INTERNATIONAL STANDARD

15050

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Information technology —
Telecommunications and information
exchange between systems — Private
Integrated Services Network —
Inter-exchange signalling protocol —
Advice of charge supplementary services

Technologies de l'information — Télécommunications et échange d'information entre systèmes — Réseau privé à intégration de services — Protocole de signalisation d'interéchange — Orientation des services https://standards.supplémentaires de charge8220-287e-40fe-9e19-c5b7a0725f17/iso-iec-15050-1997



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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work.

In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

International Standard ISO/IEC 15050 was prepared by ECMA (as ECMA-212) and was adopted, under a special "fast-track procedure", by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, in parallel with its approval by national bodies of ISO and IEC.

Annex A forms an integral part of this International Standard, Annexes B, C and D are for information only.

Introduction

This International Standard is one of a series of standards defining services and signalling protocols applicable to Private Integrated Services Networks. The series uses the ISDN concepts as developed by ITU-T (formerly CCITT) and is also within the framework of standards for open systems interconnection as defined by ISO.

This International Standard specifies the signalling protocol for use at the Q reference point in support of the Advice Of Charge supplementary services.

The International Standard is based upon the practical experience of ECMA member companies and the results of their active and continuous participation in the work of ISO/IEC JTC 1, ITU-T, ETSI and other international and national standardization bodies. It represents a pragmatic and widely based consensus.

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Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Inter-exchange signalling protocol - Advice of charge supplementary services

1 Scope

This International Standard specifies the signalling protocol for the support of the Advice Of Charge supplementary services (SS-AOC) at the Q reference point between Private Integrated Services Network Exchanges (PINX) connected together within a Private Integrated Services Network (PISN).

SS-AOC is a set of supplementary services which enable a user to receive information about the charging of its calls that leave the PISN and enter another network.

The three AOC supplementary services are:

- a) Charging information at call set-up time (AOC-S)
 - SS-AOC-S enables the user to receive information about the charging rates at call set-up time and also to receive further information during the call if there is a change of charging rates.
- b) Charging information during the call (AOC-D)
 - SS-AOC-D enables a user to receive information on the recorded charges for a call during the active phase of the call.
- c) Charging information at the end of the call (AOC-E)
 - SS-AOC-E enables a user to receive information on the recorded charges for a call when the call is terminated.

The Q reference point is defined in ISO/IEC 11579-1. DARD PREVIEW

Service specifications are produced in three stages and according to the method specified in CCITT Recommendation I.130. This International Standard contains the stage 3 specification for the Q reference point and satisfies the requirements identified by the stage 1 and stage 2 specifications in ISO/IEC₁15049_{C-15050-1997}

The signalling protocol for SS-AOC operates on top of the signalling protocol for basic circuit switched call control, as specified in ISO/IEC 11572, and uses certain aspects of the generic procedures for the control of supplementary services specified in ISO/IEC 11582.

This International Standard also specifies additional signalling protocol requirements for the support of interactions at the Q reference point between SS-AOC and other supplementary services and ANFs.

Note - Additional interactions that have no impact on the signalling protocol at the Q reference point can be found in the relevant stage 1 specifications.

This International Standard is applicable to PINXs which can interconnect to form a PISN.

2 Conformance

In order to conform to this International Standard, a PINX shall satisfy the requirements identified in the Protocol Implementation Conformance Statement (PICS) proforma in annex A.

Conformance to this International Standard includes conforming to those clauses that specify protocol interactions between SS-AOC and other supplementary services and ANFs for which signalling protocols at the Q reference point are supported in accordance with the stage 3 standards concerned.

3 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO/IEC 11572:1997,

Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Circuit mode bearer services - Inter-exchange signalling procedures and protocol.

Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Circuit-mode 64 kbit/s bearer services - Service description, functional capabilities and information flows.
Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Part 1: Reference configuration for PISN Exchanges (PINX).
Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Generic functional protocol for the support of supplementary services - Inter-exchange signalling procedures and protocol.
Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Specification, functional model and information flows - Call transfer supplementary service.
Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Inter-exchange signalling protocol - Call transfer supplementary service.
Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Inter-exchange signalling protocol - Call diversion supplementary services.
Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Specification, functional model and information flows - Advice of charge supplementary services.
Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Inter-exchange signalling protocol - Call interception additional network feature. https://standards.tich.arcatalog/standards/sist/d1dc8220-287e-40fe-9e19-
Vocabulary of terms for ISDNs5fl7/iso-iec-15050-1997
Method for the characterization of telecommunication services supported by an ISDN and network capabilities of an ISDN.
Principles of telecommunication services supported by an ISDN and the means to describe them.
Specification and description language.
Digital Subscriber Signalling System No. 1 (DSS1) - Supplementary services protocols, structure and general principles.

4 Definitions

For the purposes of this International Standard, the following definitions apply.

4.1 External definitions

This International Standard uses the following terms defined in other documents:

	Application Protocol Data Unit (APDU)	(ISO/IEC 11582)
_	Basic Service	(CCITT Rec. I.210)
	Call, Basic Call	(ISO/IEC 11582)
_	Originating PINX	(ISO/IEC 11572)
_	Outgoing Gateway PINX	(ISO/IEC 11572)
_	Private Integrated Services Network (PISN)	(ISO/IEC 11579-1)
_	Private Integrated Services Network Exchange (PINX)	(ISO/IEC 11579-1)
	Signalling	(CCITT Rec. I.112)
_	Supplementary Service	(CCITT Rec. I.210)
_	Supplementary Service Control Entity	(ISO/IEC 11582)
_	Terminating PINX	(ISO/IEC 11572)
_	Transit PINX	(ISO/IEC 11572)

User
 User A
 (ISO/IEC 11574)
 (ISO/IEC 13865)

4.2 Other definitions

advice mode: The mode in which an Originating PINX receives advice of charge information from a Gateway PINX. This can be charge rate provision, interim charge provision or final charge provision.

advice mode combination: A combination of one or more advice modes operating simultaneously.

charge rate provision: The provision to the Originating PINX of information concerning the charge rate for the call.

interim charge provision: The provision to the Originating PINX of subtotal charge information at intervals during the call and of the total charge information at the end of the call.

Note - When interim charge provision is used and the call is transferred, if the transferring user continues to be charged after transfer, no total charge information is provided when the call resulting from transfer finishes.

final charge provision: The provision to the Originating PINX of total charge information at the end of the call.

Note - When final charge provision is used and the call is transferred, if the transferring user continues to be charged after transfer, the total charge information is provided to the Transferring PINX when the call resulting from transfer finishes.

Charging Association Information: Information that allows final charge information to be associated with the call to which it relates.

Accounting Function: The entity that is able to determine charges incurred in another network (e.g. by counting meter pulses, by use of a public ISDN AOC service, or by calculation) and the assignment of these charges to the PISN user(s) involved.

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5 List of acronyms

ANF	Additional Network Feature ISO/IEC 15050:1997
AOC	Advice of Charges://standards.iteh.ai/catalog/standards/sist/d1dc8220-287e-40fe-9e19-
APDU	Application Protocol Data Unit c5b7a0725f17/iso-iec-15050-1997
ASN.1	Abstract Syntax Notation no. 1
ISDN	Integrated Services Digital Network
NFE	Network Facility Extension
PICS	Protocol Implementation Conformance Statement
PINX	Private Integrated Services Network Exchange
PISN	Private Integrated Services Network
SDL	Specification and Description Language
SS	Supplementary Service

6 Signalling protocol for the support of SS-AOC

6.1 SS-AOC description

SS-AOC is a set of supplementary services which enable a user to receive information about the charging of its calls that leave the PISN and enter another network.

The three AOC supplementary services are:

- a) Charging information at call set-up time (AOC-S)
 - SS-AOC-S enables the user to receive information about the charging rates at call set-up time and also to receive further information during the call if there is a change of charging rates.
- b) Charging information during the call (AOC-D)
 - SS-AOC-D enables a user to receive information on the recorded charges for a call during the active phase of the call.
- c) Charging information at the end of the call (AOC-E)
 - SS-AOC-E enables a user to receive information on the recorded charges for a call when the call is terminated.

These three supplementary services are supported across the PISN by charge rate provision, interim charge provision and final charge provision or combinations thereof.

Note - For example, SS-AOC-D could be supported by charge rate provision, by interim charge provision, or by charge rate provision in conjunction with final charge provision.

6.2 SS-AOC operational requirements

6.2.1 Requirements on the Originating PINX

Call establishment procedures for the outgoing side of an inter-PINX link and call release procedures, as specified in ISO/IEC 11572 shall apply.

Generic procedures for call-related control of supplementary services, as specified in ISO/IEC 11582 for an End PINX, shall apply.

6.2.2 Requirements on the Terminating PINX

Call establishment procedures for the incoming side of an inter-PINX link and call release procedures, as specified in ISO/IEC 11572, shall apply.

Generic procedures for call-related control of supplementary services, as specified in ISO/IEC 11582 for an End PINX, shall apply.

6.2.3 Requirements on the Outgoing Gateway PINX

Call establishment procedures for the incoming side of an inter-PINX link and call release procedures, as specified in ISO/IEC 11572, shall apply.

Generic procedures for call-related control of supplementary services, as specified in ISO/IEC 11582 for an End PINX, shall apply.

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Generic procedures for the call independent control (connection oriented) of supplémentary services, as specified in ISO/IEC 11582 for an Outgoing Gateway PINX, shall apply.

ISO/IEC 15050:1997

6.2.4 Requirements on a Transit PINX ards.iteh.ai/catalog/standards/sist/d1dc8220-287e-40fe-9e19-

Basic call procedures specified in ISO/IEC 11572 for a Transit PINX shall apply.

Generic procedures for call-related control of supplementary services, as specified in ISO/IEC 11582 for a Transit PINX, shall apply.

6.2.5 Additional requirements for a Transferring or Diverting PINX that can receive final charge information for a call resulting from transfer or a diverted call

Generic procedures for the call independent control (connection oriented) of supplementary services, as specified in ISO/IEC 11582 for a Terminating PINX, shall apply.

6.3 SS-AOC coding requirements

6.3.1 Operations

The operations defined in Abstract Syntax Notation number 1 (ASN.1) in table 1 shall apply.

Table 1 - Operations in Support of SS-AOC

```
SS-AOC-Operations
                       {iso (1) standard (0) pss1-advice-of-charge (15050) advice-of-charge-operations (0)}
DEFINITIONS EXPLICIT TAGS::=
BEGIN
IMPORTS
                       OPERATION, ERROR FROM Remote-Operation-Notation
                             {joint-iso-ccitt (2) remote-operations (4) notation (0)}
                        Extension FROM Manufacturer-specific-service-extension-definition
                             {iso (1) standard (0) pss1-generic-procedures (11582) msi-definition (0)}
                        notAvailable, supplementaryServiceInteractionNotAllowed
                        FROM General-Error-List
                              {ccitt (0) recommendation (0) q (17) 950 general-error-list (1)}
                        PartyNumber FROM Addressing-Data-Elements
                         { iso (1) standard (0) pss1-generic-procedures (11582) addressing-data-elements (9) }
                                    (standards.iteh.ai)
                              OPERATION
AocRate
                        ::=
                              ARGUMENT AccRateArgs0:1997
                       https://standards.iteh.ai/catalog/standards/sist/d1dc8220-287e-40fe-9e19-
                                     c5b7a0725f17/iso-iec-15050-1997
                              SEQUENCE {
AocRateArg
                                    aocRate
                                                CHOICE {
                                                chargeNotAvailable NULL,
                                                aocSCurrencyInfoList AOCSCurrencyInfoList
                                                         },
                                    rateArgExtension CHOICE {
                                          extension [1]IMPLICIT Extension,
                                          multipleExtension [2] IMPLICIT SEQUENCE OF Extension
                                                            } OPTIONAL
                                          }
                              OPERATION
 AocInterim
                        ::=
                              ARGUMENT AccInterimArg
                              SEQUENCE {
 AocInterimArg
                                    interimCharge CHOICE {
                                          chargeNotAvailable [0] IMPLICIT
                                                                            NULL,
                                                                            NULL,
                                          freeOfCharge
                                                            [1] IMPLICIT
                                          specificCurrency
                                                               SEQUENCE {
                                                 recordedCurrency [1] IMPLICIT RecordedCurrency,
```

Table 1 - Operations in Support of SS-AOC (continued)

```
interimBillingId[2] IMPLICIT InterimBillingId OPTIONAL }
                                    interimArgExtension CHOICE {
                                          extension [1]IMPLICIT Extension,
                                          multipleExtension [2] IMPLICIT SEQUENCE OF Extension
                                                                 } OPTIONAL
                                          }
                              OPERATION
AocFinal
                       ::=
                              ARGUMENT AccFinalArg
                              SEQUENCE {
AocFinalArg
                       ∷=
                                    finalCharge CHOICE {
                                          chargeNotAvailable [0] IMPLICIT NULL,
                                          freeOfCharge [1] IMPLICIT NULL,
                                          specificCurrency SEQUENCE {
                                                recordedCurrency [1] IMPLICIT RecordedCurrency,
                                                   finalBillingId[2] IMPLICIT FinalBillingId OPTIONAL }
                              iTe charging Association Charging Association W
                                                                                    OPTIONAL.
                                    finalArgExtension_CHOICE {
                                          rg⊏xtension CHOICE {
extension [1]IMPLICIT Extension,
                                          multipleExtension [2] IMPLICIT SEQUENCE OF Extension
                           https://standards.iteh.ai/catalog/standards/sist/d1dc8220-287e-40fe-9e19-
                                          c5b7a0725f17/iso-iec-15050-1997
AOCSCurrencyInfoList ::= SEQUENCE SIZE(1..10) OF AOCSCurrencyInfo
AOCSCurrencyInfo
                              SEQUENCE {
                        ::=
                               chargedItem
                                                ChargedItem,
                               rateType CHOICE {
                                    durationCurrency
                                                         [1] IMPLICIT DurationCurrency,
                                    flatRateCurrency
                                                         [2] IMPLICIT FlatRateCurrency,
                                    volumeRateCurrency [3] IMPLICIT VolumeRateCurrency,
                                    specialChargingCode SpecialChargingCode,
                                                            [4] IMPLICIT NULL,
                                    freeOfCharge
                                    currencyInfoNotAvailable [5] IMPLICIT NULL,
                                    freeOfChargefromBeginning [6] IMPLICIT NULL
                                          }
ChargedItem
                              ENUMERATED {
                        ::=
                                     basicCommunication
                                                                   (0),
                                     callAttempt
                                                                   (1),
                                     callSetup
                                                                   (2),
                                     userToUserInfo
                                                                   (3),
                                     operationOfSupplementaryServ (4) }
```

Table 1 - Operations in Support of SS-AOC (continued)

```
SEQUENCE {
DurationCurrency
                        ::=
                                    dCurrency
                                                [1] IMPLICITCurrency,
                                                 [2] IMPLICITAmount,
                                    dAmount
                                     dChargingType [3] IMPLICITChargingType,
                                     dTime
                                                    [4] IMPLICITTime,
                                                    [5] IMPLICITTime OPTIONAL }
                                     dGranularity
                               SEQUENCE {
FlatRateCurrency
                        ::=
                                     fRCurrency [1] IMPLICIT Currency,
                                     fRAmount [2] IMPLICIT Amount }
                               SEQUENCE {
VolumeRateCurrency
                                                    [1] IMPLICIT Currency,
                                     vRCurrency
                                                    [2] IMPLICIT Amount,
                                     vRAmount
                                     vRVolumeUnit [3] IMPLICIT VolumeUnit
                         "=ITINTEGER (1..10) DARD PREVIEW
SpecialChargingCode
                               sequence (standards.iteh.ai)
RecordedCurrency
                                     rCurrency [1] IMPLICIT Currency,
                                                  [F(T 15050:1997]
[2] IMPLICIT Amount }
--ardards/sist/d1dc8/2/0-287e-40fe-9e19-
                                     rAmount
                        https://sta
                               ENUMERATED 15/17/iso-iec-15050-1997 normalCharging (0),
InterimBillingId
                                     creditCardCharging (2) }
                                ENUMERATED {
 FinalBillingId
                         ::=
                                      normalCharging
                                                                  (0),
                                      creditCardCharging
                                                                  (2),
                                      callForwardingUnconditional (3),
                                      callForwardingBusy
                                                                  (4),
                                      callForwardingNoReply
                                                                  (5),
                                      callDeflection
                                                                  (6),
                                      callTransfer
                                                                  (7)}
                                IA5String (SIZE (0..10))
 Currency
                          ::=
                                -- SIZE(0) shall indicate the default currency of the PISN
                                -- The representation of other currencies is outside the scope of this standard
                                SEQUENCE {
 Amount
                          ∷=
                                      currencyAmount [1] IMPLICIT CurrencyAmount,
                                                         [2] IMPLICIT Multiplier }
                                      multiplier
                                INTEGER (0..16777215)
 CurrencyAmount
                          ::=
```

Table 1 - Operations in Support of SS-AOC (continued)

```
Multiplier
                              ENUMERATED {
                        ::=
                                    oneThousandth (0),
                                    oneHundredth (1),
                                    oneTenth
                                                   (2),
                                                   (3),
                                    one
                                    ten
                                                   (4),
                                    hundred
                                                   (5),
                                    thousand
                                                   (6) }
Time
                              SEQUENCE {
                                    lengthOfTimeUnit [1] IMPLICIT LengthOfTimeUnit,
                                                      [2] IMPLICIT Scale }
LengthOfTimeUnit
                              INTEGER (0..16777215)
                        ::=
Scale
                              ENUMERATED {
                        ∷=
                                    oneHundredthSecond (0),
                                    oneTenthSecond
                                                         (1),
                              iTe ten Seconds DAR(3), PREVIEW
                                    oneMinute oneHour
                                                         (4);teh.ai)
                                                         (6) }
(6) }
                                    twentyFourHours
                           https://standards.iteh.ai/catalog/standards/sist/d1dc8220-287e-40fe-9e19-ENUMERATED 1070-5077/
VolumeUnit
                                                  5f17/iso-iec-15050-1997
                                                (0),
                                    octet
                                    segment
                                                (1),
                                    message
                                                (2)}
                              ENUMERATED {
ChargingType
                        ::=
                                    continuousCharging
                                    stepFunction
                                                            (1)}
ChargingAssociation
                        ::=
                               CHOICE {
                                                         PartyNumber,
                                    chargeNumber [0]
                                    chargeIdentifier ChargeIdentifier }
Chargeldentifier
                               INTEGER (-32768..32767)
                        ::=
ChargeRequest
                               OPERATION
                        ::=
                                                 ChargeRequestArg
                               ARGUMENT
                               RESULT
                                                 ChargeRequestRes
                               ERRORS
                                                    freeOfCharge,
                                                    supplementaryServiceInteractionNotAllowed,
                                                    notAvailable, unspecified }
                               OPERATION
GetFinalcharge
                        ::=
                               ARGUMENT
                                                 DummyArg
```

Table 1 - Operations in Support of SS-AOC (continued)

```
ChargeRequestArg
                             SEQUENCE {
                       adviceModeCombinations SEQUENCE SIZE(0..7) OF
                                              AdviceModeCombination,
                       chargeReqArgExtension CHOICE {
                                        extension [1]IMPLICIT Extension,
                                        multipleExtension [2] IMPLICIT SEQUENCE OF Extension
                                                       } OPTIONAL
                                        }
                             SEQUENCE {
ChargeRequestRes
                       ∷=
                             adviceModeCombination AdviceModeCombination,
                             chargeRegResExtension CHOICE {
                                   extension [1]IMPLICIT Extension,
                                   multipleExtension [2] IMPLICIT SEQUENCE OF Extension
                                                          } OPTIONAL
                                        }
AdviceModeCombination ::=
                             ENUMERATED { -- advice mode combination
                                   rate (0), Charge rate provision rateInterim ARD (1), Charge rate and interim charge provision
                                   rateFinal and (2), charge rate and final charge provision
                                                       (3),
                                                             -- interim charge provision
                                                       (4), -- final charge provision
                                   final
                                   interimFinal
                                                       (5) interim charge and final charge provision
                      https://standards.
                                   rateInterimFinal (6) 105(1-1) charge rate, interim charge and final
                                                             -- charge provision
                             CHOICE{
DummyArg
                       ::=
                                                     NULL,
                                   none
                                                    [1] IMPLICIT Extension,
                                   extension
                                   multipleExtension [2] IMPLICIT SEQUENCE OF Extension
 -- The following OPERATION applies for the interaction with Call Transfer
                             OPERATION
AocComplete
                        ::=
                              ARGUMENT AocCompleteArg
                                         AocCompleteRes
                              RESULT
                                         {supplementaryServiceInteractionNotAllowed}
                              ERRORS
                             SEQUENCE {
 AocCompleteArg
                       ::=
                                                           PartyNumber,
                                    chargedUser
                                    chargingAssociation ChargingAssociation OPTIONAL,
                                                           CHOICE {
                                    completeArgExtension
                                         extension [1]IMPLICIT Extension,
                                          multipleExtension [2] IMPLICIT SEQUENCE OF Extension
                                                                } OPTIONAL
```