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Foreword

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

This ETR provides an overview of the numbering and dialling for Universal Personal Telecommunication (UPT) phase 1 services, based upon the existing numbering schemes and the existing IN.

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1 Scope

This ETSI Technical Report (ETR) provides an overview of the numbering and dialling for Universal Personal Telecommunication (UPT) phase 1 services. The phase 1 scenarios are all based upon the existing numbering schemes and the existing IN. The post phase 1 scenarios are presented as an aid to show the possible evolution paths of the phase 1 solutions to one or more of the post phase 1 scenarios. Ideally the number of post phase 1 scenarios in Europe should be minimized.

The ETR describes possible evolution paths between the phase 1 and the post phase 1 scenarios, to achieve a smooth and natural expansion of the UPT service, and minimize the impacts on both networks and customers.

All scenarios described here are part of ITU-T Recommendation E.168 [2] Application of CCITT Recommendation E.164 [3] numbering plan for UPT.

2 References

- [1] ETR 055-3: "Universal Personal Telecommunications (UPT); The service concept; Part 3: Service aspects of charging, billing and accounting".
- [2] ITU-T Recommendation E.168: "Application of E.164 numbering plan for UPT".
- [3] CCITT Recommendation E.164: "Numbering plan for the ISDN era".

3 Definitions and abbreviations

3.1 Definitions

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

Assisting network: an assisting network provides UPT capabilities that allow queries to other UPT capable networks, for example to the home network of the UPT user. An assisting network can be used for calls originating from a non-UPT capable network. An assisting network may also be used in calls from a UPT capable network when capabilities of the originating network are not used.

Originating country/network: a country/network where the UPT call originates.

Terminating country/network: a country/network where the UPT call terminates.

3.2 Abbreviations

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

CC(UPT)	UPT Country Code
CC	Country Code
CS	Country-based Scheme
GCS	Global Country-based Scheme
GNCS	Global Non Country-based Scheme
GPS	Global/continental Prefix Scheme
HS	Home-related Scheme
IN	Intelligent Network
NDC(CC)	National Destination Code used for country identification according to CCITT Recommendation E.164 [3]
NDC(non-CC)	National Destination Code used for identification of global administrator(s)
NDC(UPT)	National Destination Code with UPT/service provider identification
NDC	National Destination Code
Pi	international Prefix
Pt	trunk Prefix
Pu	standardized global UPT Prefix
SN	Subscriber Number or national (significant) Subscriber Number
UPT	Universal Personal Telecommunication

4 Basic requirements

In short term the existing national numbering and dialling formats should be maintained for calls to UPT users, and the national UPT numbering schemes should be structured in such a way that the calling users can identify that the called number is a UPT number. UPT is a location independent service and the UPT numbers should primarily be taken from the national location independent number series so that national, network internal or service provider internal number portability is not unduly restricted.

4.1 Network requirements

To achieve the most optimized routing the network should as soon as possible be able to detect that it is a call to a UPT user. This is normally done by analysing the called number and searching for the UPT indicator.

The UPT indicator triggers access to the UPT serving exchange, which will send a query to a UPT database. The UPT serving exchange may be located in the originating network, an assisting network or in the UPT users home network. Easy recognition of the UPT serving exchange and the "home" database is a network requirement to simplify the necessary network actions.

4.2 User requirements

From a user point of view the following three requirements are considered essential:

- a) user friendly procedures;
- b) minimum number of number changes during the evolution of UPT;
- c) easy user perception of charging.

User friendly procedures means that the procedures for calling a UPT user should be harmonized with the existing national and international calling procedures. Diverse procedures could easily create misdialling or inhibit customers adoption of the service.

Changes in subscriber numbers will always create heavy burdens on the customers involved and network operators, first of all because all the customers written material which have references to the numbers have to be changed, secondly because the customers have to inform all their contact points all around the world about the new numbers. Number changes should be minimized. Having first subscribed to a UPT service, the customer should anticipate that the allocated UPT number remains unchanged during the evolution of UPT.

The UPT number should give the calling user the possibility to identify that special charging arrangements may apply in a similar manner, for example, to that where an international prefix usually indicates that an international charge will apply.

NOTE: Examples of charging scenarios are given in ETR 055-3 [1].

5 Numbering and dialling in phase 1 for incoming calls to a UPT user

The phase 1 scenarios use existing numbering and dialling formats. All the phase 1 scenarios are administered nationally.

The numbering and dialling formats are described for local, national and international calls to UPT users. Two phase 1 numbering scenarios are described.

5.1 Home-related scheme

The Home-related Scheme (HS) is a numbering scenario without UPT indicator. The scenario is identical to scenario 1 in ITU-T Recommendation E.168 [2]. Recognizing it as a UPT number is not possible without analysing the complete subscriber number. The elements of the CCITT Recommendation E.164 [3] structure (CC, NDC and SN) have the following meaning for the HS.

CC: CCITT Recommendation E.164 [3] Country Code.

NDC: National Destination Code.

SN: Subscriber Number.

The international UPT number consists then of the following three elements:

CC + NDC + SN (see NOTE 1 to table 1).

The numbering and dialling formats for local, national and international calls to UPT users will be as shown in table 1.

Table 1: Numbering and dialling formats for the HS

Call type	Numbering formats	Dialling formats
Local call	SN (NOTE 2)	S (NOTE 2)
National call (NOTE 1)	NDC + SN	Pt + NDC + SN (NOTE 3)
International call (NOTE 1)	CC + NDC + SN	Pi + CC + NDC + SN
Pt: trunk Prefix (NOTE 3). Pi: international Prefix. NOTE 1: The plus sign (+) is not part of the numbering and dialling formats. It is only used to separate the individual elements in the CCITT Recommendation E.164 [3] structure. NOTE 2: This format is not used in countries that have an integrated numbering scheme, where NDC and SN are inseparably connected. NOTE 3: Pt is not used in countries that have an integrated numbering scheme, where NDC and SN are inseparably connected.		

The HS satisfies the first and second user requirement in 4.2 because the procedures and the number may remain unchanged, when changing from a non UPT subscription to a UPT subscription.

The HS is the most questionable alternative of the phase 1 scenarios, although it may enable early implementation of UPT, it does not satisfy the network requirements, uses location dependent numbers, and therefore does not indicate to the calling user that it is a UPT number that may require special charging.

5.2 Country-based scheme

The Country-based Scheme (CS) is a numbering scenario with one UPT indicator. It is identical to scenario 2 in ITU-T Recommendation E.168 [2]. The elements in the CCITT Recommendation E.164 [3] structure (CC, NDC and SN) should be interpreted as follows.

CC: CCITT Recommendation E.164 [3] Country Code.

NDC: UPT and service provider indicator (see NOTE 3 to table 2).

SN: Subscriber Number.

The international UPT number consists then of the following three elements:

CC + NDC(UPT) + SN (see NOTE 1 to table 2).

NDC(UPT): National destination code with UPT/service provider identification (see NOTE 3 to table 2)

The structuring of NDC(UPT) is a national matter, but the UPT identification should be given preference before the service provider identification. One or more UPT indicators may be used nationally. The numbering and dialling formats for local, national and international calls to UPT users will be as shown in table 2. A fixed national number format should be specified following the NDC(UPT). This is to ensure that the complete "numberlength" can be defined prior to the database query.

Table 2: Numbering and dialling formats for the CS

Call type	Numbering formats (NOTE 1)	Dialling formats (NOTE 1)
Local call	NDC(UPT) + SN	Pt + NDC(UPT) + SN (NOTE 2)
National call	NDC(UPT) + SN	Pt + NDC(UPT) + SN (NOTE 2)
International call	CC + NDC(UPT) + SN	Pi + CC + NDC(UPT) + SN
Pt: trunk prefix (NOTE 2). Pi: international prefix. NOTE 1: The plus sign (+) is not part of the numbering and dialling formats. It is only used to separate the individual elements in the CCITT Recommendation E.164 [3] structure. NOTE 2: Pt is not used in countries that have an integrated numbering scheme, where NDC and SN are inseparably connected. NOTE 3: As an option, in order to allow UPT number portability when the UPT user changes service provider, the value of the service provider field in the NDC may be a dummy, which only indicates that the identification for the current service provider needs translation of the UPT number.		

The CS uses only one national format (NDC(UPT)+ SN), with UPT indication in the leading digits of the national number. The location of the UPT indicator in the NDC field makes it possible nationally to recognize that it is a UPT call, and to charge it differently.

The CS satisfies all network requirements, although for international calls it may require a deeper number analysis in the originating country for charging and routing purposes. User requirement 3 in subclause 4.2 may not be satisfied because no calling user outside the UPT users home country will normally be able to perceive that it is a UPT call i.e. achieving a global UPT identity is very difficult in this way.

5.3 Use of national prefixes for UPT

National UPT prefixes are not recognized in ITU-T Recommendation E.168 [2].

National prefixes can never be standardized globally and should therefore not be used for accessing UPT users. As national prefixes can never be transferred across international borders, it would mean that incoming international UPT calls to a country, using only a national prefix as UPT indicator, will not be possible.

6 Numbering and dialling post phase 1 for incoming calls to UPT users

The long term scenarios should primary concentrate on the global number portability aspects. Most of the network and user requirements presented in clause 4 will be equally valid for the post phase 1 solutions. Two of the post phase 1 scenarios are numbering scenarios and one is a dialling scenario. The number of post phase 1 scenarios in Europe should be minimized.

In the following presentation of the post phase 1 scenarios the consequences regarding number administration and maximum number of digits in the national numbers are presented.

The numbering and dialling formats are described for local, national and international calls to UPT users.

6.1 Global country-based scheme

The Global Country-based Scheme (GCS) is a numbering scenario with at least one UPT indicator. It is identical to scenario 3b in ITU-T Recommendation E.168 [2]. The elements in the CCITT Recommendation E.164 [3] structure (CC, NDC and SN) should be interpreted as follows.

CC: 3 digit international UPT indicator.

NDC: 1, 2 or 3 digit country identification according to the CCs in CCITT Recommendation E.164 [3].

SN: National (significant) subscriber number.

The SN may contain a national UPT-indicator. The international UPT-number can then be written and understood as:

CC(UPT) + NDC(CC) + SN (see NOTE 1 to table 3).

CC(UPT): Country code used as international UPT-indicator.

NDC(CC): National destination code used for country identification according to CCITT Recommendation E.164 [3].

The numbering and dialling formats for local, national and international calls to UPT users will be as shown in table 3. The local and national formats are national options. A fixed national number format should be specified following the NDC(CC). This is to ensure that the complete "numberlength" can be defined prior to the database query.

Table 3: Numbering and dialling formats for the GCS

Call type	Numbering formats	Dialling formats
Local call	SN (NOTE 2)	Pt + SN NOTE 2, (NOTE 3)
National call (NOTE 1)	SN (NOTE 2)	Pt + SN NOTE 2, (NOTE 3)
International call (NOTE 1)	CC + SN (NOTE 4) CC(UPT) + NDC(CC) + SN	Pi + CC + SN (NOTE 4) Pi + CC(UPT) + NDC(CC) + SN
Pt: trunk prefix (NOTE 2). Pi: international prefix. NOTE 1: The plus sign (+) is not part of the numbering and dialling formats. It is only used to separate the individual elements in the CCITT Recommendation E.164 [3] structure. NOTE 2: It is assumed that the leading digits of SN contain a national UPT indicator. NOTE 3: Pt is not used in countries that have an integrated numbering scheme, where NDC and SN are inseparably connected. NOTE 4: CC + SN and CC(UPT)+ NDC(CC)+ SN are complementary formats. The first one has no UPT indicator in the CC field only within the SN.		

The GCS allows national administration of SN and national number formats. It will however restrict the maximum number of digits in the national (significant) subscriber number SN as shown in table 4.

Table 4: Maximum number of digits in the national (significant) subscriber number

Number of digits in CC	Maximum number of digits prior to time T	Maximum number of digits post time T
1	8	11
2	7	10
3	6	9
Time T: 31 December 1996		

The GCS can only be approved as a global solution by simultaneously approving the restrictions on the maximum number of digits in the national (significant) subscriber number according to the last row in table 4 in order to align with CCITT Recommendation E.164 [3].

Any attempt to use the scheme prior to time T (31 December 1996) with maximum 12 digits in the international number, will restrict the number of digits in the national (significant) subscriber number SN to such an extent (6 digits), that this scheme should not be taken in use prior to time T.

The use of NDC(CC) allows for national administration of the SN series. The CC(UPT) and the NDC(CC) are both administered by ITU-T. Competition may require a service provider indication in the SN, and/or interworking between the competing service providers IN-network. This is for further study.

6.2 Global non country-based scheme

The global Non Country-based Scheme (GNCS) is a numbering scenario with one UPT-indicator. It is identical to scenario 3a in ITU-T Recommendation E.168 [2]. The elements in the CCITT Recommendation E.164 [3] structure (CC, NDC and SN) should be interpreted as follows.

- CC: 3 digit international UPT-indicator.
- NDC: Identification of one or more global (ITU-T approved) numbering administrators.
- SN: Global subscriber number.

The NDC and SN have no UPT-indicators. The international UPT number can then be written and understood as.

CC(UPT) + NDC(non-CC) + SN (see NOTE 1 to table 5).

CC(UPT): Country code used as international UPT-indicator.

NDC(non-CC): National destination code used for identification of global administrator(s).

The numbering and dialling formats for local, national and international calls to UPT users will be as shown in table 5.

Table 5: Numbering and dialling formats for the GNCS

Call type	Numbering formats (NOTE)	Dialling formats (NOTE)
Local call	CC(UPT) + NDC(NON-CC) + SN	Pi + CC(UPT) + NDC(NON-CC) + SN
National call	CC(UPT) + NDC(NON-CC) + SN	Pi + CC(UPT) + NDC(NON-CC) + SN
International call	CC(UPT) + NDC(NON-CC) + SN	Pi + CC(UPT) + NDC(NON-CC) + SN
Pi: international prefix.		
NOTE: The plus sign (+) is not part of the numbering and dialling format. It is only used visually to separate the individual elements in the CCITT Recommendation E.164 [3] structure.		

The scheme assumes global administration of SN. The maximum number of digits in SN post phase 1 will be 11 for a 1 digit NDC(non-CC), 10 for a 2 digit NDC(non-CC), 9 for a 3 digit NDC(non-CC) etc. Both CC(UPT) and NDC(non-CC) are administered by ITU-T. SN is administered by the ITU-T approved administration(s). No national or continental administration takes place. None of the number elements contain location dependent information.

6.3 Global prefix scheme

The global prefix scheme is a dialling scenario with at least one UPT-indicator. It is identical to the dialling scheme presented in Annex B to ITU-T Recommendation E.168 [2] and structured as follows:

- Pu + international UPT number;
- Pu: standardized global UPT prefix.

The UPT prefix may be used to identify or further identify that the dialled number may be a UPT number. The international UPT number can either be from one of the post phase 1 scenarios in subclauses 6.1 or 6.2, or one of the phase 1 scenarios described in subclauses 5.1 or 5.2.

The UPT prefix can only be used in front of the international number.

Since the UPT prefix is not transmitted across international borders, it will either require an operational international IN, or require that the UPT prefix is translated into a UPT-indicator in the form of a CC(UPT). Such a translation can either take place in a national IN or in a national exchange that has the necessary translation capability. This means that the restriction on the numbering length, mentioned in subclause 6.1, will also be valid for the international use of the global prefix scheme prior to the implementation of a global IN. Use of signalling parameters to avoid these difficulties is for further study.

The number and dialling formats for local, national and international calls to UPT users will be as shown in table 6.

Table 6: Numbering and dialling formats for the global prefix scheme

Call type	Numbering formats	Dialling formats (NOTE 1)
Local call	See table 1, 2, 3 or 5	See table 1, 2, 3 or 5 (NOTE 2) Pu + Int. UPT number "
National call	See table 1, 2, 3 or 5	See table 1, 2, 3 or 5 (NOTE 2) Pu + Int. UPT number "
International call	See table 1, 2, 3 or 5	See table 1, 2, 3 or 5 (NOTE 2) Pu + Int. UPT number "
Pu: standardized global UPT prefix. Int. UPT number: CC + NDC + SN for the HS. CC + NDC(UPT)+ SN for the CS. CC(UPT)+ NDC(CC)+ SN for the GCS CC(UPT)+ NDC(non-CC)+ SN for the GNCS.		
NOTE 1: The plus sign (+) is not part of the numbering and dialling format. It is only used visually to separate the individual elements in the CCITT Recommendation E.164 [3] structure.		
NOTE 2: The dialling formats in table 1, 2, 3 or 5 and Pu + Int. UPT number are complementary formats.		

As it has been established that a global standardized UPT prefix is not achievable this option is not recommended.

7 Evolution from phase 1 to post phase 1

The evolution from short term to long term should be smooth and natural. An evolution that maintains the possibility to use national formats, and minimizes numbering changes during continual expansion of the UPT coverage, is a smooth evolution. If the UPT serving networks in addition to this are developed in accordance with national plans, then the evolution could be considered both smooth and natural. Such an evolution will also satisfy the network and user requirements described in subclauses 4.1 and 4.2.

7.1 Possible evolution paths

The evolution should normally take place from a HS or CS to a global scheme, although some countries may find that an international UPT service is offered before national solutions can be decided. This report deals only with a normal evolution path from a HS or CS.

To ease the description of the evolution process each scenario is identified through its acronym:

- HS: Home-related scheme;
- CS: Country-based Scheme;
- GCS: Global Country-based Scheme;
- GNCS: Global Non Country-based Scheme;
- GPS: Global Prefix Scheme.

With two phase 1 scenarios and three post phase 1 scenarios we will have a total of six possible evolution paths. Only a few of these will satisfy user and network requirements. In subclauses 7.2 to 7.7 the following paths are presented with a short description of the positive and negative consequences of each path:

- subclause 7.2: from HS to GCS;
- subclause 7.3: from HS to GNCS;
- subclause 7.4: from HS to GPS;
- subclause 7.5: from CS to GCS;
- subclause 7.6: from CS to GNCS;
- subclause 7.7: from CS to GPS.

7.2 From the home-related scheme to the global country-based scheme

The mobility of the UPT user in HS is limited by the capability of the home domain and restricted by the routing and performance considerations of the networks involved. The use of a CC(UPT) may extend the capability of the home domain and remove the routing and performance restrictions caused by the networks involved.

CC(UPT) can trigger access to a UPT serving exchange irrespective of whether the serving exchange is located in the originating, assisting or UPT users home network. The UPT serving exchange must of course have the capability to interrogate with the database in the home exchange of the UPT user, and this cannot be done without an international or bilateral IN. But since CC(UPT) can be routed internationally without problems, the evolution from HS to GCS is almost independent of the corresponding development of the IN. Almost because routing and performance considerations may limit the total path from the calling user to the UPT user. Until an international IN is established the call will be routed from the originating country to the home country of the UPT user, and from there to the terminating country.

Figure 1 shows the evolution from HS to GCS.

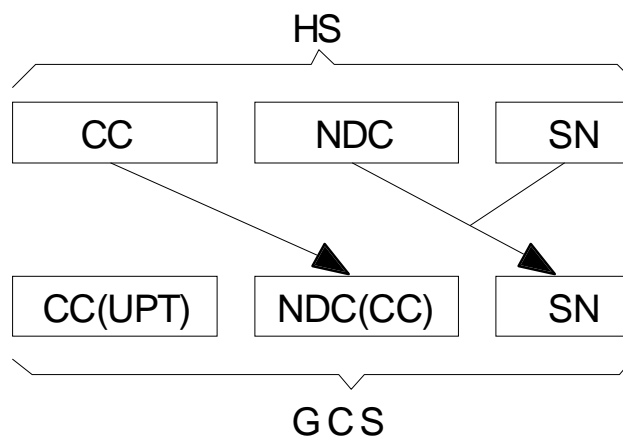


Figure 1: Evolution from HS to GCS

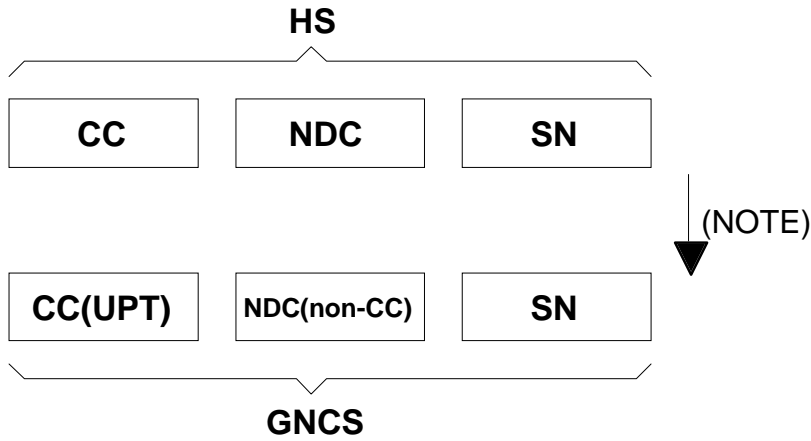
The evolution from HS to GCS, where HS forms the major part of the UPT number, does not change the evaluation done in subclause 5.1 of the HS part of the number. It is natural that national calls uses the national part of the number, and that part is still HS.

7.3 From the home-related scheme to the global non country-based scheme

The mobility of the UPT user in HS is limited by the capability of the home domain and restricted by the routing and performance considerations of the networks involved. The use of a CC(UPT) may extend the capability of the home domain and remove the routing and performance restrictions caused by the networks involved.

CC(UPT) can trigger access to a UPT serving exchange irrespective of whether the serving exchange is located in the originating, transiting or terminating country. The UPT serving exchange must of course have the capability to interrogate with the database in the home exchange of the UPT user, and this cannot be done without an international or bilateral IN. But since CC(UPT) can be routed internationally without problems, the evolution from HS to GNCS is almost independent of the corresponding development of the IN. Almost because routing and performance considerations may limit the total path from the calling user to the UPT user. Until an international IN is established the call will be routed from the originating country to the home country of the UPT user, and from there to the terminating country.

The evolution from HS to GNCS cannot take place without a complete change of number. There are no fixed connection between the numbers in HS and GNCS. In figure 2 the evolution from HS to GNCS is shown.



NOTE: The evolution from HS to GNCS cannot take place without a complete change of number.

Figure 2: Evolution from HS to GNCS

7.4 From the home-related scheme to the global prefix scheme

As it has been established that a global standardized UPT prefix is not achievable this option is not recommended. However as this possibility still exists in ITU-T Recommendation E.168 [2] as an item for further study, information relating to the evolution part is contained in Annex A for further information.

7.5 From the Country-based scheme to the global country-based scheme

The mobility of the UPT user in CS is limited by the analysis capacity of other networks, and restricted by the routing and performance considerations of the networks involved. The use of a CC(UPT) will reduce the impact of a limited analysis capacity, and may under certain circumstances remove the routing and performance restrictions caused by the networks involved.

CC(UPT) can trigger access to a UPT serving exchange irrespective of where the serving exchange is located. The UPT serving exchange must of course have the capability to interrogate the service profile of the UPT user, and internationally this cannot be done without an international or bilateral IN. But since CC(UPT) can be routed internationally without problems, the evolution from CS to GCS is almost independent of the corresponding development of the IN. Almost because routing and performance considerations may limit the total path from the calling user to the UPT user. Until an international IN is established the call will be routed from the originating country to the home country of the UPT user, and from there to the terminating country.

Figure 3 shows the evolution from CS to GCS.

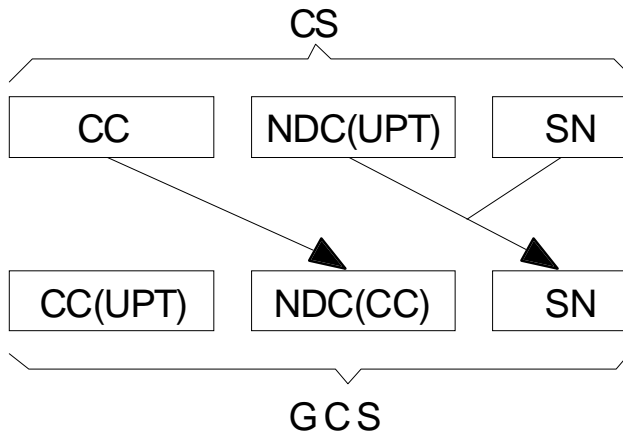


Figure 3: Evolution from CS to GCS

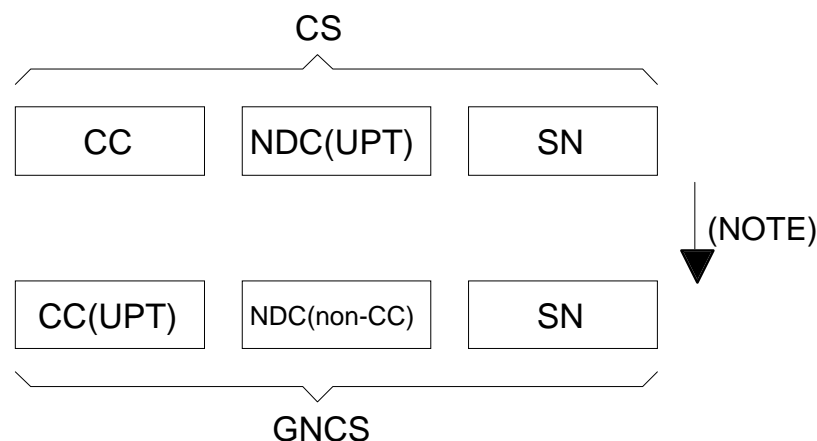
The evolution from CS to GCS, where CS forms the major part of the UPT number, does not change the evaluation done in subclause 5.2 of the CS part of the number. As this evaluation was highly favourable for CS, and the addition of CC(UPT) in front of CS completely neutralizes the minor defects of CS mentioned in the same subclause, the evolution from CS to GCS leads to a solution that in long term will satisfy all the network and user requirements.

7.6 From the country-based scheme to the global non country-based scheme

The mobility of the UPT user in CS is limited by the analysis capacity of other networks, and restricted by the routing and performance considerations of the networks involved. The use of a CC(UPT) will reduce the impact of a limited analysis capacity, and may under certain circumstances remove the routing and performance restrictions caused by the networks involved.

CC(UPT) can trigger access to a UPT serving exchange irrespective of where the serving exchange is located. The UPT serving exchange must of course have the capability to interrogate with the database in the home network of the UPT user, and internationally this cannot be done without an international or bilateral IN. But since CC(UPT) can be routed internationally without problems, the evolution from CS to GNCS is almost independent of the corresponding development of the IN. Almost because routing and performance considerations may limit the total path from the calling user to the UPT user. Until an international IN is established the call will be routed from the originating country to the home country of the UPT user, and from there to the terminating country.

The evolution from CS to GNCS cannot take place without a complete change of number. There are no fixed connection between the numbers in CS and GNCS. Figure 4 shows the evolution from CS to GNCS.



NOTE: The evolution from HS to GNCS cannot take place without a complete change of number.

Figure 4: Evolution from CS to GNCS

7.7 From the country-based scheme to the global prefix scheme

As it has been established that a global standardized UPT prefix is not achievable this option is not recommended. However as this possibility still exists in ITU-T Recommendation E.168 [2] as an item for further study, information relating to the evolution part is contained in Annex B for further information.

8 Conclusion

Two short term scenarios have been considered for the numbering and dialling for UPT phase 1 services:

- a) HS;
- b) CS.

The above consideration shows that the CS is the most appropriate and preferred alternative.

The evolution from the short term scenarios to most of the long term scenarios supports the selection of the CS as the preferred scenario, and is the best basis for the future expansion of the UPT service.

Annex A: Evolution from the home-related scheme to the global prefix scheme

The mobility of the UPT user in HS is limited by the capability of the home domain and restricted by the routing and performance considerations of the networks involved. The use of a standardized global UPT prefix (Pu) can under certain circumstances extend the capability of the home domain, and remove the routing and performance restrictions caused by the networks involved.

As prefixes in general can only be used nationally, the UPT prefix should primarily trigger access to a UPT serving exchange in the originating country. The UPT serving exchange must of course have the capability to interrogate with the database in the home exchange of the UPT user, and this cannot be done without an international or bilateral IN.

If the UPT serving exchange is outside the originating country and a UPT prefix is used, then the prefix should be translated into a UPT indicator in the form of a CC(UPT), and thereafter routed to the closest UPT serving exchange that has an IN connection to the home exchange of the UPT user.

The expanding mobility of the UPT user from the home domain to the national, continental or global domain, may either follow the evolution of the IN or be expanded through the mentioned translation of the UPT prefix. Figure A.1 shows the evolution from HS to GPS and the international dialling plan for HS.

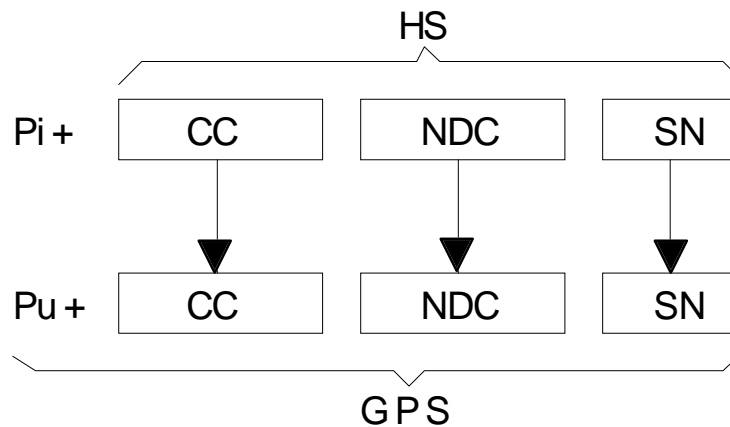


Figure A.1: Evolution from HS to GPS

The evolution from HS to GPS, where HS forms the UPT number, does not change the evaluation of HS done in subclause 5.1, because most of the national calls done in GPS is done with the HS number alone.

Annex B: Evolution from the country-based scheme to the global prefix scheme

The mobility of the UPT user in CS is limited by the analysis capacity of other networks, and could be restricted by the routing and performance considerations of the networks involved. The use of a standardized global UPT prefix (Pu) can under certain circumstances reduce the impact of a limited analysis capability, and remove the routing and performance restrictions caused by the networks involved.

As prefixes can only be used nationally, the UPT prefix should primarily trigger the calling user access to a UPT serving exchange in the originating country. The UPT serving exchange must of course have the capability to interrogate with the database in the home network of the UPT user, and this cannot be done without an international or bilateral IN.

The expanding mobility of the UPT user from the national domain to the continental and intercontinental domain may either follow the evolution of the IN or be expanded through the mentioned translation of the UPT prefix.

Figure B.1 shows the evolution from CS to GPS and the international dialling plan for CS.

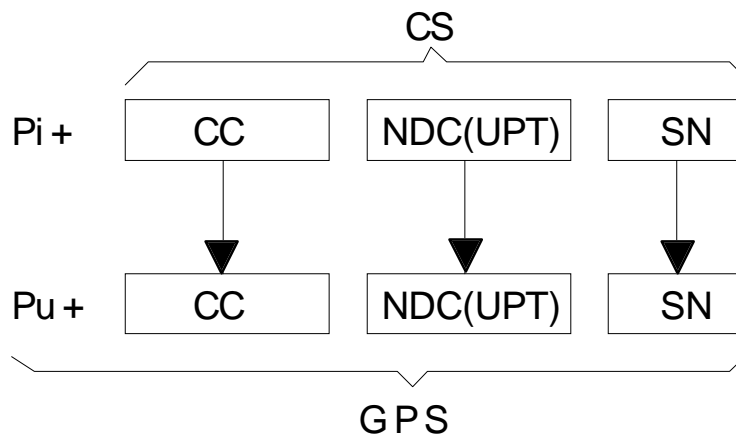


Figure B.1: Evolution from CS to GPS

The evolution from CS to GPS, where CS forms the UPT number, does not change the evaluation of CS done in subclause 5.2. As this evaluation was highly favourable for CS, and the use of a UPT prefix Pu in front of CS in stead of Pi may neutralize the minor defects mentioned in subclause 5.2 for CS, the evolution from CS to GPS leads to a solution that in long term may satisfy all the network and user requirements.

When it is stated that it may neutralize the defects and may satisfy all the requirements, the uncertainty is due to the fact that the use of prefixes is a national matter, and that, in addition, it will either require an international IN or approval of a CC(UPT).

The evolution from CS to GPS puts no additional restrictions on the national significant number.

History

Document history	
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