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# Private Telecommunication Network (PTN); PTN mobility; Use of Universal Personal Telecommunications (UPT) Phase 1; General principles and service aspects

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## Foreword

This ETSI Technical Report (ETR) was produced by the Business TeleCommunications (BTC) 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.

This ETR describes the use and the operation of the first phase of Universal Personal Telecommunications (UPT) in Private Telecommunication Networks (PTNs).

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# 1 Scope

This ETSI Technical Report (ETR) considers the use of the Universal Personal Telecommunications (UPT) Phase 1 service in Private Telecommunication Networks (PTNs) that do not provide specific support for UPT.

The following UPT Phase 1 services are considered:

- registration for incoming UPT calls;
- incoming UPT call;
- outgoing UPT call;
- deregistration for incoming calls;
- service profile management.

# 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] ETR 121 (1994): "Universal Personal Telecommunications (UPT); Architecture and functionalities for interworking".

[2] ECMA TR/60 (1992): "Supplementary services and additional network features in Private Telecommunication Networks".

[3] CCITT Recommendation E.164 (1989): "Numbering plan for the ISDN era".

# 3 Abbreviations

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

| | |
|---|---|
| ANF-CINT | Additional Network Feature Call Interception |
| UPT | Universal Personal Telecommunications |
| PTN | Private Telecommunication Network |
| MF | MultiFrequency |
| DDI | Direct Dialling In |
| SS-CLIP | Supplementary Service Calling Line Identification Presentation |
| SS-COLP | Supplementary Service Connected Line Identification Presentation |
| SS-CLIR | Supplementary Service Calling/Connected Line Identification Restriction |
| SS-MSN | Supplementary Service Multiple Subscriber Number |
| SS-CNIP | Supplementary Service Calling Name Identification Presentation |
| SS-CNIR | Supplementary Service Calling/Connected Name Identification Restriction |
| SS-CONP | Supplementary Service Connected Name Identification Presentation |
| SS-CFB | Supplementary Service Call Forwarding on Busy |
| SS-CFU | Supplementary Service Call Forwarding Unconditional |
| SS-CFNR | Supplementary Service Call Forwarding on No Reply |
| SS-CD | Supplementary Service Call Deflection |
| SS-CDIVI | Supplementary Service Controlled Diversion Immediate |
| SS-CDIVC | Supplementary Service Controlled Diversion Consult |
| SS-NS | Supplementary Service Night Service |
| SS-NI | Supplementary Service Network Interception |
| SS-DND | Supplementary Service Do Not Disturb |
| SS-DNDO | Supplementary Service Do Not Disturb Override |
| SS-SC | Supplementary Service Serial Call |
| SS-CCBS | Supplementary Service Completion of Calls to Busy Subscriber |

| | |
|---|---|
| SS-CCNR | Supplementary Service Completion of Calls on No Reply |
| SS-CW | Supplementary Service Call Waiting |
| SS-CO | Supplementary Service Call Offer |
| SS-CI | Supplementary Service Call Intrusion |
| SS-INTR | Supplementary Service Intrusion |
| SS-CT | Supplementary Service Call Transfer |
| SS-CONF | Supplementary Service Add-On Conference |
| SS-CUG | Supplementary Service Closed User Group |
| SS-CPU | Supplementary Service Call Pick-Up |
| SS-CPK | Supplementary Service Call Park |
| SS-AOC | Supplementary Service Advice of Charge |
| SS-UUS | Supplementary Service User-to-User Signalling |
| SS-IM | Supplementary Service In-Call Modification |
| SS-UST | Supplementary Service User Status |
| SS-MLPP | Supplementary Service Multi-Level Precedence and Pre-emption |
| SS-DIST | Supplementary Service Call Distribution |
| SS-NI | Supplementary Service Network Interception |

# 4 General introduction

UPT will not be introduced into all networks at the same time. Therefore UPT users will see two kinds of networks, those that support UPT and those that do not.

It is likely that for some time to come PTNs will belong to the class of networks that do not support UPT. Given that it is expected that a significant use of UPT will be for business purposes, it is important to consider how the UPT service will appear to a UPT user in a PTN.

UPT will be introduced in phases. UPT Phase 1 has already been defined and, therefore, this ETR gives a consideration as to how UPT will operate in the PTN environment.

# 5 Characteristics of PTNs relevant to UPT Phase 1

## 5.1 General characteristics

The PTNs considered in this ETR are non-UPT networks and, therefore, the following general aspects given in ETR 121 [1] apply.

The private network will not recognize the UPT user as such; non-recognition of UPT users means that no special treatment is possible for any UPT calls.

The UPT service is not being provided by the private network but is being provided by another network. Therefore, the UPT user will have to access another network in order to perform any UPT procedure. This might involve dialling a public network access code before any UPT specific access codes.

## 5.2 Specific characteristics

As well as the general considerations above, there are some specific characteristics (numbered from S1 to S4) that apply to PTNs:

- S1: the numbering plans of PTNs can differ from public networks. Even where the PTN shares the public numbering plan, not all terminals necessarily have an CCITT Recommendation E.164 [3] number;

- S2: PTN terminals are commonly subject to call barring restrictions, usually based on the type of dialled number, e.g. local, national international barring;

- S3: terminals that use other means of signalling than MultiFrequency (MF) tones are common in PTNs;

- S4: it is common for PTN terminals to have supplementary services activated, such as call forward on no reply.

### 5.3 Other considerations

In a PTN, it is common for some users to have sole use of a terminal. Therefore, all calls made from and delivered to that terminal involve just that user. Also, in those cases where a terminal is shared, or where a number of terminals are connected to the same access, there is generally common interest between the PTN users involved. For example, a call to a multi-point access might be presented to all terminals on that access, but because there is a common interest, it probably does not matter who answers the call.

This common interest might not apply when a UPT user is registered at a PTN terminal. In the example given above, if the UPT users' calls are answered by other PTN users, and vice-versa, it may cause confusion, i.e., loss of privacy, etc.

Because the PTN has no knowledge of UPT, any measures that are taken to satisfy these concerns might result in the restriction of the users access to the PTN to some extent.

## 6 Use of UPT Phase 1 in a PTN

### 6.1 Effect of the PTN characteristics on the use of UPT Phase 1

Table 1 summarizes the effect of the characteristics given in clause 5. The following letters are used to indicate the nature of each interaction:

A: generally affects the UPT service;

D: affects delivery of the UPT call;

O: affects operation of procedure;

R: restrictions on access;

"-": no interaction.

**Table 1: Characteristics of PTNs in relation to UPT Phase 1**

| | Reference | Incoming UPT call | Outgoing UPT call | Registration call | Deregistration call | Service profile call |
|---|---|---|---|---|---|---|
| Non-Direct Dialling In (DDI) terminals | S1 (see note 2) | O | - | - | - | - |
| Outgoing call barring | S2 | - | R | R | R | R |
| Non-MF terminals | S3 | - | O | O | O | O |
| PTN supplementary services | S4 | A | A | A | A | A |

NOTE 1: A more detailed explanation of each interaction follows the table.

NOTE 2: S1 to S4, refers to the specific characteristics given in subclause 5.2

**S1** If the UPT user wishes to register on a terminal which has a DDI number, that number can be provided as the UPT user's current address. However, where the terminal does not have a DDI number then an attendants number can be provided as the UPT user's current address. The UPT user would then have to make arrangements for the attendant to forward the incoming UPT calls to the UPT users current terminal. It might not be possible to make such arrangements where an automated attendant is used.

**S2** Because the PTN does not recognize the user as a UPT user, any call barring restrictions in force will be applied to outgoing calls made by the UPT user. If certain numbers are recognized as being free of charge and such calls are free of call barring restrictions, this capability could be used. For example, defining the UPT access number as a freephone number might be a solution.

**S3** This characteristic affects the use of UPT devices in a PTN. Such devices can be programmed to establish a call to a UPT network function and to input commands to it by sending MF tones directly into the microphone of a terminal. This will not work when a PTN terminal uses signalling other than MF tones to establish a call. The UPT user might have to establish the connection to the UPT network by dialling the UPT access number before MF tones can be used to control the UPT network function.

**S4** UPT calls will be treated as the other calls and so will be subject to supplementary services such as call forward unconditional, busy/ring-no-reply, Do Not Disturb, etc.

The UPT user should try to ensure that the terminal being used does not have supplementary services activated which will affect the UPT service. Alternatively, the PTN authority could allocate terminals for use by UPT users and ensure that those terminals do not have UPT affecting supplementary services activated.

Clause 7 gives further information on the interaction between UPT Phase 1 and PTN supplementary services.

### 6.2 Requirements to allow full use of UPT Phase 1

S1: The PTN terminal should have a DDI number in order to allow the UPT user to receive incoming calls.

S2: The UPT user should be allowed to dial:

- the public network access code (if any); and
- the UPT access number.

S3: If the PTN terminal uses signalling other than MF tones, then the UPT user will have to:

- firstly, manually dial the public network access code (if any) and the UPT access number;
- secondly, use an MF sending device to input commands.

S4: The PTN terminal should not have supplementary services activated which will affect the UPT service.

## 7 PTN supplementary services

There is a large number of supplementary services used in PTNs, many of which are proprietary. Therefore, it is difficult to give a comprehensive assessment of the possible effects of all these on UPT Phase 1. However, for the purposes of this ETR, the effect of the supplementary services described in ECMA TR/60 [2] have been assessed. The services in ECMA TR/60 [2] are being standardized within ECMA and should therefore be representative of supplementary services found in PTNs.

Table 2 shows, for each supplementary service described in ECMA TR/60 [2] the possible effect on the UPT Phase 1 service. The following letters are used in table 2 to indicate the nature of each interaction between UPT Phase 1 and PTN supplementary services:

A: affects access procedures used by the UPT user.

D: affects delivery of the call to the UPT use.

R: affects routeing of UPT calls.

S: social considerations might apply.

"-": no interaction.

**Table 2: PTN supplementary services**

| | Incoming UPT call | Outgoing UPT call | Registration call | Deregistration call | Service profile call |
|---|---|---|---|---|---|
| SS-CLIP | - | (see note 1) | - | - | - |
| SS-COLP | (see note 1) | - | - | - | - |
| SS-CLIR | - | - | - | - | - |
| SS-MSN | - | - | - | - | - |
| SS-CNIP | - | - | - | - | - |
| SS-CONP | - | - | - | - | - |
| SS-CNIR | - | - | - | - | - |
| SS-CFU | D | - | - | - | - |
| SS-CFB | D | - | - | - | - |
| SS-CFNR | D | - | - | - | - |
| SS-CD | D | - | - | - | - |
| SS-CDIVI | - | - | - | - | - |
| SS-CDIVC | - | - | - | - | - |
| SS-NS | D | - | - | - | - |
| SS-NI | - | - | - | - | - |
| SS-DND | D | - | - | - | - |
| SS-DNDO | - | - | - | - | - |
| SS-SC | - | - | - | - | - |
| SS-CCBS | S | - | - | - | - |
| SS-CCNR | S | - | - | - | - |
| SS-CW | S | S | S | S | S |
| SS-CO | S | S | S | S | S |
| SS-INTR | S | S | S | S | S |
| SS-CT | - | - | - | - | - |
| SS-CONF | - | - | - | - | - |
| SS-CUG | D | R | R | R | R |
| SS-CPU | S | - | - | - | - |
| SS-CPK | - | - | - | - | - |
| SS-AOC | - | - | - | - | - |
| SS-UUS | - | - | - | - | - |
| SS-IM | - | - | - | - | - |
| SS-UST | - | - | - | - | - |
| SS-MLPP | | | | | - |
| SS-DIST | R | - | A | - | - |
| NOTE 1: It is assumed that on an outgoing UPT call, a public network UPT function will replace the calling line identity by the UPT users UPT number. | | | | | |
| NOTE 2: SS-INTR is now referred to as SS-CI in ECMA. SS-NI is now referred to as ANF-CINT in ECMA. | | | | | |

**SS-CFU** Incoming UPT calls to a terminal that has SS-CFU activated will be diverted to another destination.

**SS-CFB** Incoming UPT calls to a busy terminal that has SS-CFB activated will be diverted to another destination.

**SS-CFNR** Unanswered incoming UPT calls to a terminal that has SS-CFNR activated will be diverted to another destination.

**SS-NS** Incoming UPT calls that require attendant intervention for onward routeing to the called UPT user will be routed to an alternative destination when SS-NS is activated.

**SS-DND** Incoming UPT calls to a terminal that has SS-DND activated will not be presented to the terminal.

**SS-CCBS**, **SS-CCNR** In the time between a call completion request being made by a PTN user and that request maturing a UPT user might register on the PTN user's terminal. This could lead to the UPT user being connected to a party originally called by the PTN user.

**SS-CW** If the UPT user is using a terminal that has SS-CW activated, there can be confusion between calls waiting for the UPT user and calls waiting for the terminals normal user.

**SS-CO** Calls for the PTN user could be offered to the UPT user.

**SS-INTR** Calls for the PTN user could intrude on the UPT user's calls and be connected to the UPT user.

**SS-CUG** Incoming UPT calls will be subject to incoming call barring restrictions on a terminal in a closed user group.

Outgoing UPT calls will be subject to outgoing call barring restrictions on a terminal in a closed user group.

**SS-CPU** Incoming calls to a terminal for which SS-CPU is allowed can be answered at another terminal.

**SS-DIST** Incoming calls to the UPT user could be presented to one of a number of terminals. Therefore the UPT user should not use a call distribution number when registering for incoming calls.

# 8 UPT Phase 1 supplementary services

The following supplementary services have been proposed for UPT Phase 1:

- UPT call forwarding unconditional;
- UPT call forwarding on busy;
- UPT call forwarding on no answer;
- UPT call forwarding on not reachable;
- variable routeing.

The call forwarding services only allow forwarding to a terminal, not to another UPT user.

These services will be provided and invoked by the UPT user's service provider.

## 8.1 UPT call forwarding unconditional and not reachable

The call forwarding occurs before the call reaches the private network and therefore there is no interaction.

## 8.2 UPT call forwarding on busy and no answer

Private network supplementary services appropriate to the condition of the terminal will take precedence.

## History

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