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Service description**

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Foreword

This final draft European Telecommunication Standard (ETS) has been produced by the Network Aspects (NA) Technical Committee of the European Telecommunications Standards Institute (ETSI), and is now submitted for the Voting phase of the ETSI standards approval procedure.

In analogy with CCITT Recommendation I.130 (refer to annex A), the first stage of the following three level structure is used to describe the telecommunications service as provided by European public telecommunications operators.

- Stage 1: is an overall service description, from the service subscriber's and user's stand-point;
- Stage 2: identifies the functional capabilities and information flows needed to support the service described in stage 1, and
- Stage 3: defines the signalling system protocols and switching functions needed to implement the service described in stage 1.

This ETS details the stage 1 aspects (overall service description) for the Virtual Card Calling (VCC) service, taking into account the various network architectures, e.g. Intelligent Network (IN).

The application of stage 2 and stage 3 may be different when the service is supported on an IN environment.

Proposed transposition dates	
Date of latest announcement of this ETS (doa):	3 months after ETSI publication
Date of latest publication of new National Standard or endorsement of this ETS (dop/e):	6 months after doa
Date of withdrawal of any conflicting National Standard (dow):	6 months after doa

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1 Scope

General

This European Telecommunication Standard (ETS) defines the stage 1 description of the Virtual Card Calling (VCC) service. Stage 1 is an overall service description, primarily from the service subscriber's and user's point of view, but does not deal with the details of the human interface itself. This ETS includes information applicable to network operators, service providers and terminal, switch and database manufacturers.

This ETS specifies the requirements where the service is provided to the user via a telecommunications network that is either the pan-European Integrated Services Digital Network (ISDN) or any other Public Switched Telephone Network (PSTN) as provided by European public telecommunications operators.

The requirements different from those of the basic call where the VCC service is provided to the user via a mobile network are outside the scope of this ETS. However, if calls to the VCC service originate or terminate in a mobile network and any special procedure above those for the basic calls has to be performed, this is stated in subclause 7.1 dealing with the Interworking between ISDNs, PSTNs and mobile networks.

This ETS contains the core requirements for the VCC service which are sufficient to provide a complete service.

This ETS also documents some additional requirements which can be implemented (but do not have to be implemented).

Furthermore, additional functionalities not documented in this ETS may be implemented. The requirements of which are considered outside the scope of this ETS and consequently outside the scope of the corresponding stage 2 and stage 3 standards. Such additional functionality may be on a network-wide basis, or particular to one or a group of users. Such additional functionality shall not compromise conformance to the core requirements of the service.

Charging principles are outside the scope of this ETS, unless specific service requirements are stated. These requirements deal with the allocation of certain call charges to particular users.

Interactions with services/supplementary services not listed in clauses 8 and 9 are outside the scope of this ETS.

Interactions between optional VCC service features and ISDN supplementary services are outside the scope of this ETS, unless specific indication is given.

Definition and applicability

The VCC service allows the user to be automatically charged to the service subscriber's account, which is a telecommunications account subscribed with the service provider or may be optionally an account managed by some other commercial organization, for any outgoing call. The use of non telecommunications accounts is dependent on agreements between the service provider and such commercial organizations. The call shall be free of charge for the line the call originates from. After accessing the service, the user has to enter the card number, a PIN code and the called number.

Operation of the VCC service via operators is outside the scope of this ETS.

The VCC service is applicable to all telecommunications services using the CCITT Recommendation E.164 [5] numbering plan.

This ETS is applicable to the stage 2 and stage 3 standards for the VCC service, where the text indicates the status of a requirement (i.e. as strict command or prohibition, as authorization leaving freedom, as a capability or a possibility), this shall be reflected in the relevant stage 2 and stage 3 standards. Otherwise, the status of a requirement shall be reflected in the relevant standards for the underlying protocols.

Furthermore, conformance to this ETS is either met by:

- conforming to the stage 3 standards; or
- implicitly covered by conforming to the standards for the underlying protocols,

with the field of application appropriate to the equipment being implemented. Therefore no method of testing is provided for this ETS.

The validation procedures, general principles and card numbering system shall be in conformance with CCITT Recommendations E.113 [2], E.116 [3] and E.118 [4].

2 Normative references

This ETS incorporates by dated or undated reference, provisions from other publications. These normative 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 ETS only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

- [1] ETS 300 345 (1994): "Integrated Services Digital Network (ISDN); Interworking between public ISDNs and private ISDNs for the provision of telecommunication services; General aspects".
- [2] CCITT Recommendation E.113 (1992): "Validation procedures for the international telecommunication charge card service".
- [3] CCITT Recommendation E.116 (1992): "International telecommunication charge card service".
- [4] CCITT Recommendation E.118 (1992): "The international telecommunication charge card".
- [5] CCITT Recommendation E.164 (1991): "Numbering plan for the ISDN era".

3 Definitions

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

account number: Number to identify the service subscriber's account to which the virtual card calls are to be charged. An account number may be allocated to one or several virtual cards. According to the service provider's implementation, the account number and the card number may be identical.

calling user: Entity which originates a call to the VCC service.

card number: Digits assigned to a virtual card, in conformance with CCITT Recommendation E.118 [4], permitting the determination of the account number and, if any, of the parameters of the optional service features.

core service feature: Particular service feature fundamental to the telecommunication service, i.e. in the absence of this service feature, the telecommunication service does not make sense as a commercial offering to the service subscriber.

destination user: Entity to which VCC calls are directed.

network operator: Entity which provides the network operating elements and resources for the execution of the VCC service.

non-running record: A record containing service subscriber parameters currently not in operation.

optional service feature: Service feature added to core feature to optionally enhance a service offering.

Personal Identification Number (PIN): Digits associated with a card number for authentication purposes.

running record: A record containing the service subscriber parameters used by the service and currently in operation.

Service Access Code (SAC): Digits assigned by a network operator to the VCC service, that have to be dialled by the user when initiating a virtual card call. SAC may for example be subscriber control procedure or a CCITT Recommendation E.164 [5] number (e.g. a freephone number).

service feature: Specific aspect of a telecommunication service that can also be used in conjunction with other telecommunication services or service features as part of a commercial offering. It is either a core part of a telecommunication service or an optional part offered as an enhancement to a telecommunication service.

service provider: Entity which offers the VCC service for subscription. The network operator may be the service provider.

service subscriber profile: Service subscriber related data needed by the service in order to handle the calls.

service subscriber: Entity which subscribes to the VCC service.

service: That which is offered by service provider to its customers in order to satisfy a telecommunication requirement.

virtual card call: A call billed on the account number.

virtual card: The information permitting the user to be automatically charged to an account without need of a physical card support.

4 Abbreviations

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

CPM	Customer Profile Management
CRL	Credit Limit (floor limit)
FOC	Follow-On Calling
IN	Intelligent Network
ISDN	Integrated Services Digital Network
LGS	Language Selection
LOG	call Logging
ODC	Origin Dependent Control
PDD	Pre-Defined Destination
PIN	Personal Identification Number
PLD	Provider's Limitation on Destination
PSTN	Public Switched Telephone Network
SAC	Service Access Code
SLD	Subscriber's Limitation on Destination
SPD	Speed Dialling
TDC	Time Dependent Control
VCC	Virtual Card Calling

5 Description

5.1 Core requirements

The VCC service allows the user to be automatically charged to the service subscriber's account, which is a telecommunications account subscribed with the service provider or may be optionally an account managed by some other commercial organization, for any outgoing call. The use of non telecommunications accounts is dependent on agreements between the service provider and such commercial organizations. The call shall be free of charge for the line the call originates from.

The user accesses the service by dialling the SAC then, on request, enters the card number, the PIN and the destination number. Appropriate indications shall be provided to guide the entering and dialling process.

5.2 Optional requirements

5.2.1 General

The optional requirements contain functionalities additional to the core requirements, that customize the service according to specific service subscriber's needs. These additional parts may be offered either to all the service provider's customers, or to a group or even to a single customer. In particular, the user may have call attempts accepted or rejected according to a set of restrictions.

Some optional service features may require extra information to be entered by the user.

Some possible optional service features are listed hereafter, but the service provider may offer other additional service features.

5.2.2 Provider's Limitation on Destination (PLD)

This feature permits to restrict calls to certain destinations or services (e.g. telephony, facsimile, videotex, videotelephony, etc.) according to service provider's restrictions.

For instance, free of charge numbers and destinations whose routing depends on the call origination (for instance, emergency services) may not be allowed with the VCC service.

5.2.3 Subscriber's Limitation on Destination (SLD)

This feature permits to restrict calls to certain destinations or services (e.g. telephony, facsimile, videotex, videotelephony, etc.) according to service subscriber's choices.

5.2.4 Time Dependent Control (TDC)

This feature enables the service subscriber to specify time intervals (e.g. time of day, day of week, specific dates), that can be used to modify the handling of the call (e.g. acceptance or rejection) according to the point in time when the call is placed. The time interval may be specified by the service subscriber.

5.2.5 Origin Dependent Control (ODC)

This feature enables the service subscriber to select the origination from which virtual card calls may be made. Such selection is based on the geographical area the call originates from.

5.2.6 Credit Limit (floor limit) (CRL)

This feature permits to restrict the expenditure per time period (e.g. month) or per call on the account number. The credit limit (also called floor limit) is dependent on an arrangement between the service provider and the service subscriber.

When the credit limit has been exceeded, all further calls shall be blocked. When reaching the credit limit, as a service provider option:

- the current call may be released immediately; or
- the current call may be released after a certain time interval; or
- no action may be taken for the current call.

In any case, an appropriate indication shall be given to the user.

5.2.7 Follow-On Calling (FOC)

This feature enables the calling user to place subsequent calls without re-entering the authentication information already provided when placing a first call.

5.2.8 Speed Dialling (SPD)

This feature enables a user to define a personal set of abbreviated dialling numbers. The speed calls are subject to restrictions.

5.2.9 Pre-Defined Destination (PDD)

This feature allows the calling user to place calls to a single pre-defined destination number without being requested for the called number.

5.2.10 Language Selection (LGS)

If the user is prompted by messages, this feature permits the user to change the messages language to another one.

5.2.11 Customer Profile Management (CPM)

This feature enables the service subscriber to manage one or several VCC service handling and billing profiles (or records) currently not in operation, and to control which record is running or not running.

If the service provider does not permit the subscriber to own several profiles, i.e. does not implement non-running records, this feature may allow the service subscriber to modify the profile when in operation.

This feature may also permit the modification of the PIN, and the disabling and re-enabling of the making of calls using the VCC service.

A subset of the profile parameters (e.g. PIN, speed dialling lists) may be modified by the service user, if authorized by the service subscriber.

Customization may require additional authentication procedures that can be provided by the PIN.

5.2.12 Call Logging (LOG)

This feature enables the service subscriber to obtain from the service provider detailed information on calls and/or call attempts placed to the service.

The information to be provided may be one or a combination of the following:

- calling party number;
- destination number;
- time and date;
- charge;
- call result (connected, busy, barred, not answered, etc.);
- any service specific information.

6 Procedures

6.1 Provision and withdrawal

This service shall be provided by prior arrangement with the service provider.

The VCC service shall be withdrawn by the service provider upon service subscriber's request or for service provider reasons.

6.2 Normal procedures

6.2.1 Registration and erasure

6.2.1.1 Core requirements

The service provider shall register the service subscriber's profile in the network (running record). This profile is made of two sets of parameters:

- parameters under the service provider's exclusive responsibility (e.g. the card number);
- parameters that can be modified by both the service provider and the service subscriber.

Record consistency shall be checked by the service provider at registration.

6.2.1.2 Optional requirements

The service provider and the authorized service subscribers may register non-running records that represent alternative action programs. This allows the service subscriber to activate, either directly or through service provider action, any record from the registered ones against the card number. Only one running record shall be active at one time for a given card number.

If the service provider implements non-running records, the service subscriber shall not be allowed to modify the running record in real time.

Record consistency shall be checked by the service provider at modification.

The service subscriber's access to register or modify records is subject to:

- a previous agreement with the service provider;
- an authentication procedure (possible mechanisms may include the identification of the authorized installation/terminal and/or passwords);
- a restriction on the set of parameters that may be modified (the list of such parameters is a service provider's choice);
- a restriction on the range of values to be given to such parameters.

The service subscriber may, either directly or through service provider action, erase non-running records.

6.2.2 Activation and deactivation

6.2.2.1 Core requirements

The service subscriber profile is initially activated by the service provider.

6.2.2.2 Optional requirements

A virtual card may be disabled and re-enabled by the service subscriber.

6.2.3 Invocation and operation

6.2.3.1 Core requirements

The service shall be invoked automatically when a user dials the SAC identifying the virtual card service.

The following operations shall then be performed:

- identifying the service request according to the SAC;
- prompting the user to enter the card number, the PIN and the number of the desired destination, that may be local, national or international;
- handling of the virtual card call according to the running record of the service subscriber;
- routing of the call to the appropriate destination;
- indicating the success or failure of the service request;
- charging the service subscriber for the call and creating a record for billing purposes.

6.2.3.2 Optional requirements

The user may be prompted to enter the PIN separately from the card number.

The user may change the messages language to another one.

The user may be allowed to place calls to pre-defined numbers using special abbreviated dialling codes.

Some cards may be restricted to a single pre-defined destination number, the user being not requested for the called number.

Handling of the virtual card call may take into account the possible optional features: credit limitation and restriction to calls to certain geographical areas, to a limited list of destination numbers, from certain geographical areas and/or within certain time intervals.

When the user places a virtual card call to a destination number which is not included in the allowed range of destination numbers or services, the call shall be rejected and the user shall be given an appropriate indication.

When the user places a virtual card call outside a specified time interval in which virtual card calls can be made, or from any location which is not included in the specified range of allowed origins from which virtual card calls can be made, the call shall be rejected and the user shall be given an appropriate indication.

When reaching the credit limit, according to service provider's choice:

- the current call may be released immediately; or
- the current call may be released after a certain time interval; or
- no specific action may be taken for the current call.

In any case, an appropriate indication shall be given to the user and all further calls on this virtual card shall be blocked.

For statistical purposes, the network may register extra statistical information on calls and/or call attempts placed to the service.

The user may be enabled to place subsequent calls without re-entering the card number and PIN.

6.2.4 Interrogation

6.2.4.1 Core requirements

Not applicable.

6.2.4.2 Optional requirements

The service subscriber may interrogate the network by means of an appropriate control procedure.

Access for interrogation requires an authentication procedure. Possible mechanisms may include the identification of the authorized installation/terminal and/or passwords.

The network, following the authentication, shall provide the required information on parameter values of the service subscriber's profile. If the service provider implements non-running records, the information shall be provided for both running and non-running records.

The service subscriber may obtain, from the service provider, information on virtual card calls and/or call attempts placed to the service.

6.3 Exceptional procedures

6.3.1 Registration and erasure

Not applicable.

6.3.2 Activation and deactivation

Not applicable.

6.3.3 Invocation and operation

6.3.3.1 Invalid attempts

6.3.3.1.1 Core requirements

If the user makes an invalid attempt, i.e. enters an invalid combination card number/PIN, an appropriate indication shall be given.

6.3.3.1.2 Optional requirements

Not applicable.

6.3.3.2 Fraud detection

6.3.3.2.1 Core requirements

Not applicable.

6.3.3.2.2 Optional requirements

The service provider may implement fraud detection mechanisms.

If several consecutive invalid attempts are detected on the same card number, the card number shall be put on a blacklist, an appropriate indication shall be given, and the access to the VCC service shall be denied to this card. The removal from the blacklist shall imply service provider action. The number of authorized invalid attempts may be a service provider option.

NOTE: A possible fraud consists in automatically generating dial sequences in order to find a valid combination card number/PIN, changing the card number at every attempt to avoid the basic protection mechanism described above, and a corresponding possible fraud detection mechanism consists in scanning the calling line identities which generate invalid combinations card number/PIN: if the number of invalid combinations entered from the same line per time period (e.g. one hour) exceeds a threshold, the line may be frozen for the VCC service.

6.3.4 Interrogation

Not applicable.

7 Interworking requirements

7.1 Interworking between ISDNs, PSTNs and mobile networks

When interworking between PSTNs, ISDNs and/or mobile networks occurs, no additional requirement is necessary for the basic call.

7.2 Interworking with private networks

The VCC service shall be supported in a co-operative manner across the internetwork interface (i.e. public and private).

If the VCC service is provided by an ISDN, then interworking with private ISDNs shall include the requirements given in ETS 300 345 [1].

7.3 Co-operation between network operators and service providers

Provision of the VCC service is dependent on a bilateral arrangement between service providers to authorize the user to make:

- home calls from another network;
- domestic and third network calls from another network.

8 Interaction with ISDN supplementary services

8.1 Advice of charge services

8.1.1 Charging information at call set-up time

No impact, i.e. neither service shall affect the operation of the other service.

The advice of charge shall apply to the access as normal, i.e. no additional information will be given on the calls charged to the VCC account number.

8.1.2 Charging information during the call

No impact, i.e. neither service shall affect the operation of the other service.

The advice of charge shall apply to the access as normal, i.e. no additional information will be given on the calls charged to the VCC account number.

8.1.3 Charging information at the end of the call

No impact, i.e. neither service shall affect the operation of the other service.

The advice of charge shall apply to the access as normal, i.e. no additional information will be given on the calls charged to the VCC account number.

8.1.4 Charging information on request

No impact, i.e. neither service shall affect the operation of the other service.

The advice of charge shall apply to the access as normal, i.e. no additional information will be given on the calls charged to the VCC account number.

8.2 Call waiting

No impact, i.e. neither service shall affect the operation of the other service.

8.3 Call hold

No impact, i.e. neither service shall affect the operation of the other service.

8.4 Explicit call transfer

No impact, i.e. neither service shall affect the operation of the other service.

8.5 Number identification services

8.5.1 Calling line identification presentation

No impact, i.e. neither service shall affect the operation of the other service.

8.5.2 Calling line identification restriction

No impact, i.e. neither service shall affect the operation of the other service.

8.5.3 Connected line identification presentation

No impact, i.e. neither service shall affect the operation of the other service.

8.5.4 Connected line identification restriction

No impact, i.e. neither service shall affect the operation of the other service.

8.6 Closed user group

The closed user group restrictions of the originating and the terminating access shall be considered before the call to the terminating access is set up.

8.7 Call completion services

8.7.1 Completion of calls to busy subscriber

If the terminating user is busy when a virtual card call is made, an attempt to activate the completion of calls to busy subscriber supplementary service shall not be possible.

8.7.2 Completion of calls on no reply

If the terminating user does not reply when a virtual card call is made, an attempt to activate the completion of calls on no reply supplementary service shall not be possible.

8.8 Conference services

8.8.1 Conference call, add-on

No impact, i.e. neither service shall affect the operation of the other service.

8.8.2 Meet-me conference

No impact, i.e. neither service shall affect the operation of the other service.

8.9 Direct dialling in

No impact, i.e. neither service shall affect the operation of the other service.

8.10 Diversion services

8.10.1 Call forwarding unconditional

No impact, i.e. neither service shall affect the operation of the other service.

8.10.2 Call forwarding busy

No impact, i.e. neither service shall affect the operation of the other service.

8.10.3 Call forwarding no reply

No impact, i.e. neither service shall affect the operation of the other service.

8.10.4 Call deflection

No impact, i.e. neither service shall affect the operation of the other service.

8.10.5 Selective call forwarding

No impact, i.e. neither service shall affect the operation of the other service.

8.10.6 Call forwarding unconditional to a service centre

No impact, i.e. neither service shall affect the operation of the other service.

8.11 Freephone

No impact, i.e. neither service shall affect the operation of the other service.

8.12 Malicious call identification

When malicious call identification is invoked against a virtual card call, the registered information shall also include the virtual card number.

NOTE: During a certain period, some networks may not support the registration of the virtual card number.

8.13 Multiple subscriber number

No impact, i.e. neither service shall affect the operation of the other service.

8.14 Sub-addressing

No impact, i.e. neither service shall affect the operation of the other service.

8.15 Terminal portability

No impact, i.e. neither service shall affect the operation of the other service.

8.16 Three party

No impact, i.e. neither service shall affect the operation of the other service.

8.17 User-to-user signalling

No impact, i.e. neither service shall affect the operation of the other service.

8.18 In-call modification

No impact, i.e. neither service shall affect the operation of the other service.

8.19 Hunting services

8.19.1 Line hunting

No impact, i.e. neither service shall affect the operation of the other service.

8.19.2 Trunk hunting

No impact, i.e. neither service shall affect the operation of the other service.

8.20 Support of private numbering plans

The destination number of a virtual card call can not be a private number.

8.21 Call barring services

8.21.1 Fixed outgoing call barring

No impact, i.e. neither service shall affect the operation of the other service.

NOTE: Fixed outgoing call barring may apply to the SAC. The calling line's restrictions applying to the destination to which a virtual card call is placed are not taken into account.

8.21.2 User-controlled outgoing call barring

No impact, i.e. neither service shall affect the operation of the other service.

NOTE: User-controlled outgoing call barring may apply to the SAC. The calling line's restrictions applying to the destination to which a virtual card call is placed are not taken into account.

8.22 Remote control service

No impact, i.e. neither service shall affect the operation of the other service.

8.23 Reverse charging

8.23.1 Reverse charging at call set up time

If a reverse charging at call set up time request is accepted by the called party, the call shall not be charged to the VCC account number.

NOTE: During an interim period, some networks may not support this interaction case.

8.23.2 Unconditional reverse charging

No impact, i.e. neither service shall affect the operation of the other service.

9 Interaction with other services

9.1 Universal access number

Calling the universal access number service by using the VCC service:

No impact, i.e. neither service shall affect the operation of the other service.

Accessing the VCC service by making a universal access number call:

Not applicable.

9.2 Card calling services

9.2.1 Charge card calling

Not applicable.

NOTE: As a service provider option, subscribers of the charge card calling service may also use the VCC service in order to charge the calls to the same account number.

9.2.2 Virtual card calling

Not applicable.

9.3 Premium rate

Calling the premium rate service by using the VCC service:

No impact, i.e. neither service shall affect the operation of the other service.

Accessing the VCC service by making a premium rate call:

Not applicable.

9.4 Televoting

Calling the televoting service by using the VCC service:

No impact, i.e. neither service shall affect the operation of the other service.

Accessing the VCC service by making a televoting call:

Not applicable.

Annex A (informative): The three level structure

The three level structure used to describe the telecommunications services as provided by European public telecommunications operators is defined in analogy with CCITT Recommendation I.130 (1988): "Method for the characterization of telecommunication services supported by an ISDN and network capabilities of an ISDN".

History

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