

Attribute Type Definitions

Overview	3-4
Reading the Attribute Type Definitions	3-4
Syntax	3-4
Constraints	3-4
Used In	3-5
Individual Attribute Type Definitions	3-6
Account Balance	3-7
ACL	3-7
Aliased Object Name	3-7
Allow Unlimited Credit	3-8
Authority Revocation	3-8
Back Link	3-8
Bindery Object Restriction	3-9
Bindery Property	3-9
Bindery Type	3-9
C (Country Name)	3-10
CA Private Key	3-10
CA Public Key	3-11
Cartridge	3-11
Certificate Revocation	3-11
Certificate Validity Interval	3-12
CN (Common Name)	3-12
Convergence	3-13
Cross Certificate Pair	3-13
Default Queue	3-14
Description	3-14
Detect Intruder	3-15
Device	3-15
DS Revision	3-15
EMail Address	3-15
Equivalent To Me	3-16
External Name	3-17
External Synchronizer	3-17
Facsimile Telephone Number	3-17
Full Name	3-18
Generational Qualifier	3-18
GID (Group ID)	3-18
Given Name	3-19
Group Membership	3-19
High Convergence Sync Interval	3-19
Higher Privileges	3-20
Home Directory	3-20

Host Device	3-21
Host Resource Name	3-21
Host Server	3-21
Inherited ACL	3-22
Initials	3-22
Intruder Attempt Reset Interval	3-22
Intruder Lockout Reset Interval	3-23
L (Locality Name)	3-23
Language	3-24
Last Login Time	3-24
Last Referenced Time	3-24
Locked By Intruder	3-24
Lockout After Detection	3-25
Login Allowed Time Map	3-25
Login Disabled	3-26
Login Expiration Time	3-26
Login Grace Limit	3-26
Login Grace Remaining	3-27
Login Intruder Address	3-27
Login Intruder Attempts	3-27
Login Intruder Limit	3-27
Login Intruder Reset Time	3-28
Login Maximum Simultaneous	3-28
Login Script	3-28
Login Time	3-29
Low Convergence Reset Time	3-29
Low Convergence Sync Interval	3-30
Mailbox ID	3-30
Mailbox Location	3-30
Member	3-31
Memory	3-31
Message Routing Group	3-31
Message Server	3-32
Messaging Database Location	3-32
Messaging Server	3-32
Messaging Server Type	3-33
Minimum Account Balance	3-33
Network Address	3-33
Network Address Restriction	3-34
NNS Domain	3-34
Notify	3-34
O (Organization Name)	3-35
Obituary	3-35
Object Class	3-36
Operator	3-36
OU (Organizational Unit Name)	3-37
Owner	3-37
Page Description Language	3-38
Partition Control	3-38
Partition Creation Time	3-38
Partition Status	3-39
Password Allow Change	3-39
Password Expiration Interval	3-39
Password Expiration Time	3-40

Password Minimum Length	3-40
Password Required	3-40
Password Unique Required	3-40
Passwords Used	3-41
Path	3-41
Permanent Config Parm	3-41
Physical Delivery Office Name	3-42
Postal Address	3-42
Postal Code	3-43
Postal Office Box	3-43
Postmaster	3-44
Print Job Configuration	3-44
Print Server	3-44
Printer	3-45
Printer Configuration	3-45
Printer Control	3-45
Private Key	3-45
Profile	3-46
Profile Membership	3-46
Public Key	3-47
Queue	3-47
Queue Directory	3-47
Received Up To	3-48
Reference	3-48
Replica	3-48
Replica Up To	3-49
Resource	3-49
Revision	3-49
Role Occupant	3-50
S (State or Province Name)	3-50
SA (Street Address)	3-50
SAP Name	3-51
Security Equals	3-51
Security Flags	3-52
See Also	3-52
Serial Number	3-53
Server	3-53
Server Holds	3-53
Status	3-54
Supported Connections	3-54
Supported Gateway	3-54
Supported Services	3-55
Supported Typefaces	3-55
Surname	3-56
Synchronized Up To	3-56
T (Tree Name)	3-56
Telephone Number	3-57
Title	3-57
Type Creator Map	3-57
Unknown	3-58
Unknown Base Class	3-58
User	3-58
UID (User ID)	3-59
Version	3-59
Volume	3-59

Overview

This chapter describes the “Attribute Type Definitions” used to create attributes of objects in the Directory tree. All attributes found in the Directory consist of an attribute type and an attribute value, which can be multi-valued. The attribute type identifies the nature of information the attribute stores. The attribute type definition identifies the attribute syntax to be used and specifies the constraints that are imposed on the syntax. These constraints are also known as attribute flags. Attributes are assigned to objects according to the object’s class definition.

The information in this chapter is presented in the most logical order to help you understand how attribute types for object classes are created and how they function in the Directory. You should read this chapter if you wish to learn the specific details about the attribute type definitions.

Reading the Attribute Type Definitions

For each attribute type definition listed in this chapter, the name of the attribute type appears in large type at the first of the attribute listing. A brief description of the attribute’s purpose is then given, followed by the attribute syntax, constraints, object classes used in, and remarks, if any. These remarks may include such things as further restrictions, how to use the attribute, and references to related documents.

Following is an explanation of the information used to define the attribute types.

Syntax

The name of the syntax for this attribute type is listed here. See the previous section “Attribute Syntax Definitions” for the syntax specification.

Constraints

Any restrictions affecting the attribute value are listed as attribute flags. The possible attribute flags, defined in NWDSDEFS.H for client use and NAMEBASE.H for internal or NLM use, are as follows:

DS_HIDDEN_ATTR. This constraint flags the attribute for NDS™ server use only. The client cannot set or modify this constraint flag and thus cannot see or modify the attribute.

DS_NONREMOVABLE_ATTR. This flag prevents the attribute from being removed from an object class definition. The client cannot set or modify this constraint flag and thus cannot modify the attribute. All base schema attribute type definitions have the nonremovable flag “set” (*On*).

DS_READ_ONLY_ATTR. The user cannot modify the attribute because a name server has created the attribute and maintains it.

DS_PUBLIC_READ. This constraint indicates that anyone can read the attribute without read privileges being assigned. You cannot use inheritance masks to prevent an object from reading attributes with this constraint.

DS_SERVER_READ. With this constraint “set” (*On*) for an attribute, server class objects can read the attribute even though the privilege to read has not been inherited or explicitly granted. You cannot use inheritance masks to restrict servers from reading attributes with this constraint. The client cannot set or modify this constraint flag and thus cannot modify the attribute.

DS_SF_PER_REPLICA. If this constraint is “set” (*On*) the information in the attribute is not synchronized on other replicas. The client cannot set or modify this constraint flag and thus cannot modify the attribute.

DS_SYNC_IMMEDIATE. When modifications are made to an attribute with this constraint flag “set” (*On*), other replicas containing the object are synchronized immediately rather than at the next synchronization interval. In NDS release 489 all attributes have this flag “set” (*On*) except *Back Link*, *Bindery Property*, *Bindery Object Restriction*, *Bindery Type*, *Login Time*, *Reference*, *Unknown*, *Unknown Base Class*, *Synchronize Up To*, *Last Login Time*, and *Last Referenced Time*.

DS_STRING_ATTR. These attributes are of string type. You can use attributes of this type as naming attributes.

DS_SIZED_ATTR. The attribute has an upper and lower bound. This can be the length for strings or the value for integers.

DS_SINGLE_VALUED_ATTR. The attribute has a single value only with no order implied.

DS_WRITE_MANAGED. Users must have managed rights on the object that contains this attribute before they can change the attribute’s value.

Used In

Listed here are the object class definitions that require or allow an attribute of this type when creating the object class. This list includes those object classes for which the attribute is either mandatory or optional. Those object classes for which the particular attribute is mandatory are denoted with an “(M)” following the object class name. The attributes are optional for all others object classes.

Table 3.1 lists those attributes that are mandatory for the object classes that use them.

Table 3.1
Object Classes for Mandatory Attributes

<i>Attribute</i>	<i>Object Class</i>
Aliased Object Name	Alias
Bindery Object Restriction	Bindery Object
Bindery Type	Bindery Object Bindery Queue
C (Country Name)	Country
CN (Common Name)	Bindery Object Bindery Queue Device External Entity Group List Organizational Person Organizational Role Person Profile Resource Server
Host Server	Directory Map Volume
Login Script	Profile
Object Class	Top
O (Organization Name)	Organization
OU (Organizational Unit Name)	Organizational Unit
Queue Directory	Queue
Surname	Person
Tree Name	Tree Root

For more information about the specific attributes an object class uses, see chapter 4, “Object Class Definitions.”

Individual Attribute Type Definitions

This section contains a detailed definition for each of the 145 attribute types used by NDS release 611 object classes.

Account Balance

Description	This attribute specifies the amount of credit (or money) the user can spend to purchase network services.
Syntax	Counter
Constraints	DS_NONREMOVABLE-ATTR DS_SINGLE_VALUED_ATTR DS_SYNC_IMMEDIATE
Used In	Server User
Remarks	If the server has accounting rules enforced, it refuses services to the user when the user's <i>Account Balance</i> drops below a specified minimum balance.

ACL

Description	The <i>ACL</i> attribute contains access control information for the object and its attributes.
Syntax	Object ACL
Constraints	DS_NONREMOVABLE_ATTR DS_SYNC_IMMEDIATE
Used In	Top
Remarks	None

Aliased Object Name

Description	This attribute is assigned to Alias objects in the Directory. The aliased object is the object the alias points to.
Syntax	Distinguished Name
Constraints	DS_NONREMOVABLE_ATTR DS_SINGLE_VALUED_ATTR DS_SYNC_IMMEDIATE
Used In	Alias (M)
Remarks	None

Allow Unlimited Credit

Description	This attribute allows the user to access and use all network services he or she has rights to without having to maintain a minimum account balance.
Syntax	Boolean
Constraints	DS_NONREMOVABLE_ATTR DS_SINGLE_VALUED_ATTR DS_SYNC_IMMEDIATE
Used In	Server User
Remarks	None

Authority Revocation

Description	This attribute is a time-stamped list of revoked public keys. This list is the public keys of all the Certification Authorities known and certified by the Certification Authority.
Syntax	Octet String
Constraints	DS_NONREMOVABLE_ATTR DS_READ_ONLY_ATTR DS_SINGLE_VALUED_ATTR DS_SYNC_IMMEDIATE
Used In	Partition Top
Remarks	None

Back Link

Description	The <i>Back Link</i> attribute is attached to any object that a remote server requires an external reference for.
Syntax	Back Link
Constraints	DS_NONREMOVABLE_ATTR DS_READ_ONLY_ATTR DS_SERVER_READ
Used In	Top
Remarks	This attribute contains the set of servers that store an external reference to an associated object. The attribute is used to notify these servers of changes in the object's status.

Bindery Object Restriction

Description	This attribute is an integer attribute used by bindery objects.
Syntax	Integer
Constraints	DS_NON_REMOVABLE_ATTR DS_READ_ONLY_ATTR DS_SINGLE_VALUED_ATTR
Used In	Bindery Object (M)
Remarks	This attribute is an error code that indicates why the Bindery object cannot be represented as a Directory object.

Bindery Property

Description	This attribute emulates bindery properties that other attribute types cannot be represent.
Syntax	Octet String
Constraints	DS_NONREMOVABLE_ATTR DS_READ_ONLY_ATTR
Used In	Top
Remarks	<p>Properties of any name and data structure can be attached to objects in the bindery. This is not the case with the Directory. <i>Bindery Property</i> attributes hold the information stored in Bindery properties through the Bindery API and Bindery services.</p> <p>Any object can have a bindery property through inheritance from <i>Top</i>, but only Users, Groups, Queues, Print Servers, Profiles and Bindery Objects can be accessed through the bindery services calls. <i>Bindery Property</i> attributes can only be added through bindery service calls. So even though it may be legal in the schema, in practice, no other objects will ever have bindery properties.</p>

Bindery Type

Description	This attribute associates a bindery object type with an object of the <i>Bindery Object</i> class.
Syntax	Numeric String
Constraints	DS_NONREMOVABLE_ATTR DS_READ_ONLY_ATTR DS_SINGLE_VALUED_ATTR DS_STRING_ATTR

Used In Bindery Object (M)
Bindery Queue (M)

Remarks None

C (Country Name)

Description This attribute specifies a country in the Directory.

Syntax Case Ignore String

Constraints DS_NONREMOVABLE_ATTR
DS_SINGLE_VALUED_ATTR
DS_SIZED_ATTR (2, 2)
DS_STRING_ATTR
DS_SYNC_IMMEDIATE

Used In Country (M)

Remarks When used as a component of a Directory name, a Country Name identifies the country in which the named object is either physically located or associated with in some other important way. An attribute value for *C* is a string chosen from ISO 3166, which is a list of 2-character country abbreviations for all the countries in the world.

CA Private Key

Description The *CA Private Key (Certification Authority Private Key)* attribute contains the Certification Authority private key.

Syntax Octet String

Constraints DS_HIDDEN_ATTR
DS_NONREMOVABLE_ATTR
DS_READ_ONLY_ATTR
DS_SINGLE_VALUED_ATTR
DS_SYNC_IMMEDIATE

Used In Partition
Top

Remarks This attribute signs public keys that are produced for objects. The attribute contains the cryptographically protected private key. Applications cannot access this attribute because it is a hidden attribute.

CA Public Key

Description	The <i>CA Public Key</i> (<i>Certification Authority Public Key</i>) attribute contains the certification authority public key.
Syntax	Octet String
Constraints	DS_NONREMOVABLE_ATTR DS_PUBLIC_READ DS_READ_ONLY_ATTR DS_SINGLE_VALUED_ATTR DS_SYNC_IMMEDIATE
Used In	Partition Top
Remarks	This attribute verifies public keys that are produced for objects subordinate to the certification authority. The attribute contains the public key along with the certification information.

Cartridge

Description	This attribute contains a list of font cartridges present in the printer.
Syntax	Case Ignore String
Constraints	DS_NONREMOVABLE_ATTR DS_STRING_ATTR DS_SYNC_IMMEDIATE
Used In	Printer
Remarks	None

Certificate Revocation

Description	This attribute is a time stamped list of all public keys revoked by the Certification Authority.
Syntax	Octet String
Constraints	DS_NONREMOVABLE_ATTR DS_READ_ONLY_ATTR DS_SINGLE_VALUED_ATTR DS_SYNC_IMMEDIATE
Used In	Partition Top
Remarks	None

Certificate Validity Interval

Description	This attribute specifies the amount of time that a certificate is valid.
Syntax	Interval
Constraints	DS_NONREMOVABLE_ATTR DS_SINGLE_VALUED_ATTR DS_SIZED_ATTR (0..60) DS_SYNC_IMMEDIATE
Used In	Top
Remarks	The length of time is specified when the certificate is made.

CN (Common Name)

Description	This attribute specifies an identifier of an object. A common name is not a complete Directory name; it is a name by which an object is commonly known in a particular context.
Syntax	Case Ignore String
Constraints	DS_NONREMOVABLE_ATTR DS_SIZED_ATTR (1..64) DS_STRING_ATTR DS_SYNC_IMMEDIATE
Used In	Bindery Object (M) Bindery Queue (M) Device (M) External Entity (M) Group (M) List (M) Organizational Person (M) Organizational Role (M) Person (M) Profile (M) Resource (M) Server (M)
Remarks	The user object who creates the <i>CN</i> object chooses this attribute, subject to the guidelines the organization defines. An object doesn't chose its own name, but rather the name is chosen by whoever creates the object. Typically, the administrator creates the object and chooses the name, usually within the established guidelines for naming new objects. Typically, an object does not have rights to rename itself; thus, an object has no control over its own name. For devices and application entities, the organization responsible for the object chooses the string. A <i>CN</i> is not necessarily definitive and may admit ambiguity within its limited scope.

CN attributes conform to the naming conventions of the country or culture they are associated with. Common names are the leaf object names, often used for the naming value of the object, and are usually short. The full name of an object might comprise, for example, a personal title, a first name, a middle name, a last name, and a generational qualifier or decorations and awards. Variant names are associated with a named object as separate and alternative attribute values. Common variant names should be made available.

Convergence

Description This attribute indicates how persistent a partition should be in attempting to keep its replicas up to date.

Syntax Integer

Constraints DS_NONREMOVABLE_ATTR
DS_SINGLE_VALUED_ATTR
DS_SIZED_ATTR (0, 1)
DS_SYNC_IMMEDIATE

Used In Partition

Remarks The possible values of the *Convergence* attribute and their meanings are as follows:

- 0 Low Do not propagate updates as they come in. Wait for a periodic synchronization to update any replicas. You can keep synchronization frequency low to save resources. Partitions with *Low Convergence* and pending updates should be synchronized at least once every 24 hours. See the *Low Convergence Sync Interval* and *Low Convergence Reset Time* attributes for details on setting the convergence cycle.
- 1 High Make one attempt to propagate an update to all replicas when it comes in. If this fails, schedule a synchronization for the next interval of time. *High Convergence* is the default value for this attribute.

Cross Certificate Pair

Description This attribute is a pair of public keys that allow public key verification to circumvent the normal certification hierarchy. This provides a shorter certification path.

Syntax Octet String

Constraints DS_NONREMOVABLE_ATTR
DS_SYNC_IMMEDIATE

Used In Partition
Top

Remarks None

Default Queue

Description This attribute specifies a queue where jobs submitted to the specified printer will go unless a different queue is specified.

Syntax Distinguished Name

Constraints DS_NONREMOVABLE_ATTR
DS_SERVER_READ
DS_SINGLE_VALUED_ATTR
DS_SYNC_IMMEDIATE

Used In Printer

Remarks None

Description

Description This attribute specifies text that describes the associated object.

Syntax Case Ignore String

Constraints DS_NONREMOVABLE_ATTR
DS_SIZED_ATTR (1..1024)
DS_STRING_ATTR
DS_SYNC_IMMEDIATE

Used In Country
Device
External Entity
Group
List
Locality
Organization
Organizational Role
Organizational Unit
Person
Profile
Resource
Server

Remarks An attribute value for the *Description* attribute is a string. For example, the object “Standards Interest” might have the associated description “distribution list for exchange of information about intra-company standards development”.

Detect Intruder

Description This attribute indicates a desire to identify suspicious login attempts.

Syntax Boolean

Constraints DS_NONREMOVABLE_ATTR
DS_SINGLE_VALUED_ATTR
DS_SYNC_IMMEDIATE

Used In Organization
Organizational Unit

Remarks None

Device

Description This attribute lists all printers that service the specified queue.

Syntax Distinguished Name

Constraints DS_NONREMOVABLE_ATTR
DS_SYNC_IMMEDIATE

Used In Queue

Remarks None

DS Revision

Description This attribute contains the internal revision number of the Directory Services agent running on a NetWare server.

Syntax Integer

Constraints DS_NONREMOVABLE_ATTR
DS_PUBLIC_READ
DS_SINGLE_VALUED_ATTR
DS_SYNC_IMMEDIATE

Used In NCP Server

Remarks None

EMail Address

Description This attribute contains the E-Mail address of the user. The name must conform to the established conventions for E-Mail names.

Syntax EMail Address

Constraints	DS_NONREMOVABLE_ATTR DS_PUBLIC_READ DS_SYNC_IMMEDIATE
Used In	External Entity Group List Organization Organizational Person Organizational Role Organizational Unit
Remarks	<p><i>E-Mail Address</i> specifies a user's mailbox that in a non-MHS E-Mail system. A user can have only one E-Mail address. The E-Mail address for a MHS user is stored in the <i>Mailbox Location</i> and <i>Mailbox ID</i> attributes. The E-Mail address for a non-MHS user is stored in the <i>E-Mail Address</i> attribute.</p> <p><i>E-Mail Address</i> can also specify a user's E-Mail Alias as known in a foreign messaging system. A non-MHS messaging system can use the Alias to send mail to a MHS user. A user can have more than one E-Mail Alias, one for each non-MHS system.</p> <p>The <i>E-Mail Address</i> attribute information is stored in an <i>E-Mail_Address_T</i> structure. The convention for storing non-MHS E-Mail addresses and aliases in the structure is as follows:</p> <ul style="list-style-type: none"> • If the type field of the <i>E-Mail_Address_T</i> structure is set to zero, the data structure contains an E-Mail address, in the form of <i>non-MHS_Email_protocol:non-MHS_Email_Address</i> (<i>non-MHS_Email_Protocol</i> is a 1-8 character string, and the <i>non-MHS_Email_Address</i> is a string for the actual address value). • If the type field of the <i>E-Mail_Address_T</i> structure is set to one, the data structure contains an E-Mail Alias, in the form of <i>non-MHS_Email_protocol:non-MHS_Email_Alias</i>. (<i>non-MHS_Email_Protocol</i> is a 1-8 character string, and the <i>non-MHS_Email_Alias</i> is a string for the actual alias value).

Equivalent To Me

Description	This attribute specifies a list of objects that are security equivalent to the object containing the attribute.
Syntax	Distinguished Name
Constraints	DS_NONREMOVABLE_ATTR DS_SERVER_READ DS_SYNC_IMMEDIATE
Used In	Top
Remarks	None

External Name

Description	This attribute specifies the name of the external entity in the form that service uses.
Syntax	Octet String
Constraints	DS_NONREMOVABLE_ATTR DS_SINGLE_VALUED_ATTR DS_SYNC_IMMEDIATE
Used In	External Entity
Remarks	<p>This attribute holds names that the Directory does not interpret. These names should not be translated.</p> <p>MHS uses <i>External Name</i> to include users from non-NDS directories in order to provide an integrated address book for sending mail.</p>

External Synchronizer

Description	This attribute is reserved for future use.
Syntax	Octet String
Constraints	DS_NONREMOVABLE_ATTR DS_SYNC_IMMEDIATE
Used In	None
Remarks	None

Facsimile Telephone Number

Description	This attribute specifies the telephone number and, optionally, the parameters for a facsimile terminal associated with an object.
Syntax	Facsimile Telephone Number
Constraints	DS_NONREMOVABLE_ATTR DS_SYNC_IMMEDIATE
Used In	External Entity Organization Organizational Person Organizational Role Organizational Unit
Remarks	An attribute value for the <i>Facsimile Telephone Number</i> is a string that complies with E.123, the standard format for showing international telephone numbers (for example, "+81 3 347 7418"), and an optional bit string formatted according to Recommendation T.30.

Full Name

Description	This attribute specifies the full name of an object.
Syntax	Case Ignore String
Constraints	DS_NONREMOVABLE_ATTR DS_SIZED_ATTR (0..127) DS_STRING_ATTR DS_SYNC_IMMEDIATE
Used In	Group List Person Profile Server
Remarks	Full names conform to the naming conventions of the country or culture they are associated with. For example a typical full name for a person in an English speaking country might comprise a personal title, a first name, a middle name, a last name, generational qualifier, and decorations and awards.

Generational Qualifier

Description	This attribute specifies the generation of the object.
Syntax	Case Ignore String
Constraints	DS_NONREMOVABLE_ATTR DS_PUBLIC_READ DS_SINGLE_VALUED_ATTR DS_SIZED_ATTR (1..8) DS_STRING_ATTR DS_SYNC_IMMEDIATE
Used In	Person
Remarks	Examples of generational qualifiers are Junior, Jr., Senior, Sr., or III.

GID (Group ID)

Description	This attribute specifies a unique group ID for use by UNIX clients.
Syntax	Integer
Constraints	DS_NONREMOVABLE_ATTR DS_SINGLE_VALUED_ATTR DS_SYNC_IMMEDIATE

Used In	Group
Remarks	None

Given Name

Description	This attribute specifies the given name of an object.
Syntax	Case Ignore String
Constraints	DS_NONREMOVABLE_ATTR DS_PUBLIC_READ DS_SINGLE_VALUED_ATTR DS_SIZED_ATTR (1..32) DS_STRING_ATTR DS_SYNC_IMMEDIATE
Used In	Person
Remarks	In the American culture, <i>Given Name</i> is the first name of a person. It does not include the family name.

Group Membership

Description	This attribute contains a list of the groups the object belongs to.
Syntax	Distinguished Name
Constraints	DS_NONREMOVABLE_ATTR DS_SYNC_IMMEDIATE DS_WRITE_MANAGED
Used In	User
Remarks	None

High Convergence Sync Interval

Description	This attribute holds the interval at which a partition synchronization will occur if no events have initiated synchronization.
Syntax	Interval
Constraints	DS_NONREMOVABLE_ATTR DS_SINGLE_VALUED_ATTR DS_SYNC_IMMEDIATE
Used In	Partition
Remarks	When <i>High Convergence</i> is in effect, synchronization of partition information is event-driven. When a partition's information is changed, an immediate synchronization with other replicas is initiated. If no update

activity occurs within the *High Convergence Synchronization Interval*, synchronization will be initiated. The default for this interval is 60 minutes.

Higher Privileges

Description	This attribute specifies an alternative set of security access privileges.
Syntax	Distinguished Name
Constraints	DS_NONREMOVABLE_ATTR DS_SERVER_READ DS_SYNC_IMMEDIATE DS_WRITE_MANAGED
Used In	User
Remarks	This attribute is not currently implemented. When implemented it will allow a person to activate a certain set of privileges, then deactivate them when desired. This avoids the need to log in as supervisor to perform certain functions. You can activate the <i>Higher Privileges</i> , perform the desired function, and then deactivate the privileges. In the code, this attribute is named "Security Also Equals".

Home Directory

Description	This attribute contains the initial value for a client's current working directory.
Syntax	Path
Constraints	DS_NONREMOVABLE_ATTR DS_SINGLE_VALUED_ATTR DS_SIZED_ATTR (1..255) DS_SYNC_IMMEDIATE
Used In	User
Remarks	<p>The <i>Home Directory</i> attribute is used primarily by UNIX clients. UNIX clients maintain their configuration information in the client's home directory. This attribute should contain a legal name in the UNIX name space of the host server defined for the client.</p> <p>This attribute is also used from DOS to set a default directory location when logging in, at least in bindery mode. DOS and OS/2 clients use login scripts to provide their initial configuration information. Macintosh clients have other means for storing configuration information.</p>

Host Device

Description	This attribute contains the Distinguished Name of the device the object is associated with.
Syntax	Distinguished Name
Constraints	DS_NONREMOVABLE_ATTR DS_SINGLE_VALUED_ATTR DS_SYNC_IMMEDIATE
Used In	Printer Server
Remarks	None

Host Resource Name

Description	This attribute contains the name the resource is known by on the local host.
Syntax	Case Ignore String
Constraints	DS_NONREMOVABLE_ATTR DS_SINGLE_VALUED_ATTR DS_STRING_ATTR DS_SYNC_IMMEDIATE
Used In	Resource
Remarks	This attribute is used when a resource is locally known by a different name on the host server. For example, a volume's global name might be "Tools.Development.Acme.US." That volume's local name on the server might be "SYS:".

Host Server

Description	This attribute identifies the server an object is associated with.
Syntax	Distinguished Name
Constraints	DS_NONREMOVABLE_ATTR DS_SINGLE_VALUED_ATTR DS_SYNC_IMMEDIATE
Used In	Directory Map (M) Queue Volume (M)
Remarks	None

Inherited ACL

Description	This attribute contains a summary of access control information inherited from a superior partition.
Syntax	Object ACL
Constraints	DS_NONREMOVABLE_ATTR DS_READ_ONLY_ATTR DS_SYNC_IMMEDIATE
Used In	Partition
Remarks	The information in this attribute is used to optimize effective rights calculations within a partition. The attribute lists all access control information inherited from objects superior to the partition object.

Initials

Description	This attribute specifies the user object's initials.
Syntax	Case Ignore String
Constraints	DS_NONREMOVABLE_ATTR DS_PUBLIC_READ DS_SINGLE_VALUED_ATTR DS_SIZED_ATTR (1..8) DS_STRING_ATTR DS_SYNC_IMMEDIATE
Used In	Person
Remarks	None

Intruder Attempt Reset Interval

Description	This attribute designates the time frame to monitor consecutive failed login attempts in.
Syntax	Interval
Constraints	DS_NONREMOVABLE_ATTR DS_SINGLE_VALUED_ATTR DS_SYNC_IMMEDIATE
Used In	Organization Organizational Unit
Remarks	If the number of consecutive failed Login attempts exceeds the <i>Login Intruder Limit</i> , the user is prevented from attempting further logins. The <i>Intruder Attempt Reset Interval</i> is the amount of time within which consecutive login attempts must fail. For example, if the interval is 30

minutes and the limit is 3 login attempts, a user attempting to log in every 20 minutes would never be locked out. If, however, the user attempted to log in every minute, the user would be locked out after the third attempt.

Intruder Lockout Reset Interval

Description	This attribute identifies the amount of time a user remains locked out after failing to log in.
Syntax	Interval
Constraints	DS_NONREMOVABLE_ATTR DS_SINGLE_VALUED_ATTR DS_SYNC_IMMEDIATE
Used In	Organization Organizational Unit
Remarks	None

L (Locality Name)

Description	This attribute specifies a physical or geographical location.
Syntax	Case Ignore String
Constraints	DS_NONREMOVABLE_ATTR DS_SIZED_ATTR (1..128) DS_STRING_ATTR DS_SYNC_IMMEDIATE
Used In	Device External Entity Group List Locality Organization Organizational Person Organizational Role Organizational Unit Profile Resource Server
Remarks	When used as a component of a Directory name, a <i>Locality Name</i> identifies a geographical area or locality the named object is physically located in or is associated in some other important way with.

Language

Description	This attribute contains an ordered list of languages.
Syntax	Case Ignore List
Constraints	DS_NONREMOVABLE_ATTR DS_SINGLE_VALUED_ATTR DS_SYNC_IMMEDIATE
Used In	User
Remarks	This attribute is used by applications to determine which language display the object desires.

Last Login Time

Description	This attribute contains the time of the last login before the current one.
Syntax	Time
Constraints	DS_NONREMOVABLE_ATTR DS_READ_ONLY_ATTR DS_SINGLE_VALUED_ATTR
Used In	User
Remarks	The <i>Login Time</i> attribute is used for the current login session.

Last Referenced Time

Description	This attribute contains the time stamp for the last time the object was referenced.
Syntax	Timestamp
Constraints	DS_NONREMOVABLE_ATTR DS_SF_PER_REPLICA DS_SINGLE_VALUED_ATTR
Used In	Top
Remarks	None

Locked By Intruder

Description	This attribute specifies that an object has been disabled due to intruder detection.
Syntax	Boolean

Constraints	DS_NONREMOVABLE_ATTR DS_SINGLE_VALUED_ATTR DS_SYNC_IMMEDIATE
Used In	User
Remarks	In the case of a <i>User</i> object, if <i>TRUE</i> this attribute indicates the user cannot log in to the network because too many sequential attempts to log in have been denied. This usually happens when a person does not know the correct password and tries to guess it too many times.

Lockout After Detection

Description	This attribute indicates that users should be kept from attempting to log in once they are identified as an intruder.
Syntax	Boolean
Constraints	DS_NONREMOVABLE_ATTR DS_SINGLE_VALUED_ATTR DS_SYNC_IMMEDIATE
Used In	Organization Organizational Unit
Remarks	Monitoring user attempts to log in can occur without actually enforcing any restrictions on logging in. This attribute can be used to indicate that users should be locked out once the limits of tolerance have been exceeded. Those tolerance limits are designated with other attribute values.

Login Allowed Time Map

Description	This attribute specifies an account's allowed login time periods for each day of the week to a precision of one-half hour.
Syntax	Octet String
Constraints	DS_NONREMOVABLE_ATTR DS_SINGLE_VALUED_ATTR DS_SIZED_ATTR (42, 42) DS_SYNC_IMMEDIATE
Used In	User
Remarks	None

Login Disabled

Description	This attribute informs the user that their account has been disabled.
Syntax	Boolean
Constraints	DS_NONREMOVABLE_ATTR DS_SINGLE_VALUED_ATTR DS_SYNC_IMMEDIATE
Used In	User
Remarks	When this attribute is set to <i>True</i> , it disables the user account. This is used for explicit permanent disabling of an account. It can only be manually set and cleared.

Login Expiration Time

Description	This attribute specifies a date and time after which a client cannot log in and authenticate as an object.
Syntax	Time
Constraints	DS_NONREMOVABLE_ATTR DS_SINGLE_VALUED_ATTR DS_SYNC_IMMEDIATE
Used In	User
Remarks	None

Login Grace Limit

Description	This attribute specifies the total number of times an old password can be used to access the account after it has expired.
Syntax	Integer
Constraints	DS_NONREMOVABLE_ATTR DS_SINGLE_VALUED_ATTR DS_SYNC_IMMEDIATE
Used In	User
Remarks	None

Login Grace Remaining

Description	This attribute specifies how many grace logins are left before the account is locked.
Syntax	Counter
Constraints	DS_NONREMOVABLE_ATTR DS_SINGLE_VALUED_ATTR DS_SYNC_IMMEDIATE
Used In	User
Remarks	None

Login Intruder Address

Description	This attribute specifies the address of the node causing the intruder detection lockout.
Syntax	Net Address
Constraints	DS_NONREMOVABLE_ATTR DS_SINGLE_VALUED_ATTR DS_SYNC_IMMEDIATE
Used In	User
Remarks	None

Login Intruder Attempts

Description	This attribute specifies the number of failed login attempts within the current attempt interval.
Syntax	Counter
Constraints	DS_NONREMOVABLE_ATTR DS_SINGLE_VALUED_ATTR DS_SYNC_IMMEDIATE
Used In	User
Remarks	None

Login Intruder Limit

Description	This attribute specifies the number of failed login attempts allowed before an account is locked due to intruder detection.
Syntax	Integer

Constraints DS_NONREMOVABLE_ATTR
DS_SINGLE_VALUED_ATTR
DS_SYNC_IMMEDIATE

Used In Organization
Organizational Unit

Remarks None

Login Intruder Reset Time

Description This attribute specifies the next time the *Login Intruder Attempts* variable will be reset.

Syntax Time

Constraints DS_NONREMOVABLE_ATTR
DS_SINGLE_VALUED_ATTR
DS_SYNC_IMMEDIATE

Used In User

Remarks None

Login Maximum Simultaneous

Description This attribute specifies the number of simultaneous login sessions authenticated for the object.

Syntax Integer

Constraints DS_NONREMOVABLE_ATTR
DS_SINGLE_VALUED_ATTR
DS_SYNC_IMMEDIATE

Used In User

Remarks None

Login Script

Description This attribute contains the object's login script.

Syntax Stream

Constraints DS_NONREMOVABLE_ATTR
DS_SINGLE_VALUED_ATTR
DS_SYNC_IMMEDIATE

Used In Group
Organization
Organizational Unit

Profile (M)
User

Remarks

The *Login Script* attribute contains the login script for users and for containers O and OU. At the container level, this script replaces the system login script. In addition to the container login script and the user login script, users can optionally execute a profile login script.

When a user logs in, the LOGIN program searches one level above (to either the Organization or Organizational Unit) and runs the container login script, then the specified profile script (if any), then the user's login script (if any).

Login Time

Description

This attribute specifies the time a user logged in for the current login session.

Syntax

Time

Constraints

DS_NONREMOVABLE_ATTR
DS_SINGLE_VALUED_ATTR

Used In

User

Remarks

None

Low Convergence Reset Time

Description

This attribute specifies the time to start the low convergence synchronization cycle.

Syntax

Time

Constraints

DS_NONREMOVABLE_ATTR
DS_SINGLE_VALUED_ATTR
DS_SYNC_IMMEDIATE

Used In

Partition

Remarks

This reset time is implemented only if the *Convergence* attribute of the partition specifies low convergence. The time stored in this attribute is the time of day at which a synchronization will occur and the interval counter will be reset or initialized. The next synchronization will occur after the low synchronization interval has lapsed.

Low Convergence Sync Interval

Description	This attribute specifies the amount of time (in seconds) that must pass from the start of one partition synchronization to the start of the next.
Syntax	Interval
Constraints	DS_NONREMOVABLE_ATTR DS_SINGLE_VALUED_ATTR DS_SYNC_IMMEDIATE
Used In	Partition
Remarks	This synchronization interval is only implemented if the <i>Convergence</i> attribute specifies low convergence.

Mailbox ID

Description	This attribute contains a unique ID associated with the object's mailbox and messaging server.
Syntax	Case Ignore String
Constraints	DS_NONREMOVABLE_ATTR DS_PUBLIC_READ DS_SINGLE_VALUED_ATTR DS_SIZED_ATTR (1..8) DS_STRING_ATTR DS_SYNC_IMMEDIATE
Used In	External Entity Group List Organization Organizational Person Organizational Role Organizational Unit
Remarks	None

Mailbox Location

Description	This attribute contains the name of the messaging server that services the object's mailbox.
Syntax	Distinguished Name
Constraints	DS_NONREMOVABLE_ATTR DS_PUBLIC_READ DS_SINGLE_VALUED_ATTR DS_SYNC_IMMEDIATE

Used In	External Entity Group Organization Organizational Person Organizational Role Organizational Unit
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Remarks	None
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Member

Description	This attribute lists objects associated with a group or list.
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Syntax	Distinguished Name
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Constraints	DS_NONREMOVABLE_ATTR DS_SYNC_IMMEDIATE
--------------------	---

Used In	Group List
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Remarks	None
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Memory

Description	This attribute specifies the amount of printer memory (in kilobytes).
--------------------	---

Syntax	Integer
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Constraints	DS_NONREMOVABLE_ATTR DS_SINGLE_VALUED_ATTR DS_SYNC_IMMEDIATE
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Used In	Printer
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Remarks	Currently the <i>Memory</i> attribute is used only for printers, but it is not limited to printers. In the future, it could be used for other devices.
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Message Routing Group

Description	This attribute specifies the name of the message routing group(s) a messaging server can belong to.
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Syntax	Distinguished Name
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Constraints	DS_NONREMOVABLE_ATTR DS_SYNC_IMMEDIATE
--------------------	---

Used In	Messaging Server
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Remarks	None
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Message Server

Description This attribute specifies the name of a server object that stores and forwards broadcast-type messages.

Syntax Distinguished Name

Constraints DS_NONREMOVABLE_ATTR
DS_SINGLE_VALUED_ATTR
DS_SYNC_IMMEDIATE

Used In User

Remarks None

Messaging Database Location

Description This attribute contains the location of the messaging file-directory structure.

Syntax Path

Constraints DS_NONREMOVABLE_ATTR
DS_SINGLE_VALUED_ATTR
DS_SYNC_IMMEDIATE

Used In Messaging Server

Remarks MHS messaging servers use a file-system subtree to (1) receive messages from applications, or other messaging servers, (2) store messages while they are being routed, (3) store internal control files, and (4) extract files.

Messaging Server

Description This attribute identifies a messaging server that is running on the NCP server.

Syntax Distinguished Name

Constraints DS_NONREMOVABLE_ATTR
DS_SYNC_IMMEDIATE

Used In NCP Server

Remarks None

Messaging Server Type

Description	This attribute contains the type of a messaging server.
Syntax	Case Ignore String
Constraints	DS_NONREMOVABLE_ATTR DS_SINGLE_VALUED_ATTR DS_SIZED_ATTR (1..32) DS_STRING_ATTR DS_SYNC_IMMEDIATE
Used In	Messaging Server
Remarks	Examples of messaging server types are MHS, GMHS, and X400.

Minimum Account Balance

Description	This attribute specifies the minimum amount of credit (or money) a user must have in his or her account to access specified services.
Syntax	Integer
Constraints	DS_NONREMOVABLE_ATTR DS_SINGLE_VALUED_ATTR DS_SYNC_IMMEDIATE
Used In	Server User
Remarks	None

Network Address

Description	This attribute contains one or more network addresses of the associated objects.
Syntax	Net Address
Constraints	DS_NONREMOVABLE_ATTR DS_SYNC_IMMEDIATE
Used In	Device Queue Server User
Remarks	As implied by the <i>Net Address</i> syntax, this attribute is an octet string and an integer that denotes the type of the underlying transport. Also, it is an attribute that can recur, as implied by not having the DS_SINGLE_VALUED_ATTR constraint.

Network Address Restriction

Description	This attribute restricts objects to specific network or node addresses.
Syntax	Net Address
Constraints	DS_NONREMOVABLE_ATTR DS_SYNC_IMMEDIATE
Used In	CommExec Printer User
Remarks	As implied by the <i>Net Address</i> syntax, this attribute is an octet string and an integer that denotes the type of the underlying transport. This attribute may recur, as implied by its not having the DS_SINGLE_VALUED_ATTR constraint.

NNS Domain

Description	This attribute specifies the name of the “NNS Domain” that has been upgraded into the container.
Syntax	Case Ignore String
Constraints	DS_NONREMOVABLE_ATTR DS_SIZED_ATTR (1..128) DS_STRING_ATTR DS_SYNC_IMMEDIATE
Used In	Organization Organizational Unit
Remarks	None

Notify

Description	This attribute specifies a list of objects that are to be notified of a specified event.
Syntax	Typed Name
Constraints	DS_NONREMOVABLE_ATTR DS_SYNC_IMMEDIATE
Used In	Printer
Remarks	None

O (Organization Name)

Description	This attribute specifies an organization.
Syntax	Case Ignore String
Constraints	DS_NONREMOVABLE_ATTR DS_SIZED_ATTR (1..64) DS_STRING_ATTR DS_SYNC_IMMEDIATE
Used In	Device Group List Organization (M) Profile Resource Server
Remarks	When used as a component of a Directory name, an Organization Name identifies an organization that the named object is affiliated with. An attribute value for <i>O</i> is a string chosen by the organization. Any variant names should be associated with the named organization as separate and alternative attribute values.

Obituary

Description	This attribute is used to avoid name collisions during certain operations.
Syntax	Octet String
Constraints	DS_HIDDEN_ATTR DS_NONREMOVABLE_ATTR DS_READ_ONLY_ATTR DS_SYNC_IMMEDIATE
Used In	Top
Remarks	<p>The <i>Obituary</i> attribute is used internally by Directory Services. Thus, an application cannot access this attribute because it is a hidden attribute. Obituaries provide a unique identification, other than the object name, that may be required in order to resolve certain functions.</p> <p>For example, when an object is renamed, an obituary time stamp is recorded. Updates to the object may have occurred elsewhere but have not yet been synchronized on the partition where the rename occurred. When the skulking reaches the partition with the renamed object, it will not be able to find the renamed object by name. The update will eventually take place using the obituary attribute's time stamp as identification.</p>

Following are the types of obituaries:

- 0 = Restored
- 1 = Dead
- 2 = Moved
- 3 = Inhibit move
- 4 = Old RDN
- 5 = new RDN
- 6 = Backlink
- 7 = Tree-old-rdn
- 8 = Tree-new-rdn
- 9 = Purge all
- 10 = Move tree

Object Class

Description This attribute contains an unordered list of object classes. These classes are the fully expanded set of super classes for the object this attribute is assigned to.

Syntax Class Name

Constraints DS_NONREMOVABLE_ATTR
DS_READ_ONLY_ATTR
DS_SYNC_IMMEDIATE

Used In Top (M)

Remarks When an object is created, a single initial value for object class must be specified. When the server creates the object, it expands the value set of the object class attribute to include all of the super classes of the initially specified class.

Operator

Description This attribute specifies an object with operator privileges.

Syntax Distinguished Name

Constraints DS_NONREMOVABLE_ATTR
DS_SERVER_READ
DS_SYNC_IMMEDIATE

Used In Computer
NCP Server
Print Server
Printer
Queue

Remarks None

OU (Organizational Unit Name)

Description	This attribute specifies an organizational unit.
Syntax	Case Ignore String
Constraints	DS_NONREMOVABLE_ATTR DS_SIZED_ATTR (1..64) DS_STRING_ATTR DS_SYNC_IMMEDIATE
Used In	Device External Entity Group List Organizational Person Organizational Role Organizational Unit (M) Profile Resource Server
Remarks	<p>When used as a component of a Directory name, an Organizational Unit Name identifies a unit of an organization that the named object is affiliated with. The unit is understood to be part of an organization designated by an Organization attribute assigned to the same object. Thus, if an <i>OU</i> attribute is used in a NDS name, it must be associated with an <i>O</i> attribute.</p> <p>An attribute value for <i>OU</i> is a string chosen by the organization that the unit belongs to. An example of an organizational unit name is "OU=Technology Division". If "TD" is a common abbreviation for Technology Division, it must be assigned as a separate attribute value (OU=TD).</p>

Owner

Description	This attribute specifies the name of an object that has some responsibility for the associated object.
Syntax	Distinguished Name
Constraints	DS_NONREMOVABLE_ATTR DS_SYNC_IMMEDIATE
Used In	Device Group List
Remarks	A value for this attribute is a <i>Distinguished Name</i> , which could represent a group. This is an attribute that can recur, since there is no DS_SINGLE_VALUED_ATTR constraint associated with its syntax.

Page Description Language

Description	This attribute identifies the “Page Description Languages” (PDLs) supported by a printer.
Syntax	Printable String
Constraints	DS_NONREMOVABLE_ATTR DS_SIZED_ATTR (1..64) DS_STRING_ATTR DS_SYNC_IMMEDIATE
Used In	Printer
Remarks	Multiple PDLs should be represented as multiple values of this attribute. An example of an attribute value for this attribute is “Page Description Language = PostScript.”

Partition Control

Description	This attribute holds the states of split and join operations.
Syntax	Typed Name
Constraints	DS_NONREMOVABLE_ATTR DS_PUBLIC_READ DS_READ_ONLY_ATTR DS_SYNC_IMMEDIATE
Used In	Partition
Remarks	None

Partition Creation Time

Description	This attribute identifies the particular incarnation of the partition replica list.
Syntax	Timestamp
Constraints	DS_NONREMOVABLE_ATTR DS_READ_ONLY_ATTR DS_SINGLE_VALUED_ATTR DS_SYNC_IMMEDIATE
Used In	Partition
Remarks	<i>Partition Creation Time</i> is also known as the “epoch”. It is defined by explicit management intervention to recover from replicas’ hard failures that prevent synchronization from completing.

Partition Status

Description	This attribute provides information on the success or failure of the last synchronization cycle.
Syntax	Octet string
Constraints	DS_NONREMOVABLE_ATTR DS_READ_ONLY_ATTR DS_PUBLIC_READ_ATTR
Used In	Partition
Remarks	One of three partition status flags are set: 0x00000000 indicates an error in the local database or the synchronization Marker. 0x00000001 indicates an error has occurred during synchronization with this replica. The server and entry is given, if relevant. 0x00000002 indicates all replicas were synchronized in the last synchronization cycle. The <i>Replica Number</i> is set to 0 (zero).

Password Allow Change

Description	This attribute determines whether the person logged in under an account may or may not change the password for that account.
Syntax	Boolean
Constraints	DS_NONREMOVABLE_ATTR DS_SINGLE_VALUED_ATTR DS_SYNC_IMMEDIATE
Used In	User
Remarks	None

Password Expiration Interval

Description	This attribute specifies the next time interval after which the password for this object expires.
Syntax	Interval
Constraints	DS_NONREMOVABLE_ATTR DS_SINGLE_VALUED_ATTR DS_SYNC_IMMEDIATE
Used In	User
Remarks	None

Password Expiration Time

Description	This attribute specifies the next time a password will expire.
Syntax	Time
Constraints	DS_NONREMOVABLE_ATTR DS_SINGLE_VALUED_ATTR DS_SYNC_IMMEDIATE
Used In	User
Remarks	None

Password Minimum Length

Description	This attribute establishes the minimum length of an object's clear-text password.
Syntax	Integer
Constraints	DS_NONREMOVABLE_ATTR DS_SINGLE_VALUED_ATTR DS_SYNC_IMMEDIATE
Used In	User
Remarks	None

Password Required

Description	This attribute establishes that the object must have a password to log in.
Syntax	Boolean
Constraints	DS_NONREMOVABLE_ATTR DS_SINGLE_VALUED_ATTR DS_SYNC_IMMEDIATE
Used In	User
Remarks	None

Password Unique Required

Description	This attribute establishes that when an object's password is changed, it must be unique from those in the <i>Password Used</i> attribute.
Syntax	Boolean
Constraints	DS_NONREMOVABLE_ATTR

	DS_SINGLE_VALUED_ATTR DS_SYNC_IMMEDIATE
Used In	User
Remarks	None

Passwords Used

Description	This attribute specifies old (previously used) passwords.
Syntax	Octet String
Constraints	DS_HIDDEN_ATTR DS_NONREMOVABLE_ATTR DS_SYNC_IMMEDIATE
Used In	User
Remark	Application cannot access this attribute because it is a hidden attribute. The <i>Passwords Used</i> attribute is maintained internally, if <i>Unique Passwords Required</i> is set to True. When a password is changed, the old password value is stored in this attribute. Before a password is accepted to be changed, this list is searched to see if the “new” password is already in the list of previously used passwords. Old passwords are purged from the list when the password timestamp is older than 8 times the password expiration interval.

Path

Description	This attribute specifies a physical location of a file system directory.
Syntax	Path
Constraints	DS_NONREMOVABLE_ATTR DS_SYNC_IMMEDIATE
Used In	Directory Map
Remarks	None

Permanent Config Parm

Description	This attribute holds the permanent configuration parameters.
Syntax	Octet String
Constraints	DS_PUBLIC_READ
Used In	NCP Server
Remarks	None

Physical Delivery Office Name

Description	This attribute specifies the name of the city, village, etc., where a physical delivery office is situated.
Syntax	Case Ignore String
Constraints	DS_NONREMOVABLE_ATTR DS_SIZED_ATTR (1..128) DS_STRING_ATTR DS_SYNC_IMMEDIATE
Used In	External Entity Organization Organizational Person Organizational Role Organizational Unit
Remarks	None

Postal Address

Description	This attribute specifies the address information required for the physical delivery of postal messages to a named object.
Syntax	Postal Address
Constraints	DS_NONREMOVABLE_ATTR DS_SYNC_IMMEDIATE
Used In	External Entity Organization Organizational Person Organizational Role Organizational Unit
Remarks	<p>A value for this attribute is typically composed of selected attributes from the MHS Unformatted Postal O/R Address version 1, according to Recommendation F.401. The address is limited to 6 lines of 30 characters each, including a <i>Postal Country Name</i>.</p> <p>Normally the information contained in such an address could include an addressee's name, street address, city, state or province, postal code and possibly a post office box number, depending on the specific requirements of the named object.</p> <p>NetWare administrative utilities will link the <i>Postal Address</i> value to the following attributes: <i>Physical Delivery Office Name</i>, <i>Postal Code</i>, <i>Postal Office Box</i>, and <i>Street Address</i>.</p> <p>The <i>Postal Address</i> uses the following as default values:</p> <p>Line 1: The object's RDN (<i>Relative Distinguished Name</i>)</p>

Line 2: *Street Address* or *Postal Office Box Number*

Line 3: (no default value)

Line 4: *Physical Delivery Office Name, State or Province Name*

Line 5: *Postal Code*

Line 6: *Country Name* (from the object's DN)

The second line of the *Postal Address* will default to the post office box, if present, or otherwise to the street address. The third line of the *Postal Address* should be presented in the utility as the second line of both the post office box and street address. Attribute values are truncated to 30 characters when used in the *Postal Address*.

Postal Code

Description This attribute specifies the postal code of the named object. If this attribute value is present, it is part of the object's *Postal Address*.

Syntax Case Ignore String

Constraints DS_NONREMOVABLE_ATTR
DS_SIZED_ATTR (0..40)
DS_STRING_ATTR
DS_SYNC_IMMEDIATE

Used In External Entity
Organization
Organizational Person
Organizational Role
Organizational Unit

Remarks None

Postal Office Box

Description This attribute specifies the post office box the object receives physical postal delivery at.

Syntax Case Ignore String

Constraints DS_NONREMOVABLE_ATTR
DS_SIZED_ATTR (0..40)
DS_STRING_ATTR
DS_SYNC_IMMEDIATE

Used In External Entity
Organization
Organizational Person

Organizational Role
Organizational Unit

Remarks None

Postmaster

Description This attribute specifies one or more users who have the privileges to manage a messaging server, such as privileges to remove a mailbox.

Syntax Distinguished Name

Constraints DS_NONREMOVABLE_ATTR
DS_SYNC_IMMEDIATE

Used In Messaging Server

Remarks Postmasters also receive messages about special events in the messaging server, such as messages being unprocessed.

Print Job Configuration

Description This attribute contains information on the specified print job configuration.

Syntax Stream

Constraints DS_NONREMOVABLE_ATTR
DS_SINGLE_VALUED_ATTR
DS_SYNC_IMMEDIATE

Used In Organization
Organizational Unit
User

Remarks None

Print Server

Description This attribute designates an object as the host server for a specific printer.

Syntax Typed Name

Constraints DS_NONREMOVABLE_ATTR
DS_SINGLE-VALUED_ATTR
DS_SYNC_IMMEDIATE

Used In Printer

Remarks None

Printer

Description	This attribute contains a list of printers' object names that are serviced by the print server.
Syntax	Typed Name
Constraints	DS_NONREMOVABLE_ATTR DS_SYNC_IMMEDIATE
Used In	Print Server
Remarks	None

Printer Configuration

Description	This attribute contains information on the specified printer configuration.
Syntax	Octet String
Constraints	DS_NONREMOVABLE_ATTR DS_SINGLE_VALUED_ATTR DS_SYNC_IMMEDIATE
Used In	Printer
Remarks	None

Printer Control

Description	This attribute is the Directory Services counterpart of the DOS printer definition file NET\$PRN.DAT.
Syntax	Stream
Constraints	DS_NONREMOVABLE_ATTR DS_SINGLE_VALUED_ATTR DS_SYNC_IMMEDIATE
Used In	Organization Organizational Unit User
Remarks	None

Private Key

Description	This attribute contains an RSA private key.
Syntax	Octet String

Constraints	DS_HIDDEN_ATTR DS_NONREMOVABLE_ATTR DS_READ_ONLY_ATTR DS_SINGLE_VALUED_ATTR DS_SYNC_IMMEDIATE
Used In	Server User

Remarks This attribute produces signed authentication information that can verify the identity of an object. The *Private Key* attribute contains a cryptographically procted RSA private key. Applications cannot access this attribute because it is a hidden attribute.

Profile

Description	This attribute identifies the login profile to be used if the user doesn't specify one at login time.
--------------------	---

Syntax	Distinguished Name
Constraints	DS_NONREMOVABLE_ATTR DS_SINGLE_VALUED_ATTR DS_SYNC_IMMEDIATE
Used In	Group User

Remarks See remarks for the *Login Script* attribute.

Profile Membership

Description	This attribute contains a list of profiles that the object can use.
--------------------	---

Syntax	Distinguished Name
Constraints	DS_NONREMOVABLE_ATTR DS_SYNC_IMMEDIATE DS_WRITE_MANAGED
Used In	Group User

Remarks This attribute allows objects to have multiple profiles. This is useful for NNS users who are allowed to have multiple profiles.

Public Key

Description	This attribute contains a certified RSA public key.
Syntax	Octet String
Constraints	DS_NONREMOVABLE_ATTR DS_PUBLIC_READ DS_READ_ONLY_ATTR DS_SINGLE_VALUED_ATTR DS_SYNC_IMMEDIATE
Used In	Server User
Remarks	This attribute verifies authentication information produced with the corresponding private key. The attribute contains the public key, along with information that certifies the integrity of the public/private key pair. Certification information is necessary to prevent legitimate key pairs from being replaced by illicit key pairs.

Queue

Description	This attribute contains the <i>Distinguished Name</i> of the queue that the object is associated with.
Syntax	Typed Name
Constraints	DS_NONREMOVABLE_ATTR DS_SYNC_IMMEDIATE
Used In	Printer
Remarks	None

Queue Directory

Description	This attribute contains the name of the subdirectory where the queue's files are stored.
Syntax	Case Ignore String
Constraints	DS_NONREMOVABLE_ATTR DS_SERVER_READ DS_SINGLE_VALUED_ATTR DS_SIZED_ATTR (1..255) DS_STRING_ATTR DS_SYNC_IMMEDIATE

Used In	Queue (M)
Remarks	The subdirectory name should include the local volume designation along with the subdirectory name, which should be a valid DOS name.

Received Up To

Description	This attribute specifies the last time the replica has received any updates.
Syntax	Timestamp
Constraints	DS_NONREMOVABLE_ATTR DS_READ_ONLY_ATTR DS_SYNC_IMMEDIATE
Used In	Partition
Remarks	None

Reference

Description	This attribute contains a list of objects that a specified object can be referenced by.
Syntax	Distinguished Name
Constraints	DS_HIDDEN_ATTR DS_NONREMOVABLE_ATTR DS_READ_ONLY_ATTR DS_SF_PER_REPLICA
Used In	Top
Remarks	<p>The <i>Reference</i> attribute is kept only on the replica which it originated in. It is not synchronized to other replicas. It makes it easier to find the objects that have a reference to a certain object. If object A, B, C, and D all have privileges granted to object X (through use of the ACL attribute), the <i>Reference</i> attribute of object X will contain the object names of A, B, C and D.</p> <p>This attribute also lists bindery object relations in bindery emulation. Since this attribute is hidden it cannot be accessed by any application.</p>

Replica

Description	This attribute identifies the name servers that store replicas of the partition.
Syntax	Replica Pointer
Constraints	DS_NONREMOVABLE_ATTR

DS_PUBLIC_READ
 DS_READ_ONLY_ATTR
 DS_SYNC_IMMEDIATE

Used In	Partition
Remarks	The <i>Replica</i> attribute identifies a set of name servers that store replicas of the partition. This is a multi-valued attribute. It is present and non-NULL in every partition entry, and it may not be directly modified. The set is updated as a side effect of the operations that create, destroy, or change the replication of a partition.

Replica Up To

Description	This attribute contains a time stamp of what changes the object has sent out to other replicas of a partition.
Syntax	Octet String
Constraints	DS_NONREMOVABLE_ATTR DS_PUBLIC_READ DS_READ_ONLY_ATTR DS_SYNC_IMMEDIATE
Used In	Partition
Remarks	None

Resource

Description	This attribute contains a list of resources associated with the object.
Syntax	Distinguished Name
Constraints	DS_NONREMOVABLE_ATTR DS_SYNC_IMMEDIATE
Used In	Server
Remarks	The <i>Resource</i> attribute lists resources that are managed by the server.

Revision

Description	This attribute specifies the revision number of the object.
Syntax	Counter
Constraints	DS_NONREMOVABLE_ATTR DS_PUBLIC_READ DS_READ_ONLY_ATTR DS_SINGLE_VALUED_ATTR

	DS_SYNC_IMMEDIATE
Used In	Top
Remarks	None

Role Occupant

Description	This attribute specifies the name of the object that fulfills an organizational role.
Syntax	Distinguished Name
Constraints	DS_NONREMOVABLE_ATTR DS_SYNC_IMMEDIATE
Used In	Organizational Role
Remarks	None

S (State or Province Name)

Description	This attribute specifies a state or province.
Syntax	Case Ignore String
Constraints	DS_NONREMOVABLE_ATTR DS_SIZED_ATTR (1..128) DS_STRING_ATTR DS_SYNC_IMMEDIATE
Used In	External Entity Locality Organization Organizational Person Organizational Role Organizational Unit
Remarks	When used as a component of a Directory name, a State or Province Name identifies a geographical subdivision that the named object is either physically located in, or associated with in some other important way.

SA (Street Address)

Description	This attribute specifies a site for local distribution and physical delivery in the form of a postal address (that is, the street name, place, avenue, and house number).
Syntax	Case Ignore String
Constraints	DS_NONREMOVABLE_ATTR

	DS_SIZED_ATTR (1..128) DS_STRING_ATTR DS_SYNC_IMMEDIATE
Used In	External Entity Locality Organization Organizational Person Organizational Role Organizational Unit
Remarks	When used as a component of a Directory name, a Street Address identifies the address that the named object is either located in or associated with in some other important way. The attribute value for street address is a string.
SAP Name	
Description	This attribute contains the name used by a print server when advertising itself using the NetWare Service Advertising Protocol (SAP).
Syntax	Case Ignore String
Constraints	DS_NONREMOVABLE_ATTR DS_SINGLE_VALUED_ATTR DS_SIZED_ATTR (1..47) DS_STRING_ATTR DS_SYNC_IMMEDIATE
Used In	Print Server
Remarks	None
Security Equals	
Description	This attribute specifies group membership and security equivalences of an object.
Syntax	Distinguished Name
Constraints	DS_NONREMOVABLE_ATTR DS_SERVER_READ DS_SYNC_IMMEDIATE DS_WRITE_MANAGED
Used In	Server User
Remarks	None

Security Flags

Description	This attribute specifies the security flags for an object, that is, whether the object is using “NCP signing.”
Syntax	Integer
Constraints	DS_NONREMOVABLE_ATTR DS_SINGLE_VALUED_ATTR DS_SYNC_IMMEDIATE
Used In	Server User
Remarks	The four security flags and their meaning are as follows: <ul style="list-style-type: none">• 0 = No signing• 1 = Signing allowed• 2 = Signing preferred• 3 - Signing mandatory

See Also

Description	This attribute specifies the name of Directory objects that may reflect other aspects of the same real world object.
Syntax	Distinguished Name
Constraints	DS_NONREMOVABLE_ATTR DS_SYNC_IMMEDIATE
Used In	Device External Entity Group List Locality Organization Organizational Role Organizational Unit Person Profile Resource Server
Remarks	None

Serial Number

Description This attribute specifies an identifier as the serial number of a device.

Syntax Printable String

Constraints DS_NONREMOVABLE_ATTR
DS_SIZED_ATTR (1..64)
DS_STRING_ATTR
DS_SYNC_IMMEDIATE

Used In AFP Server
Device

Remarks None

Server

Description This attribute specifies a list of servers.

Syntax Distinguished Name

Constraints DS_NONREMOVABLE_ATTR
DS_SERVER_READ
DS_SYNC_IMMEDIATE

Used In Computer
Queue

Remarks None

Server Holds

Description This attribute contains the number of accounting charges pending while a server performs a chargeable action.

Syntax Hold

Constraints DS_NONREMOVABLE_ATTR
DS_SYNC_IMMEDIATE

Used In User

Remarks This attribute is used in NetWare accounting. If accounting is active, a server can charge for various actions or activities. Before performing some action, the server may wish to determine if the account has sufficient balance to pay for the request. A server may place a hold against an object's balance, which is an estimate of what the final charge will be. If the hold is successful, meaning sufficient balance remains, the action is performed. The hold is cancelled and a true charge for the actual amount is made against the object's balance. Up to 16 different servers can have holds pending against a user's balance simultaneously. So while a hold is

pending, this attribute contains the server hold making the charge and the total hold amount.

Status

Description	This attribute specifies the operational state of the specified object.
Syntax	Integer
Constraints	DS_NONREMOVABLE_ATTR DS_PUBLIC_READ DS_SINGLE_VALUED_ATTR DS_SYNC_IMMEDIATE
Used In	Computer Printer Server Volume
Remarks	Operational state values for <i>Status</i> might be <i>Up</i> (1) and <i>Down</i> (0).

Supported Connections

Description	This attribute identifies the number of concurrent connections a server allows.
Syntax	Integer
Constraints	DS_NONREMOVABLE_ATTR DS_SINGLE_VALUED_ATTR DS_SYNC_IMMEDIATE
Used In	AFP Server
Remarks	None

Supported Gateway

Description	This attribute contains a list of gateways supported by the associated object.
Syntax	Case Ignore String
Constraints	DS_NONREMOVABLE_ATTR DS_SIZED_ATTR (1..4096) DS_STRING_ATTR DS_SYNC_IMMEDIATE
Used In	Messaging Server

Remarks	<p><i>Supported Gateways</i> provide messaging connectivity between the MHS messaging system and external messaging systems. Thus, this attribute supports existing third-party gateway products.</p> <p>The gateway name consists of two sub-attributes: <i>Gateway Name</i> and <i>Gateway Protocol Type</i>. The names have the convention of eight or fewer characters followed by “/”, followed by another eight or fewer characters.</p>
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Supported Services

Description	This attribute contains a list of services that the associated object supports.
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Syntax	Case Ignore String
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Constraints	DS_NONREMOVABLE_ATTR DS_SIZED_ATTR (1..64) DS_STRING_ATTR DS_SYNC_IMMEDIATE
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Used In	Messaging Server NCP Server
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Remarks	None
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Supported Typefaces

Description	This attribute identifies the typefaces supported by a printer. Multiple typefaces should be represented as multiple values.
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Syntax	Case Ignore String
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Constraints	DS_NONREMOVABLE_ATTR DS_SIZED_ATTR (1..64) DS_STRING_ATTR DS_SYNC_IMMEDIATE
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Used In	Printer
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Remarks	None
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Surname

Description This attribute specifies the name a person inherits from a parent or assumes by marriage, and by which that person is known. For example, in the name “Robert Jones,” “Jones” is the surname. However, in the Chinese name “Sun Yat-sen,” “Sun” is the surname.

Syntax Case Ignore String

Constraints DS_NONREMOVABLE_ATTR
DS_PUBLIC_READ
DS_SINGLE_VALUED_ATTR
DS_SIZED_ATTR (1..64)
DS_STRING_ATTR
DS_SYNC_IMMEDIATE

Used In Person (M)

Remarks The value for this attribute is a string.

Synchronized Up To

Description This attribute contains a list of the time stamps that indicate the last time all servers holding a copy of the specified replica were synchronized.

Syntax Timestamp

Constraints DS_NONREMOVABLE_ATTR
DS_READ_ONLY_ATTR
DS_SF_PER_REPLICA

Used In Partition

Remarks None

T (Tree Name)

Description This attribute specifies the name of the tree.

Syntax Case Ignore String

Constraints DS_SIZED_ATTR (1..64)
DS_SYNC_IMMEDIATE

Used In Tree Root (M)

Remarks None

Telephone Number

Description	This attribute specifies a telephone number associated with an object.
Syntax	Telephone Number
Constraints	DS_NONREMOVABLE_ATTR DS_STRING_ATTR DS_SYNC_IMMEDIATE
Used In	Organization Organizational Role Organizational Unit Person
Remarks	A value for this attribute is a string that complies with the standard format for showing international telephone numbers, Recommendation E.123 (for example, "+ 44 582 10101").

Title

Description	This attribute specifies the designated position or function of an object within an organization.
Syntax	Case Ignore String
Constraints	DS_NONREMOVABLE_ATTR DS_SIZED_ATTR (1..64) DS_STRING_ATTR DS_SYNC_IMMEDIATE
Used In	External Entity Organizational Person
Remarks	A value for this attribute is a string, such as "Manager, Distributed Applications".

Type Creator Map

Description	This attribute identifies an object as a Macintosh file-system client.
Syntax	Stream
Constraints	DS_NONREMOVABLE_ATTR DS_SINGLE_VALUED_ATTR DS_SYNC_IMMEDIATE
Used In	User
Remarks	This attribute is used internally by "NetWare for Macintosh" to identify clients that should be given type and creator descriptions when file information is requested.

Unknown

Description	This attribute contains an attribute value for an attribute that is no longer defined by the schema.
Syntax	Unknown
Constraints	DS_NONREMOVABLE_ATTR
Used In	(Special)
Remarks	The <i>Unknown</i> attribute is provided for use by the server in restoring objects. If an attribute definition has been deleted and an object that is being restored has a value of the deleted attribute type, the now undefined attribute will be restored as <i>Unknown</i> .

Unknown Base Class

Description	This attribute stores the class an object was before it was changed to an unknown class.
Syntax	Case Ignore String
Constraints	DS_NONREMOVABLE_ATTR DS_READ_ONLY_ATTR DS_SINGLE_VALUED_ATTR DS_SIZED_ATTR (1..32) DS_STRING_ATTR
Used In	None
Remarks	None

User

Description	This attribute contains a list of users associated with the object.
Syntax	Distinguished Name
Constraints	DS_NONREMOVABLE_ATTR DS_SERVER_READ DS_SYNC_IMMEDIATE
Used In	Queue Server
Remarks	The <i>User</i> attribute contains a list specifying which users are authorized to use the device, resource, or server.

UID (User ID)

Description This attribute specifies a unique user ID for use by UNIX clients.

Syntax Integer

Constraints DS_NONREMOVABLE_ATTR
DS_SINGLE_VALUED_ATTR
DS_SYNC_IMMEDIATE

Used In User

Remarks None

Version

Description This attribute is a string describing the version identifier of the software associated with the object.

Syntax Case Ignore String

Constraints DS_NONREMOVABLE_ATTR
DS_PUBLIC_READ
DS_SINGLE_VALUED_ATTR
DS_SIZED_ATTR (1..64)
DS_STRING_ATTR
DS_SYNC_IMMEDIATE

Used In Server

Remarks None

Volume

Description This attribute contains the *Distinguished Name* of the volume a queue is located on.

Syntax Distinguished Name

Constraints DS_NONREMOVABLE_ATTR
DS_SINGLE_VALUED_ATTR
DS_SYNC_IMMEDIATE

Used In Queue

Remarks None

