



INTERNATIONAL TELECOMMUNICATION UNION

ITU-T H.350 Sub-series Implementors' Guide

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

(26 November 2004)

SERIES H: AUDIOVISUAL AND MULTIMEDIA SYSTEMS
Infrastructure of audiovisual services – Communication
procedures

**Implementors' Guide for ITU-T H.350 Sub-series
of Recommendations ("Directory Services
Architecture for Multimedia Conferencing")**

Summary

This document is a compilation of reported defects identified in the versions of ITU-T Recommendation H.350 and its related Recommendations currently in force. It must be read in conjunction with the Recommendations to serve as an additional authoritative source of information for implementers. The changes, clarifications and corrections defined herein are expected to be included in future versions of affected H.350-series Recommendations.

This revision contains all updates submitted up to and including those at Study Group 16 meeting in November, 2004, in Geneva. It supersedes the earlier version approved 2004-01.

Change Log

Revision	Date	Description
1	30 January 2004	Approved by ITU-T Study Group 16 (TD 58/WP2)
2	26 November 2004	Approved by ITU-T Study Group 16 (TD 76/PLEN)

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IMPLEMENTATORS' GUIDE FOR ITU-T H.350 SUB-SERIES OF RECOMMENDATIONS

1 Scope

This guide resolves defects in the following categories:

- editorial errors
- technical errors, such as omissions and inconsistencies
- ambiguities

In addition, the Implementers Guide may include explanatory text found necessary as a result of interpretation difficulties apparent from the defect reports.

This Guide will not address proposed additions, deletions, or modifications to the Recommendations that are not strictly related to implementation difficulties in the above categories. Proposals for new features should be made through contributions to the ITU-T.

2 Introduction

This document addresses implementation concerns associated with white pages applications, clarifies the use of H.225 partyNumber, and gives an ASN.1 representation of H.350 object classes for use in X.500 series directories.

3 References

This document refers to the following H.350 series Recommendations:

- ITU-T Recommendation H.350 (2003), Directory Services Architecture for Multimedia Conferencing.
- ITU-T Recommendation H.350.1 (2003), Directory Services Architecture for H.323.
- ITU-T Recommendation H.350.2 (2003), Directory Services Architecture for H.235.
- ITU-T Recommendation H.350.3 (2003), Directory Services Architecture for H.320.
- ITU-T Recommendation H.350.4 (2003), Directory Services Architecture for SIP.
- ITU-T Recommendation H.350.5 (2003), Directory Services Architecture for Non-Standard Protocols.
- ITU-T Recommendation H.350.6 (2004), Directory Services Architecture for Call Forwarding and Preferences.

4 Nomenclature

In addition to traditional revision marks, the following marks and symbols are used to indicate to the reader how changes to the text of a Recommendation should be applied:

Symbol	Description
<u><i>[Begin Correction]</i></u>	Identifies the start of revision marked text based on extractions from the published Recommendations affected by the correction being described.
<u><i>[End Correction]</i></u>	Identifies the end of revision marked text based on extractions from the published Recommendations affected by the correction being described.

...	Indicates that the portion of the Recommendation between the text appearing before and after this symbol has remained unaffected by the correction being described and has been omitted for brevity.
--- <i>SPECIAL INSTRUCTIONS</i> --- {instructions}	Indicates a set of special editing instructions to be followed.

5 Technical and Editorial Corrections to ITU-T Recommendation H.350

5.1 Authenticating Across Multiple Directories for Endpoint Automatic Configuration

Description:	This change adds additional non-normative discussion on the implementation scenario in which the enterprise directory and H.350 directory are separate, but there is a need to authenticate across both. This adds a new section to Appendix I of H.350.
---------------------	--

[Begin Correction]

I.3 Authenticating Across Multiple Directories for Automatic Endpoint Configuration.

In some implementations the H.350 attributes are stored in the same enterprise directory as the people, or owner, information. However, other implementations have separate H.350 and enterprise directories. One application of H.350 is to enable a user to log onto the network using their single sign on credentials, and have the endpoint download its configuration information from the H.350 directory. If the H.350 directory and enterprise directory are the same, then there is no problem. If the H.350 directory and the enterprise directory are separate servers, then there is a security concern.

When an endpoint attempts to bind to an H.350 directory, the H.350 directory is not aware of the user's authentication credentials, because those are stored in a different directory, i.e. the enterprise directory. There must be some way for the H.350 directory to determine the owner of a particular H.350 entry and only allow access to that data to the owner. This can be accomplished by the use of the **owner** attribute as described in IETF RFC 2256 section 5.33.

Example

An example of the use of **owner** is given below using specific information from the ViDeNet system. Be sure to not use these sample OIDs, domain or other ViDe specific values listed in the example.

Step one is to create an object class that would contain the attribute owner

```
objectclass ( 1.3.6.1.4.1.10411.3.1.1.4
    NAME 'VIDEOwner'
    AUXILIARY
    SUP top
    MAY ( owner )
)
```

Step two is to have this new object class part of the endpoint or SIP UA entry.

Here is an example of a complete entry showing how to also populate the owner entry.

```
dn: commUniqueId=30,ou=commidentity,dc=vide,dc=net
objectClass: top
objectClass: commObject
```

```

objectClass: h323Identity
objectClass: h235Identity
objectClass: VIDEOwner
objectClass: SIPIdentity
objectClass: h320Identity
objectClass: genericIdentity
commUniqueId: 30
h323IdentityEndpointType: Terminal
commOwner: ldap://videnet.unc.edu/dc=vide,dc=net??sub?(uid=elkhoury)
owner: uid=elkhoury,ou=people,dc=vide,dc=net
h235IdentityEndpointID: NadimElkhoury
h323IdentitydialedDigits: 00112971208
h323IdentityGKDomain: 152.2.17.189
h235IdentityPassword: testing123

```

This is the section that should be entered in the commObject server.

```

database meta
suffix "ou=people,dc=vide,dc=net"
uri    ldap://videnet.unc.edu/ou=people,dc=vide,dc=net"
lastmod off

```

On the Enterprise directory side this is how you would protect the entry. Change the admin information account and the domain name from the example.

```

access to attr=h235IdentityPassword
by dnattr="owner" write
by self write
by anonymous auth
by dn="cn=Admin,dc=vide,dc=net" write
by * none

access to attr=SIPIdentityPassword
by dnattr="owner" write
by self write
by anonymous auth
by dn="cn=Admin,dc=vide,dc=net" write
by * none

```

5.2 Potential Targets of commOwner

Description:	A need has been identified for clarification of the different types of objects that can 'own' commObjects. This text updates H.350 Appendix I.
---------------------	--

[Begin Correction]

I.4 Potential Targets of commOwner

Most H.350 attributes are by design auxiliary classes. This enables a commObject to be 'owned' by many potential entries in a directory. For example, the most common scenario is that in which a person has an endpoint. In this scenario, a user's inetOrgPerson entry has a commURI value which points to the commObject endpoint that is associated with that person. Respectively, the endpoint represented by the target commObject has a value for commOwner that points back to the person's inetOrgPerson entry. This two way 'ownership' relationship connects the person (represented by a 'person' object class) to her endpoint. Note that this linkage is usual, but not mandatory.

While the most common scenario is that a user is associated with an endpoint, H.350 is by no means limited to this. For example, it is possible that a conference room is represented in a directory, and has a commURI/commOwner pair connecting that conference room with its endpoint. In this case the linkage is not with a 'person' object class, but a 'conference room' object

class. Further, it is possible to consider a zoological application in which video enabled endpoints were placed in various cages. In this scenario, each cage would be represented in the directory with a 'cage' object class and have a commURI/commOwner pair connecting the cage to its endpoint.

This flexibility enables many possible implementation scenarios, but also requires attention during implementation, especially of white pages where lookups are generally performed on the owner of an endpoint, rather than on endpoint attributes directly. In particular, the problem is to determine the type of object class for which to search.

I.4.1 Simple White Pages Scenario

In a simple single domain scenario, a white pages application is configured to search an enterprise directory to find people, conference rooms, or other resources, and return their H.350 information. The most common way that people are represented in a directory is with inetOrgPerson. However, many institutions have derived institution-specific people object classes. In those cases, a white pages application searching for inetOrgPerson attributes will not return anything useful. Therefore, the white pages application should be configurable as to what attribute type to be searched.

I.4.2 Directory of Directories Scenario

A directory of directories is one in which a single search engine queries directories in many different domains. For example, a national government may maintain a white pages application that searches many provincial directories. This is an extension of the simple white pages scenario. However, each provincial directory may use a different object class to represent people. The white pages application must maintain a table of each directory that it searches, authentication credentials if required for that directory, and the attributes to be searched for that directory. This means that a registration process is required for target directories. Further, the white pages application should publish the attribute type that it expects when it receives queries.

[End Correction]

6 Technical and Editorial Corrections to ITU-T Recommendation H.350.1

6.1 h323IdentitypartyNumber Encoding Clarification

Description:	A need has been identified for clarification of the use of the h323IdentitypartyNumber attribute defined in H.350.1. In particular, partyNumber is defined in H.225 as having several elements associated with it. In the initial version of H.350, interpretation of the data in h323IdentitypartyNumber is left to the implementor. Normative clarification of the use of this field is an aid to vendor interoperability.
---------------------	--

--- SPECIAL INSTRUCTIONS ---

This revision does not affect the definition of the attribute. It merely specifies how to encode the value of the attribute. Thus, it revises the NOTES associated with H.350.1, section 6.8

[Begin Correction]

Notes

This LDAP attribute has three elements encoded together, and separated by a colon (:) delimiter. The form of the encoding MUST be as follows:

partyNumber:numberingPlan:typeOfNumber

Valid values for these elements are enumerated in the following section.

6.8.1 partyNumber

The **partyNumber** element is the actual digit string of the alias. Example: 1234567890

6.8.2 numberingPlan

The **numberingPlan** element MUST be exactly one of the following string values as defined in H.225 :

```
privateNumber  
e164Number
```

6.8.3 typeOfNumber

When **numberingPlan** is 'privateNumber', **typeOfNumber** MUST be exactly one of the following string values as defined in H.225:

```
level2RegionalNumber  
level1RegionalNumber  
pISNSpecificNumber  
localNumber
```

When **numberingPlan** is 'e164Number', **typeOfNumber** MUST be exactly one of the following string values as defined in H.225:

```
Unknown  
internationalNumber  
networkSpecificNumber  
subscriberNumber  
abbreviatedNumber
```

Note that when encoding a private numbering plan of type 'unknown' (000) it is not necessary to encode it in the **h323IdentitypartyNumber** attribute. Instead, use **h323IdentitydialedDigits**.

[End Correction]

7 X.500 Support for ITU-T Recommendations H.350 - H.350.5

Description:	The original H.350 series provides LDIF definitions for use with LDAP directories, but does not include ASN.1 definitions. This addition adds the X.500 ASN.1 definitions for the entire series H.350 through H.350.5.
---------------------	--

7.1 X.500 ASN.1 Definitions for H.350

Description:	This addition includes an overview of X.500 considerations, and the ASN.1 definitions of base data structures necessary to represent H.350 elements in ASN.1. This creates a new section 9 in H.350.
---------------------	--

[Begin Correction]

9 Using H.350 With X.500 Directories

LDAP object classes are based upon the ITU's X.500 directory architecture. While H.350 specifies use with LDAP, it is also possible to use H.350 with X.500 directories. To do so requires ASN.1 definitions of the object classes and attributes, rather than the LDAP definitions and LDIF files included in the original H.350 series documents.

~~Please note that the ASN.1 definitions limit some attributes to 256 characters, where the LDIF does not specify a limit. Implementers are advised to be aware of this and adjust their operations accordingly. Specifically, a character string of greater than 256 characters may be truncated when~~

~~being imported from an LDAP directory to an X.500 directory. This limitation applies to the following attributes in the H.350 series:~~

~~commOwner
commURI
h235IdentityEndpointID
genericIdentityProtocolIdentifier
genericIdentityMessage
h320ServiceLevel
h323IdentityURLID
h323IdentityEndpointType
h323IdentityServiceLevel
SIPIdentitySIPURI
SIPIdentityUsername~~

Note that ASN.1 definitions found in H.350.x documents may rely on the ASN.1 definitions given here for basic data structures.

9.1 X500.asn

```
InformationFramework {joint-iso-itu-t ds(5) module(1) informationFramework(1) 4}
DEFINITIONS ::=

BEGIN

-- EXPORTS All --
-- The types and values defined in this module are exported for use in the other
ASN.1 modules contained
-- within the Directory Specifications, and for the use of other applications
which will use them to access
-- Directory services. Other applications may use them for their own purposes,
but this will not constrain
-- extensions and modifications needed to maintain or improve the Directory
service.

-- OBJECT-CLASS information object class specification --

OBJECT-CLASS ::= CLASS {
    &Superclasses      OBJECT-CLASS OPTIONAL,
    &kind              ObjectClassKind DEFAULT structural,
    &MandatoryAttributes ATTRIBUTE OPTIONAL,
    &OptionalAttributes ATTRIBUTE OPTIONAL,
    &id                OBJECT IDENTIFIER UNIQUE }
WITH SYNTAX {
    [ SUBCLASS OF      &Superclasses ]
    [ KIND             &kind ]
    [ MUST CONTAIN    &MandatoryAttributes ]
    [ MAY CONTAIN     &OptionalAttributes ]
    ID                &id }

ObjectClassKind ::= ENUMERATED {
    abstract (0),
    structural (1),
    auxiliary (2) }

-- object classes --
top OBJECT-CLASS ::= {
    KIND           abstract
    MUST CONTAIN  { objectClass }
    ID             { 2 5 6 0 } }

-- ATTRIBUTE information object class specification --
```

```

ATTRIBUTE ::= CLASS {
    &derivation
    &Type
    required --
        &equality-match
        &ordering-match
        &substrings-match
        &single-valued
        &collective
        -- operational extensions --
        &no-user-modification
        &usage
        &id
    WITH SYNTAX {
        [ SUBTYPE OF
        [ WITH SYNTAX
        [ EQUALITY MATCHING RULE
        [ ORDERING MATCHING RULE
        [ SUBSTRINGS MATCHING RULE
        [ SINGLE VALUE
        [ COLLECTIVE
        [ NO USER MODIFICATION
        [ USAGE
        ID
    }
}

ATTRIBUTE OPTIONAL,
OPTIONAL, -- either &Type or &derivation

MATCHING-RULE OPTIONAL,
MATCHING-RULE OPTIONAL,
MATCHING-RULE OPTIONAL,
BOOLEAN DEFAULT FALSE,
BOOLEAN DEFAULT FALSE,
BOOLEAN DEFAULT FALSE,
BOOLEAN DEFAULT FALSE,
AttributeUsage DEFAULT userApplications,
OBJECT IDENTIFIER UNIQUE }

&derivation ]
&Type ]
&equality-match ]
&ordering-match ]
&substrings-match ]
&single-valued ]
&collective ]
&no-user-modification ]
&usage ]
&id }

WITH SYNTAX {
    [ EQUALITY MATCHING RULE
    [ ORDERING MATCHING RULE
    [ SUBSTRINGS MATCHING RULE
    [ SINGLE VALUE
    [ COLLECTIVE
    [ NO USER MODIFICATION
    [ USAGE
    ID
}

AttributeUsage ::= ENUMERATED {
    userApplications (0),
    directoryOperation (1),
    distributedOperation (2),
    dSAOperation (3) }

objectClass ATTRIBUTE ::= {
    WITH SYNTAX OBJECT IDENTIFIER
    EQUALITY MATCHING RULE objectIdentifierMatch
    ID { 2 5 4 0 } }

objectIdentifierMatch MATCHING-RULE ::= {
    SYNTAX OBJECT IDENTIFIER
    ID { 2 5 13 0 } }

-- MATCHING-RULE information object class specification --

MATCHING-RULE ::= CLASS {
    &ParentMatchingRules
    &AssertionType
    &uniqueMatchIndicator
    &id
    WITH SYNTAX {
        [ PARENT
        [ SYNTAX
        [ UNIQUE-MATCH-INDICATOR
        ID
    }
}

MATCHING-RULE OPTIONAL,
OPTIONAL,
ATTRIBUTE OPTIONAL,
OBJECT IDENTIFIER UNIQUE }

&ParentMatchingRules ]
&AssertionType ]
&uniqueMatchIndicator ]
&id }

END

```

9.2 X509.asn

```

AuthenticationFramework {joint-iso-itu-t ds(5) module(1)
authenticationFramework(7) 4}
DEFINITIONS :=
BEGIN

IMPORTS

```

```

ATTRIBUTE
    FROM InformationFramework {joint-iso-itu-t ds(5) module(1)
informationFramework(1) 4}

    certificateExactMatch, certificatePairExactMatch, certificateListExactMatch
        FROM CertificateExtensions {joint-iso-itu-t ds(5) module(1)
certificateExtensions(26) 4} ;

-- public-key certificate definition --
Certificate      ::= OCTET STRING
CertificatePair   ::= OCTET STRING
CertificateList   ::= OCTET STRING

-- PKI directory attributes --
userCertificate      ATTRIBUTE ::= {
    WITH SYNTAX          Certificate
    EQUALITY MATCHING RULE certificateExactMatch
    ID                  { 2 5 4 36 } }

cACertificate      ATTRIBUTE ::= {
    WITH SYNTAX          Certificate
    EQUALITY MATCHING RULE certificateExactMatch
    ID                  { 2 5 4 37 } }

crossCertificatePair      ATTRIBUTE ::= {
    WITH SYNTAX          CertificatePair
    EQUALITY MATCHING RULE certificatePairExactMatch
    ID                  { 2 5 4 40 } }

certificateRevocationList      ATTRIBUTE ::= {
    WITH SYNTAX          CertificateList
    EQUALITY MATCHING RULE certificateListExactMatch
    ID                  { 2 5 4 39 } }

authorityRevocationList ATTRIBUTE ::= {
    WITH SYNTAX          CertificateList
    EQUALITY MATCHING RULE certificateListExactMatch
    ID                  { 2 5 4 38 } }

END

CertificateExtensions {joint-iso-itu-t ds(5) module(1) certificateExtensions(26)
4}
DEFINITIONS IMPLICIT TAGS ::=
BEGIN
-- EXPORTS ALL --
IMPORTS
    MATCHING-RULE
        FROM InformationFramework {joint-iso-itu-t ds(5) module(1)
informationFramework(1) 4} ;

certificateExactMatch MATCHING-RULE ::= {
    SYNTAX          CertificateExactAssertion
    ID              { 2 5 13 34 } }

CertificateExactAssertion ::= SEQUENCE {
    serialNumber    INTEGER,
    issuer         OCTET STRING }

certificateListExactMatch MATCHING-RULE ::= {
    SYNTAX          CertificateListExactAssertion
    ID              { 2 5 13 38 } }

CertificateListExactAssertion ::= OCTET STRING

```

```

certificatePairExactMatch MATCHING-RULE      ::=  {
    SYNTAX    OCTET STRING
    ID        { 2 5 13 36 } }

END

```

9.3 X520.asn

```

SelectedAttributeTypes {joint-iso-itu-t ds(5) module(1)
selectedAttributeTypes(5) 4}
DEFINITIONS ::=

BEGIN

-- EXPORTS All --
-- The types and values defined in this module are exported for use in the other
ASN.1 modules contained
-- within the Directory Specifications, and for the use of other applications
which will use them to access
-- Directory services. Other applications may use them for their own purposes,
but this will not constrain
-- extensions and modifications needed to maintain or improve the Directory
service.

IMPORTS

-- from ITU-T Rec. X.501 | ISO/IEC 9594-2

MATCHING-RULE
    FROM InformationFramework {joint-iso-itu-t ds(5) module(1)
informationFramework(1) 4} ;

-- Directory string type --

DirectoryString { INTEGER : maxSize } ::= CHOICE {
    teletexString TeletexString (SIZE (1..maxSize)),
    printableString PrintableString (SIZE (1..maxSize)),
    bmpString BMPString (SIZE (1..maxSize)),
    universalString UniversalString (SIZE (1..maxSize)),
    uTF8String UTF8String (SIZE (1..maxSize)) }

-- Matching rules --

caseIgnoreMatch MATCHING-RULE ::= {
    SYNTAX    DirectoryString {128}
    ID        { 2 5 13 2 } }

caseIgnoreOrderingMatch MATCHING-RULE ::= {
    SYNTAX    DirectoryString {128}
    ID        { 2 5 13 3 } }

caseIgnoreSubstringsMatch MATCHING-RULE ::= {
    SYNTAX    SubstringAssertion
    ID        { 2 5 13 4 } }

SubstringAssertion ::= SEQUENCE OF CHOICE {
    initial  [0] DirectoryString {128},
    any      [1] DirectoryString {128},
    final    [2] DirectoryString {128} }

caseExactMatch MATCHING-RULE ::= {
    SYNTAX    DirectoryString {128}
    ID        { 2 5 13 5 } }

```

```

caseExactOrderingMatch MATCHING-RULE ::= {
    SYNTAX DirectoryString {128}
    ID      { 2 5 13 6 } }

caseExactSubstringsMatch MATCHING-RULE ::= {
    SYNTAX SubstringAssertion -- only the PrintableString choice
    ID      { 2 5 13 7 } }

octetStringMatch MATCHING-RULE ::= {
    SYNTAX OCTET STRING
    ID      { 2 5 13 17 } }

END -- SelectedAttributeTypes

```

9.4 commObjectASN1.asn

```

CommObject { itu-t(0) recommendation(0) h(8) 350 1 cr(1) commObject(2)
module(4) }
DEFINITIONS ::=

BEGIN
-- Communication Object Schema

-- Schema for Representing Communication Objects in an LDAP Directory

-- Abstract

-- This document defines the schema for representing Communication
-- objects in an LDAP directory [LDAPv3]. It defines schema elements
-- to represent a communication object [commObject].

--          .1 = Communication related work
--          .1.2 = commObject
--          .1.2.1 = attributes
--          .1.2.2 = objectclass
--          .1.2.3 = syntax

-- Attribute Type Definitions

-- The following attribute types are defined in this document:

--      commUniqueId
--      commOwner
--      commPrivate

IMPORTS

-- from ITU-T Rec. H.350

h350-cr, caseIgnoreIA5Match, caseIgnoreIA5SubstringsMatch
    FROM CommURI { itu-t(0) recommendation(0) h(8) 350 1 cr(1) commURI(1)
module(4) }

-- from ITU-T Rec. X.501 | ISO/IEC 9594-2

ATTRIBUTE, OBJECT-CLASS, top
    FROM InformationFramework {joint-iso-itu-t ds(5) module(1)
informationFramework(1) 4}

-- from ITU-T Rec. X.520 | ISO/IEC 9594-6

DirectoryString {}, caseExactMatch
    FROM SelectedAttributeTypes {joint-iso-itu-t ds(5) module(1)
selectedAttributeTypes(5) 4} ;

```

```

commUniqueId ATTRIBUTE ::= {
    WITH SYNTAX IA5String
    EQUALITY MATCHING RULE caseIgnoreIA5Match
    SUBSTRINGS MATCHING RULE caseIgnoreIA5SubstringsMatch
    ID { at 1 } }

| commOwner ATTRIBUTE ::= {
    WITH SYNTAX DirectoryString { 32768256}
    EQUALITY MATCHING RULE caseExactMatch
    ID { at 2 } }

commPrivate ATTRIBUTE ::= {
    WITH SYNTAX IA5String
    ID { at 3 } }

-- Object Class Definitions

-- The following object classes are defined in this document:

--     commObject

-- commObject

commObject OBJECT-CLASS ::= {
    SUBCLASS OF { top }
    MUST CONTAIN { commUniqueId }
    MAY CONTAIN { commOwner | commPrivate }
    ID { oc 1 } }

co      OBJECT IDENTIFIER ::= { h350-cr co(2) }
at      OBJECT IDENTIFIER ::= { co at(1) }
oc      OBJECT IDENTIFIER ::= { co oc(2) }

END -- end of ASN.1

```

9.5 commURIASN1.asn

```

CommURI { itu-t(0) recommendation(0) h(8) 350 1 cr(1) commURI(1) module(4) }
DEFINITIONS ::=
BEGIN

```

```

-- Communication Object Schema

-- Schema for Representing Communication Objects in an LDAP Directory

-- Abstract

-- This document defines the schema for representing Communication
-- objects in an LDAP directory [LDAPv3]. It defines schema elements
-- to represent a communication object URI [commURIOBJECT].

```

```

--          .1 = Communication related work
--          .1.1 = commURIOBJECT
--          .1.1.1 = attributes
--          .1.1.2 = objectclass
--          .1.1.3 = syntax

```

IMPORTS

-- from ITU-T Rec. X.501 | ISO/IEC 9594-2

```

ATTRIBUTE, OBJECT-CLASS, MATCHING-RULE, top
    FROM InformationFramework {joint-iso-itu-t ds(5) module(1)
informationFramework(1) 4}

-- from ITU-T Rec. X.520 | ISO/IEC 9594-6

DirectoryString {}, caseExactMatch
    FROM SelectedAttributeTypes {joint-iso-itu-t ds(5) module(1)
selectedAttributeTypes(5) 4} ;

-- Attribute Type Definitions

-- The following attribute types are defined in this document:

-- commURI

commURI ATTRIBUTE ::= {
    WITH SYNTAX DirectoryString {32768-256}
    EQUALITY MATCHING RULE caseExactMatch
    ID { at 1 } }

-- Object Class Definitions

-- The following object classes are defined in this document:

-- commURIObject

-- commURIObject
-- This auxiliary object class represents a URI attribute type

commURIOBJECT OBJECT-CLASS ::= {
    SUBCLASS OF { top }
    MAY CONTAIN { commURI }
    ID { oc 1 } }

h350-cr   OBJECT IDENTIFIER ::= { itu-t(0) recommendation(0) h(8) 350 1 cr(1) }
cu        OBJECT IDENTIFIER ::= { h350-cr cu(1) }
at        OBJECT IDENTIFIER ::= { cu at(1) }
oc        OBJECT IDENTIFIER ::= { cu oc(2) }

caseIgnoreIA5Match MATCHING-RULE ::= {
    SYNTAX IA5String
    ID { 1 3 6 1 4 1 1466 109 114 2 } }

caseIgnoreIA5SubstringsMatch MATCHING-RULE ::= {
    SYNTAX IA5String
    ID { 1 3 6 1 4 1 1466 109 114 3 } }

userSMIMECertificate ATTRIBUTE ::= {
    WITH SYNTAX OCTET STRING
    ID { 2 16 840 1 113730 3 1 40 } }

END -- end of ASN.1

```

[End Correction]

7.2 X.500 ASN.1 Definitions for H.350.1

Description:	This addition includes the ASN.1 definitions of data structures necessary to
---------------------	--

represent H.350.1 elements in ASN.1. This creates a section 8 in H.350.1.

[Begin Correction]

8 h323IdentityASN1.asn

```
H323Identity { itu-t(0) recommendation(0) h(8) 350 1 cr(1) h323Identity(3)
module(4) }
DEFINITIONS ::=

BEGIN

-- h323Identity Object Schema

-- Schema for representing h323Identity Object in an LDAP Directory

-- Abstract

-- This document defines the schema for representing h323Identity
-- object in an LDAP directory [LDAPv3]. It defines schema elements
-- to represent an h323Identity object [h323Identity].

--          .1 = Communication related work
--          .1.3 = h323Identity
--          .1.3.1 = attributes
--          .1.3.2 = objectclass
--          .1.3.3 = syntax

IMPORTS

-- from ITU-T Rec. H.350

h350-cr, caseIgnoreIA5Match, caseIgnoreIA5SubstringsMatch
  FROM CommURI { itu-t(0) recommendation(0) h(8) 350 1 cr(1) commURI(1)
module(4) }

-- from ITU-T Rec. X.501 | ISO/IEC 9594-2

ATTRIBUTE, OBJECT-CLASS, top
  FROM InformationFramework {joint-iso-itu-t ds(5) module(1)
informationFramework(1) 4}

-- from ITU-T Rec. X.520 | ISO/IEC 9594-6

DirectoryString {}, caseExactMatch, caseExactSubstringsMatch, caseIgnoreMatch,
caseIgnoreSubstringsMatch
  FROM SelectedAttributeTypes {joint-iso-itu-t ds(5) module(1)
selectedAttributeTypes(5) 4} ;



-- Attribute Type Definitions

-- The following attribute types are defined in this document:

--          h323IdentityGKDomain
--          h323Identityh323-ID
--          h323IdentitydialedDigits
--          h323Identityemail-ID
--          h323IdentityURL-ID
--          h323IdentitytransportID
--          h323IdentitypartyNumber
--          h323IdentitymobileUIM
--          h323IdentityEndpointType
--          h323IdentityServiceLevel
```

```

h323IdentityGKDomain ATTRIBUTE ::= {
    WITH SYNTAX IA5String
    EQUALITY MATCHING RULE caseIgnoreIA5Match
    ID { at 1 } }

h323Identityh323-ID ATTRIBUTE ::= {
    WITH SYNTAX IA5String
    EQUALITY MATCHING RULE caseIgnoreIA5Match
    SUBSTRINGS MATCHING RULE caseIgnoreIA5SubstringsMatch
    ID { at 2 } }

h323IdentitydialedDigits ATTRIBUTE ::= {
    WITH SYNTAX IA5String
    EQUALITY MATCHING RULE caseIgnoreIA5Match
    SUBSTRINGS MATCHING RULE caseIgnoreIA5SubstringsMatch
    ID { at 3 } }

h323Identityemail-ID ATTRIBUTE ::= {
    WITH SYNTAX IA5String
    EQUALITY MATCHING RULE caseIgnoreIA5Match
    SUBSTRINGS MATCHING RULE caseIgnoreIA5SubstringsMatch
    ID { at 4 } }

h323IdentityURL-ID ATTRIBUTE ::= {
    WITH SYNTAX DirectoryString { 32768256 }
    EQUALITY MATCHING RULE caseExactMatch
    SUBSTRINGS MATCHING RULE caseExactSubstringsMatch
    ID { at 5 } }

h323IdentitytransportID ATTRIBUTE ::= {
    WITH SYNTAX IA5String
    EQUALITY MATCHING RULE caseIgnoreIA5Match
    SUBSTRINGS MATCHING RULE caseIgnoreIA5SubstringsMatch
    ID { at 6 } }

h323IdentitypartyNumber ATTRIBUTE ::= {
    WITH SYNTAX IA5String
    EQUALITY MATCHING RULE caseIgnoreIA5Match
    SUBSTRINGS MATCHING RULE caseIgnoreIA5SubstringsMatch
    ID { at 7 } }

h323IdentitymobileUIM ATTRIBUTE ::= {
    WITH SYNTAX IA5String
    EQUALITY MATCHING RULE caseIgnoreIA5Match
    SUBSTRINGS MATCHING RULE caseIgnoreIA5SubstringsMatch
    ID { at 8 } }

h323IdentityEndpointType ATTRIBUTE ::= {
    WITH SYNTAX DirectoryString { 32768256 }
    EQUALITY MATCHING RULE caseIgnoreMatch
    SUBSTRINGS MATCHING RULE caseIgnoreSubstringsMatch
    ID { at 9 } }

h323IdentityServiceLevel ATTRIBUTE ::= {
    WITH SYNTAX DirectoryString { 32768256 }
    EQUALITY MATCHING RULE caseIgnoreMatch
    SUBSTRINGS MATCHING RULE caseIgnoreSubstringsMatch
    ID { at 10 } }

-- Object Class Definitions

-- The following object class is defined in this document:
-- h323Identity

```

```

-- h323Identity

h323Identity OBJECT-CLASS ::= {
    SUBCLASS OF { top }
    MAY CONTAIN { h323IdentityGKDomain |
        h323Identityh323-ID |
        h323IdentitydialedDigits |
        h323Identityemail-ID |
        h323IdentityURL-ID |
        h323IdentitytransportID |
        h323IdentitypartyNumber |
        h323IdentitymobileUIM |
        h323IdentityEndpointType |
        h323IdentityServiceLevel }
    ID { oc 1 } }

h323-Id   OBJECT IDENTIFIER ::= { h350-cr h323-Id(5) }
at        OBJECT IDENTIFIER ::= { h323-Id at(1) }
oc        OBJECT IDENTIFIER ::= { h323-Id oc(2) }

END -- end of ASN.1

```

[End Correction]

7.3 X.500 ASN.1 Definitions for H.350.2

Description:	This addition includes the ASN.1 definitions of data structures necessary to represent H.350.2 elements in ASN.1. This creates a section 8 in H.350.2.
---------------------	--

[Begin Correction]

8 h235IdentityASN1.asn

```

H235Identity { itu-t(0) recommendation(0) h(8) 350 1 cr(1) h235Identity(4)
module(4) }
DEFINITIONS ::=

BEGIN

-- h235Identity Object Schema

-- Schema for representing h235Identity Object in an LDAP Directory

-- Abstract

-- This document defines the schema for representing h235Identity
-- object in an LDAP directory [LDAPv3]. It defines schema elements
-- to represent an h235Identity object [h235Identity].

--           .1 = Communication related work
--           .1.4 = h235Identity
--           .1.4.1 = attributes
--           .1.4.2 = objectclass
--           .1.4.3 = syntax

IMPORTS

-- from ITU-T Rec. H.350

h350-cr

```

```

FROM CommURI { itu-t(0) recommendation(0) h(8) 350 1 cr(1) commURI(1)
module(4) }

-- from ITU-T Rec. X.501 | ISO/IEC 9594-2

ATTRIBUTE, OBJECT-CLASS, top
  FROM InformationFramework {joint-iso-itu-t ds(5) module(1)
informationFramework(1) 4}

-- from ITU-T Rec. X.509 | ISO/IEC 9594-8

userCertificate, cACertificate, authorityRevocationList,
certificateRevocationList, crossCertificatePair
  FROM AuthenticationFramework {joint-iso-itu-t ds(5) module(1)
authenticationFramework(7) 4}

-- from ITU-T Rec. X.520 | ISO/IEC 9594-6

DirectoryString {}, caseIgnoreMatch, caseIgnoreSubstringsMatch, octetStringMatch
  FROM SelectedAttributeTypes {joint-iso-itu-t ds(5) module(1)
selectedAttributeTypes(5) 4} ;

-- Attribute Type Definitions

-- The following attribute types are defined in this document:

--      h235IdentityEndpointID
--      h235IdentityPassword

h235IdentityEndpointID ATTRIBUTE ::= {
|   WITH SYNTAX DirectoryString {32768256}
|   EQUALITY MATCHING RULE caseIgnoreMatch
|   SUBSTRINGS MATCHING RULE caseIgnoreSubstringsMatch
|   ID { at 1 } }

h235IdentityPassword ATTRIBUTE ::= {
|   WITH SYNTAX OCTET STRING
|   EQUALITY MATCHING RULE octetStringMatch
|   ID { at 2 } }

-- Object Class Definitions

-- The following object class is defined in this document:

--      h235Identity

h235Identity OBJECT-CLASS ::= {
|   SUBCLASS OF { top }
|   MAY CONTAIN { h235IdentityEndpointID | h235IdentityPassword |
|     userCertificate | cACertificate |
|     authorityRevocationList | certificateRevocationList |
|     crossCertificatePair }
|   ID { oc 1 } }

h235-Id  OBJECT IDENTIFIER ::= { h350-cr h235-Id(4) }
at      OBJECT IDENTIFIER ::= { h235-Id at(1) }
oc      OBJECT IDENTIFIER ::= { h235-Id oc(2) }

END -- end of ASN.1

```

[End Correction]

7.4 X.500 ASN.1 Definitions for H.350.3

Description:	This addition includes the ASN.1 definitions of data structures necessary to represent H.350.3 elements in ASN.1. This creates a section 8 in H.350.3
---------------------	---

[Begin Correction]

8 h320IdentityASN1.asn

```
H320Identity { itu-t(0) recommendation(0) h(8) 350 1 cr(1) h320Identity(5)
module(4) }
DEFINITIONS ::=

BEGIN

-- h320Identity Object Schema

-- Schema for representing h320Identity Object in an LDAP Directory

-- Abstract

-- This document defines the schema for representing h320Identity
-- object in an LDAP directory [LDAPv3]. It defines schema elements
-- to represent an h320Identity object [h320Identity].

--           .1 = Communication related work
--           .1.5 = h320Identity
--           .1.5.1 = attributes
--           .1.5.2 = objectclass
--           .1.5.3 = syntax

IMPORTS

-- from ITU-T Rec. H.350

h350-cr, caseIgnoreIA5Match
    FROM CommURI { itu-t(0) recommendation(0) h(8) 350 1 cr(1) commURI(1)
module(4) }

-- from ITU-T Rec. X.501 | ISO/IEC 9594-2

ATTRIBUTE, OBJECT-CLASS, top
    FROM InformationFramework {joint-iso-itu-t ds(5) module(1)
informationFramework(1) 4}

-- from ITU-T Rec. X.520 | ISO/IEC 9594-6

DirectoryString {}, caseIgnoreMatch, caseIgnoreSubstringsMatch
    FROM SelectedAttributeTypes {joint-iso-itu-t ds(5) module(1)
selectedAttributeTypes(5) 4} ;

-- Attribute Type Definitions

-- The following attribute types are defined in this document:

--     h320IdentityCC
--     h320IdentityNDC
--     h320IdentitySN
--     h320IdentityServiceLevel
--     h320IdentityExtension

h320IdentityCC ATTRIBUTE ::= {
```

```

WITH SYNTAX IA5String (SIZE (1..3))
EQUALITY MATCHING RULE caseIgnoreIA5Match
ID { at 1 } }

h320IdentityNDC ATTRIBUTE ::= {
  WITH SYNTAX IA5String (SIZE (1..15))
  EQUALITY MATCHING RULE caseIgnoreIA5Match
  ID { at 4 } }

h320IdentitySN ATTRIBUTE ::= {
  WITH SYNTAX IA5String (SIZE (1..15))
  EQUALITY MATCHING RULE caseIgnoreIA5Match
  ID { at 5 } }

h320IdentityServiceLevel ATTRIBUTE ::= {
  | WITH SYNTAX DirectoryString {32768256}
  EQUALITY MATCHING RULE caseIgnoreMatch
  SUBSTRINGS MATCHING RULE caseIgnoreSubstringsMatch
  ID { at 2 } }

h320IdentityExtension ATTRIBUTE ::= {
  WITH SYNTAX DirectoryString {120}
  EQUALITY MATCHING RULE caseIgnoreMatch
  SUBSTRINGS MATCHING RULE caseIgnoreSubstringsMatch
  ID { at 3 } }

-- Object Class Definitions

-- The following object class is defined in this document:

-- h320Identity

-- h320Identity

h320Identity OBJECT-CLASS ::= {
  SUBCLASS OF { top }
  MAY CONTAIN { h320IdentityCC |
    h320IdentityNDC |
    h320IdentitySN |
    h320IdentityServiceLevel |
    h320IdentityExtension }
  ID { oc 1 } }

h320-Id  OBJECT IDENTIFIER ::= { h350-cr h320-Id(5) }
at      OBJECT IDENTIFIER ::= { h320-Id at(1) }
oc      OBJECT IDENTIFIER ::= { h320-Id oc(2) }

END -- end of ASN.1

```

[End Correction]

7.5 X.500 ASN.1 Definitions for H.350.4

Description:	This addition includes the ASN.1 definitions of data structures necessary to represent H.350.4 elements in ASN.1. This creates a section 8 in H.350.4.
---------------------	--

[Begin Correction]

8 sipIdentityASN1.asn

```
SipIdentity { itu-t(0) recommendation(0) h(8) 350 1 cr(1) sipIdentity(6)
module(4) }
DEFINITIONS ::=

BEGIN

-- SIPIdentity Object Schema

-- Schema for representing SIPIdentity Object in an LDAP Directory

-- Abstract

-- This document defines the schema for representing SIPIdentity
-- object in an LDAP directory [LDAPv3]. It defines schema elements
-- to represent an SIPIdentity object [SIPIdentity].

--          .1 = Communication related work
--          .1.6 = SIPIdentity
--          .1.6.1 = attributes
--          .1.6.2 = objectclass
--          .1.6.3 = syntax

IMPORTS

-- from ITU-T Rec. H.350

h350-cr, caseIgnoreIA5Match, caseIgnoreIA5SubstringsMatch, userSMIMECertificate
    FROM CommURI { itu-t(0) recommendation(0) h(8) 350 1 cr(1) commURI(1)
module(4) }

-- from ITU-T Rec. X.501 | ISO/IEC 9594-2

ATTRIBUTE, OBJECT-CLASS, top
    FROM InformationFramework {joint-iso-itu-t ds(5) module(1)
informationFramework(1) 4}

-- from ITU-T Rec. X.520 | ISO/IEC 9594-6

DirectoryString {}, caseExactMatch, caseExactSubstringsMatch, caseIgnoreMatch,
caseIgnoreSubstringsMatch, octetStringMatch
    FROM SelectedAttributeTypes {joint-iso-itu-t ds(5) module(1)
selectedAttributeTypes(5) 4} ;

-- Attribute Type Definitions

-- The following attribute types are defined in this document:

--      SIPIdentitySIPURI
--      SIPIdentityRegistrarAddress
--      SIPIdentityProxyAddress
--      SIPIdentityAddress
--      SIPIdentityPassword
--      SIPIdentityUserName
--      SIPIdentityServiceLevel

| SIPIdentitySIPURI ATTRIBUTE ::= {
|     WITH SYNTAX DirectoryString {32768256}
|     EQUALITY MATCHING RULE caseExactMatch
|     SUBSTRINGS MATCHING RULE caseExactSubstringsMatch
|     ID { at 1 } }

SIPIdentityRegistrarAddress ATTRIBUTE ::= {
    WITH SYNTAX IA5String
    EQUALITY MATCHING RULE caseIgnoreIA5Match
    ID { at 2 } }
```

```

sIPIdentityProxyAddress ATTRIBUTE ::= {
    WITH SYNTAX IA5String
    EQUALITY MATCHING RULE caseIgnoreIA5Match
    ID { at 3 } }

sIPIdentityAddress ATTRIBUTE ::= {
    WITH SYNTAX IA5String
    EQUALITY MATCHING RULE caseIgnoreIA5Match
    ID { at 4 } }

sIPIdentityPassword ATTRIBUTE ::= {
    WITH SYNTAX OCTET STRING
    EQUALITY MATCHING RULE octetStringMatch
    ID { at 5 } }

sIPIdentityUserName ATTRIBUTE ::= {
    WITH SYNTAX DirectoryString {32768256}
    EQUALITY MATCHING RULE caseIgnoreMatch
    SUBSTRINGS MATCHING RULE caseIgnoreSubstringsMatch
    ID { at 6 } }

sIPIdentityServiceLevel ATTRIBUTE ::= {
    WITH SYNTAX IA5String
    EQUALITY MATCHING RULE caseIgnoreIA5Match
    SUBSTRINGS MATCHING RULE caseIgnoreIA5SubstringsMatch
    ID { at 7 } }

-- Object Class Definitions

-- The following object class is defined in this document:

-- SIPIdentity

-- SIPIdentity

sIPIdentity OBJECT-CLASS ::= {
    SUBCLASS OF { top }
    MAY CONTAIN { sIPIdentitySIPURI |
        sIPIdentityRegistrarAddress |
        sIPIdentityProxyAddress |
        sIPIdentityAddress |
        sIPIdentityPassword |
        sIPIdentityUserName |
        sIPIdentityServiceLevel |
        userSMIMECertificate }
    ID { oc 1 } }

sip-Id   OBJECT IDENTIFIER ::= { h350-cr sip-Id(6) }
at      OBJECT IDENTIFIER ::= { sip-Id at(1) }
oc      OBJECT IDENTIFIER ::= { sip-Id oc(2) }

END -- end of ASN.1

```

[End Correction]

7.6 X.500 ASN.1 Definitions for H.350.5

Description:	This addition includes the ASN.1 definitions of data structures necessary to
---------------------	--

represent H.350.5 elements in ASN.1. This creates a section 8 in H.350.5.

[Begin Correction]

8 genericIdentityASN1.asn

```
GenericIdentity { itu-t(0) recommendation(0) h(8) 350 1 cr(1)
genericIdentity(7) module(4) }
DEFINITIONS ::=

BEGIN

-- genericIdentity Object Schema

-- Schema for representing a genericIdentity Protocol Object in an LDAP
Directory

-- Abstract

-- This document defines the schema for representing genericIdentity
-- object in an LDAP directory [LDAPv3]. It defines schema elements
-- to represent an genericIdentity object [genericIdentity].

--          .1 = Communication related work
--          .1.7 = genericIdentity
--          .1.7.1 = attributes
--          .1.7.2 = objectclass
--          .1.7.3 = syntax

IMPORTS

-- from ITU-T Rec. H.350

h350-cr
    FROM CommURI { itu-t(0) recommendation(0) h(8) 350 1 cr(1) commURI(1)
module(4) }

-- from ITU-T Rec. X.501 | ISO/IEC 9594-2

ATTRIBUTE, OBJECT-CLASS, top
    FROM InformationFramework {joint-iso-itu-t ds(5) module(1)
informationFramework(1) 4}

-- from ITU-T Rec. X.520 | ISO/IEC 9594-6

DirectoryString {}, caseIgnoreMatch, caseIgnoreSubstringsMatch
    FROM SelectedAttributeTypes {joint-iso-itu-t ds(5) module(1)
selectedAttributeTypes(5) 4} ;

-- Attribute Type Definitions

genericIdentityProtocolIdentifier ATTRIBUTE ::= {
|   WITH SYNTAX DirectoryString {32768-256}
|   EQUALITY MATCHING RULE caseIgnoreMatch
|   SUBSTRINGS MATCHING RULE caseIgnoreSubstringsMatch
|   ID { at 1 } }

genericIdentityMessage ATTRIBUTE ::= {
|   WITH SYNTAX DirectoryString {32768-256}
|   EQUALITY MATCHING RULE caseIgnoreMatch
|   SUBSTRINGS MATCHING RULE caseIgnoreSubstringsMatch
|   ID { at 2 } }

-- Object Class Definitions
```

```

-- The following object class is defined in this document:
-- genericIdentity

-- genericIdentity

genericIdentity OBJECT-CLASS ::= {
    SUBCLASS OF { top }
    MAY CONTAIN { genericIdentityProtocolIdentifier | genericIdentityMessage }
    ID { oc 1 } }

gi      OBJECT IDENTIFIER ::= { h350-cr gi(7) }
at      OBJECT IDENTIFIER ::= { gi at(1) }
oc      OBJECT IDENTIFIER ::= { gi oc(2) }

-- end of ASN.1
END

```

[End Correction]

8. X.500 ASN.1 Definitions for H.350.6

Description:	This correction changes the length of DirectoryString in ASN.1 representation contained in Section 8 from 256 to 32768.
---------------------	---

[Begin Correction]

```

callPreferenceURI ATTRIBUTE ::= {
    WITH SYNTAX DirectoryString {25632768}
    EQUALITY MATCHING RULE caseExactMatch
    SUBSTRINGS MATCHING RULE caseExactSubstringsMatch
    ID { at 1 } }

```

[End Correction]

Annex: H.350 Series Recommendation Series Defect Report Form

DATE:	
CONTACT INFORMATION	
NAME:	
COMPANY:	
ADDRESS:	
TEL:	
FAX:	
EMAIL:	
AFFECTED RECOMMENDATIONS:	
DESCRIPTION OF PROBLEM:	
SUGGESTIONS FOR RESOLUTION:	

NOTE - Attach additional pages if more space is required than is provided above.