

## Software Product Description

### Compaq OpenVMS Enterprise Directory for eBusiness V5.0 SPD 40.77.11

#### Description

The Compaq™ OpenVMS Enterprise Directory for eBusiness may be used to implement a distributed network directory service following the CCITT X.500 Recommendations. These Recommendations split the functions of the directory between one or more Directory System Agents (DSA), where all information is held and one or more Directory User Agents (DUA), from which all inquiries and other directory actions are made. Using the X.500 model, departments and organizations may adopt an incremental independent approach to the establishment of a directory service using conforming products from multiple vendors. These separate implementations may then be connected together to provide a single logical directory service which spans the department, the organization, the region or the world, as appropriate. The Directory may contain information on anything of interest, typically people, systems, network resources, authentication certificates and databases and may be accessed both by individual users and applications.

V5.0 includes an LDAPv3 and v2 interface enabling full interoperability with other LDAP applications and clients.

The OpenVMS Enterprise Directory product set includes:

- \* OpenVMS Enterprise Directory Server - a Directory System Agent
- \* OpenVMS Enterprise Directory Administration Facility - a Directory User Agent

Other Compaq messaging and networking products such as all versions of Office Server and ALL-IN-1 V3.2, also provide the directory

user agent function in order to access information in the Enterprise Directory Server.

The OpenVMS Enterprise Directory products are based on the 1993 edition of ISO/IEC 9594 and the CCITT X.500 series of recommendations.

#### Abstract Services

The OpenVMS Enterprise Directory components provide and support all of the X.500 Abstract Services, including:

- Read  
Read attributes from a named entry
- Compare  
Test an attribute value without reading it
- Abandon  
Abandon an outstanding operation
- List  
List names of subordinate entries
- Search  
Find entries matching a search expression
- Add  
Create a new entry
- Remove  
Delete an entry
- Modify Entry  
Add or remove attributes or values
- Modify RDN  
Rename an entry

The following operations are supported via the LDAPv3 protocol:

- Bind – with simple password
- Unbind
- Search – no extensibleMatch option
- Modify
- Add
- Delete

AE-PX3PL-TE

- Modify Distinguished Name – no newSuperior option
- Compare
- Abandon
- Backwards compatibility with LDAPv2 clients and directories

The following LDAP string syntaxes are supported:

- AttributeTypeDescription (not in v2)
- Binary
- BitString
- Boolean
- Distinguished Name
- DirectoryString
- FacsimileTelephoneNumber
- GeneralisedTime (not in v2)
- IA5String
- Integer
- Jpeg
- MHS-OR-Address
- Delete String
- UTC Time
- Telex Number
- NumericString
- ObjectClassDescription
- OID
- PostalAddress
- PrintableString
- TelephoneNumber
- Delivery Method
- Printable or Numeric String

## Schema

The OpenVMS Enterprise Directory uses a highly configurable schema allowing customer definition of attributes, object classes, structure rules, and name forms. The schema is installed individually at each DSA. A default schema that implements the schema in X.520 and X.521 (1995 edition) as well as other useful definitions such as one for supporting Entrust/PKI 5 are included.

## Security

The OpenVMS Enterprise Directory supports a subset of the Simplified Access Control scheme from the 1993 edition of the standard. This allows administrators to define policies that control access rights (such as read, browse, modify, remove) to entries and individual attributes within a particular part of the directory (naming context).

The OpenVMS Enterprise Directory allows for the authentication of users by name and password. It also allows access to be restricted based on network address and for chained operations.

## Distributed Operations

The DSA supports standard X.500 distributed operations including chaining and referrals. Knowledge management of superior and subordinate references allows an OpenVMS Enterprise Directory DSA to participate as a first-level DSA or a subordinate DSA in a multi-vendor distributed Directory Information Base (DIB).

## Replication

The OpenVMS Enterprise Directory supports shadowing of data between DSAs, allowing data to be replicated in the network for high availability and performance. Shadowing also allows replication of knowledge information for distributed operation, access control policies and authentication information, thus reducing the amount of management required.

Shadowed information is represented using the DSA Information Model defined in the 1993 edition of the standard. OpenVMS Enterprise Directory supports the shadowing service defined in X.525, including supplier initiated and consumer-initiated agreements, both scheduled and on change replication providing full or incremental updates.

## Protocols

The Directory Service is based on the client-server model. The DSA server supports the directorySystemAC application context (DSP protocol) to communicate with other DSAs. Communications between server DSAs and client DUAs are supported by the directoryAccessAC application context (DAP protocol). DAP enables DUAs in other X.500 implementations to access the OpenVMS Enterprise Directory DSA and vice-versa. DSP enables full interworking with DSAs in other implementations.

The X.500 DSA server supports LDAPv2 and LDAPv3 protocols.

For shadowing, the DSA supports shadowSupplierInitiatedAC and shadowConsumerInitiatedAC application contexts in both the synchronous and asynchronous variants (DISP protocol) and the directoryOperational BindingManagementAC application context (DOP protocol).

The OpenVMS Enterprise Directory V5.0 runs on the OpenVMS Alpha operating system. It provides integrated, multi-protocol support allowing concurrent DAP and DSP access over OSI (using transport classes TP0, TP2, TP4) and RFC1006 over TCP/IP.

### **Database**

The OpenVMS Enterprise Directory provides a Directory Information Base based on the 1993 edition of Extended Information Models. This indexed database supports high-performance searching and sophisticated matching including approximate (Soundex) match. The database is held in main memory to ensure optimal response times.

### **Service Management**

The OpenVMS Enterprise Directory provides DSA management conforming to Compaq's Enterprise Management Architecture (EMA), integrated with DECnet-Plus. This provides remote management facilities to configure and control DSAs, and to log significant events.

### **Programming Interface**

Application access to the OpenVMS Enterprise Directory is provided through the X/Open™ Company Limited's OSI-Abstract-Data Manipulation API and API to Directory Services, also known as the XDS/XOM Application Program Interface.

Documentation, useful libraries and supporting files for the API are included with the OpenVMS Enterprise Directory.

The OpenVMS Enterprise Directory includes a base component that contains the DUA libraries and other supporting files necessary to support applications written to the directory API. This base component, therefore, provides run-time client access to the API libraries; it is distributed with the OpenVMS Enterprise Directory product.

### **Directory User Agents**

The OpenVMS Enterprise Directory Administration Facility provides a Directory User Agent. The Information Management Utility (DXIM) allows users to search and browse the directory and to maintain the data stored in it. Operations include the addition, modification, and deletion of entries. DXIM supports both DECwindows™ Motif® and command line interfaces. It can be used on a DSA node or remotely from any other node in the network.

DXIM is configurable, based on the schema definitions, to support customer defined attributes and classes.

Access to the OpenVMS Enterprise Directory may also be obtained through other Compaq software products which contain the Directory User Agent function. For example, Office Server will allow users of TeamLinks, Outlook, IMAP4, POP3 and Web clients access to information in the X.500 Directory.

Inclusion of the LDAP interface enables the following clients to obtain directory information:

- Internet Explorer
- Netscape Web Client
- Outlook 98 Client

And any client accessing via Office Server V4.0A (LDAPv2 support) or Office Server V5.0 and V6.0 (LDAPv3 support).

### **STANDARDS SUPPORTED**

The OpenVMS Enterprise Directory products are implemented according to the 1993 edition of ISO/IEC 9594 and the CCITT X.500 series of Recommendations. The products have successfully completed testing to the Open Systems Testing Consortium (OSTC) 1988 X.500 conformance tests. The conformance testing was carried out by the United Kingdom National Computer Centre, an accredited OSTC testing centre, who produced OSTC test reports valid in all European Community states. The products have been registered by the U.S. National Institute of Standards and Technology (NIST) as conformant to U.S. GOSIP.

The products are designed and implemented to conform, with some minor exceptions, to the following European and US profiles:

NIST OIW Stable Implementor's Agreements - Version 5 edition 1

- ENV 41210
- ENV 41212
- ENV 41215
- ENV 41512

The product also supports, where applicable, the following Internet standards:

- RFC 1006
- RFC 1274
- RFC 1277 (as it applies to TCP/IP networks)
- RFC 1278

The LDAP functionality will conform to the following standards. For LDAP V2:

- RFC 1777 Lightweight Directory Access Protocol
- RFC 1558 A String Representation of LDAP Search Filters
- RFC 1778 The String Representation of Standard Attribute Syntaxes

For LDAP V3:

- RFC 2251 Lightweight Directory Access Protocol (v3)
- RFC 2252 Lightweight Directory Access Protocol (v3): Attribute Syntax Definitions
- RFC 2253 Lightweight Directory Access Protocol (v3): UTF-8 String Representation of Distinguished Names
- RFC 2254 The String Representation of LDAP Search Filters
- RFC 2255 The LDAP URL Format
- RFC 2256 A Summary of the X.500 (96) User Schema for use with LDAP V3

### Character Set Support

LDAPv3 strings are based on the UTF-8 character set and are restricted to characters that can be mapped to the T.61 character set. Input characters will be substituted by their base character wherever possible, if they can't be mapped to T.61.

## HARDWARE REQUIREMENTS

### Processors Supported

OpenVMS Enterprise Directory is supported on all valid OpenVMS AlphaServer configurations supported by DECnet-Plus. Refer to the DECnet-Plus for OpenVMS Alpha Software Product Description (SPD 50.45.xx) for further information on supported hardware configurations.

### Disk Space Requirements

The counts below refer to the disk space required on the system disk or specified file systems. The sizes are approximate; actual sizes may vary depending on the user's system environment, configuration, and software options selected.

The counts below refer to the space required to install the Directory Server, Administration, and Application Programming components. The Base component is a mandatory component for all installations. Permanent disk space requirements for the components are cumulative. Directory data files are not included and will require additional space which can be on a non-system disk.

Disk space required for installation:

<i>Component</i>	<i>Blocks</i>	<i>Kbytes</i>
All:	40000	20480

Disk space required for use (permanent):

<i>Component</i>	<i>Blocks</i>	<i>Kbytes</i>
Base:	6000	3072
Server:	18000	9216
Administration:	7000	3584
Application Programming:	1000	512
Look-up client	5000	2560

### Memory Requirements

The performance of this product is dependent on the amount of system memory. The memory size suggested for most typical hardware configurations is at least 128 Mbytes for systems running the Directory Server. On these server systems, memory usage increases in proportion to the amount of data stored in the database.

## CLUSTER ENVIRONMENT

This layered product is fully supported when installed on any valid and licensed VMScluster™\* configuration without restrictions. Only one Directory System Agent (DSA) can be active on a single node or VMScluster at any one time. The HARDWARE REQUIREMENTS section of this document details any special hardware required by this product.

\* VMScluster configurations are fully described in the VMScluster Software Product Description (29.78.xx) and include CI, Ethernet, and Mixed Interconnect configurations.

## SOFTWARE REQUIREMENTS

For OpenVMS Alpha Systems:

For Systems Using Terminals:

OpenVMS Alpha Operating System  
V7.2-1, V7.3 or later

DECnet-Plus V7.2-1 ECO2 for  
OpenVMS Alpha or later

Compaq TCP/IP Services for  
OpenVMS V5.0A or later is required  
for RFC1006 transport and LDAP  
protocols

For all OpenVMS Systems:

This product may run in either of the following ways:

Standalone Execution - Running the X11 display server and the client application on the same machine.

Remote Execution - Running the X11 display server and the client application on different machines.

### OpenVMS Tailoring:

The following OpenVMS classes are required for full functionality of this layered product:

- OpenVMS Required Saveset
- Network Support
- Programming Support
- VMS Workstation Support

## GROWTH CONSIDERATIONS

The minimum hardware/software requirements for any future version of this product may be different from the requirements for the current version.

## DISTRIBUTION MEDIA

This product is available:

- with OpenVMS V7.3 and later distributions of OpenVMS
- the OpenVMS Alpha Layered Products CD-ROM distribution's Software Product Library, formerly known as CONDIST
- the OpenVMS e-Business CD V1.1 and later

The on-line documentation for this product is available on the OpenVMS V7.3 kit and Alpha Online Documentation CD-ROM distributions.

A printed documentation kit is available that covers both platforms.

## ORDERING INFORMATION

In this section, an asterisk (\*) denotes variant fields. For additional information on available licenses, services, and media, refer to the appropriate price book.

*Software Product Services:*

- QT-2NZA\*-\*

### Compaq OpenVMS Enterprise Directory Administration Facility:

*Software Licenses on the OpenVMS Alpha Software Products Library:*

- QL-2P0A\*-\*

*Software Product Services:*

- QT-2P0A\*-\*

### Documentation for all products:

*OpenVMS Printed Documentation:*

- QA-0P4AA-GZ

## SOFTWARE LICENSING

This software is furnished under the licensing provisions of Compaq Computer Corporation's Standard Terms and Conditions. For more information about Compaq's licensing terms and policies, contact your local Compaq office or Partner.

### **License Management Facility Support**

This product is bundled at no license charge with OpenVMS V7.3 on an Unlimited System Use basis. There are no LMF license checks.

In a messaging environment with mail user agents, a MAILbus 400 MTA and gateways, a 5,000 entry DSA may be sufficient to support a user population of around 1000 people. For further details of this mechanism, consult the product documentation.

The OpenVMS Enterprise Directory includes a base component that contains the DUA libraries and other supporting files necessary to support applications written to the directory API. This base component, therefore, provides run-time client access to the API libraries; it is distributed with the OpenVMS Enterprise Directory product.

## SOFTWARE PRODUCT SERVICES

Software Product Services is based on Service level SPL3 when the product is first activated on every system.

## SOFTWARE WARRANTY

This software is provided by Compaq with a warranty in accordance with the Compaq OpenVMS operating system warranty that it is installed upon.

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