

CA Directory

Release Summary

r12.0 SP8



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Chapter 1: New and Changed Features

This section contains the following topics:

[New and Changed Features in SP8](#) (see page 9)

[New and Changed Features in SP7](#) (see page 12)

[New and Changed Features in SP6](#) (see page 15)

[New and Changed Features in SP5](#) (see page 16)

[New and Changed Features in SP4](#) (see page 19)

[New and Changed Features in SP3](#) (see page 20)

[New and Changed Features in SP2](#) (see page 22)

[Deprecated and Discontinued Commands and Features](#) (see page 27)

New and Changed Features in SP8

Set TCP Buffer Sizes

CA Directory now allows you to select the TCP buffer sizes for Directory r12.0 SP8. TCP buffer sizes sets the send and receive socket buffer sizes.

To set the TCP buffer sizes, use the following command:

```
set tcp-buff-size = <txSize>, <rxSize>;
```

txSize

Defines TCP buffer size of the send buffer where size is in bytes.

Default: 0

rxSize

Defines TCP buffer size of the receive buffer where size is in bytes.

Default: 0

These values affect the send and receive buffer sizes as they are passed to the socket() system call.

Setting both the values to 0 allows the operating system to scale the buffers up to the operating system imposed maximum.

Note: We recommend using the default settings.

Virtual List Views (VLV) Support

CA Directory now supports VLV which provides you two ways to access a page in a sorted result.

Access Method 01:

The client provides a greater-than-or-equal to match-value defining a position in the desired page. For example, the server returns the page starting with an entry where the attribute, such as myattr1 has a value greater than or equal to 499.

LDUA Example:

```
search-req base-object=<> whole-subtree
controls = { server-side-sort myattr1
virtual-list-view before = 1 after = 3 greater-or-equal = 0000000499 };
wait;
```

Access Method 02:

The server returns the page defined by an ordinal offset, when there is no matching value. For example, the server returns the page that starts with entry 2000. The request can only be handled by assembling the entire result set, sorting it, and moving to the 2000th entry.

LDUA Example:

```
search-req base-object=<> whole-subtree
controls = { server-side-sort myattr1
virtual-list-view before = 1 after = 3 offset = 2000 content-count = 6000 };
wait;
```

before

Defines the number of entries before the target entry that the client requests the server to send.

after

Defines the number of entries after the target entry that the client requests the server to send.

offset

Defines the target entry.

content-count

Defines the number of entries in the result set.

greater-or-equal

Defines the target entry by comparing it to the values of the attribute specified.

Horizontal Partitioning with Wildcard Support

Horizontal partitioning definition now supports a wildcard asterisk (*) as an attribute type. The wildcard asterisk partitions all the objects in the scope of the horizontally partitioned set of DSAs.

Example:

Horizontally Partitioned set of DSAs with the following prefixes:

```
prefix      = <c AU><o Users><* "[hash1(4)=0]">
prefix      = <c AU><o Users><* "[hash1(4)=1]">
prefix      = <c AU><o Users><* "[hash1(4)=2]">
prefix      = <c AU><o Users><* "[hash1(4)=3]">
```

Following are examples for partitioning the objects by commonName, uid, and so on:

```
<c AU><o Users><cn "Craig LINK">
<c AU><o Users><uid 456788>
```

Certifications

CA Directory is now certified on the following operating systems:

- CentOS 6.0
- RHEL 5.7

Note: For more information, see [Operating System Support](#) (see page 31).

DXmanager

CA Directory r12 SP8 contains a new version of the Directory package only (which includes DXserver). It does not include a new version of the Directory Manager package (which includes DXmanager).

You can upgrade the Directory package without updating Directory Management.

If you are installing for the first time, install the following versions of these packages:

- Directory r12.0 SP8
- Directory Management r12.0 SP2

Note: For more information about the installation packages, see Installation Components in the Installation Guide.

New and Changed Features in SP7

Configure Your Query Log

The *set query-log-advanced* command has been created, to help you configure your query log.

Using this command, you can make the query log include the following information:

- Whether each request was sent over SSL.
- The source of each request
- Any LDAP controls known/supported by the DSA.
- The LDAP error name and number in an error response.
- The time taken for each update to successfully complete.
- The attributes requested on each search, instead of the count of attributes being returned. This option performs the same function as the *set query-log-show-eis* command.

Listen on All Returned DNS Addresses

CA Directory has been enhanced to listen on all returned DNS addresses. This ensures correct fail-over even if some of the returned addresses are not valid.

CA Directory queries the DNS for a particular logical address (hostname). If more than one physical address is returned, all are retained.

In case the first address is not valid, the DSA will failover to the second, etc. Previously, only the first address would be accepted.

Note that the returned addresses are still screened according to preference. That is, if IPv4 is preferred, only IPv4 addresses will be accepted;

If IPv6 is preferred, only IPv6 addresses will be accepted; if no preference is stated, we will accept all the IPv6 addresses followed by all the IPv4 addresses.

Preference is expressed by using the prefixes *tcp*, *ip*, *ipv6*, *ipv4*. All except for *ipv4* and *ipv6* prefer IPv6 followed by IPv4.

The prefix *ipv6* specifies only IPv6 addresses and *ipv4* specifies only IPv4 addresses.

User Passwords Replicated as Hashed Passwords

Attribute values for *userPassword* are now replicated as hashed passwords rather than in cleartext, assuring that the stored values of master and replica DSAs are exactly the same even when using salted hashes.

Alarm Log Now Reports Datastore Usage at Startup

An ALARM has been added to the alarm log at startup reporting on datastore size, used bytes, and reclaimable bytes.

Server Side Sorting Works with Router DSAs

Server Side Sorting (RFC 2891) has been enhanced to work via Router DSAs.

Size Limits for Simple Paged Results

Size limits for Simple Paged Results LDAP control searches are now applied to the page rather than to the complete result set.

UNIX Installation Defaults to 64-bit

The UNIX install will default to the 64-bit CA Directory when both 32-bit and 64-bit versions are available in the install package.

Deprecated Command: clear schema

The *clear schema* command is now deprecated.

You can now add new schema at any time with the *init* command. If you change schema, such as *ldap-names*, restart the DSA for the changes to take effect.

If you change the syntax of attribute types, you need to dump and reload. This has not changed.

New Command: set interrupt-searches

The new command *set interrupt-searches = true* allows searches to be abandoned and prevents long searches blocking updates.

This new command must be used in conjunction with the *set dxgrid-queue = true* command.

Certifications

CA Directory is now certified on the following:

- Windows 7 SP1 64-bit
- Windows 2008 R2 SP1 64-bit
- RHEL 6.0 64-bit
- RHEL 6.1 64-bit

Note: For more information see [Operating System Support](#) (see page 31).

New and Changed Features in SP6

Certifications

CA Directory and CA Directory Management are now certified on HP-UX 11iv3 IA-64, and AIX 7.1 64-bit.

Note: For more information see [Operating System Support](#) (see page 31).

Salted SHA512 and Salted MD5 Supported for Hashing the userPassword Attribute

CA Directory now supports Salted SHA-512 and Salted MD5 hashing of the *userPassword* attribute.

These newly supported algorithms have been added to the *set password-storage* command. For more information, see *set password-storage Command* in the *Reference Guide*.

Improved Upgrade from Versions of CA Directory that Use Ingres

The migration from Ingres to DXgrid DB has been greatly improved. This is particularly important when upgrading from CA Identity Manager r12.5.

DXmanager

CA Directory r12 SP6 does not include a new version of the Directory Manager package (which includes DXmanager). It contains a new version of the Directory package only (which includes DXserver).

You can safely upgrade the Directory package without updating Directory Management.

If you are installing for the first time, install the following versions of these packages:

- Directory r12 SP6
- Directory Management r12 SP2

Note: For more information about the installation packages, see *Installation Components* in the *Installation Guide*.

New and Changed Features in SP5

The following features were added or enhanced in r12 SP5.

SHA-2 Hash Family Support

CA Directory now supports SHA-2 for hashing operations, following the requirements in the following standard: [US NIST FIPS 180-3 \(Oct 2008\) Secure Hash Standard \(SHS\) Requirements](#).

This affects the following tools:

- DXcertgen can now create certificates with SHA-2 signatures
- DXpassword can now hash passwords using SHA-2 algorithms

DXloaddb Checks the Syntax for telephoneNumber and facsimileTelephoneNumber

The following attributes must not contain a space character only:

- telephoneNumber
- facsimileTelephoneNumber

If one of these attributes does contain a space only, any DISP updates will fail.

To help you avoid this problem, DXloaddb now checks the syntax of these attributes for space-only values, and rejects any it finds with an error similar to the following:

```
Invalid syntax for fax/telephone number  
Wrong syntax for value " " on line 19
```

DXloaddb Rejects Entries with Multiple Passwords

DXloaddb now rejects entries with multiple passwords in the userPassword attribute.

To permit DXloaddb to load an entry with multiple passwords, use the following command:

```
set enable-nonstandard-behaviour=true;
```

If your data has an entry with multiple passwords and you upgrade to CA Directory r12 SP5, you will receive an error message similar to the following:

```
Entry on line 20 contains multiple values for single-valued attribute 'userPassword'
```

You will need to fix the problem entries before you run DXloaddb.

Change to iTechPoz Schema

The pozLocation attribute in the iTechPoz.dxc schema is now of syntax caseIgnoreString, to allow searches to be case insensitive.

Prevent the Creation of an Entry with Multiple Unrelated Structural Object Classes

It is now possible to prevent adding an entry which has more than one unrelated structural object classes as specified in Section 8.3.2 of X.501 and Section 2.4.2 of RFC4512.

To enforce this, add the following command to your settings:

```
set check-structural-oc = true;
```

A Multiwrite Group Cannot Contain LDAP Servers Only

A multiwrite group can no longer contain LDAP servers only. Each multiwrite group must contain at least one CA Directory DSA.

If a multiwrite group contains only LDAP servers, peer DSAs send updates only to the first LDAP server in the group. It does not pass the updates on to the other LDAP servers.

If you currently have a multiwrite group that contains only LDAP servers, you should make one of the following changes:

- Move the other LDAP servers into groups serviced by CA Directory DSAs.
- Add each LDAP server to its own group, so they are replicated to asynchronously.
- Remove the other LDAP servers from multi-write or from the configuration altogether.

Add Prefixes and Suffixes to the Search Results from a View

When you set up a view, you can add a constant prefix or suffix to search results in a view.

For example, you could add a prefix to search results from a particular source, to help you distinguish these results from results from other sources.

For more information, see Set Up Views in the *Administration Guide*.

New SNMP Counters for Tracking Datastore Usage

You can now track data store usage using the following SNMP counters:

- dxCacheEntries
- dxCacheFilesize
- dxCacheUsedBytes
- dxCacheReclaimable

Certifications

CA Directory and CA Directory Management are now certified on SLES 11.1 and Windows 7 64-bit.

Note: For more information see [Operating System Support](#) (see page 31).

DXmanager

CA Directory r12 SP5 does not include a new version of the Directory Manager package (which includes DXmanager). It contains a new version of the Directory package only (which includes DXserver).

You can safely upgrade the Directory package without updating Directory Management.

If you are installing for the first time, install the following versions of these packages:

- Directory r12 SP5
- Directory Management r12 SP2

Note: For more information about the installation packages, see Installation Components in the Installation Guide.

New and Changed Features in SP4

The following features were added or enhanced in r12 SP4.

Wild Card Search on an Integer Syntax No Longer Possible

It is no longer possible to do a wild card search on an integer syntax. The DSA will return an "unwilling-to-perform" error rather than returning an incorrect result.

seeAlso initial and final Searches Take into Consideration LDAP/X.500 Order

The initial and final search filter of the seeAlso attribute now works correctly for LDAP and X.500 searches.

The seeAlso attribute has a syntax of distinguishedName (DN) and is stored in the X.500 order. An LDAP DN has the reverse order of a DN in X.500. Therefore swap over the initial or final LDAP search before applying it to the CA Directory search.

For example, if the seeAlso LDAP attribute has a value of:

```
cn=Cora BALDWIN,ou=Applications,ou=Customer,o=DEMOCORP,c=AU
```

then this value is stored internally as

```
<c AU><o DEMOCORP><ou Customer><ou Applications><cn "Cora BALDWIN">
```

If you use an LDAP search filter of (seeAlso=*o=DemoCorp,c=AU), then the query is automatically changed to (c=AU,o=DEMOCORP,*), returning a result as expected. This applies to any attribute with distinguishedName Syntax.

New set exclude-addresses Command

This command lets you specify a list of IP addresses for which you want to refuse LDAP/DAP binds. You can display the excluded addresses with the get stack console command.

set concurrent-bind-user Command Allows the DSA to Process Concurrent Binds

The concurrent-bind-user setting now supports multiple distinguished names through a comma-separated list.

Memory Dumps Use Less Memory

Memory dumps require less memory when performing a DXgrid online dump. The required memory is reduced from the size of the entire DXgrid file (including unused space), down to the size of the data.

Certifications

CA Directory and CA Directory Management are now certified on RHEL 5.5, SLES 10.3, and Windows Server 2008 32 bit and 64 bit.

Note: For more information see [Operating System Support](#) (see page 31).

New Views Filter

Views have been enhanced to support a new from-client filter item. When specified in a search phase, the filter passed in from the client application will be used.

DXmanager

CA Directory r12 SP4 is a DXserver-only release. For new customers, the release package consists of the following ISOs:

- CA Directory r12 SP4 multi-platform
- CA Directory Management r12 SP2 multi-platform

New and Changed Features in SP3

The following features were added or enhanced in r12 SP3.

DXinfo Extended to Include DXmanager Related Logs and Configuration Files

DXinfo has been extended with a command line option `-a`. This allows you to include DXmanager related logs and configuration files. You can collect an additional folder that contains the files you would like to send to CA support site.

For example, you can collect the Config Model files by exporting the relevant configurations on Dxmanager and save them in a folder.

Example

The following command collects the files into a compressed file.

```
dxinfo -a <folderName>
```

Get Cache Command Displays Total Number of Entries

The get cache command of DXgrid now displays the total number of entries.

CA Directory Silent Install without DXadmin

You can now install CA Directory silently without DXadmin.

Access Control Rule Definition

CA Directory no longer applies locking to access control in order to improve performance.

As a consequence, you can no longer define access control rules dynamically using the console.

WebLogic Dynamic Groups Support

CA Directory now supports WebLogic's implementation of Dynamic Groups, that is, exact match searches against the entryDN attribute. When an entryDN is detected when processing a filter, the following occurs:

- The base-object of the search to the entry in the filter item is changed
- The search scope is changed to a to base-object
- The filter item is replaced with a true filter item, that is, (objectClass=*)

DXpassword Obfuscated Passwords

The DXpassword tool has been expanded to produce obfuscated passwords, by specifying the new encryption method CADIR. This helps shield passwords in configuration files from users with access to the computer running the DSA.

Previously, the *dsa-password* and *ldap-dsa-password* attributes could only be specified as clear-text in the DSA knowledge file.

Now, you can use the DXpassword tool with the new CADIR option to encrypt the password, and include the hash in the knowledge file. This prevents people with access to the operating system from being able to read the passwords in the knowledge file and gaining unauthorized access the LDAP server.

Active Directory memberOf Support

CA Directory now supports Active Directory's implementation of *memberOf*.

DXsoak Simple Authentication Binds Support

DXsoak now supports simple authentication binds.

DXmanager

SP3 is a DXserver-only release. For new customers the release package consists of two ISOs:

- CA Directory r12 SP3 multi-platform
- CA Directory Management r12 SP2 multi-platform

New and Changed Features in SP2

The following features were added or enhanced in r12 SP2.

Horizontal Partitioning

Horizontal partitioning allows the automatic distribution of entries of a namespace among a number of DSAs. This allows load sharing. Horizontal partitioning is particularly useful where there is one large flat namespace that needs to be distributed across multiple DSAs.

A normal router DSA can now send operations to an HP DSA "set". The router determines to which HP DSA to send based on the details in the operation (for example, the base DN of the search, or the DN of the update), chains it on to the specific HP DSA and then waits for a response.

The administrator does not need to manually allocate entries to each DSA because part of the DN is hashed to allocate entries to DSAs.

Preferred Replication Method–Multiwrite-DISP

We have enhanced multiwrite-DISP and it is now the preferred replication method. It combines the efficiency of multiwrite and the robustness of DISP.

Note: For more information about multiwrite replication with DISP recovery, see the *Administration Guide*.

Ability to Exclude Attributes From DXdumpdb

You can now exclude certain attributes when performing a DXdumpdb. For example, you may wish to exclude passwords when dumping a data store to an LDIF file.

For more information, see the *Reference Guide*.

SNMP For Authentication

You can now use the set auth-trap command as a mechanism to hook into the authentication processing on the DSA using SNMP traps. When this is set to true, this command turns on raising an authentication trap whenever an authentication failure occurs.

Increase the Size of a Datastore

You can now use the DXextenddb tool to increase the size of a specified data store.

The size of the data store is set in the DSA initialization file (DXI). If you want to change the size, you must change the configuration file and then run the DXextenddb tool.

By default, the size of the datastore is 500 MB.

Relative Distinguished Name (RDN) Order

You can now specify the order in which the attributes appear in the RDN, if you have a multi-valued RDN. This is a comma separated list. The first attribute in the list will be displayed first in the multi-valued RDN. For more information, see the *Reference Guide*.

DSA Hubs

You can now specify which DSAs in a group of multi-write DSAs acts as a hub. This only works if you also have multi-write-group enabled. This setting prevents unsuitable DSAs being selected as the hub in a failover situation.

Automatic Prompt for 64bit Processing

The Linux 32 bit and 64 bit installation packages are now combined in a hybrid package. If your system is 64 bit compatible, you will be asked whether you want to install in 64 bit mode.

Items Exported to LDIF Are Automatically Sorted

The DXdumpdb command now automatically sorts entries alphabetically at every level of the hierarchy. This means you no longer need to use the ldifsort tool to sort your LDIF files.

String Values

The DXloaddb command lets you load a datastore from an LDIF file as it did previously, however the DXloaddb can now handle string values.

SSL Functionality Integrated Into the DSA

The SSL functionality that used to provide certificate authentication in the SSLD external to the DSA, has been incorporated into each DSA.

To automatically migrate the old SSL configuration to the new configuration settings, upgrade CA Directory to the latest version.

You can migrate your SSL configuration without upgrading the entire product.

Simplified Configuration Files

The DSA data files have been simplified; the `.[z]oc` and `.[z]at` files have been merged into the `.[z]db` file.

Installation Improvements

A number of improvements to the installation process have been made:

- DXadmind is no longer essential for a Directory Installation
- You will now be prompted for whether you want install DXadmind
- The samples have changed to reflect the new SSL configuration

Attribute Compression

To save space in the DX Grid, you can now compress specific attributes in the directory. To do this, you should use the `set compress` command.

For further information, see the Reference Guide.

New Commands Added in r12 SP2

The following commands are new to r12 SP2. For more information about these commands, see the *Reference Guide*.

- `clear multi-write-queue`
- `get ciphers`
- `get oper`
- `set cache-index-all-except`
- `set dereference-alias-on-bind`
- `set multi-write-group-hub`
- `set rdn-order`
- `set trap-on-update-verbose`

DirectoryString Values Type

DirectoryString values received by DXgrid via LDAP updates are now given the type UTF8string. Previously, they were given the type printableString but this resulted in interoperability problems with other X.500 directories. This is an X.500 only issue and should not affect LDAP clients.

SSLD Port Number in DXmanager is Deprecated

The DXmanager GUI lets the user set an SSLD port number in a number of places. This value is now deprecated. You can use the default value or ignore it. Changing the SSLD port number has no effect.

DXserver Schema Changes

This release introduces the following changes to the DXserver schema:

- The attribute type dxAttrDeleteOldRDN has been renamed to dxDeleteOldRDN in dxserver.dxc schema.

Note: This change should be transparent in most cases. However, if an old schema is copied over the new one, attempting to start a DSA fails with the following error: "Error in initialization files - Cannot rename attribute."

- The schema definition of dxDeleteTimestamp now includes no-user-modification and single-valued.

Note: This change should be transparent in most cases. However, if an old schema is copied over the new one, attempting to start a DSA fails with the following error: "Error in initialization files - Cannot change properties of attribute." Also, if this attribute was used incorrectly, there may also be problems in mixed version replication.

Reverse Index of Cached Attributes

CA Directory does not use a reverse index in preference to a regular forward index. It is only used in substring lookups where you use specify *final* as an allowed filter.

Gigabyte Value Expressed in Megabytes

CA Directory now uses the standard way for measuring gigabytes (GB). The number of megabytes (MB) in each GB is 1,000 and not 1,024 as it used to be. For example, the size of a new datastore is 1,000 MB (1 GB) and not 1,024 as the documentation for the DXnewdb tool states.

Datastore File Format Changes

The datastore (DXgrid) file format has changed. You cannot use any r12.0 SP1 components to operate on a datastore file that has been created or modified by r12.0 SP2. You can open an r12.0 SP1 datastore file with r12.0 SP2, but this causes the format to change and makes it unreadable for r12.0 SP1.

Deprecated and Discontinued Commands and Features

Some commands and features have been superseded, either because other commands or features with more power have replaced them, or because their functionality is performed automatically. The following section lists these commands and features.

Commands Deprecated in r12 SP7

The following commands were deprecated in r12 SP7:

Command	Reason	Side-effect
clear schema	This command could be used to remove the schema from a running DSA. This would cause any current operations to fail.	Silently ignored

Commands Deprecated in r12 SP2

The following commands were deprecated in r12 SP2:

Command	Reason	Side-effect
cmip-psap (knowledge)	CMIP support has been removed.	Silently ignored
get dib	The directory information base (DIB) has been replaced by DXgrid.	Syntax error, and the command is ignored
set disable-overlay	The overlay feature has been removed as similar functionality can be achieved using Views	Critical alarm, and the DSA shuts down
set multi-write-disp-queue	Recovery is via MW-DISP	Warning, and the command is ignored
set overlay-items	The overlay feature has been removed as similar functionality can be achieved using Views	Critical alarm, and the DSA shuts down
set overlay-target	The overlay feature has been removed as similar functionality can be achieved using Views	Critical alarm, and the DSA shuts down
ssld-port (knowledge)	SSLD is no longer used for encryption. This is handled by the DSA. Use the <i>set ssl</i> command.	Silently ignored

Commands Not Required if You Use DXmanager

The following table lists the commands that are now obsolete if you are using DXmanager to configure DSAs. These commands are still valid if you are not using DXmanager.

Command	Reason	Side-effect
always-chain-down	Automatically set to TRUE when using DXmanager configuration	Critical alarm and DXserver shutdown
authentication	Derived when using DXmanager configuration - the minimum authentication level of all DSAs in the grid	Critical alarm and DXserver shutdown
cache-attrs	All attributes are cached for DXgrid	Critical alarm and DXserver shutdown
cache-load-all	Set to true for DXgrid	Critical alarm and DXserver shutdown
dxconsole-connect-alert	Set via DXmanager	Critical alarm and DXserver shutdown
dxgrid-db-location	Set by DXmanager configuration	Critical alarm and DXserver shutdown
lookup-cache	Set to true for DXgrid	Critical alarm and DXserver shutdown
min-auth	Derived when using DXmanager configuration - the minimum authentication level of all DSAs in the grid	Critical alarm and DXserver shutdown
multi-casting	Automatically set to TRUE when using DXmanager configuration	Critical alarm and DXserver shutdown
multi-chaining	Automatically set to TRUE when using DXmanager configuration	Critical alarm and DXserver shutdown
multi-write-dsp-idle-time	No longer required in r12 due to architectural DXserver changes	Still supported
multi-write-disp-queue	Set via DXmanager	Critical alarm and DXserver shutdown
multi-write-disp-recovery	Set via DXmanager	Critical alarm and DXserver shutdown
multi-write-notify	No longer required in r12 due to architectural DXserver changes	Still supported
multi-write-queue	Set via DXmanager	Critical alarm and DXserver shutdown
multi-write-serial	Set via DXmanager	Critical alarm and DXserver shutdown

Command	Reason	Side-effect
set dsa (knowledge)	<p>Set via DXmanager with the following knowledge set as default:</p> <ul style="list-style-type: none"> ■ multi-write-group = "region name" ■ load-share-group = "site name" ■ dsa-flags = no-service-while-recovering - always enabled for data DSAs ■ dsa-flags = load-share - always enabled ■ precedence & write-precedence - cannot set explicit ordering. DSA will order by current region first. ■ trust-flags = allow-downgrading, allow-upgrading - set automatically based on authentication level. ■ trust-flags = no-server-credentials - set automatically if a non-X500 DSA. 	Still supported for legacy DSA instances
wait-for-multiwrite	Set via DXmanager	Critical alarm and DXserver shutdown

Features No Longer Supported

The following features are no longer supported in CA Directory:

- SSLD

The SSL functionality is now included in each DSA.

- CMIP

We recommend you use SNMP for network-based monitoring.

Chapter 2: Operating System Support

You can install CA Directory on Windows, UNIX, and Linux operating systems.

You can download the installation package for each operating system from Technical Support at <http://ca.com/support>.

For operating systems not listed here, contact Technical Support at <http://ca.com/support>.

This section contains the following topics:

[Directory OS Support](#) (see page 32)

[Directory Management OS Support](#) (see page 33)

Directory OS Support

You can install the Directory package on the following operating systems:

Operating System	Version	32-bit DXserver	64-bit DXserver
Solaris UltraSparc	9 10	Yes	Yes
Solaris x86/64	10	Yes	Yes
Linux x86	RHEL 5.7 SLES 11.1	Yes	
Linux x86/64	CentOS 6.0 RHEL 5.7 RHEL 6.1 SLES 11.1	No Yes No Yes	Yes
Windows x86	Server 2003 R2 SP2 Server 2008 SP2	Yes	No
Windows x86/x64	Server 2003 R2 SP2 Server 2008 SP2 Server 2008 R2 SP1 7 SP1	Yes Yes No No	Yes
AIX Power5 and higher	V6.1 V7.1		Yes
HP-UX PA-RISC	11i v1 (B.11.11) 11i v2 (B.11.23)	Yes	
HP-UX Itanium2	11i v2 (B.11.23) 11i v3 (B.11.31)		Yes

Note: The new glibc minimum requirement is version 2.5, which means that SLES 10.x shipping with glibc 2.4 is not supported.

Support of virtualization platforms (for example, VMware and Zones) is covered by the generic CA policy as defined in Techdoc TEC307048. You can find this document in the knowledge base of the CA Technical Support website at <http://ca.com/support>.

Directory Management OS Support

You can install the Directory Management package (which includes DXmanager) on the following operating systems:

Operating System	Version
Solaris UltraSparc	9 10
Solaris x86/64	10
Linux x86	RHEL 5.7 SLES 11.1
Linux x86/64	CentOS 6.0 RHEL 5.7 RHEL 6.1 SLES 11.1
Windows x86	Server 2003 R2 SP2 Server 2008 SP2
Windows x86/x64	Server 2003 R2 SP2 Server 2008 SP2 Server 2008 R2 SP1 7 SP1

Chapter 3: System Requirements

For production systems with very large datastores, or where maximum performance or fault-tolerance is required, consult CA at <http://ca.com/support> for advice on choosing server and disk configurations before installing this product.

This section contains the following topics:

[Minimum Memory and Disk Space](#) (see page 35)

[Supported Web Browsers](#) (see page 35)

[Java Runtime Environment](#) (see page 36)

[UNIX Requirements](#) (see page 36)

[Linux Requirements](#) (see page 36)

[Windows Requirements](#) (see page 36)

Minimum Memory and Disk Space

This table lists the minimum space and memory requirements for the three types of servers used in a CA Directory installation.

Computer Role	Minimum RAM	Minimum Disk Space	Required Software
Administrator's Computer	2 GB	10 GB	JRE 1.6.0_16 or higher
Directory Management Server	4 GB	10 GB	JRE 1.6.0_16 or higher
Directory Host	4 GB	100 GB, plus enough space for the directory data	If JXplorer is installed, JRE 1.6.0_16 or higher

Supported Web Browsers

DXmanager and JXweb support Internet Explorer 6, 7, and 8.

If you use Internet Explorer 9, run it in Internet Explorer 8 Browser Mode.

You must also enable JavaScript in your Internet browser.

Java Runtime Environment

DXmanager and JXweb require JRE 1.6.0_16 or higher to be installed on some computers in the backbone.

If you install on 64-bit Windows, you must use the 32-bit version of Java.

Note: For information about which computers require JRE, see the *Installation Guide*.

UNIX Requirements

You must have superuser (root) access to the system to install CA Directory.

Linux Requirements

You must have a superuser (root) access to the system to install CA Directory.

The following Linux kernels are supported on both the 32-bit and 64-bit platform:

- Linux Kernel 2.6 with glibc 2.5

Windows Requirements

You must have superuser (administrator) access to the system to install CA Directory.

Windows Installer v3 or later is required.

Winsock-compatible TCP/IP must be installed and configured.

If you install on 64-bit Windows, you must use the 32-bit version of Java.

Chapter 4: Documentation

Updated documentation for this product is available at <http://ca.com/support>.

This section contains the following topics:

[CA Directory Documentation](#) (see page 38)

[Documentation Conventions](#) (see page 38)

CA Directory Documentation

The documentation for CA Directory is listed in the following table.

The Bookshelf is available from the product media. The documents in the Bookshelf are available in both PDF and HTML formats. When you open a document from the bookshelf and perform a search, it will automatically search all other documents in the Bookshelf.

Guide	Content	Location
Administration Guide	Explanations and procedures to help you with CA Directory administration, including configuration, security and maintenance.	Bookshelf
Installation Guide	Explanations and procedures to help you install the product.	Bookshelf
Integration Guide	Explanations and procedures to help you integrate: <ul style="list-style-type: none"> ■ an Eracom HSM ■ a Websphere Portal Server ■ Entrust Security Manager 	Bookshelf
Reference Guide	Comprehensive reference information related to product functionality. Includes information about tools, commands, port numbers, system messages, limits and schemas.	Bookshelf
Release Summary	New and changes features since the last release, known issues, operating system support and installation and operations considerations.	Bookshelf
Readme	Deprecated. All information that used to be in this document is now in this Release Summary.	Installation folder
Release Notes	A list of all issues addressed in this release.	Installation folder
Tech Docs	Documents written by the Support team in answer to specific customer questions that have been raised.	support.ca.com

Documentation Conventions

The CA Directory documentation uses the following conventions:

Format	Meaning
--------	---------

Format	Meaning
Mono-spaced font	Code or program output
<i>Italic</i>	Emphasis or a new term
Bold	Text that you must type exactly as shown
A forward slash /	Platform-independent directory separator used to describe UNIX and Windows paths

The documentation also uses the following special conventions when explaining command syntax and user input (in a mono-spaced font):

Format	Meaning
<i>Italic</i>	Information that you must supply
Between square brackets []	Optional operands
Between braces { }	Set of mandatory operands
Choices separated by pipe	Separates alternative operands (choose one). For example, the following means <i>either</i> a user name <i>or</i> a group name: <code>{username groupname}</code>
...	Indicates that the preceding item or group of items can be repeated
<u>Underline</u>	Default values
A backslash at end of line preceded by a space \	Sometimes a command does not fit on a single line in this guide. In these cases, a space followed by a backslash (\) at the end of a line indicates that the command continues on the following line. Note: Avoid copying the backslash character and omit the line break. These are not part of the actual command syntax.

Example: Command Notation Conventions

The following code illustrates how command conventions are used in this guide:

```
ruler className [props({all|{propertyName1[,propertyName2]...})}]
```

In this example:

- The command name (ruler) is shown in regular mono-spaced font as it must be typed as shown.
- The *className* option is in italic as it is a placeholder for a class name (for example, USER).
- You can run the command without the second part enclosed in square brackets, which signifies optional operands.

When using the optional parameter (props), you can choose the keyword *all* or, specify one or more property names separated by a comma.

Chapter 5: Known Issues

The following sections list known issues for CA Directory.

This section contains the following topics:

[Known Issues Affecting All Operating Systems](#) (see page 41)

[Known Issues On All UNIX Operating Systems](#) (see page 44)

[Known Issues On Linux Only](#) (see page 44)

[Known Issues On Solaris Only](#) (see page 47)

[Known Issues On HP-UX Only](#) (see page 48)

[Known Issues On AIX Only](#) (see page 50)

[Known Issues On Windows Only](#) (see page 50)

Known Issues Affecting All Operating Systems

Misleading Alarm Message When Declaring a Setting Twice

If a setting is defined twice, you will see errors similar to the following after you upgrade:

```
[112] 20100830.084539.200 DSA_W1970 Old-style configuration: changing item 'summary-log'
```

```
[112] 20100830.084539.200 DSA_W1970 Old-style configuration: changing item 'trace-log'
```

These error messages mean that the problem configuration item is defined twice.

Action Required After DXmanager Upgrade

After you upgrade DXmanager, you must restart all Internet Explorer sessions running DXmanager before you can see the new functionality.

In addition, if you switch back and forth between different versions of DXmanager on the same computer, you must clear the Java cache each time you go back to the older version. For more information about how to clear the Java cache, see the *Administration Guide*.

IE7 Maintains DXmanager Session After Tab is Closed

In Internet Explorer 7, if you have logged in to DXmanager, closing the tab does not terminate the session. This means that if you re-open the tab, or open a new tab to the same address, the browser continues the session without requiring you to log in again. This can present a security risk.

To work around this issue, log out of DXmanager before you close the tab, or close the browser, not just the tab.

DXmanager Only Allows One DXadmin Port and Password

DXmanager can store only one port number and password for the DXadmin processes on every computer.

This means that during installation, you should set the same values for these on each host.

After installation, when you are using DXmanager to set up the directory backbone, you will specify the DXadmin port and password that you set during the installation.

DXmanager May Incorrectly Show a Stopped or Started DSA as Initializing

After deploying a new configuration, DXmanager may incorrectly show a DSA as initializing, when the DSA is, in fact, stopped or running.

To update the state of the DSA and correct the display, do the following:

1. Right click on the DSA icon.
2. If the Start DSA and Stop DSA options are available, click one of these.

If these options are not available, restart CA Directory Webserver.

This will change the DSA to the selected state, and the display will be correct.

DXmanager Chart Issues

The following DXmanager chart issues exist:

- DXmanager charts are not updated if none of the DSAs being charted are running.
- DXmanager charts do not display correct information after you deploy a new configuration.

To work around this issue, re-request the chart. To do this, navigate to a configuration page and then back to the main tabbed page for charts on the dashboard. Alternatively, clear then redefine a chart request for the charts tab.

DXmanager Does Not Validate All Data Entry Fields

If you deploy a configuration with invalid settings, DXserver will not start. Take care when entering configuration values.

DXmanager Drop-down Menus Show Unexpected Behavior

Some second level drop-down menus display the options you can select at a random location on the screen. To work around this, select the second level tabs directly.

No Monitoring in a Pure IPv6 Environment

Monitoring in a pure IPv6 environment does not work. This means that DXmanager does not provide:

- Statistics (for example, graphs)
- Status of running DSAs updated in real time
- Error messages from the DSA (for example: why a DSA could not start, data files filling up, and so on).

Note: Monitoring does work in an IPv4 or IPv4/IPv6 hybrid environment.

Cannot Start DSA after Upgrade from CA Directory 8.1

The following settings are no longer valid. Remove them from your configuration:

```
set limit-list = true|false;  
set limit-search = true|false;  
set eis-count-attr = dxentrycount;
```

Known Issues On All UNIX Operating Systems

DXwebserver Reports the Wrong Status

The dxwebserver status command can report that "DXwebserver is not running" even though it is running. This can happen if the java path is greater than 78 characters.

This also means that:

- After starting the DXwebserver successfully, the erroneous message is displayed.
- dxwebserver stop command does not work.

To work around this issue, search for your java processes using the ps -ef command, then manually kill the appropriate process.

Known Issues On Linux Only

CA Directory on 64-bit Linux Requires 32-bit Library

If you install CA Directory on a 64-bit Linux operating system, you may see an error similar to the following:

```
./dxsetup.sh: /working/SP5/dxserver/install/getfqdn: /lib/ld-linux.so.2: bad ELF interpreter: No such file or directory
```

This error message indicates that the 32-bit glibc is not installed. Some tools require this library, even on 64-bit operating systems.

To check the versions of glibc that are installed, use the following command:

```
rpm -qa --queryformat "%{NAME}, %{VERSION}, %{RELEASE}, %{ARCH}\n" | grep glibc
```

If the i686 glibc packages are missing from your system then install them before you install CA Directory.

For example, CA Directory on RedHat EL 6.0 requires the following:

- glibc-2.12-1.7.el6 (i686)
- glibc-devel-2.12-1.7.el6 (i686)

Index for PDF Documentation Does Not Work on Linux

In Adobe Acrobat Reader 7 on Linux, the PDF index does not work. This means that when you open one of the PDF user documents on Linux in Reader 7, you will see a long error message, starting with the following text: Acrobat could not load the following search index associated with this document...

You can still read the PDFs, and you can still search for text within a particular PDF.

Nautilus Warnings

When logging in as the user *dsa* on Linux platforms, some applications may display errors due to the environmental variable "POSIXLY_CORRECT" being set in the *dsa* user's environment. This flag is required for the correct operation of the DXtools. If this flag is removed from the environment so the other applications can work correctly it must be set again before calling any of the DXtools. This may be accomplished by wrapping the tools in a shell script.

CA Directory Does Not Operate Correctly with SELinux on RedHat

To allow CA Directory to operate correctly, you must either run SELinux in permissive mode, or disable SELinux.

Linux Needs Compatibility Standard C++ Libraries

Valid on RedHat Enterprise Linux 5, RedHat Enterprise Linux 6, SUSE Linux Enterprise Server 10, and SUSE Linux Enterprise Server 11

Symptom:

When I install the CA Directory Management package, I get the message:

```
The required C library libstdc++-libc6.2-2.so.3 could not be found
Please install this library and restart DXwebserver
```

Solution:

The compatibility Standard C++ Libraries that DXmanager require are not installed.

On RedHat Enterprise Linux 5, install the following:

- compat-libstdc++-296-2.96-138.i386.rpm
- compat-libstdc++-33-3.2.3-61.i386.rpm

RedHat Enterprise Linux 6, install the following:

- compat-libstdc++-296-2.96-144.el6.i686.rpm
- compat-libstdc++-33-3.2.3-69.el6.i686.rpm

On SUSE Linux Enterprise Server 10, do the following:

1. Navigate to YaST2, Software, Software Management
2. Search for and install the appropriate compat rpm for your architecture:
 - SLES 10 32bit - compat (compat-2006.1.25-11.2)
 - SLES 10 64bit - compat-32bit (compat-32bit-2006.1.25-11.2)

On SUSE Linux Enterprise Server 11, do the following:

1. Navigate to YaST2, Software, Software Repositories, Configuration, Repositories
2. Enable the SLES11-Extras repository. The repository is not enabled by default.
You can now access the compat rpms.
3. Navigate to YaST2, Software, Software Management
4. Search for and install the appropriate compat rpm for your architecture:
 - SLES 11 32bit - compat (compat-2009.1.19-2.1)
 - SLES 11 64bit - compat-32bit (compat-32bit-2009.1.19-2.1)

DSAs May Not Start Automatically After Reboot on SuSe 9.3 After Installing EEM

On SuSe 9.3, if you install CA EEM after installing CA Directory, EEM creates duplicate symbolic links to `/etc/init.d/dxserver`. As a result the script is called twice, and fails.

To work around this issue, delete the duplicate symbolic links. The name of the symbolic link is called `S99dxserver`. Delete that link from the following directories:

- `/etc/init.d/rc3.d`
- `/etc/init/rc4.d`
- `/etc/init/rc5.d`

DXdumpdb and DXloaddb Fail When the "get cache;" Command is Used

If you upgrade CA Directory from r8.1 to r12 SP1 and you have the "get cache;" command defined in the configuration, `DXdumpdb` and `DXloaddb` will fail as their parser detects this and returns an error.

When this happens during an upgrade, the installation program prompts you to find out whether you want to continue with the installation, causing data to be lost.

Known Issues On Solaris Only

Installing on Solaris 9

If you are not running a standard Solaris 9 installation, ensure you have the following Sun packages installed before you install CA Directory:

- `SUNWbcp`
- `SUNWscpr`
- `SUNWscpu`
- `SUNWscpux`
- `SUNWsra`
- `SUNWsrh`
- `SUNWipc`
- `SUNWcsw`
- `SUNWnisu` (This is only required if *getent* is not packaged in `SUNWcsw`)

Known Issues On HP-UX Only

Cannot Install CA Directory r12 SP1 on HP-UX in Trusted Mode

Before you can install or upgrade CA Directory on a HP-UX computer in trusted mode, you must prepare first.

To prepare for installing CA Directory r12 SP1:

1. Make any kernel parameter changes.
2. Rebuild the kernel if required.
3. Add the *etrdir* group through SAM or by editing */etc/group*.

Ensure that the GID is unique.

For example:

```
etrdir::100:
```

4. Add the *dsa* user with the primary group *etrdir*. Do this using SAM or by editing */etc/passwd* and */etc/shadow*.

Ensure that the UIDs are unique.

If you use SAM, do not create the home directories (let DXsetup do this).

For example:

```
dsa:x:1002:100:DXserver  
Administrator:/opt/CA/eTrustDirectory/dxserver:/bin/csh
```

5. Set the *umask* to something less severe.

For example:

```
set umask 0022
```

For information about trusted mode, see <http://docs.hp.com/en/B2355-90121/ch01s03.html>.

DXserver does not Start on HP-UX 11.11

When you try to start a DSA, the DSA does not start, and the following message appears:

```
/usr/lib/dld.sl: Unresolved symbol: getaddrinfo (code) from dxserver  
IOT trap
```

This happens because CA Directory r12 SP1 uses the `getaddrinfo()` function call to provide IPv6 functionality. However, the initial releases of HP-UX 11.11 did not include support for this function. You need to install the HP-UX patch PHCO_31903 or higher before you can run CA Directory.

To check whether you need to upgrade HP-UX:

Use one of these methods:

- Run the System Administration utility (SAM).

This indicates what software is installed.

- Run the following command:

```
nm /usr/lib/libc.sl | grep getaddrinfo
```

If it returns no rows, then you must install PHCO_31903 or higher before installing CA Directory.

DSA Database File Size Limited to 2 GB by HP-UX PA-RISC

On HP-UX PA-RISC, it is not possible to memory map files of a total size greater than 2 GB. If you are running a single DSA, the DB file cannot be larger than 2 GB. If you are running multiple DSAs, the sum of their sized cannot be greater than 2 GB.

Note: This problem does not affect HP-UX Itanium, because it is 64-bit/.

Known Issues On AIX Only

Cannot Create a Datastore Larger Than 1GB on AIX

On AIX, it may not be possible to create a datastore larger than 1 GB. This is due to a limitation on AIX: the default OS fsize limit on AIX is set to 2097151 blocks (1GB).

If you try to create a larger datastore using DXnewdsa or DXnewdb, you will see a message similar to the following:

```
$ dxnewdsa -s 2000 tmp 19689
Cannot write to datastore: File too large
Could not create new data store
```

Follow these steps:

1. Check the value of *ulimit*, using the following command:

```
$ ulimit
```

If the result is 2097151, your datastore size is limited to 1 GB.

2. Set the fsize limit to unlimited with the following command:

```
chuser fsize=-1 dsa
```

Known Issues On Windows Only

Cannot Install on a Network Drive

CA Directory cannot be installed on a network drive. If you try to install CA Directory on a network drive, an error message appears and the installation allows you to change to a local directory instead of the network drive.

DXtools Do Not Support Files Larger Than 4GB on Windows 32Bit

Contact CA Support if you intend to process a file with more than 4GB of data on Windows.

Upgrades on Windows May Impact Other CA Products

Many CA products use a shared Licensing component called Lic98. If you have Lic98 version 1.7 or 1.8, it may be left in an unusable state when a product that needs it is uninstalled. CA Directory removes all older versions of CA Directory during upgrade to r12 SP1 and this could break other CA products calling Lic98.

To work around this issue, upgrade Lic98 to version 1.8.01 or later. To do this, refer to the [CA ALP License Update for Windows](#).

Adding a Host Address on Windows Server 2008

If you are adding a new host address using DXmanager (either from the Maps applet or using the Single DSA Backbone) on a host machine that is running Windows Server 2008, enter an IP address rather than a hostname.

Chapter 6: Published Fixes

All published fixes for this product can be found through Published Solutions on Technical Support at <http://ca.com/support>.

Appendix A: Third-Party License Agreements

CA Directory uses some third-party code. This appendix includes the license agreements for that code.

This section contains the following topics:

[Software Under the Apache License](#) (see page 56)

[Aleksey XML Security Library v.1.2.9 and the xmlsec-nss Library](#) (see page 60)

[Java Architecture for XML Binding \(JAXB\) 2.0](#) (see page 72)

[JBoss 4.0.1 SP1](#) (see page 73)

[JWSDP 1.4](#) (see page 73)

[Libxml2 parser by Daniel Veillard](#) (see page 74)

[Microsoft Cabinet File SDK](#) (see page 74)

[OpenLDAP](#) (see page 75)

[OpenSSL](#) (see page 76)

[PCRE](#) (see page 80)

[Sun JRE 1.6.0_16](#) (see page 83)

[zlib 1.2.3](#) (see page 87)

Software Under the Apache License

Portions of this product include software developed by the Apache Software Foundation (<http://www.apache.org/>).

- Ant 1.6.5
- Ant 1.6.5
- Commons Codec 1.3
- Commons Codec 1.3
- commons configuration 1.3
- Commons Digester 1.7
- Commons httpclient 2.0.2
- Commons httpclient 2.0.2
- Commons Lang 2.1
- HTTP Web Server 2.0.54
- Log4j 1.2.8
- Slide 2.1
- Tomcat 6.0.18
- Velocity 1.5
- Xalan-C 1.9.0
- XML Security 1.3

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Apache License

Version 2.0, January 2004

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LEGAL form mozilla source code base directory

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B) Intermind owns pending U.S. patent applications on communications systems which employ metadata ("channel objects") to define a control structure for information transfer. The Netscape code does not infringe as released; however, modifications which utilize channel objects as described by Intermind should be considered carefully. The following is a statement from Intermind: "Intermind's claims fundamentally involve the use of a control structure to automate communications. ...The essence of Intermind's top claim is that two devices sender and receiver have persistent storage, communicate over a network, and exchange a control structure including metadata which describes: 1) what information is to be updated, 2) when to update this information, and 3) how to transfer the updated information. In addition, at least the receiving device must be able to process the metadata in order to perform the update determination and transfer. Any digital communications system which incorporates all of these elements will be covered by Intermind's patents." See Intermind.com.

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