

5.0 U. S. Government Schema

This section contains schema information defining the object classes, attributes, structure rules, name forms and content rules as specified for the Government X.500 Electronic Directory.

5.1 Object Classes

This section lists all of the object classes used directly by the Government X.500 Electronic Directory. In addition, it lists all inherited object classes and object classes specific to the Government X.500 Electronic Directory Schema. Within the Government X.500 Electronic Directory there are two types of attributes that comprise an object class:

- **Mandatory** - Attributes that must be implemented in order for the directory entry to be generated and exist within the directory.
- **Optional** - Attributes that may be implemented to add value to the directory entry but are not required for it to exist.

The following table contains all of the object classes that are mandatory to implement in an organization's schema to ensure effective communication and interoperation with the Government X.500 Electronic Directory. It also contains the objects class source definition, and their implementation categorization.

Object Class	Source	Implementation	
		Mandatory	Optional
Alias	X.521	x	
Application Entity	X.521	x	
Application Process	X.521	x	
Country	X.521	x	
Device	X.521	x	
Directory System Agent	X.521	x	
Group Of Names	X.521	x	

Object Class	Source	Implementation	
		Mandatory	Optional
Locality	X.521	x	
Organization	X.521	x	
Organizational Unit	X.521	x	
Organizational Person	X.521	x	
Organizational Role	X.521	x	
Document	RFC 1274	x	
Document Series	RFC 1274	x	

The remainder of this section defines the object classes identified above. Each object class contains the following information:

- Type - Abstract, structural, or auxiliary
- Object Class - Mandatory or optional to implement
- Text describing the object class and what it is used for
- Attributes - Mandatory or optional to implement
- Naming Rules - Defines the attributes used to name the directory entry
- Structure Rules - Defines superior/subordinate object classes
- Content Rules - Identifies any special content rules specific to the Government X.500 Electronic Directory.

alias**Type** Structural**Implementation** Mandatory**Description**

Used as the basis of schema definitions for specific user-defined alias object classes. Directory entries cannot be created using the `alias` object class. An alias entry can only be created using a subclass of the `alias` class. Each of the subclasses of `alias` permits the use of an appropriate naming attribute so that aliases can be created that have names similar to those of other classes.

Mandatory Attributes`aliasedObjectName`**Optional Attributes**`none`**Naming Rules**

Entries cannot be created directly from the `alias` class itself.

Structure Rules

There are no structure rules for this object class. Each subclass of the `alias` class specifies a structure rule.

Content Rules`aliasedObjectName`

applicationEntity

Type Structural

Implementation Mandatory

Description

An application entity is an entity within an OSI network that performs some task for an application process, e.g., routing messages, locating and returning requested information. An application entity could be an X.400 Message Transfer Agent.

Mandatory Attributes

commonName

presentationAddress

Optional Attributes

description

localityName

organizationName

organizationalUnitName

seeAlso

supportedApplicationContext

Naming Rules

The commonName attribute must be used for naming.

Structure Rules

applicationEntity entries must have an immediately superior entry of the object class applicationProcess.

applicationProcess

Type Structural
Implementation Mandatory

Description

The applicationProcess provides a mechanism for documenting information about an element within an open system that performs the information processing for a particular application, as defined in the CCITT X.200 Series of Recommendations. The applicationProcess object class can be used to support Configuration Management.

Mandatory Attributes

commonName

Optional Attributes

description
localityName
organizationalUnitName
seeAlso

Naming Rules

The commonName attribute must be used for naming.

Structure Rules

A directory entry of the object class applicationProcess must have an immediately superior entry of one of the object classes:

organization
organizationalUnit
locality

country

Type Structural
Implementation Mandatory

Description

This structural object class is used to define entries in the Global DIT that represent countries. For example `c=US`. A `country` entry can only be created by Directory Administration Authority for that specific country.

Mandatory Attributes

`countryName`

Optional Attributes

`description`
`searchGuide`

Naming Rules

Attribute `countryName` must be used for naming.

Structure Rules

A `country` entry must immediately beneath the logical root of the DIT, it cannot be subordinate to an entry of any other class.

device

Type Structural

Implementation Mandatory

Description

The `device` object class can be used to document hardware devices, such as printers, computers, and other peripherals. The `device` object class can be used as an inventory tracking tool.

Mandatory Attributes

`commonName`

Optional Attributes

`description`

`localityName`

`organizationName`

`organizationalUnitName`

`owner`

`seeAlso`

`serialNumber`

Naming Rules

The `commonName` attribute must be used for naming.

Structure Rules

`device` entries must have an immediately superior entry of one of the following object classes:

`organization`

`organizationalUnit`

`locality`

document**Type** Structural**Implementation** Mandatory**Description**

The `document` object class provides a resource utility for storing and maintaining bibliographic reference information. The `document` object class will be used to identify source locations for accessing and retrieving Green and Yellow Pages data for a specific document, book, report, etc.

Mandatory Attributes`documentIdentifier`**Optional Attributes**`commonName`
`description`
`documentAuthor`
`documentLocation`
`documentPublisher`
`documentTitle`
`documentVersion`
`localityName`
`organizationName`
`organizationalUnitName`
`seeAlso`**Naming Rules**

The `commonName` attribute must be used for naming.

Structure Rules

`document` entries must have an immediately superior entry of the following object class:

`documentSeries`**Content Rules**`audio`
`commonName`
`description`
`documentAuthor`
`documentIdentifier`



documentLocation
documentPublisher
documentTitle
documentVersion
information
keyWord
lastModifiedBy
lastModifiedTime
localityName
manager
organizationName
organizationalUnitName
photo
seeAlso
uniqueIdentifier

documentSeries**Type** Structural**Implementation** Mandatory**Description**

The `documentSeries` object class provides a resource utility for storing and maintaining bibliographic categorization information. The `documentSeries` object class can be used to identify topics under which documents are located and referenced.

Mandatory Attributes`commonName`**Optional Attributes**`description`
`localityName`
`organizationName`
`organizationalUnitName`
`seeAlso`
`telephoneNumber`**Naming Rules**

The `commonName` attribute must be used for naming.

Structure Rules

`device` entries must have an immediately superior entry of one of the following object classes:

`organization`
`organizationalUnit`
`locality`

Directory System Agent

Type Structural

Implementation Mandatory

Description

This object class is used to define entries in the DIT that represent Directory System Agents, as defined in ITU-T Recommendation X.501. This object class is a subclass of `applicationEntity` as well as `top`.

Mandatory Attributes

`commonName`
`description`
`organizationName`
`organizationalUnitName`
`presentationAddress`
`supportedApplicationContext`

Optional Attributes

`knowledgeInformation`

Naming Rules

The `commonName` attribute must be used for naming.

Structure Rules

A directory entry of the object class `dSA` must have an immediately superior entry of one of the following object classes:

`country`
`locality`
`organization`
`organizationalUnit`

groupOfNames**Type** Structural**Implementation** Mandatory**Description**

The `groupOfNames` object class provides a mechanism for storing an unordered set of fully distinguished names of directory entries. Each distinguished name can represent entries for individuals and/or other groups. The `groupOfNames` object class will be used to support the Affinity Group concept of grouping individuals and organizations with common interests, e.g., members of working groups, committees, distribution lists, individuals with CPR training and certifications.

Mandatory Attributes`commonName`
`UniqueMember`**Optional Attributes**`businessCategory`
`description`
`organizationName`
`organizationalUnitName`
`owner`
`seeAlso`**Naming Rules**

The `commonName` attribute must be used for naming.

Structure Rules

A directory entry of the object class `groupOfNames` must have an immediately superior entry of one of the following object classes:

`locality`
`organization`
`organizationalUnit`

locality**Type** Structural**Implementation** Mandatory**Description**

locality entries represent a geographical locality, such as a state, a province, a city, or a building. locality entries can be used to represent the geographical subdivisions of an organization.

Mandatory Attributes

object class

Optional Attributes

description
localityName
stateOrProvinceName
streetAddress
searchGuide
seeAlso

Naming Rules

The localityName attribute must be used for naming.

Structure Rules

A locality entry of the object class groupOfNames must have an immediately superior entry of one of the following object classes:

country
locality
organization
organizationalUnit

A locality entry is permitted immediately beneath the root of the directory information tree.

localityAlias

Type Structural

Implementation Optional

Description

The `localityAlias` object class is used to define alias entries that represent localities or regions.

Mandatory Attributes

object class
aliasedObjectName

Optional Attributes

localityName
stateOrProvinceName

Naming Rules

The `localityAlias` attribute must be used for naming.

Structure Rules

A locality entry of the object class `groupOfNames` must have an immediately superior entry of one of the following object classes:

country
locality
organization
organizationalUnit

A `localityAlias` entry is permitted immediately beneath the root of the directory information tree.

Content Rules

object class
aliasedObjectName
localityName
stateOrProvinceName

organization

Type Structural
Implementation Mandatory

Description

organization entries represent large scale organizations. In the context of the Government X.500 Electronic Directory the organization is equivalent to the entire Federal Government.

Mandatory Attributes

organizationName

Optional Attributes

businessCategory
description
Locale Attribute Set
Postal Attribute Set
seeAlso
searchGuide
Telecommunications Attribute Set
userPassword

Naming Rules

The organizationName attribute must be used for naming.

Structure Rules

A directory entry of the object class organization does not need to have a superior entry. However, if it does then the immediately superior entry must be of one of the following object classes:

country
locality

An organization entry is permitted immediately beneath the root of the directory information tree.

Content Rules

algorithmsSupported
alternateRecipients



auxiliaryVector
backpointers
businessCategory
description
destinationIndicator
facsimileTelephoneNumber
hoursOfOperation
informationRequestForms
internationaliSDNNumber
keyWord
localityName
mhsDeliverableContentLength
MHS Deliverable Content Types
mhsDeliverableEits
mhsMessageStore
mhsORAddresses
mhsPreferredDeliveryMethods
mosaicKeyManagementCertificate
mosaicKeyMandSigCertificate
mosaicUserSignatureCertificate
organizationChart
organizationUnitName
physicalDeliveryOfficeName
postOfficeBox
postalAddress
postalCode
preferredDeliveryMethod
primaryPOC
programList
registeredAddress
searchGuide
secondaryPOC
seeAlso
snsGuardGateway
stateOrProvinceName
streetAddress
telephoneNumber
teletexTerminalIdentifier
telexNumber
userpassword
x121Address

organizationalPerson**Type** Structural**Implementation** Mandatory**Description**

organizationalPerson entries represent people employed by, or associated with an organization. The organizationalPerson object class is a subclass of person. In the context of the Government X.500 Electronic Directory an organizationalPerson represents an individual employed by the government (Federal, State, Local, Tribal).

Mandatory Attributes

commonName
surname

Optional Attributes

Local Attribute Set
Postal Attribute Set
Telecommunications Attribute Set
title
Organizational Unit Name

Naming Rules

The commonName attribute must be used for naming.

Structure Rules

A directory entry of the object class organizationalPerson must have an immediately superior entry of one of the following object classes:

locality
organization
organizationalUnit

Content Rules

algorithmsSupported
aliaspointer
alternateRecipient
aprUKMs
augUKMs
auxiliaryVector
backpointers

businessCategory
commonName
decUKMs
description
destinationIndicator
effectiveDate
expirationDate
facsimileTelephoneNumber
februaryUserKeyManagementSignature
generationQualifier
givenName
initials
internationalISDNNumber
JanUKMs
JulUKMs
JunUKMs
keyWord
lastModifiedTime
listPointer
localityName
MarUKMs
MayUKMs
mhsDeliverableContentLength
mhsDeliverableEits
mhsMessageStore
mhsORAddresses
mhs-or-addresses-with-capabilities
mhsPreferredDeliveryMethods
mhsUndeliverableEits
mhsDeliverableContentTypes
minimize
mosaicKeyManagementCertificate
mosaicKeyManagementSigCertificate
mosaicUserSignatureCertificate
nameDifferentiator
nationality
novUKMs
octUKMs
organizationUnitName
physicalDeliveryOfficeName
postOfficeBox
postalAddress
postalCode
preferredDelivery
preferredDeliveryMethod
preferredMailAddress
registeredAddress
rfc822Mailbox
roomNumber
sdnsKeyManagementCertificate
sdnsKMandSigCertificate



sdnsUserSignatureCertificate
seeAlso
sepUKMs
snsGuardGateway
stateOrProvinceName
streetAddress
suiteAKeyManagementCertificate
suiteAKeyMandSigCertificate
suiteAUserSignatureCertificate
surname
telephoneNumber
teletexTerminalIdentifier
telexNumber
textEncodedORAddress
title
uniqueIdentifier
userCertificate
userPassword
x121Address

organizationPersonAlias

Type Structural

Implementation Optional

Description

organizationalPersonAlias entries are used to define alternative entries representing organizationalPersons.

Mandatory Attributes

commonName
aliasedObjectName

Optional Attributes

There are no optional attributes for this object class.

Naming Rules

The commonName attribute must be used for naming.

Structure Rules

A directory entry of the object class organizationlPersonAlias must have an immediately superior entry of one of the following object classes:

locality
organization
organizationalUnit

Content Rules

commonName
aliasedObjectName

organizationalRole

Type Structural
Implementation Mandatory

Description

`organizationalRole` entries represent a position or role within an organization. The `organizationalRole` directory entry contain the fully distinguished name of an individual or object in the directory. This value can be regularly updated to reflect personnel changes over time.

Mandatory Attributes

`commonName`

Optional Attributes

`Locale Attribute Set`
`organizationalUnitName`
`Postal Attribute Set`
`preferredDeliveryMethod`
`role Occupant`
`seeAlso`
`Telecommunications Attribute Set`

Naming Rules

The `commonName` attribute must be used for naming.

Structure Rules

A directory entry of the object class `organizationlRole` must have an immediately superior entry of one of the following object classes:

`organization`
`organizationalUnit`

Content Rules

`algorithmsSupported`
`algorithmsSupported`
`aliasPointer`
`alternateRecipients`
`aprUKMs`
`augUKMs`
`auxiliaryVector`
`backpointers`

commonName
decUKMs
description
destinationIndicator
effectiveDate
expirationDate
facsimileTelephoneNumber
febUKMs
internationaliSDNNNumber
janUKMs
julUKMs
JunUKMs
keyWord
listPointer
localityName
marchUKMs
MayUKMs
mhsDeliverableContentLength
mhsDeliverableEits
mhsMessageStore
mhsORAddresses
mhs-or-addresses-with-capabilities
mhsPreferredDeliveryMethods
mhsUndeliverableEits
mhsDeliverableContentTypes
minimize
mosaicKeyManagementCertificate
mosaicKeyManagementSigCertificate
mosaicUserSignatureCertificate
nationality
novUKMs
octUKMs
organizationUnitName
physicalDeliveryOfficeName
postOfficeBox
postalAddress
postalCode
preferredDelivery
preferredDeliveryMethod
registeredAddress
rfc822Mailbox
roleOccupant
sdnsKeyManagementCertificate
sdnsKmandSigCertificate
sdnsUserSignatureCertificate
seeAlso
sepUKMs
SnsGuardGateway
snsGuardGateway
stateOrProvinceName
streetAddress



suiteAKeyManagementCertificate
suiteAKeyMandSigCertificate
suiteAUserSignatureCertificate
telephoneNumber
teletexTerminalIdentifier
telexNumber
title
userPassword
x121Address

organizationalUnit

Type Structural
Implementation Mandatory

Description

organizationalUnit entries represent subdivisions of organizations, such as departments, offices or branches. In the context of the Government X.500 Electronic Directory the organizationalUnit represents departmental level and lower organizations beneath the o=U.S. Government entry of the Global DIT. Example organizationalUnits include Virginia Department of Transportation (VDOT), Housing and Urban Development (HUD), Fairfax City Library, etc.

Mandatory Attributes

organizationalUnitName

Optional Attributes

businessCategory
description
Locale Attribute Set
Postal Attribute Set
seeAlso
searchGuide
Telecommunications Attribute Set
userPassword

Naming Rules

The OrganizationalUnitName attribute must be used for naming.

Structure Rules

A directory entry of the object class organizationalUnit must have an immediately superior entry of one of the following object classes:

locality
organization
organizationalUnit

Content Rules

algorithmsSupported
alternateRecipients



auxiliaryVector
backpointers
businessCategory
description
destinationIndicator
facsimileTelephoneNumber
hoursOfOperation
informationRequestForms
internationaliSDNNumber
keyWord
localityName
mhsDeliverableContentLength
MHS Deliverable Content Types
mhsDeliverableEits
mhsMessageStore
mhsORAddresses
mhsPreferredDelivery Methods
mosaicKeyManagementCertificate
mosaicKeyMandSigCertificate
mosaicUserSignatureCertificate
organizationChart
organizationUnitName
physicalDeliveryOfficeName
postOfficeBox
postalAddress
postalCode
preferredDeliveryMethod
primaryPOC
programList
registeredAddress
searchGuide
secondaryPOC
seeAlso
snsGuardGateway
stateOrProvinceName
streetAddress
telephoneNumber
teletexTerminalIdentifier
telexNumber
userpassword
x121Address

organizationalUnitAlias

Type Structural

Implementation Optional

Description

organizationalUnitAlias entries are used to alternatively define organizationalUnit entries.

Mandatory Attributes

organizationalUnitName
aliasedObjectName

Optional Attributes

There are no optional attributes for this object class.

Naming Rules

The OrganizationalUnitName attribute must be used for naming.

Structure Rules

A directory entry of the object class organizationalUnitAlias must have an immediately superior entry of one of the following object classes:

locality
organization
organizationalUnit

Content Rules

organizationalUnitName
aliasedObjectName

5.2 U. S. Government Defined Object Classes

The following object classes are defined to support the U.S. Government information requirements.

The definition of a new URI auxiliary object class is shown below, taken from the Internet Draft “Definition of X.500 Attribute Types and an Object Class to Hold Uniform Resource Identifiers (URIs)”, 11 October 1995, by Mark Smith, University of Michigan. For more information, review the document by visiting the following home page:

<http://ds2.internic.net/internet-drafts/draft-ietf-asid-x500-url-02.txt>.

5.2.1 Labeled URI Object Class Definition

The `labeledURI` Object class is a subclass of `top` and may contain the `labeledURI` and `labeledURL` attributes. The intent is that this object class can be added to existing directory objects to allow for inclusion of URI values. This approach does not preclude including the `labeledURI` and `labeledURL` attribute types directly in other object classes as appropriate.

`labeledURIObject`

Description: object that contains the URI attribute types

OID: `umichObjectClass.15` (1.3.6.1.4.1.250.3.15)

SubclassOf: `top`

MustContain:

MayContain: `labeledURI`, `labeledURL`

5.3 U. S. Government Directory Attributes

This section lists all of the attributes defined directly by the Government X.500 Electronic Directory. When viewing attributes in the Government X.500 Directory, it is necessary to discuss them in the context of implementation within the schema, and in the context of population of the attribute values. Implementation within the schema means that the attribute is either mandatory or optional to be present in the

schema for Government X.500 DSAs. Population means that of the attributes that are mandatory to be present in the schema, a subset of those attributes will be mandatory to contain a value.

- **Implementation Mandatory** - Attributes that must be implemented in order for the directory entry to be generated and exist within the directory.
- **Implementation Optional** - Attributes that may be implemented to add value to the directory entry but are not required for it to exist.
- **Population Mandatory** - Of the attributes that are mandatory to implement, the designated attributes must be populated with valid data according to their schema definition.
- **Population Optional** - Of the attributes that are mandatory to implement, attributes designated as optional may be populated with data at the discretion of the agency. Views of these attributes will not be consistent throughout the Government.

In most cases, attributes that are designated as mandatory to implement and populate are required in order to support Government white, blue, and yellow pages views in a consistent manner.

The table in Appendix D contains all of the attributes that are mandatory to implement and populate in an organization's schema to ensure effective communication and interoperability with the Government X.500 Electronic Directory. In addition, each attribute that is mandatory to implement and mandatory to populate also contains guidance on the definition of access control information. Two permission categories are identified; read, for read only, and modify, which includes adding, deleting, and modifying attributes. The Government Directory Security Architecture, section 4.4.3, describes security groupings that may be used in order to simplify restricting access to directory information. Each attribute is also listed with its source schema. For further information on any attribute, refer to the schema noted as its source.

5.3.1 Attributes Used by the U.S. Government Schema

Appendix D defines attributes required by the U.S. Government schema beyond those defined in X.402(1988) and X.520(1993), and their source. The following schemas are sources for the attributes listed in Appendix D.

COSINE - Attributes imported from the Organization for Cooperation for OSI Networking in Europe (COSINE)

RFC 1274 - Attributes imported from the Internet community via RFC 1274, "The COSINE and Internet X.500 Schema."

RFC 1148 - Attributes imported from the Internet community via RFC 1148, "Mapping Between X.400 (1988)/ISO 10021 and RFC 822."

NADF - Attributes imported from the North American Directory Forum, a group of North American service providers, vendors, and large organizations concerned with X.500 implementation in North America.

DMS - Attributes imported from the Defense Message System (DMS) Schema, August, 1995.

SDN.702 - Attributes imported from the Secure Data Network (SDN) Schema in order to support U.S. Government usage of Message Security Protocol (MSP) technology where required, August 1995, Version 2.8.

5.3.2 U.S. Government Defined Attributes

The following attributes are defined to support the U.S. Government information requirements and are defined in Abstract Syntax Notation One (ANS.1) in Appendix F.

5.3.2.1 Key Word Attributes

The Key Word attributes, `keyWord` and `programList`, are used to describe commonly understood programs, services, documents and functions performed by the Government. The `programList` attribute may be used to provide information about, for example, the IRS which provides individual tax payer assistance, or the Justice Department which has programs addressing civil rights and equal employment opportunity (EEO). Those words, civil rights, EEO, and individual tax payer assistance may be values in the `programList` attribute. The `keyWord` attribute allows more broad information that is not necessarily tied to an agency program. Any word that may be used to describe an agency's business lines may be entered as a value in the `keyWord` attribute.

keyWord

Attribute Type: User

Attribute Syntax: Directory String

Attribute Value: Words designated as key descriptors of the organization's business.

Size: 64 characters

Single Value: False

Matching Rule: Case Ignore Substrings Match

OID: TBD¹

programList

Attribute Type: User

Attribute Syntax: Directory String

Attribute Value: Words designated as key descriptors of the organization's business.

Size: 64 characters

Single Value: False

Matching Rule: Case Ignore Substrings Match

OID: TBD²

¹ OID's are yet to be defined because they have not been formally registered.

² OID's are yet to be defined because they have not been formally registered.

5.3.2.2 Blue Pages Specific Attributes

Three attributes, Hours of Operation, Primary Point of Contact, and Secondary Point of Contact, are defined in the U.S. Government Schema in order to support display of Government services information to the public citizen.

The `hoursofOperation` attribute is used to display a range of hours that a citizen may obtain information from an individual in an organization. This attribute may be viewed as part of organization, and organization unit entries.

`hoursofOperation`

Attribute Type: User

Attribute Syntax: Directory String

Attribute Value: range of time (e.g. 9:00 am to 5:00 pm)

Size: 128 characters

Single Value: True

Matching Rule: N/A

OID: TBD³

The `primaryPOC` attribute returns the Directory Name of an individual designated as the primary point of contact to answer inquiries for the organization. The `secondaryPOC` attribute returns the Directory Name of an individual designated as the secondary point of contact to answer inquiries for the organization. This attribute may be viewed as part of organization, and organization unit entries. The `primaryPOC` and `secondaryPOC` attributes may also be displayed when the `seeAlso` attribute is queried.

`primaryPOC`

Attribute Type: user

Subtype of: distinguishedName attribute (X.520)

Attribute Syntax: Distinguished Name (DN)

Attribute Value: DN of the object filling this organizational role

Case Ignore String Syntax

Single Value: True

³ OID's are yet to be defined because they have not been formally registered.

Matching Rule: Distinguished Name Match

OID: TBD⁴

secondaryPOC

Attribute Type: user

Subtype of: distinguishedName attribute (X.520)

Attribute Syntax: Distinguished Name

Attribute Value: DN of the object filling this organizational role

Case Ignore String Syntax

Single Value: False

Matching Rule: Distinguished Name Match

OID: TBD⁵

5.3.2.3 World Wide Web Link Attributes

The attributes `organizationChart` and `informationRequestForm` are used to point to information that is contained at a location on the World Wide Web (WWW). Uniform Resource Locators (URL) are used to identify the location of information within the WWW community. The WWW link attributes contain the URL for the information desired (e.g., organizational chart, information request form). In the future, additional information may be stored as other types of Uniform Resource Identifiers (URIs). URIs commonly in use on the WWW today include the Hypertext Markup Language (HTTP) and the File Transfer Protocol (FTP).

organizationalChart

Attribute Type: user

Attribute Syntax: Labeled URL

Attribute Value: URL for the information request form stored on the WWW

⁴ OID's are yet to be defined because they have not been formally registered.

⁵ OID's are yet to be defined because they have not been formally registered.

informationRequestForm

Attribute Type: user

Attribute Syntax: Labeled URL

Attribute Value: URL for the information request form stored on the WWW

The definition of two new URL attribute types are shown below, taken from the Internet Draft "Definition of X.500 Attribute Types and an Object Class to Hold Uniform Resource Identifiers (URIs)", 11 October 1995, by Mark Smith, University of Michigan. For more information, review the document by visiting the following home page:

<http://ds2.internic.net/internet-drafts/draft-ietf-asid-x500-url-02.txt>.

5.3.2.3.1 Labeled URL Attribute Type

The `labeledURL` attribute type has the `caseExactString` syntax (since URLs are case-sensitive) and it is multivalued. Since space characters are not allowed to appear un-encoded in URLs, there is no ambiguity about where the label begins. Multiple `labeledURL` values will generally indicate different resources that are all related to the X.500 object, but may indicate different locations for the same resource.

The label is used to describe the resource to which the URL points, and is intended as a friendly name that a human may recognize. Note that in some cases it may be helpful to include in the label some indication of the kind and/or size of the resource referenced by the URL.

Note that the label may include any characters allowed by the `caseExactString` syntax, but that the use of non-IA5 (non-ASCII) characters is discouraged as not all directory clients may handle them in the same manner.

Some examples of valid `labeledURL` values (the first does not have a label):

- <ftp://ds.internic.net/rfc/rfc822.txt>
- <http://www.umich.edu/> University of Michigan Home Page
- <http://champagne.inria.fr/Unites/rennes.gif> Rennes [photo]

labeledURL

ShortName: None

Description: Uniform Resource Locator with optional label

OID: umichAttributeType.41 (1.3.6.1.4.1.250.1.41)

Syntax: caseExactString

SizeRestriction: None

SingleValued: False

5.3.2.4 Physical Location

The physical location of an organizational person in the U. S. Government will be designated using the `roomNumber` attribute. The `roomNumber` attribute is used from the COSINE and Internet schema. The Room Number attribute type may specify the room number, cube number, floor number, or any other meaningful number used to identify an object's physical location. The `commonName` attribute should be used for naming room objects.

roomNumber ATTRIBUTE

WITH ATTRIBUTE-SYNTAX

caseIgnoreStringSyntax

(SIZE (1 .. ub-room-number))

::= {pilotAttributeType 6}

5.3.2.5 MHS O/R Addresses With Capabilities Attribute Type

The MHS *OR-addresses with Capabilities* attribute type is defined in X.402 (1995). The description is repeated here because the standard is not yet published.

This complex attribute type is used to represent X.400 addresses and their associated properties. It allows for multiple addresses for an entry, each with different attributes.

```
mhsORAddressesWithCapabilities ATTRIBUTE ::= {  
    WITH SYNTAX      AddressCapabilities  
    ID                id-at-mhsORAddressesWithCapabilities }
```

The MHS OR-addresses with Capabilities attribute characterizes an attribute whose value identifies the delivery capability of each of a user's OR-addresses. When a message delivery agent (e.g., an MTA) selects an address, the first in the sequence which has the desired capabilities is chosen; when a human selects, the description may give guidance.

```

AddressCapabilities ::= SEQUENCE {
    description GeneralString OPTIONAL,
    address ORAddress,
    capability SET OF Capability }

Capability ::= SET {
    deliverable-content-types[0] SET OF ContentType OPTIONAL,
    deliverable-content-length [1] ContentLength OPTIONAL,
    deliverable-encoded-information-types [2] ExtendedEncodedInformationTypes OPTIONAL,
    undeliverable-encoded-information-types [3] ExtendedEncodedInformationTypes OPTIONAL,
    security-labels [4] SecurityContext OPTIONAL }

```

5.3.2.6 MHS Preferred Delivery Attribute Type

The MHS Preferred Delivery attribute type is used to determine the type of messaging system of a user; it has one of the values "AUTODIN", "SMTP" or "MHS". "MHS" signifies either standard X.400 (1984 or 1988) or DMS-compliant X.400.

```

preferredDelivery ATTRIBUTE ::= {
    WITH SYNTAX ENUMERATED {SMTP (0), AUTODIN (1),
    SINGLE VALUE MHS (2)}
    ID TRUE
    id-at-preferredDelivery }

```

5.3.3 Collective Attributes

The Government Electronic Directory will support and recommends the use of collective attributes. Collective attributes are attributes which are shared by a collection of entries. For example, a postal address may apply to all organizations and individuals in the same building. Rather than repeat the postal address in the

entries of everyone in the building, it can be stored in the directory only once with an indication of the entries that it applies to.

Collective attribute entries are entered in subentries of administration points in the DIT and are included in entries by specifying them in content rules. When an entry is queried, a collective attribute appears to the user like any other attribute. Organizations employing collective attributes must determine the most efficient use of them based on the design of their DIT and the most commonly modified attributes in their DIB.

The X.520 (1993) recommendation lists the following collective attributes, which are part of the U.S. Government Schema.

- Collective Locality Name
- Collective State or Province Name
- Collective Street Address
- Collective Organization Name
- Collective Organizational Unit Name
- Collective Postal Address
- Collective Postal Code
- Collective Post Office Box
- Collective Physical Delivery Office Name
- Collective Telephone Number
- Collective Telex Number
- Collective Teletex Terminal Identifier
- Collective Facsimile Telephone Number
- Collective International ISDN Number

5.4 Government X.500 Directory Support for Affinity Groups

The ITU-T X.500 Series of recommendations provide a framework in which membership within a group can be documented. The X.521 Recommendation, Selected Object Classes, specifies the **group of names** object class which is “used to define entries representing an unordered set of names which represent individual objects or other groups of names.” In other words, the object class

group of names contains information which identifies the membership of an affinity group. The affinity group may consist of individuals and or other lists of individuals. The **group of names** object class is defined as comprising the following attributes as defined in the X.520.

business category (Mandatory) - Contains terms that identify the business, technical, special interests, and functions of the affinity group, e.g., computing, child care, directory services, law and order, sports medicine.

common name (Mandatory) - The unique name by which the affinity group is commonly known

description (Optional) - A free text description of the affinity group. It could contain the charter of the affinity group, its mission, and functions.

organization name (Optional) - Organization name to which the affinity group belongs.

organizational unit name (Optional) - Organizational unit name to which the affinity group belongs.

owner (Mandatory) - The distinguished name of the party responsible for maintaining the affinity group.

see also (Optional) - Distinguished names of directory entries which contain information related to the affinity group, e.g., organizations, distribution lists, other affinity groups, and business categories.

unique member (Mandatory) - A list of distinguished names identifying each member of the affinity group. A distinguished name points to a specific directory entry. A member can be an individual or another affinity group.

As depicted in Exhibit 5-1 below, the **group of names** object class can be specified at each level of the Directory Information Tree (DIT). This means that affinity groups may be generated at each level of the directory hierarchy. Exhibit 5-2 provides an example of affinity groups within the Federal Government DIT.

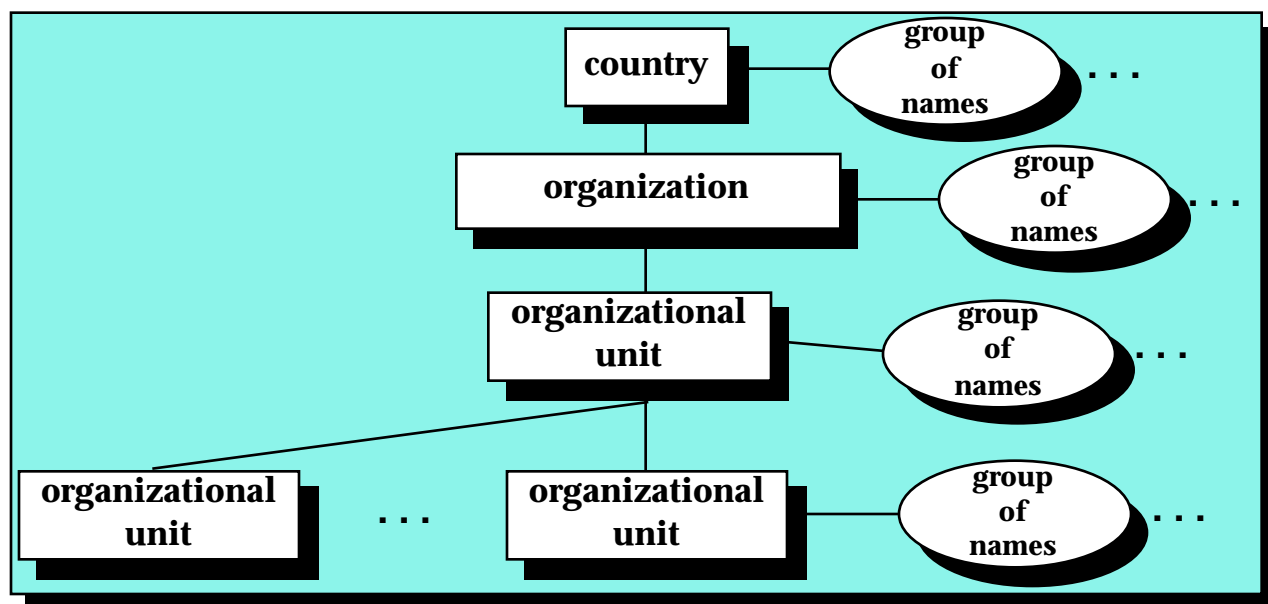


Exhibit 5-1

Directory Information Tree With group of names Objects

Exhibit 5-2

Example DIT with Affinity Groups

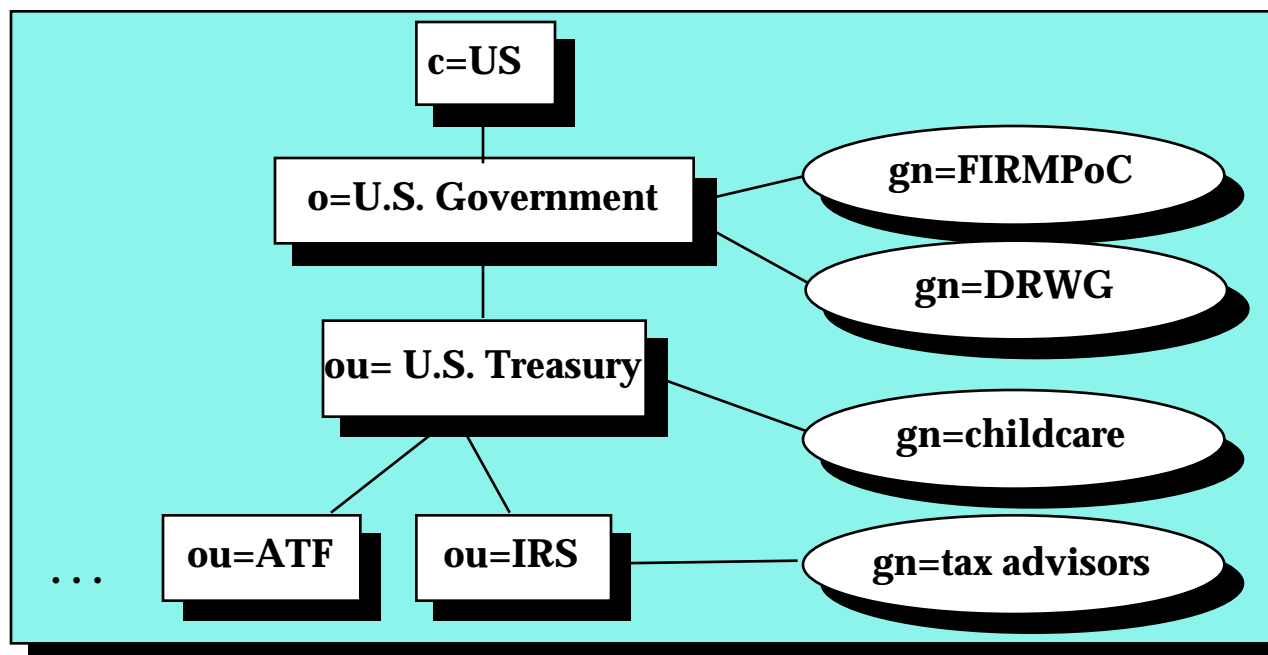


Table 5-1 provides an example of data stored in the DRWG affinity group that is registered at the o=U.S. Government level, as depicted in Exhibit 5-1. Table 5-2 provides an example of data stored in the “childcare” affinity group registered under the U.S. Treasury, as depicted in Exhibit 5-2. In this case the affinity group “childcare” has been set up to enable parents requiring daycare to communicate.

Attribute	Data
common name	Directory Registration Working Group
member	c=us,o=us govt,ou=doe,....cn=hack,ron c=us,o=us govt,ou=dod,....cn=hicks, cindy c=us,o=us govt,ou=gsa,....cn=finley, jack
description	Inter-agency working group to
organization name	U.S. Government
organizational unit name	
owner	c=us,o=us govt,ou=doe,....cn=hack,ron
see also	FIRMPoC, ISP, EM-PMO,
business category	directory services, naming, registration,

Table 5-1

Example Directory Entry for Directory Registration Working Group Affinity Group

Attribute	Data
common name	childcare
member	c=us,o=us govt,ou=treasury,....cn=brown, r c=us,o=us govt,ou=treasury,....cn=smith, c
description	Persons requiring daycare services,
organization name	U.S. Government
organizational unit name	ou=U.S. Treasury
owner	c=us,o=us govt,ou=treasury,....cn=bean, b
see also	
business category	childcare, daycare, nursery,

Table 5-2

Example Directory Entry for “childcare” Affinity Group



Members of affinity groups may also store information relevant to the affinity groups to which they are members. The **business category** attribute of the **organizational person** object class may be used to store the **common name** of all the affinity groups to which an individual belongs. For example, the individual Bill Brown may belong to the affinity group DRWG. He will have DRWG entered into the **business category** attribute of his directory entry.

Maintaining affinity groups within an X.500 Directory will require strict administrative controls and access control techniques. To generate an affinity group within an organization the requesting organization will be required to register the name of the affinity group. Once the affinity group's name is registered, the owning organization or individual may enter the affinity group information.