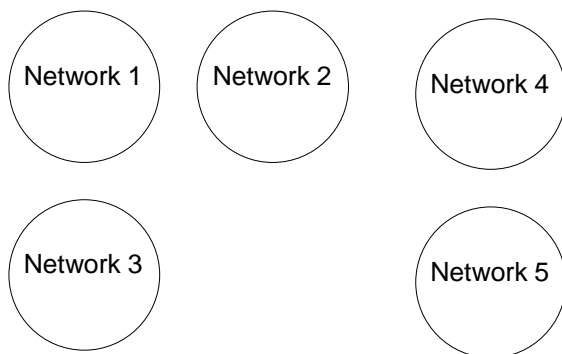
Implementation of UPTAC should be mandatory, but maintaining an UPTAN in parallel with UPTAC is a national matter. The possibility to create a national formatted UPTAC in addition to the standardized UPTAC is a national matter.

PUI should be structured with 3 fields; MCC (Mobile country code), HDC (Home database code) or MNC (Mobile network code) and UC (User code). The length of PUI should always be 15 digits. This global PUI can in the authentication process be used after both UPTAC and UPTAN. Use of PUI without the MCC field is a national/service provider matter, and can only be used after the UPTAN

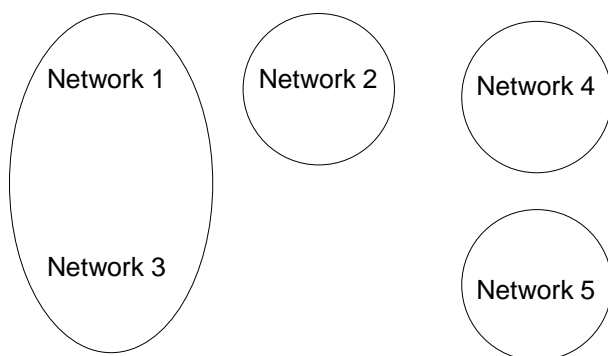
In order to to permit the UPT user to move there is a need to transfer the PUI from the visited network to the home network of the UPT user. A Global title will be created from the PUIs to identify the location of the home database of the UPT user.

Annex A: Example of an evolution in four steps

Step 1: Separate UPT networks

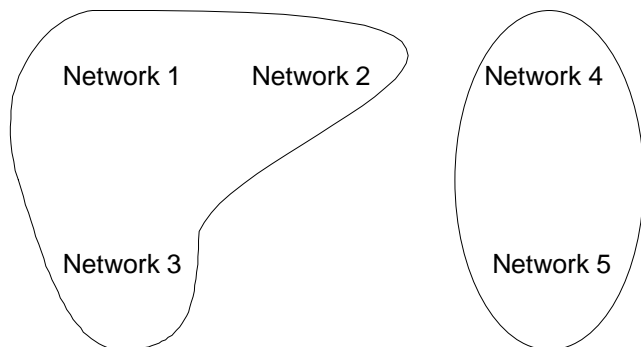


Step 2: Merging of some UPT networks



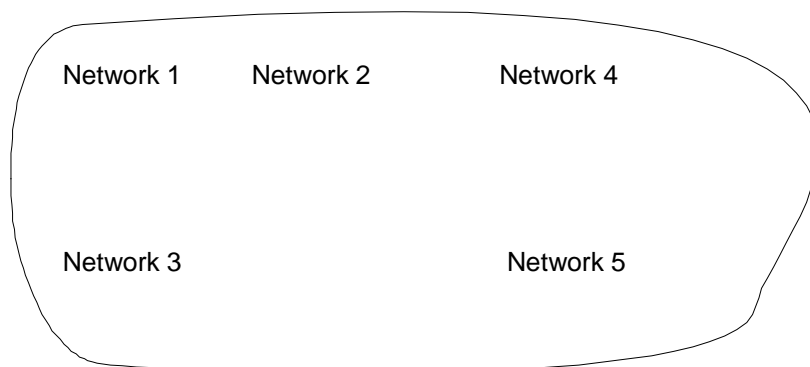
Two of the separate networks in step 1 (Network 3 and 5) have decided to implement UPTAC for network internal purposes to accustom their customers to the future use of UPTAC. When network 1 and 3 merge in step 2 to 1 (one) UPT environment, the service provider in network 1 has decided to implement UPTAC for national purposes in parallel with his national UPTAN.

Step 3: Further merging into regional/continental UPT networks



Evolution to step 3 may create multinational/continental UPT environments (networks), where use of UPTAN now is necessary only between the two separate UPT environments that now exists.

Step 4: Final step, one global UPT network



In step 4, the final step in this example of evolution, we have one global UPT environment where UPTAC can be used all over.

Annex B: Example of use of UPTAC and UPTAN within and between networks during an evolution as indicated in annex A.

Step 1. Separate environments with UPT capabilities

From	To network 1	To network 2	To network 3	To network 4	To network 5
Network 1	UPTAN	UPTAN	UPTAN	UPTAN	UPTAN
Network 2	UPTAN	UPTAN	UPTAN	UPTAN	UPTAN
Network 3	UPTAN	UPTAN	UPTAC	UPTAN	UPTAN
Network 4	UPTAN	UPTAN	UPTAN	UPTAN	UPTAN
Network 5	UPTAN	UPTAN	UPTAN	UPTAN	UPTAC

Step 2. First merging of some environments with UPT capabilities

From	To network 1	To network 2	To network 3	To network 4	To network 5
Network 1	UPTAN/UPTAC	UPTAN	UPTAC	UPTAN	UPTAN
Network 2	UPTAN	UPTAN	UPTAN	UPTAN	UPTAN
Network 3	UPTAC	UPTAN	UPTAC	UPTAN	UPTAN
Network 4	UPTAN	UPTAN	UPTAN	UPTAN	UPTAN
Network 5	UPTAN	UPTAN	UPTAN	UPTAN	UPTAC

Step 3. Further merging into regional/continental environments with UPT capabilities

From	To network 1	To network 2	To network 3	To network 4	To network 5
Network 1	UPTAN/UPTAC	UPTAC	UPTAC	UPTAN	UPTAN
Network 2	UPTAC	UPTAN/UPTAC	UPTAC	UPTAN	UPTAN
Network 3	UPTAC	UPTAC	UPTAC	UPTAN	UPTAN
Network 4	UPTAN	UPTAN	UPTAN	UPTAN/UPTAC	UPTAC
Network 5	UPTAN	UPTAN	UPTAN	UPTAC	UPTAC

Step 4. The final step, one global environment with UPT capabilities all over

From	To network 1	To network 2	To network 3	To network 4	To network 5
Network 1	UPTAN/UPTAC	UPTAC	UPTAC	UPTAC	UPTAC
Network 2	UPTAC	UPTAN/UPTAC	UPTAC	UPTAC	UPTAC
Network 3	UPTAC	UPTAC	UPTAC	UPTAC	UPTAC
Network 4	UPTAC	UPTAC	UPTAC	UPTAN/UPTAC	UPTAC
Network 5	UPTAC	UPTAC	UPTAC	UPTAC	UPTAC

NOTE: Changes from one step to the next is indicated with shaded cells.

History

Document history	
September 1996	First Edition