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X.500 Implementations Catalog-96

Status of this Memo

This memo provides information for the Internet community. This memo does not specify an Internet standard of any kind. Distribution of this memo is unlimited.

Abstract

This document is a revision to [RFC 1632]: A Revised Catalog of Available X.500 Implementations and is based on the results of data collection via a WWW home page that enabled implementors to submit new or updated descriptions of currently available implementations of X.500, including commercial products and openly available offerings. [RFC 1632] is a revision of [RFC 1292]. We contacted each contributor to [RFC 1632] to request an update and published the URL of the WWW home page survey template in several mailing lists to encourage the submission of new product descriptions.

This document contains detailed description of 31 X.500 implementations - DSAs, DUAs, and DUA interfaces.

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1. Introduction

This document catalogs currently available implementations of X.500, including commercial products and openly available offerings. For the purposes of this survey, we classify X.500 products as,

DSA

A DSA is an OSI application process that provides the Directory functionality,

DUA

A DUA is an OSI application process that represents a user in accessing the Directory and uses the DAP to communicate with a DSA, and

DUA Interface

A DUA Interface is an application process that represents a user in accessing the Directory using either DAP but supporting only a subset of the DAP functionality or a protocol different from DAP to communicate with a DSA or DUA.

Section 2 of this document contains a listing of implementations cross referenced by keyword. This list should aid in identifying implementations that meet your criteria.

To compile this catalog, the IDS Working Group solicited input from the X.500 community by publishing a URL for a set of on-line description forms deployed on the WWW as a home page on an InterNIC server. This URL

(<http://www.internic.net/projects/x500catalog/catalogtop.html>) was advertised on the following directory-related mailing lists: iso@nic.ddn.mil, isode@nic.ddn.mil, osi-ds@cs.ucl.ac.uk, ids@merit.edu, ietf-asid@umich.edu, mhs-ds@mercury.udev.cdc.com, nadf-l@ema.org, and dssig@nist.gov.

Readers are encouraged to submit comments regarding both the forms and content of this memo. New submissions are welcome. Please direct input to the Integrated Directory Services (IDS) Working Group (ietf-ids@umich.edu) or to the authors. IDS will produce new versions of this document when a significant number of substantive comments have been received or when significant updates and/or modifications to X.500-related standards documents have been ratified. This will be determined by the IDS chairpersons.

1.1 Purpose

The Internet has experienced a steady growth in X.500 piloting activities. This document hopes to provide an easily accessible source of information on X.500 implementations for those who wish to consider X.500 technology for deploying a Directory service.

1.2 Scope

This document contains descriptions of both free and commercial X.500 implementations. It does not provide instructions on how to install, run, or manage these implementations. The descriptions and indices are provided to make the readers aware of available options and thus enable more informed choices.

1.3 Disclaimer

Implementation descriptions were written by implementors and vendors, and not by the editors. We worked with the description authors to ensure uniformity and readability, but cannot guarantee the accuracy or completeness of the descriptions, nor the stability of the implementations.

1.4 Overview

Section 1 contains introductory information.

Section 2 contains a list of keywords, their definitions, a cross reference of the X.500 implementations by these keywords and a table containing implementor name, implementor abbreviation, and the page of this document on which the description begins for a particular implementor.

Section 3 contains the X.500 implementation descriptions.

Section 4 has a list of references.

Section 6 lists the editors' addresses.

1.5 Acknowledgments

The creation of this catalog would not have been possible without the efforts of the description authors and the members of the IDS Working Group. Our special thanks to the editors of [RFC 1632], Linda Millington and Sri Sataluri who graciously contributed the nroff source file used to structure their version of the catalog.

2. Keywords

Keywords are abbreviated attributes of the X.500 implementations. The list of keywords defined below was derived from the implementation descriptions themselves. Implementations were indexed by a keyword either as a result of: (1) explicit, not implied, reference to a particular capability in the implementation description text, or (2) input from the implementation description author(s).

2.1 Keyword Definitions

This section contains keyword definitions. They have been organized and grouped by functional category. The definitions are ordered first alphabetically by keyword category, and second alphabetically by implementation name within keyword category.

2.1.1 Availability

Available via FTP

Implementation is available using FTP.

Commercially Available

This implementation can be purchased.

Free

Available at no charge, although other restrictions may apply.

Limited Availability

Need to contact provider for terms and conditions of distribution.

2.1.2 Conformance with International Standards

PICS-AVAIL

Completed PICS per X.581/X.582

DAP

Support for the DAP protocol

DSP

Support for the DSP protocol

DISP

Support for the DISP protocol

DOP

Support for the DOP protocol

BAC

Support for Basic Access Control

SAC

Support for Simplified Access Control

2.1.3 Conformance with Proposed Internet Standards

These RFCs specify standards track protocols for the Internet community. Implementations which conform to these evolving proposed standards have a higher probability of interoperating with other implementations deployed on the Internet.

RFC-1274

Implementation supports [RFC 1274]: Barker, P., and S. Kille, The COSINE and Internet X.500 Schema, University College, London, England, November 1991.

RFC-1276

Implementation supports [RFC 1276]: Kille, S., Replication and Distributed Operations extensions to provide an Internet Directory using X.500, University College, London, England, November 1991.

RFC-1277

Implementation supports [RFC 1277]: Kille, S., Encoding Network Addresses to support operation over non-OSI lower layers, University College, London, England, November 1991.

RFC-1567

Implementation supports [RFC 1567]: Mansfield, G., and Kille, S., X.500 Directory Monitoring MIB, AIC Systems Laboratory, ISODE Consortium, January 1994.

RFC-1777

Implementation supports [RFC 1777]: Yeong, W., Howes, T., and Kille, S., Lightweight Directory Access Protocol, March 1995.

RFC-1778

Implementation supports [RFC 1778]: Howes, T., Kille, S., Yeong, W., and Robbins, The String Representation of Standard Attribute Syntaxes, March 1995.

RFC-1779

Implementation supports [RFC 1779]: Kille, S., A String Representation of Distinguished Names, March 1995.

RFC-1798

Implementation supports [RFC 1798]: Young, A., Connection-less Lightweight Directory Access Protocol, June 1995.

2.1.4 Consistence with Informational and Experimental Internet RFCs

These RFCs provide information to the Internet community and are not Internet standards. Compliance with these RFCs is not necessary for interoperability but may enhance functionality.

RFC-1202

Implementation supports [RFC 1202]: Rose, M. T., Directory Assistance Service. February 1991.

RFC-1249

Implementation supports [RFC 1249]: Howes, T., M. Smith, and B. Beecher, DIXIE Protocol Specification, University of Michigan, August 1991.

RFC-1275

Implementation supports [RFC 1275]: Kille, S., Replication Requirements to provide an Internet Directory using X.500, University College, London, England, November 1991.

RFC-1278

Implementation supports [RFC 1278]: Kille, S., A string encoding of Presentation Address, University College, London, England, November 1991.

RFC-1279

Implementation supports [RFC 1279]: Kille, S., X.500 and Domains, University College, London, England, November 1991.

RFC-1558

Implementation supports [RFC 1558]: Howes, T., A String Representation of LDAP Search Filters, December 1993.

RFC-1562

Implementation supports [RFC 1562]: Michaelson, G. and Prior, M., Naming Guidelines for the AARNet X.500 Directory Service, December 1993.

RFC-1608

Implementation supports [RFC 1608]: Johannsen, T., Mansfield, G., Kusters, M., and Sataluri, S., Representing IP Information in the X.500 Directory, March 1994.

RFC-1609

Implementation supports [RFC 1609]: Mansfield, G., Johannsen, T., and Knopper, M., Charting Networks in the X.500 Directory, March 1994.

RFC-1617

Implementation supports [RFC 1617]: Barker, P., Kille, S., and Lenggenhager, T., Naming and Structuring Guidelines for X.500 Directory Pilots, May 1994.

RFC-1781

Implementation supports [RFC 1781]: Kille, S., Using OSI Directory to Achieve User Friendly Naming, March 1995.

RFC-1801

Implementation supports [RFC 1801]: Kille, S., MHS Use of the X.500 Directory to support MHS Routing, June 1995.

RFC-1803

Implementation supports [RFC 1803]: Wright, R., Getchell, Howes, T., Sataluri, S., Yee, P., and Yeong, W., Recommendations for an X.500 Production Directory Service, June 1995.

RFC-1804

Implementation supports [RFC 1804]: Mansfield, G., Rajeev, P., Raghavan, S., and Howes, T., Schema Publishing in X.500 Directory, June 1995.

2.1.5 Consistence with Other Relevant Standards and Profiles

ADI12

Implementation support ISO/IEC pdISP 10615-2: DSA Support of Directory Access.

ADI21

Implementation supports ISO/IEC ISP 10615-3: Directory System: DSA Responder Role.

ADI22

Implementation supports ISO/IEC ISP 10615-4: Directory System: DSA Initiator Role.

ADI31

Implementation supports ISO/IEC pdISP 10615-X: DUA Support of Distributed Operations.

ADI32

Implementation supports ISO/IEC pdISP 10615-X: DSA Support of Distributed Operations.

FDI11

Implementation supports ISO/IEC pdISP 10616: Common Directory Use.

FDI3

Implementation supports ISO/IEC pdISP 11190: FTAM Use of The Directory.

XDS

Implementation supports the XDS API defined in IEEE 1224.2

2.1.6 Support for Popular Schema Elements

NADF

Implementation supports the directory schema defined in NADF SD-4.

Other Popular Schemas

Implementation supports other popular schema elements.

2.1.7 Miscellaneous Functionality

DYN-OBJ

Implementation allows the object class of an entry to be changed dynamically (not allowed in X.500[1988], allowed in 1993)

ALIAS-CONSISTENCY

Implementation incorporates facilities for maintenance of alias integrity in the face of modification or deletion of the aliased object.

2.1.8 Implementation Type

API

Implementation comes with an application programmer's interface (i.e., a set of libraries and include files).

DSA Only

Implementation consists of a DSA only. No DUA is included.

DSA/DUA

Both a DSA and DUA are included in this implementation.

DUA Interface

Implementation is a DUA-like program that uses either DAP, but supporting only a subset of the DAP functionality, or uses a protocol different from DAP to communicate with a DSA or DUA.

DUA Only

Implementation consists of a DUA only. No DSA is included.

LDAP

DUA interface program uses the Lightweight Directory Access Protocol (LDAP).

2.1.9 Internetworking Environment

CLNS

Implementation operates over the OSI ConnectionLess Network Service (CLNS).

OSI Transport

Implementation operates over one or more OSI transport protocols.

RFC-1006

Implementation operates over [RFC 1006] with TCP/IP transport service. [RFC 1006] is an Internet Standard.

X.25

Implementation operates over OSI X.25.

2.1.10 Pilot Connectivity

DUA Connectivity

The DUA can be connected to the pilot, and information on any pilot entry looked up. The DUA is able to display standard attributes and object classes and those defined in the COSINE and Internet Schema.

DSA Connectivity

The DSA is connected to the DIT, and information in this DSA is accessible from any pilot DUA.

2.1.11 Miscellaneous

Included in ISODE

DUAs that are part of ISODE.

Limited Functionality

Survey states that the implementation has some shortcomings or intended lack of functionality, e.g., omissions were part of the design to provide an easy-to-use user interface.

Motif

Implementation provides a Motif-style X Window user interface.

OpenView

Implementation provides an OpenView-style X Window user interface.

X Window System

Implementation uses the X Window System to provide its user interface.

Language Support

Implementation supports single or multiple languages.

Documentation Language Support

Documentation for implementation is available in single or multiple languages.

Number of Implementations

Implementor gave an estimate of the number of instantiations of their implementation are deployed in live directory services.

Existing Database Support

Implementation includes support for a non-X.500 DIT repository, synchronization with non-X.500 DBMS, or non-X.500 DBMS to X.500 DIT repository format conversion tools.

2.1.12 Operating Environment

MS Windows

Implementation runs under Microsoft Windows.

MS Windows NT

Implementation runs under Microsoft Windows NT.

MS Windows95

Implementation runs under Microsoft Windows95.

386

Implementation runs on a 386-based platform.

486

Implementation runs on a 486-based platform.

Pentium

Implementation runs on a Pentium-based platform.

Bull

Implementation runs on a Bull platform.

CDC

Implementation runs on a CDC MIPS platform.

DEC ULTRIX

Implementation runs under DEC ULTRIX.

DEC UNIX

Implementation runs under DEC UNIX.

DEC OpenVMS AXP

Implementation runs on a DEC AXP platform running OpenVMS.

DEC OpenVMS VAX

Implementation runs on a DEC VAX platform running OpenVMS.

HP

Implementation runs on an HP platform.

IBM PC

Implementation runs on a PC.

IBM RISC

Implementation runs on IBM's RISC UNIX workstation.

ICL

Implementation runs on an ICL platform.

Macintosh

Implementation runs on a Macintosh.

Multiple Vendor Platforms

Implementation runs on more than one hardware platform.

Sequent

Implementation runs on a Sequent platform.

SNI

Implementation runs on a Siemens Nixdorf platform.

Solbourne

Implementation runs on a Solbourne platform.

Sun

Implementation runs on a Sun platform.

Tandem

Implementation runs on a Tandem platform.

UNIX

Implementation runs on a generic UNIX platform.

2.2 Implementations Indexed by Keyword

This section contains an index of implementations by keyword. You can use this list to identify particular implementations that meet your chosen criteria.

Table 2-1 shows the implementations about which information can be found in this document as well as the abbreviation used to represent this implementation and the page number on which each implementation description begins.

Implementation Name	Abbreviation	Page
A-Window-To-Directory	AWTD	33
Critical Angle X.500 Enabler	CAXE	35
cxdua	cxdua	39
Cycle (tm) LiveData (tm)	Cycle	41
DC X500	DCX500	43
Directory Enquiries	DE	52
Digital X.500 Directory Server	DXDS	55
DIR.D(tm) V2.6	DIR.D	61
DIR.X(tm) V3.1	DIR.X-3.1	64
DIR.X(tm) V4.0	DIR.X-4.0	70
DIR.X-SYNC(tm) V2.0	DIR.X-SYNC	76
DX500 OpenDirectory(tm)	DX500	80
FORUM LOOK'UP(tm)	FORUM	82
FX*500(tm)	FX*500	87
Global Directory Server	GDS	95
i500 Enterprise Directory Server	i500	101
ISODE Rel. 3.0 X.500(1993) Directory	ISODE.r3	105
ISOPLEX DS (tm) DSA	ISOPLEX	109
LDAP Implementation	LDAP	113
maX.500 Macintosh DUA Interface	maX.500	117
Messageware DSA	MDSA	120

Table 2-1: Table of Implementation Identifiers (cont.)

Implementation Name	Abbreviation	Page
===== Messageware PC-DUA	===== MDUA	===== 124
----- NonStop Directory Services	----- NSDS	----- 127
----- ORG.D(tm) V2.0/V2.1	----- ORG.D	----- 132
----- OSIAM X.500-88	----- OSIAM-88	----- 136
----- OSIAM X.500-93	----- OSIAM-93	----- 139
----- PMDf-X500	----- PMDf	----- 145
----- TransIT500	----- T500	----- 149
----- waX.500 :: Windows Access to X.500	----- waX.500	----- 163
----- X500-DS	----- X500-DS	----- 165
----- X500-DUA	----- X500-DUA	----- 165

Table 2-1: Table of Implementation Identifiers (cont.)

The index is organized as follows: keywords appear in alphabetical order; implementations characterized by that keyword are listed alphabetically as well.

For formatting purposes, we have used the abbreviations for implementation names as defined above in Table 2-1.

ADI12

- AWTD
- DIR.X-3.1
- DIR.X-4.0
- DXDS
- GDS
- i500
- OSIAM-88
- X500-DS
- X500-DUA

ADI21

- AWTD
- DIR.X-3.1
- DIR.X-4.0
- DXDS
- GDS
- i500
- OSIAM-88
- X500-DS
- X500-DUA

ADI22

AWTD
DIR.X-3.1
DIR.X-4.0
DXDS
GDS
i500
OSIAM-88
X500-DS
X500-DUA

FORUM
FX*500
GDS
i500
ISODE.r3
LDAP
MDSA
NSDS
OSIAM-88
OSIAM-93
PMDf
X500-DS
X500-DUA

ADI31

AWTD
DIR.X-3.1
DIR.X-4.0
GDS
OSIAM-88
X500-DS
X500-DUA

Available via FTP

CAXE
cxdua
LDAP
maX.500
MDSA
waX.500

ADI32

DIR.X-3.1
DIR.X-4.0
GDS
i500
OSIAM-88
X500-DS
X500-DUA

BAC

DCX500
DIR.X-4.0
DXDS
FX*500
GDS
i500
ISODE.r3
MDSA
PMDf

ALIAS-CONSISTENCY

AWTD
FORUM
GDS
i500
NSDS
X500-DS
X500-DUA

Bull

AWTD
OSIAM-88
OSIAM-93
X500-DS
X500-DUA

API

AWTD
Cycle
DCX500
DIR.X-3.1

Commercially Available

AWTD

DIR.X-4.0	CAXE
DXDS	cxdua
Cycle	DEC UNIX
DCX500	
DIR.D	DXDS
DIR.X-3.1	ISODE.r3
DIR.X-4.0	LDAP
DIR.X-SYNC	MDSA
DXDS	PMDF
FORUM	
FX*500	DEC OpenVMS AXP
GDS	
i500	DXDS
ISODE.r3	PMDF
MDSA	
NSDS	DEC OpenVMS VAX
ORG.D	
OSIAM-88	DXDS
OSIAM-93	LDAP
PMDF	PMDF
X500-DS	
X500-DUA	DISP
DAP	DCX500
	DIR.X-4.0
AWTD	DXDS
CAXE	FORUM
Cycle	FX*500
DCX500	GDS
DIR.X-3.1	i500
DIR.X-4.0	ISODE.r3
DXDS	MDSA
FORUM	OSIAM-93
FX*500	
GDS	Documentation Language Support
i500	
ISODE.r3	AWTD
MDSA	Cycle
NSDS	DCX500
OSIAM-88	DIR.D
OSIAM-93	DIR.X-3.1
PMDF	DIR.X-4.0
X500-DS	DIR.X-SYNC
X500-DUA	FORUM
DEC ULTRIX	FX*500
	GDS
	LDAP

ISODE.r3	maX.500
LDAP	MDSA
MDSA	ORG.D
OSIAM-88	OSIAM-93
OSIAM-93	PMDF
waX.500	X500-DS
	X500-DUA
DOP	
	DSP
DIR.X-4.0	
DXDS	
DSA Connectivity	AWTD
	CAXE
	DCX500
	DIR.X-3.1
	DIR.X-4.0
	DXDS
	FORUM
	FX*500
	GDS
	i500
	ISODE.r3
	MDSA
	NSDS
	OSIAM-88
	OSIAM-93
	PMDF
	X500-DS
	DUA Connectivity
DSA Only	AWTD
	CAXE
	DCX500
	FX*500
	MDSA
DSA/DUA	AWTD
	Cycle
	DIR.X-3.1
	DIR.X-4.0
	DXDS
	FORUM
	GDS
	i500
	ISODE.r3
	LDAP
	maX.500
	MDSA
	ORG.D
	OSIAM-88
	OSIAM-93
	PMDF

MDSA	DUA Interface
NSDS	
OSIAM-88	Cycle
DCX500	FORUM
DIR.D	FX*500
DIR.X-SYNC	GDS
DXDS	i500
FORUM	ISODE.r3
FX*500	LDAP
GDS	MDSA
LDAP	OSIAM-88
maX.500	OSIAM-93
NSDS	
ORG.D	FDI11
OSIAM-88	
OSIAM-93	
PMDF	
DUA Only	
AWTD	AWTD
cxdua	DIR.X-3.1
maX.500	DIR.X-4.0
MDSA	DXDS
waX.500	GDS
X500-DUA	i500
	OSIAM-88
	X500-DS
	X500-DUA
	FDI3
DYN-OBJ	
AWTD	AWTD
CAXE	DIR.X-3.1
DCX500	DIR.X-4.0
DXDS	DXDS
FORUM	GDS
FX*500	i500
GDS	OSIAM-88
i500	X500-DS
ISODE.r3	X500-DUA
LDAP	Free
MDSA	CAXE
NSDS	cxdua
PMDF	ISODE.r3
X500-DS	LDAP
X500-DUA	maX.500
	waX.500
Existing Database Support	
CAXE	HP

Cycle	DCX500
DCX500	DIR.X-3.1
DXDS	DIR.X-4.0
DIR.X-SYNC	Included in ISODE
FORUM	
GDS	PMDF
i500	
ISODE.r3	Language Support
LDAP	
MDSA	AWTD
OSIAM-88	Cycle
OSIAM-93	DCX500
	DIR.D
IBM PC	DIR.X-3.1
	DIR.X-4.0
	DIR.X-SYNC
CAXE	DXDS
Cycle	FORUM
DCX500	FX*500
DIR.D	GDS
DIR.X-3.1	LDAP
DIR.X-4.0	MDSA
DXDS	NSDS
FORUM	ORG.D
FX*500	OSIAM-88
i500	OSIAM-93
ISODE.r3	PMDF
LDAP	X500-DS
MDSA	X500-DUA
ORG.D	
OSIAM-88	
OSIAM-93	LDAP
IBM RISC	
	CAXE
DCX500	cxdua
DIR.X-3.1	DIR.D
DIR.X-4.0	DXDS
FORUM	FX*500
GDS	GDS
ISODE.r3	i500
LDAP	ISODE.r3
MDSA	LDAP
OSIAM-88	maX.500
OSIAM-93	NSDS
X500-DS	ORG.D
X500-DUA	waX.500
	Limited Availability

ICL

i500
MDSA
NSDS
PMDF

Limited Functionality

Cycle
DIR.D

Motif

DXDS
GDS
ISODE.r3
MDSA
PMDF

Macintosh

FORUM
LDAP
maX.500

MS Windows

cxdua
Cycle
DIR.D
DXDS
FORUM
LDAP
MDSA
ORG.D
OSIAM-88
OSIAM-93
waX.500

MS Windows NT

CAXE
Cycle
DCX500
DIR.D
DIR.X-3.1
DIR.X-4.0

CAXE
ISODE.r3
MDSA
MDSA
ORG.D
OSIAM-88
OSIAM-93
waX.500

MS Windows95

Cycle
DIR.D
DXDS
LDAP
MDSA
ORG.D
OSIAM-93
waX.500

Multiple Vendor Platforms

CAXE
Cycle
DCX500
DIR.D
DIR.X-3.1
DIR.X-4.0
DIR.X-SYNC
FORUM
FX*500
GDS
ISODE.r3
LDAP
MDSA
ORG.D
OSIAM-88
OSIAM-93
PMDF

NADF

DIR.D
DIR.X-3.1
DIR.X-4.0
FORUM
GDS

DXDS
 GDS
 i500
 LDAP
 NSDS
 ORG.D
 OSIAM-88
 OSIAM-93
 PMDF
 X500-DS
 X500-DUA

Number of Implementations

Cycle
 DIR.D
 DIR.X-3.1
 DIR.X-SYNC
 FORUM
 GDS
 LDAP
 waX.500

OpenView

MDSA

OSF-DCE

AWTD

OSI CLNS

AWTD
 Cycle
 DIR.X-3.1
 DIR.X-4.0
 DXDS
 FX*500
 GDS
 i500
 ISODE.r3
 MDSA
 NSDS
 OSIAM-88
 OSIAM-93
 PMDF
 X500-DS

ISODE.r3
 LDAP
 maX.500
 MDSA
 AWTD
 DCX500
 DIR.X-3.1
 DIR.X-4.0
 DXDS
 FORUM
 FX*500
 GDS
 ISODE.r3
 MDSA
 NSDS
 OSIAM-88
 PMDF
 X500-DS
 X500-DUA

OSI Transport

AWTD
 CAXE
 Cycle
 DCX500
 DIR.X-3.1
 DIR.X-4.0
 DXDS
 FORUM
 FX*500
 GDS
 i500
 ISODE.r3
 MDSA
 NSDS
 OSIAM-88
 OSIAM-93
 PMDF
 X500-DS
 X500-DUA

Other Popular Schemas

CAXE
 i500
 ISODE.r3
 maX.500

X500-DUA	PMDF
OSI CONS	Pentium-class
CAXE	GDS
Cycle	i500
DCX500	ISODE.r3
DIR.D	LDAP
DIR.X-3.1	MDSA
DIR.X-4.0	NSDS
DIR.X-SYNC	OSIAM-88
DXDS	OSIAM-93
FORUM	PMDF
FX*500	X500-DS
GDS	X500-DUA
ISODE.r3	
LDAP	RFC-1202
MDSA	
ORG.D	GDS
OSIAM-88	MDSA
OSIAM-93	PMDF
waX.500	
PICS-AVAIL	RFC-1249
CAXE	GDS
Cycle	RFC-1274
DCX500	
DIR.X-3.1	CAXE
DIR.X-4.0	DCX500
DXDS	DIR.X-3.1
FX*500	DIR.X-4.0
i500	DXDS
ISODE.r3	FORUM
MDSA	FX*500
NSDS	GDS
OSIAM-88	i500
OSIAM-93	ISODE.r3
X500-DS	LDAP
X500-DUA	maX.500
RFC-1006	MDSA
	NSDS
AWTD	OSIAM-88
CAXE	OSIAM-93
Cycle	PMDF
DCX500	waX.500
DIR.X-3.1	RFC-1275

DIR.X-4.0
DXDS
FORUM
FX*500

GDS
ISODE.r3
PMDF

RFC-1276

GDS
MDSA
PMDF

RFC-1558

CAXE
DIR.D
DIR.X-3.1
DIR.X-4.0

RFC-1277

AWTD
CAXE
DIR.X-3.1
DIR.X-4.0
DXDS
FORUM
GDS
ISODE.r3
MDSA
NSDS
OSIAM-88
OSIAM-93
PMDF
X500-DS
X500-DUA

DXDS
GDS
i500
ISODE.r3
LDAP
maX.500
MDSA
ORG.D
PMDF

RFC-1562

GDS
ISODE.r3
MDSA
PMDF

RFC-1278

CAXE
DIR.D
DIR.X-4.0
DXDS
FORUM
GDS
i500
ISODE.r3
LDAP
MDSA
ORG.D
PMDF

RFC-1567

DCX500
DIR.X-3.1
DIR.X-4.0
FX*500
GDS
i500
ISODE.r3

RFC-1279

CAXE
DIR.X-3.1

RFC-1608

MDSA
PMDF

RFC-1609

MDSA

RFC-1617

GDS		
ISODE.r3		CAXE
MDSA		DXDS
NSDS		FORUM
PMDF		GDS
ISODE.r3		RFC-1779
MDSA		
PMDF		CAXE
		DCX500
RFC-1777		DIR.D
		DIR.X-3.1
CAXE		DIR.X-4.0
cxdua		DXDS
DCX500		FORUM
DIR.D		FX*500
DIR.X-3.1		GDS
DIR.X-4.0		ISODE.r3
DXDS		LDAP
FX*500		maX.500
GDS		MDSA
i500		NSDS
ISODE.r3		ORG.D
LDAP		OSIAM-88
maX.500		OSIAM-93
MDSA		PMDF
NSDS		waX.500
ORG.D		
OSIAM-88		RFC-1781
OSIAM-93		
PMDF		FORUM
waX.500		GDS
		ISODE.r3
RFC-1778		LDAP
		maX.500
CAXE		MDSA
DCX500		PMDF
DIR.D		
DIR.X-3.1		RFC-1798
DIR.X-4.0		
DXDS		LDAP
FORUM		PMDF
FX*500		
GDS		RFC-1801
ISODE.r3		
LDAP		CAXE
maX.500		DIR.X-3.1
MDSA		DIR.X-4.0

NSDS	DXDS
ORG.D	GDS
OSIAM-88	ISODE.r3
OSIAM-93	MDSA
PMDF	PMDF
waX.500	
RFC-1803	ISODE.r3
	LDAP
CAXE	MDSA
DXDS	OSIAM-88
GDS	OSIAM-93
ISODE.r3	
MDSA	Tandem
PMDF	
RFC-1804	NSDS
	UNIX
MDSA	
SAC	AWTD
	DCX500
DCX500	DIR.X-3.1
DIR.X-4.0	DIR.X-4.0
DXDS	FORUM
FX*500	FX*500
GDS	ISODE.r3
i500	LDAP
ISODE.r3	MDSA
MDSA	OSIAM-88
NSDS	OSIAM-93
PMDF	X500-DS
	X500-DUA
SNI	XDS
DIR.D	AWTD
DIR.X-3.1	DCX500
DIR.X-4.0	DIR.X-3.1
DIR.X-SYNC	DIR.X-4.0
ISODE.r3	DXDS
ORG.D	FORUM
Solbourne	FX*500
	i500
	ISODE.r3
LDAP	MDSA
	NSDS
Sun	OSIAM-88
	OSIAM-93

MDSA
ORG.D
OSIAM-88
OSIAM-93
waX.500

3. Implementation Descriptions

In the following pages you will find descriptions of X.500 implementations listed in alphabetical order. In the case of name collisions, the name of the responsible organization, in square brackets, has been used to distinguish the implementations. Note that throughout this section, the page header reflects the name of the implementation, not the date of the document. The descriptions follow a common format, as described below:

NAME

The name of the X.500 implementation and the name of the responsible organization. Implementations with a registered trademark indicate this by appending "(tm)", e.g., GeeWhiz(tm).

ABSTRACT

A brief description of the application. This section may optionally contain a list of the pilot projects in which the application is being used.

COMPLIANCE with X.500-1988 (applicable only for DSAs and DUAs)

A statement of compliance with respect to the 1988 CCITT Recommendations X.500-X.521 [CCITT-88], specifically Section 9 of X.519, or the 1988 NIST OIW Stable Implementation Agreements [NIST-88].

COMPLIANCE with X.500-1993 (applicable only for DSAs and DUAs)

A statement of compliance with respect to the 1993 ITU-T Recommendations X.500-X.521 [ITU-T-93], specifically Section 9 of X.519, or the 1994 NIST OIW Stable Implementation Agreements [NIST-94].

CONFORMANCE WITH PROPOSED INTERNET STANDARDS

A statement of compliance with respect to the several proposed Internet Standards.

CONSISTENCE WITH INFORMATIONAL AND EXPERIMENTAL RFCs

A statement of compliance with respect to the several informational and experimental Internet RFCs.

INTEROPERABILITY

A list of other DUAs and DSAs with which this implementation can interoperate.

PILOT CONNECTIVITY

Describes the level of connectivity it can offer to the pilot directory service operational on the Internet in North America, and to pilots co-ordinated by the PARADISE project in Europe. Levels of connectivity are: Not Tested, None, DUA Connectivity, and DSA Connectivity.

BUGS

A warning on known problems and/or instructions on how to report bugs.

CAVEATS AND GENERAL LIMITATIONS

A warning about possible side effects or shortcomings, e.g., a feature that works on one platform but not another.

INTERNETWORKING ENVIRONMENT

A list of environments in which this implementation can be used, e.g., [RFC 1006] with TCP/IP, TP0 or TP4 with X.25.

HARDWARE PLATFORMS

A list of hardware platforms on which this application runs, any additional boards or processors required, and any special suggested or required configuration options.

SOFTWARE PLATFORMS

A list of operating systems, window systems, databases, or unbundled software packages required to run this application.

NUMBER OF IMPLEMENTATIONS IN THE FIELD

A statement regarding the number of implementations deployed in the field.

AVAILABILITY

A statement regarding the availability of the software (free or commercially available), a description of how to obtain the software, and (optionally) a statement regarding distribution conditions and restrictions.

DATE LAST UPDATED or CHECKED

The month and year within which this implementation description was last modified.

NAME

A-Window-To-Directory (AWTD)

ABSTRACT

A-Window-To-Directory is a simple-to-use DUA interface available on PC that provides access to the X.500 Directory Services. The available operations are: bind (authenticated or anonymous), read, list, compare, modify, modifyRDN, search, add, remove and unbind. It is designed to be used with the Bull X500-DUA product and for that reason is able to handle any of the defined schema. The new acronyms, objects and attributes are automatically loaded without any customisation. The interface of the application may be personalized in several ways, through Local Preferences stored on the PC and through User Settings stored on the UNIX machine that runs the Bull X500-DUA product.

COMPLIANCE with X.500-1988 (applicable only for DSAs and DUAs)

A-Window-To-Directory offers all the services described in the 88 CCITT X.500 standard.

COMPLIANCE with X.500-1993 (applicable only for DSAs and DUAs)

No

CONFORMANCE WITH PROPOSED INTERNET STANDARDS

No

CONSISTENCE WITH INFORMATIONAL AND EXPERIMENTAL RFCs

No

INTEROPERABILITY

Is designed to interoperate with Bull X500-DUA and X500-DS products

PILOT CONNECTIVITY

[No information provided. -- Ed.]

BUGS

Bull S.A. provides complete software maintenance with the products.

CAVEATS AND GENERAL LIMITATIONS

[No information provided. -- Ed.]

INTERNETWORKING ENVIRONMENT

Proprietary protocol to access the Bull X500-DUA through TCP/IP sockets. The product may be used on LAN (Ethernet) or WAN (X.25).

HARDWARE PLATFORMS

386SX/DX, 486SX/DX PC Ethernet board/connection 4 MBytes RAM 3 Mbytes on disk

SOFTWARE PLATFORMS

MS-DOS 5.0 Microsoft Windows 3.1 Microsoft TCP/IP stack installed, version 1.0

NUMBER OF IMPLEMENTATIONS IN THE FIELD

[No information provided. -- Ed.]

AVAILABILITY

The product is commercially available since February 1995.

DATE LAST UPDATED or CHECKED

November 1995

ADDITIONAL INFORMATION and/or COMMENTS

[No information provided. -- Ed.]

NAME

Critical Angle X.500 Enabler

(CAIx500e)

ABSTRACT

The X.500 Enabler product allows an LDAP-only directory server to be integrated into X.500 environments, by transparently converting X.500 DAP and DSP requests into LDAP requests.

The initial release scheduled for 4Q96 will allow for connections from X.500-capable clients and servers to an LDAP-capable server, and will support the following features:

- * LDAP version 2, as defined in RFC 1777,
- * all attributes defined for LDAPv2, with the exception of certificates and revocation lists,
- * X.500(1988) DAP and DSP protocols over TCP/IP (using RFC 1006),
- * the following operations: Bind (with none or simple credentials), Read, Compare, List, Search, Abandon, AddEntry, ModifyEntry, RemoveEntry and ModifyRDN,
- * the X.500(1993) critical extensions field, to aid in deployments incorporating 1993 DSAs.

This release will be available for Solaris 2.5 (SPARC and Intel) and Windows NT 4.0 Server (Intel).

The product is expected to enter a public beta test period in September 1996. Beta test evaluation copies will be free (limited to two copies per site) but will be set to expire in December 1996.

Released versions of X.500 Enabler will be licensed per server, and will be distributed over the Internet.

COMPLIANCE with X.500-1988 (applicable only for DSAs and DUAs)

The X.500 enabler accepts DAP and DSP connections.

It supports Bind (with none or simple credentials), Read, Compare, List, Search, Abandon, AddEntry, ModifyEntry, RemoveEntry and ModifyRDN.

It supports the attributes and object classes defined in X.520 and X.521.

COMPLIANCE with X.500-1993 (applicable only for DSAs and DUAs)

The X.500 Enabler will accept connections from X.500(1993) DUAs and DSAs.

It supports the X.511(1993) critical extension mechanism.

Non-critical protocol fields which do not map onto LDAPv2 are ignored.

Attribute and object classes from X.520(1993) and X.521(1993) are supported, including collective. Operational attributes from X.501 are supported, with the exception of subschema.

As LDAPv3-based servers become available, it is expected that the X.500 Enabler will be upgraded to map more of the X.500(1993) protocol onto LDAPv3.

CONFORMANCE WITH PROPOSED INTERNET STANDARDS

[RFC 1006] is the supported transport service.

The product supports the object classes and attributes defined in RFC 1274.

CONSISTENCE WITH INFORMATIONAL AND EXPERIMENTAL RFCs

[No information provided. -- Ed.]

INTEROPERABILITY

The X.500 Enabler is being tested with public-domain X.500 and LDAP clients and servers, and with the various X.500 clients and servers connected to the PARADISE project, such as from the ISODE Consortium.

Critical Angle intends to do interoperability testing with commercial LDAP-only servers as they become available.

PILOT CONNECTIVITY

This product will be used to connect LDAP-only servers, such as University of Michigan's slapd, and many vendor's forthcoming commercial LDAP server products, into the PARADISE project directory, so that they can be accessed by LDAP and X.500 DUAs throughout the project.

BUGS

Bugs reports may be sent to <bug-x500e@critical-angle.com>.

CAVEATS AND GENERAL LIMITATIONS

X.509 certificates and revocation lists are not supported due to limitations in the LDAP version 2 protocol. This restriction will be removed once LDAP version 3 servers become generally available.

Under Windows NT there are limitations on the number of simultaneous incoming connections.

INTERNETWORKING ENVIRONMENT

This product supports RFC 1006 for DAP and DSP, and LDAP over TCP.

HARDWARE PLATFORMS

This product will initially be available for Sun Solaris 2.5 SPARC and Intel, and Windows NT Server 4.0 Intel.

Subsequent versions may be available on additional platforms.

SOFTWARE PLATFORMS

An LDAP-based server, such as the freely-available slapd, is required. It does not need to run on the same host as the X.500 Enabler.

NUMBER OF IMPLEMENTATIONS IN THE FIELD

[No information provided. -- Ed.]

AVAILABILITY

This product is licensed per-host server, and is distributed over the Internet.

In addition to discounts for large deployment orders, subscription programs permit customers to obtain subsequent update releases at a substantial discount.

Beta test evaluations are free (limited to two copies per site), and will expire 90 days after the start of the beta period.

DATE LAST UPDATED or CHECKED

September 1996

ADDITIONAL INFORMATION and/or COMMENTS

[No information provided. -- Ed.]

NAME

cxdua

Chromatix, Inc. 10451 Twin Rivers Rd, Suite 265 Columbia, MD 21044

ABSTRACT

The CXDUA is a Windows 3.1 DUA that has been derived from a highly portable and flexible Unix based Administrative Directory User Agent. The goal of the original design was to support features to assist a directory administrator in managing the directory. These features include a highly portable GUI, Entry Templates, Entry Lists, Batch Operations and Directory Control Functions.

Both the Windows and the Unix versions support strong authentication.

The Unix DUA has been used in various DMS and NSA pilot projects.

COMPLIANCE with X.500-1988 (applicable only for DSAs and DUAs)

[No information provided. -- Ed.]

COMPLIANCE with X.500-1993 (applicable only for DSAs and DUAs)

[No information provided. -- Ed.]

CONFORMANCE WITH PROPOSED INTERNET STANDARDS

[No information provided. -- Ed.]

CONSISTENCE WITH INFORMATIONAL AND EXPERIMENTAL RFCs

[No information provided. -- Ed.]

INTEROPERABILITY

[No information provided. -- Ed.]

PILOT CONNECTIVITY

[No information provided. -- Ed.]

BUGS

[No information provided. -- Ed.]

CAVEATS AND GENERAL LIMITATIONS

[No information provided. -- Ed.]

INTERNETWORKING ENVIRONMENT

[No information provided. -- Ed.]

HARDWARE PLATFORMS

Windows 3.1

SOFTWARE PLATFORMS

[No information provided. -- Ed.]

NUMBER OF IMPLEMENTATIONS IN THE FIELD

[No information provided. -- Ed.]

AVAILABILITY

The software is freely available via anonymous ftp from [ftp.chromatix.com](ftp://ftp.chromatix.com) or can be obtained via the WEB at <http://www.chromatix.com>. Commercial versions will be available in the near future.

DATE LAST UPDATED or CHECKED

0496

ADDITIONAL INFORMATION and/or COMMENTS

[No information provided. -- Ed.]

NAME

Cycle (tm) LiveData (tm) (Cycle)

Cycle Software, Inc.

ABSTRACT

A component of the Cycle Virtual Data Highway.

Network software product used to break down barriers between isolated systems. Available separately as Cycle LiveNet (DUA) and Cycle LiveNet Directory (DUA & DSA)

COMPLIANCE with X.500-1988 (applicable only for DSAs and DUAs)

Cycle LiveData is compliant with the 1988 NIST OIW Stable Agreements to the extent that implementations based on the more recent stable agreements are compliant.

COMPLIANCE with X.500-1993 (applicable only for DSAs and DUAs)

Cycle LiveData is compliant with the 1993 NIST OIW Stable Agreements.

CONFORMANCE WITH PROPOSED INTERNET STANDARDS

Unknown

CONSISTENCE WITH INFORMATIONAL AND EXPERIMENTAL RFCs

Unknown

INTEROPERABILITY

Not tested

PILOT CONNECTIVITY

Not tested

BUGS

No known bugs

CAVEATS AND GENERAL LIMITATIONS

Current release supports objects of the Application Entity Object Class only. This limitation is being relaxed in the next release.

INTERNETWORKING ENVIRONMENT

[RFC 1006] with TCP/IP,TP4, [RFC-1070] with IP,IPX, and NetBEUI.

HARDWARE PLATFORMS

Runs on Microsoft Windows hardware platforms.

SOFTWARE PLATFORMS

Windows 95, Windows NT, Windows for Workgroups

NUMBER OF IMPLEMENTATIONS IN THE FIELD

> 1,000

AVAILABILITY

Commercially Available.

Contact:

Cycle Software, Inc.
1212 Hancock St.
Quincy, MA 02169

Voice- 617-770-9594
Fax- 617-770-9903
E-mail cycle@livedata.com.

DATE LAST UPDATED or CHECKED

1/96

ADDITIONAL INFORMATION and/or COMMENTS

[No information provided. -- Ed.]

NAME

DC X500

Data Connection Ltd
100 Church Street
Enfield
Middlesex
EN2 6BQ
UK

ABSTRACT

DC X500 provides a truly scalable X.500 based enterprise directory server with the necessary architectural flexibility to enable integration with existing database and directory technologies.

From a pure X.500 standpoint, DC X500 provides a full function state-of-the-art DSA implementation.

- * Architected from scratch according to the 1993 X.500 standards (i.e. not a 1988 DSA with 1993 features grafted on)
- * Support for all the key X.500 OSI protocols:
 - * Directory Access Protocol (DAP) for user access
 - * Directory System Protocol (DSP) for distributed DSA communications
 - * Directory Information Shadowing Protocol (DISP) to support replication between servers to give improved performance in a distributed network
- * Support of the 1993 Basic Access Control and Simplified Access Control models
- * Support for the key Internet X.500 related standards:
 - * integrated Lightweight DAP (LDAP) for DUA access
 - * Madman MIBs for easy integration with SNMP

The DC X500 architecture is based on Data Connection's underlying product architecture which has evolved since 1987 and includes:

- * genuine multi-threaded implementation

- * true portability (the product is available on a range of operating systems e.g Windows NT, AIX, HP-UX. OS/2 etc and it is possible to port the core technology to any hardware/software platform)
- * secure service recording for operation tracking and billing
- * support for system monitoring (both alarms and statistics)

Key product features include:

- * Name resolution and integrated use of Search Indices based on 2-3 trees leads to high performance operation evaluation (subsecond response times on million entry DSAs)
- * Generic schema support based on 1993 concepts that allows customers to tailor the schema to meet their precise data structuing requirements
- * System recycle time is minimised (e.g. DC X500 can be backed up while running and search indices are dynamically updated), helping achieve the goal of continuous (24x7) availability and high reliability.
- * No artificial software constraints are imposed resulting in a truly scalable product - assuming the availability of the necessary hardware DC X500 can be configured to support millions of entries in a single DSA.

DC X500 is certified for used within the Paradise Pilot project. The product has also undergone interoperability testing at the EuroSInet interoperability workshops in Europe.

COMPLIANCE with X.500-1988 (applicable only for DSAs and DUAs)

From 1988 X.519

9.2 Conformance by DSAs

9.2.1 Statement Requirements

- a) directoryAccessAC and directorySystemAC are both supported
- b) the DSA can act as a first level DSA
- c) the chained mode of operation is supported.

- d) security levels none and simple as supported with the delivered product. However, the product is architected to interface to an external security module to support strong authentication.
- e) DC X500 supports the selected attribute types defined in X.520.
- f) DC X500 supports the selected object classes defined in X.521.

9.2.2 Static Requirements

DC X500 supports the static requirements implied by the above statement.

9.2.3 Dynamic Requirements

DC X500 supports the dynamic requirements implied by the above statement.

COMPLIANCE with X.500-1993 (applicable only for DSAs and DUAs)

From 1993 X.519

9.2 Conformance by DSAs

9.2.1 Statement Requirements

- a) directoryAccessAC and directorySystemAC are both supported
- b) n/a
- c) the DSA can act as a first level DSA
- d) the chained mode of operation is supported.
- e) security levels none and simple as supported with the delivered product. However, the product is architected to interface to an external security module to support strong authentication.
- f) DC X500 supports the selected attribute types defined in X.520. Attributes based on the syntax DirectoryString using the UNIVERSAL STRING choice can be stored however the UNIVERSAL STRING choice cannot be used for matching rules.
- g) DC X500 supports the selected object classes defined in X.521.

h) DC X500 supports the following extensions

subentries	Y
copyShallDo	Y
attributeSizeLimit	Y
extraAttributes	Y
modifyRightsRequest	N
pagedResultsRequest	N
matchedValuesOnly	N
extendedFilter	N
targetSystem	N
useAliasOnUpdate	Y
newSuperior	Y

i) DC X500 does not support collective attributes

j) DC X500 does not support hierarchical attributes

k) DC X500 supports the following operational attributes

Directory Operational Attributes:

structural object class
governing structural rule
create timestamp
modify timestamp
creators name
modifiers name

prescriptive ACI
entry ACI
subentry ACI

DSA Operational Attributes:

myAccessPoint
superiorKnowledge
supplierKnowledge (*)
consumerKnowledge(*)
secondaryShadows (*)

* - supported using local proprietary extension

Distributed Operation Attributes (dsa-shared):

specificKnowledge
nonSpecificKnowledge

- l) DC X500 supports return of alias names
- m) DC X500 supports indicating that returned entry information is complete
- n) DC X500 supports modifying the object class attribute to add and/or remove values identifying auxiliary object classes
- o) DC X500 supports Basic Access Control
- p) DC X500 supports Simplified Access Control
- q) DC X500 does not support subschema administration as defined in X.501.
- r) DC X500 supports the name binding defined in X.521
- s) DC X500 cannot administer collective attributes.

9.2.2 Static Requirements

DC X500 supports the static requirements implied by the above statement.

9.2.3 Dynamic Requirements

DC X500 supports the dynamic requirements implied by the above statement.

9.3 Conformance By Shadow Supplier

9.3.1 Statement Requirements

- a) shadowSupplierInitiatedAC and shadowConsumerInitiatedAC are supported.
- b) security levels none and simple as supported with the delivered product. However, the product is architected to interface to an external security module to support strong authentication.
- c) DC X500 supports the following UnitOfReplication:
 - * Entry filtering on object class is supported
 - * Selection/Exclusion of attributes via a AttributeSelection is not supported

- * Inclusion of subordinate knowledge in the replicated area is supported
- * Inclusion of extended knowledge in addition to subordinate knowledge is supported

9.3.2 Static Requirements

- a) DC X500 supports the shadowSupplierInitiatedAC and shadowConsumerInitiatedAC
- b) DC X500 provides support for modifyTimestamp and createTimestamp operational attributes

9.3.3 Dynamic Requirements

- a) DC X500 conforms to the mapping onto used services defined in clause 8
- b) DC X500 conforms to the procedures of X.525 as they relate to DISP.

9.4 Conformance by a Shadow Consumer

9.4.1 Statement Requirements

- a) shadowSupplierInitiatedAC and shadowConsumerInitiatedAC are supported.
- b) security levels none and simple as supported with the delivered product. However, the product is architected to interface to an external security module to support strong authentication.
- c) DC X500 can act as a secondary supplier.
- d) DC X500 does not support shadowing o overlapping units of replication. (Overlapping Administration Points are supported though).

9.4.2 Static Requirements

- a) DC X500 supports both shadowSupplierInitiatedAC and shadowConsumerInitiatedAC.
- b) DC X500 supports the modifyTimestamp and createTimestamp operational attributes.

c) DC X500 supports the copyShallDo service element

9.4.3 Dynamic Requirements

a) DC X500 conforms to the mapping onto used services defined in clause 8

b) DC X500 conforms to the procedures of X.525 as they relate to DISP.

CONFORMANCE WITH PROPOSED INTERNET STANDARDS

[No information provided. -- Ed.]

CONSISTENCE WITH INFORMATIONAL AND EXPERIMENTAL RFCs

[No information provided. -- Ed.]

INTEROPERABILITY

DC X500 has interoperated with the following implementations:

DUAs:

ICL
SNI
Net-tel
Bull
AT&T
CDC
Digital
ICL
Nexor

DSAs:

SNI
ICL
AT&T
CDC
Digital
ICL
Net-tel
Nexor

PILOT CONNECTIVITY

DC X500 has been tested and approved for connectivity to the PARADISE pilot project.

BUGS

[No information provided. -- Ed.]

CAVEATS AND GENERAL LIMITATIONS

[No information provided. -- Ed.]

INTERNETWORKING ENVIRONMENT

DC X500 supports the following network connectivity:

- * [RFC 1006] with TCP/IP
- * TPO with X.25

HARDWARE PLATFORMS

DC X500 is a portable product

SOFTWARE PLATFORMS

DC X500 is a portable product. It is available on the following platforms:

- * UNIX, including
 - * IBM AIX
 - * HP UX
 - * Sun Solaris
 - * Windows NT
 - * OS/2.

Porting to further UNIX platforms is very straightforward, in particular where existing transport services are available. Other proprietary systems (such as Novell's Netware, Digital's VMS or fault tolerant or mainframe environments) can also be supported if required.

NUMBER OF IMPLEMENTATIONS IN THE FIELD

[No information provided. -- Ed.]

AVAILABILITY

DC X500 is commercially available.

For further details, please contact:

Nigel Ratcliffe Data Connection Ltd 100 Church Street Enfield
Middlesex EN2 6BQ UK

Tel: +44 181 366 1177

E-mail: nr@datcon.co.uk

DATE LAST UPDATED or CHECKED

February 1996

ADDITIONAL INFORMATION and/or COMMENTS

Data Connection provides a whole series of directory applications, including a corporate telephone directory, e-mail synchronisation, security services, groupware directory integration and a directory publishing application. These can be accessed by Windows applications or standard web browsers.

Further information can be found at <http://www.datcon.co.uk>.

NAME

DE

ABSTRACT

DE (Directory Enquiries) is intended to be a simple-to-use DUA interface, suitable for the naive user, and suitable for running as a public access dua. it will work on any terminal. The user is presented with a series of (verbose) prompts asking for person's name department organization country. There is extensive on-line help. The matching algorithms are such that near matches are presented to the user before less good matches.

There have been a few minor enhancements since the description in [RFC 1632]. The power searching feature still sets DE apart from most other DUAs - this allows a user to search for an entry even when they do not know the name of the organisation in which the person works - you still have to specify the country. DE also allows UFN style searching. DE uses slightly different search algorithms depending on whether it is accessing part of the Directory mastered by a Quipu DSA - Quipu DSAs tend to use lots of replication and so encourage searching. DE incorporates a QOS feature where it maintains a database of past information availability and DSA responsiveness. Translations exist into at least 4 different languages.

DE runs over ISODE DAP and University of Michigan LDAP. There is a version of DE, called DOS-DE, which has been ported to DOS, and this uses LDAP.

DE was funded by the COSINE PARADISE project, and DE is used as the PARADISE public access dua. You can test the software by telnet to directory.ja.net and logging in as dua -- no password required.

COMPLIANCE with X.500-1988 (applicable only for DSAs and DUAs)

N/A

COMPLIANCE with X.500-1993 (applicable only for DSAs and DUAs)

[No information provided-- Ed.]

CONFORMANCE WITH PROPOSED INTERNET STANDARDS

[RFC 1274] and [RFC 1487] Yes and yes

CONSISTENCE WITH INFORMATIONAL AND EXPERIMENTAL RFCs

[RFC 1484]. yes

INTEROPERABILITY

N/A

PILOT CONNECTIVITY

The interface is widely used in the publicly accessible PARADISE directory.

BUGS

Doesn't handle aliases well when power searching.

Send bug reports to:

p.barker@cs.ucl.ac.uk

CAVEATS AND GENERAL LIMITATIONS

DE tries to cater well for the general case, at the expense of not dealing with the less typical. The main manifestation of this is that the current version does not handle searching under localities very well.

It can handle photographs and reproduce sound attributes if these are dealt with by ancillary programs.

INTERNETWORKING ENVIRONMENT

[RFC 1006] with TCP/IP, TP0 or TP4 with X.25, and LDAP.

HARDWARE PLATFORMS

UNIX + DOS platforms

SOFTWARE PLATFORMS

UNIX + DOS

NUMBER OF IMPLEMENTATIONS IN THE FIELD

[No information provided. -- Ed.]

AVAILABILITY

The software is freely available from

`ftp://cs.ucl.ac.uk/dirpilot/de-7.0.tar.Z`

The DOS version is freely available. Look in the following directory:

`ftp://ftp.bath.ac.uk/pub/x500/dosde7/`

DATE LAST UPDATED or CHECKED

March 96

ADDITIONAL INFORMATION and/or COMMENTS

[No Information Provided -- Ed.]

NAME

Digital X.500 Directory Server Digital Equipment Corporation

This single entry covers a number of different products

ABSTRACT

The Digital X.500 Directory Services product set includes a directory server product and a variety directory user agents, as well as a directory synchronizer utility.

The Digital X.500 Directory Server product provides a high performance DSA implemented according to the 1993 edition of the standard. The InfoBroker Server product extends this to provide the server component for LDAP and WWW user agents. Features of these servers include:

- * Integrated multi-protocol support allowing concurrent DAP, DSP, DISP and DOP access over OSI and TCP/IP (using [RFC 1006]) protocols.
- * Indexed database (DIB) to support high-performance searching and sophisticated matching including approximate match.
- * A DIB based on the 1993 edition Extended Information Models.
- * Support for chaining and referrals in support of a distributed DIB
- * Support for the 1993 edition Basic Access Control scheme.
- * Configurable schema based on the 1993 edition (including attributes, object classes, structure rules, name forms).
- * Support for 1993 edition Shadowing using the DISP and DOP protocol, including both incremental and on-change features for high performance.
- * Remote management to control DSAs and log significant events.
- * Support for the LDAP protocols using the InfoBroker Server product across either TCP/IP or DECnet transport protocols.
- * A Look-up Daemon that accepts requests from Web Browsers, allowing access to the directory from any web browser.
- * Both X/OPEN XDS/XOM and LDAP APIs.

- * An award winning documentation set.

The Digital X.500 Administration Facility, X.500 Information Manager and InfoBroker Client products provide MS-Windows, Motif and command line interfaces to access and manage the information stored in the X.500 directory, including:

- * Support for different ways of accessing the directory, either by browsing or searching based on an extensible set of filters.
- * Support for bulk load, unload and reload of entries.
- * Driven off the same configurable schema information as the DSA allowing extensibility of window layouts and text to support customer-defined object classes and attributes.

The Synchronizer-500 is an X.500 DUA which:

- * Enables bi-directional synchronization between X.500 and virtually ANY other non-X.500 directory facilitating common management.
- * Maps incoming data into X.500 using flexible configuration files
- * Facilitates creation of a multivendor electronic mail database, creating addresses in the appropriate syntax for any mail system.
- * Provides uniqueness checking on mnemonic O/R addresses, preventing address duplication

COMPLIANCE with X.500-1988 (applicable only for DSAs and DUAs)

The Digital X.500 Directory Services products are based on the 1993 edition standard. They are compatible with, and interwork with, 1988 edition DUAs and DSAs, and are implemented to conform to relevant NIST OIW and EWOS agreements and the X.500 Implementors Guide.

OSTC conformance testing (1988 DUA/DAP, DSA/DAP) has been completed and registered successfully.

The X.500 Directory Server is registered as conformant to US-GOSIP.

COMPLIANCE with X.500-1993 (applicable only for DSAs and DUAs)

Conformance with respect to clause 9.2 of ISO/IEC 9594-5:1993:

- * Supports the directoryAccessAC (DAP) and directorySystemAC (DSP) application contexts.
- * The DSA is capable of acting as a first-level DSA.
- * Chaining is supported.
- * Bind security levels of simple (unprotected password) and none are supported.
- * Supports the shadowSupplierInitiatedAC and shadowConsumerInitiatedAC in both synchronous and asynchronous variants (DISP protocol) and the directoryOperationalBindingManagementAC (DOP protocol) for shadowing
- * All attribute types defined in ISO/IEC 9594-6:1993 are supported except for 1993 edition supertypes and collective attributes and EnhancedSearchGuide. Customers can define new attribute types. UNIVERSAL STRING is not supported for attributes based on DirectoryString.
- * All object classes defined in ISO/IEC 9594-7:1993 are supported. Customers can define new object classes.
- * The following operational attributes are supported:

governingStructureRule	myAccessPoint
modifyTimestamp	supplierKnowledge
superiorKnowledge	specificKnowledge
consumerKnowledge	prescriptiveACI
dseType	entryACI
createTimestamp	
- * Dynamic modification of object class is permitted
- * Basic Access Control is supported with some restrictions.
- * All name forms defined in ISO/IEC 9594-7:1993 are supported. Customers can defined new name forms and structure rules.

CONFORMANCE WITH PROPOSED INTERNET STANDARDS

The InfoBroker products support the V1 and V2 LDAP protocols for easy integration into LDAP-compliant client and server environments.

Standards supported include [RFC 1006], [RFC 1274], [RFC 1277], [RFC 1777], [RFC 1779].

CONSISTENCE WITH INFORMATIONAL AND EXPERIMENTAL RFCs

RFCs supported include [RFC 1278], [RFC 1558]

INTEROPERABILITY

Digital has performed X.500 interoperability testing at various Eurosinet and OSInet events, during the COS Pilot activity and in-house. In addition, Digital's products were part of the EEMA Interoperability Demonstration in Amsterdam 1995.

Digital has achieved successful DAP and DSP interworking with a number of vendors. In the a recent Eurosinet Interoperability event, tests were performed against:

AT&T	ISOCOR
Control Data Systems	NET-TEL Computer Systems Ltd
DCL (Data Connection Ltd)	NEXOR
ICL	SNI (Siemens Nixdorf)

In addition, previous interoperability tests have been performed against:

Hewlett Packard	Telstra
ISODE Consortium	UNISYS
QUIPU	

Digital has performed limited successful 1993 DISP (Replication) interworking with two vendors at a Eurosinet Interoperability event. These were:

ICL	NEXOR
-----	-------

All interoperability test results will be available on request from Digital.

PILOT CONNECTIVITY

Digital is actively involved in both public and private pilots of X.500.

BUGS

Digital provides complete software maintenance services with products on a worldwide basis.

CAVEATS AND GENERAL LIMITATIONS

None

INTERNETWORKING ENVIRONMENT

The Digital X.500 Services products operate over:

- * [RFC 1006] over TCP/IP
- * OSI TP0, TP2 and TP4 over CLNS and CONS as appropriate
- * TCP/IP or DECnet transport protocols to communicate with an LDAP server.

HARDWARE PLATFORMS

The Digital X.500 Directory Service products run on:

- * Alpha processors supported by Digital UNIX
- * Alpha and VAX processors supported by OpenVMS

SOFTWARE PLATFORMS

The Digital X.500 Directory Service products currently run on:

- * Digital UNIX running DECnet/OSI
- * OpenVMS/AXP running DECnet/OSI
- * OpenVMS/VAX running DECnet/OSI

For the latest availability on these and other other hardware and software platforms please contact Digital.

NUMBER OF IMPLEMENTATIONS IN THE FIELD

[No information provided. -- Ed.]

AVAILABILITY

The Digital X.500 Directory Service products are commercially available from Digital Equipment Corporation. For further information please contact your local Digital office and quote SPD numbers 40.77.XX, 53.32.XX, 53.33.XX and 60.43.XX, or contact one of:

Ian Gunn, Product Manager:
Manager:
Tel: +1 603 881 0762
Email: ian.gunn@zko.mts.dec.com
nick.tatham@reo.mts.dec.com
Digital Equipment Corporation
Corporate Software Engineering
Engineering
110 Spit Brook Road
Nashua, NH. 03062-2698
USA

Nick Tatham, Engineering
Tel: +44 1734 203635
Email:
Digital Equipment Co. Ltd
Corporate Software
PO Box 121
Reading, RG2 0TU
UK

DATE LAST UPDATED or CHECKED

13th November 1995

ADDITIONAL INFORMATION and/or COMMENTS

None

NAME

DIR.D(tm) V2.6
Siemens Nixdorf Informationssysteme AG

ABSTRACT

DIR.D V2.6 is Siemens Nixdorf's directory browser product. Through its file manager like user interface only retrieval operations are supported. The DDE interface also allows for modification operations. DIR.D is an MS-Windows application acting as an LDAP client.

Among others, DIR.D has the following features:

- * Graphical representation of the DIT
- * Tree browsing
- * Simple and complex searches, including approximate search
- * Adaptable to any directory schema
- * Configurable user interface
- * Automatic unbind after idle time
- * Anonymous and simple unprotected bind
- * Tight integration with SNI's X.400 user agent MAIL.D and CIT product ComfoPhone
- * Data transfer to Windows applications via clipboard, file, Drag&Drop, and DDE

COMPLIANCE with X.500-1988 (applicable only for DSAs and DUAs)

DIR.D V2.6 is an LDAP client.

COMPLIANCE with X.500-1993 (applicable only for DSAs and DUAs)

DIR.D V2.6 is an LDAP client.

CONFORMANCE WITH PROPOSED INTERNET STANDARDS

DIR.D V2.6 is compliant with the following RFCs: [RFC 1777], [RFC 1778], [RFC 1779].

CONSISTENCE WITH INFORMATIONAL AND EXPERIMENTAL RFCs

DIR.D V2.6 is compliant with the following RFCs: [RFC 1278], [RFC 1558].

INTEROPERABILITY

DIR.D V2.6 is based on University of Michigan's LDAP implementation V3.0. It can interoperate with any LDAP server.

PILOT CONNECTIVITY

DIR.D V2.6 is used to browse in the European NameFLOW-PARADISE pilot network.

BUGS

To report bugs and/or to retrieve additional information on SNI's directory products please send mail to infoline-com@s41.mchl.x400scn.sni.de.

CAVEATS AND GENERAL LIMITATIONS

DIR.D V2.6 was designed for information retrieval.

INTERNETWORKING ENVIRONMENT

LDAP with TCP/IP

HARDWARE PLATFORMS

PC (Intel)

SOFTWARE PLATFORMS

Windows 3.1 + Winsockets
Windows for Workgroups 3.11 + Winsockets
Windows 95
Windows NT 3.5
OS/2 3.0 + Windows for OS/2 + Winsockets

NUMBER OF IMPLEMENTATIONS IN THE FIELD

> 10,000

AVAILABILITY

DIR.D V2.6 can be delivered as a binary product. It is commercially available from:

Siemens Nixdorf Informationssysteme AG
ASW BA COM 1
D-81730 Munich
Germany

Please contact

Giovanni Rabaioli
Voice: +49/89-636-41095
Fax: +49/89-636-42552
Mail: Giovanni.Rabaioli@mch.sni.de

DATE LAST UPDATED or CHECKED

April 1996

ADDITIONAL INFORMATION and/or COMMENTS

The following X.500 products are also part of SNI's X.500 product family:

DIR.X V4.0	1993 X.500 Directory Service
DIR.X V3.1	1988 X.500 Directory Service
ORG.D V2.1	Full administrative LDAP browser
DIR.X-SYNC	V2.0 Directory synchronization

NAME

DIR.X (tm) V3.1 Siemens Nixdorf Informationssysteme AG

ABSTRACT

DIR.X V3.1 is Siemens Nixdorf's Directory Service product compliant with the 1988 ITU-T X.500 recommendations. Siemens Nixdorf has supplied its Directory Service product as the GDS (Global Directory Service) component to OSF DCE. However, DIR.X V3.1 has a number of features and enhancements which are not available in the GDS component of OSF DCE.

DIR.X V3.1 is a distributed, replicated Directory Service. It consists of DSA, DUA and a tools package including comfortable administration and management utilities. DIR.X implements the protocol stack ranging from LDAP, DAP, DSP over ACSE, ROSE, Presentation, Session down to [RFC 1006]. On transport layer it supports TCP/IP and OSI LAN/WAN protocols.

Data stored by DIR.X can be accessed via

- * the MS-Windows user interfaces DIR.D/ORG.D which are available as separate products from Siemens Nixdorf
- * any third-party LDAP or DAP browser
- * directory applications using the standardized X/Open XDS/XOM APIs (Directory Service / OSI Abstract Data Manipulation). The Siemens Nixdorf implementation was the first to gain XPG4-certification.
- * a command-line administration program
- * a menu-driven administration program
- * WWW
- * a shell interface
- * the Query-by-mail interface of SNI's directory synchronization product DIR.X-SYNC

DIR.X enables

- * The storage of globally-unique, tree-like name structures which can be mapped onto organizations.

- * The use of several alternative names (aliases) for one and the same directory entry.
- * Search queries that allow the user to select objects on the basis of specific attributes and their values, as with a "Yellow Pages" telephone directory
- * Treemanagement functions which can cover entire subtrees.
- * The creation and automatic updating of copies ("shadows") from remote computers.
- * Access protection at attribute level, which regulates access on an object-specific basis.
- * The storage of unstructured attributes (graphics, pixels).

The tools package of DIR.X V3.1 includes:

- * gdssetup: A simple-to-use tool for the generation and initialization of a directory configuration.
- * gdshdsch: Enables the directory administrator to modify the directory schema off-line.
- * X.500 MIB access via SNMP
- * gdscp: A TCL based administration tool for UNIX clients with full XDS functionality
- * gdshd: A powerful import/export tool

Additional features include:

- * support for ISO 8859-1 characters
- * dynamic schema modifications
- * caching.

COMPLIANCE with X.500-1988 (applicable only for DSAs and DUAs)

DIR.X V3.1 fully complies with the following ITU-T recommendations and ISO/IEC standards:

ITU-T	ISO/IEC	Title
X.500	9594-1	Overview of Concepts, Models, and Services
X.501	9594-2	Models
X.511	9594-3	Abstract Service Definition
X.518	9594-4	Procedures for Distributed Operations
X.519	9594-5	Protocol Specifications
X.520	9594-6	Selected Attribute Types
X.521	9594-7	Selected Object Classes
X.509	9594-8	Authentication Framework

DIR.X V3.1 was successfully conformance tested by the OSI Test Laboratory of Siemens Nixdorf. The OSI Test Laboratory is accredited by BAPT/DEKITZ (registration number TTI-P-G055/92-40). Test reports, PICS per X.581/X.582 and PIXITs are available for all tested protocols: DSA/DAP, DUA/DAP, Presentation, ACSE, and Session embedded in X.500.

COMPLIANCE with X.500-1993 (applicable only for DSAs and DUAs)

DIR.X V3.1 is not compliant with the 1993 ITU-T recommendations. Please refer to the DIR.X V4.0 implementation description.

CONFORMANCE WITH PROPOSED INTERNET STANDARDS

DIR.X V3.1 is compliant with the following RFCs: [RFC 1274], [RFC 1277], [RFC 1565], [RFC 1567], [RFC 1777], [RFC 1778], [RFC 1779].

CONSISTENCE WITH INFORMATIONAL AND EXPERIMENTAL RFCs

DIR.X V3.1 is compliant with the following RFCs: [RFC 1278], [RFC 1558], [RFC 1801].

INTEROPERABILITY

DIR.X V3.1 can interoperate with:

- * OSF DCE Global Directory Service (GDS)
- * ISODE Consortium Quipu V8.0
- * ISODE Consortium 93 DSA R3.0
- * AT&T OpenDirectory 2.0.1

- * Bull X.500-DS and X.500-DUA
- * Control Data MailHub 2.4
- * Data Connection DC X500 V1
- * Digital DEC X.500 Directory Services V2.0
- * ICL I500 DSA V5.2
- * ISOCOR ISOPLEX DS V1.00
- * NET-TEL RouteFinder 500 DSA 1.0
- * NEXOR Messageware Directory Server V0.9
- * Olivetti UX_X500 V1.1
- * Unisys TransIT X.500 V7.1

PILOT CONNECTIVITY

Several DIR.X V3.1 DSAs and DUAs are connected to the European NameFLOW- PARADISE pilot network.

BUGS

To report bugs and/or to retrieve additional information on SNI's directory products please send mail to infoline-com@s41.mchl.x400scn.sni.de.

CAVEATS AND GENERAL LIMITATIONS

DIR.X V3.1 is highly portable and without any general limitation. SNMP support is available for SNI platforms only.

INTERNETWORKING ENVIRONMENT

[RFC 1006] with TCP/IP
OSI TP0, TP2 with X.25
OSI TP4 with CLNP
OSI TP4 with CONS (LAN)

HARDWARE PLATFORMS

SNI platforms (RM200/300/400/600, Pyramid Nile 100/150, MX300i/500i) for X.25: X.25 board needed

IBM RS/6000
for X.25: X.25 board needed

HP 9000
for X.25: X.25 board needed

Sun Sparc
no X.25 board needed (X.25 can use the serial line)

PC (Intel)
for X.25: X.25 board needed

SOFTWARE PLATFORMS

SINIX 5.42 + CMX + XTI
for X.25: WAN-CCP needed

Pyramid Nile 100/150 DC/OSx1.1

Unixware

AIX 3.2
for X.25: OSI/6000 needed

HP-UX 9.01
for X.25: OTS 9000 needed

Solaris 2.3
for X.25: SunLink X.25 and SunLink OSI needed

NUMBER OF IMPLEMENTATIONS IN THE FIELD

100 and growing

AVAILABILITY

DIR.X V3.1 can be delivered as a binary product or as source to OEM customers. It is commercially available from:

Siemens Nixdorf Informationssysteme AG ASW BA COM 1 D-
81730 Munich Germany

Please contact

Giovanni Rabaioli
Voice: +49/89-636-41095
Fax: +49/89-636-42552
Mail: Giovanni.Rabaioli@mch.sni.de

DATE LAST UPDATED or CHECKED

April 1996

ADDITIONAL INFORMATION and/or COMMENTS

The following X.500 products are also part of SNI's X.500 product family:

DIR.X V4.0	1993X.500 Directory Service
DIR.D V2.6	LDAP browser for information retrieval
ORG.D V2.1	Full administrative LDAP browser
DIR.X-SYNC V2.0	Directory synchronization

NAME

DIR.X (tm) V4.0 Siemens Nixdorf Informationssysteme AG

ABSTRACT

DIR.X V4.0 is Siemens Nixdorf's Directory Service product compliant with the 1993 ITU-T X.500 recommendations. The implementation incorporates SNI's experience of 10 years development, support and maintenance of the DIR.X products conformant to the 1988 Directory Standards, and has the following main features:

- * It conforms to the 1993 Directory standards, with particular emphasis on the requirements for interoperability with other X.500 implementations
- * The implementation is scaleable: it handles small-scale workgroup directories as well as very large directories for backbone solutions in large organisations
- * The implementation is extensible: new functionality can easily be incorporated
- * Existing databases and proprietary directory services can be accessed or integrated with the implementation.
- * Particular emphasis is placed on ease of administration of the Directory Service a service based on DIR.X V4.0 can be administered effectively from a central site, including the management of configuration and monitoring options
- * The implementation has a high throughput performing well not only on small systems, but also on high-performance backend servers, handling hundreds of requests in parallel on a multiprocessor machine.

DIR.X V4.0 is a distributed, replicated Directory Service. It consists of:

- * DSA
- * DUA
- * Command-line DUA using a TCL (Tool Control Language) shell interface (dirxcp)
- * Management centre (dirxadm)

- * Toolkit for application development

Data stored by DIR.X can be accessed via

- * the MS-Windows user interfaces DIR.D/ORG.D which are available as separate products from Siemens Nixdorf
- * any third-party LDAP or DAP browser
- * directory applications using the standardized X/Open XDS/XOM APIs (Directory Service / OSI Abstract Data Manipulation). The Siemens Nixdorf implementation was the first to gain XPG4-certification.
- * a command-line administration program
- * a menu-driven administration program
- * WWW
- * a shell interface
- * the Query-by-mail interface of SNI's directory synchronization product DIR.X-SYNC

DIR.X V4.0 is fully backwards compatible with 1988 DSAs and DUAs.

COMPLIANCE with X.500-1988 (applicable only for DSAs and DUAs)

DIR.X V4.0 is fully backwards compatible with the following ITU-T recommendations and ISO/IEC standards:

ITU-T	ISO/IEC	Title
X.500	9594-1	Overview of Concepts, Models, and Services
X.501	9594-2	Models
X.511	9594-3	Abstract Service Definition
X.518	9594-4	Procedures for Distributed Operations
X.519	9594-5	Protocol Specifications
X.520	9594-6	Selected Attribute Types
X.521	9594-7	Selected Object Classes
X.509	9594-8	Authentication Framework

COMPLIANCE with X.500-1993 (applicable only for DSAs and DUAs)

DIR.X V4.0 fully complies with the following ITU-T recommendations and ISO/IEC standards:

ITU-T	ISO/IEC Title
X.500	9594-1 Overview of Concepts, Models, and Services
X.501	9594-2 Models
X.511	9594-3 Abstract Service Definition
X.518	9594-4 Procedures for Distributed Operations
X.519	9594-5 Protocol Specifications
X.520	9594-6 Selected Attribute Types
X.521	9594-7 Selected Object Classes
X.509	9594-8 Authentication Framework
X.525	9594-9 Replication

CONFORMANCE WITH PROPOSED INTERNET STANDARDS

DIR.X V4.0 is compliant with the following RFCs: [RFC 1274], [RFC 1277], [RFC 1565], [RFC 1567], [RFC 1777], [RFC 1778], [RFC 1779].

CONSISTENCE WITH INFORMATIONAL AND EXPERIMENTAL RFCs

DIR.X V4.0 is compliant with the following RFCs: [RFC 1278], [RFC 1558], [RFC 1801].

INTEROPERABILITY

Interoperability tests have not been completed yet.

PILOT CONNECTIVITY

[No information provided. -- Ed.]

BUGS

To report bugs and/or to retrieve additional information on SNI's directory products please send mail to infoline-com@s41.mchl.x400scn.sni.de.

CAVEATS AND GENERAL LIMITATIONS

DIR.X V4.0 is highly portable and without any general limitation.

INTERNETWORKING ENVIRONMENT

[RFC-1006] with TCP/IP
OSI TP0, TP2 with X.25
OSI TP4 with CLNP
OSI TP4 with CONS (LAN)

HARDWARE PLATFORMS

SNI platforms (RM200/300/400/600, Pyramid Nile 100/150)
for X.25: X.25 board needed

IBM RS/6000
for X.25: X.25 board needed

HP 9000
for X.25: X.25 board needed

Sun Sparc
no X.25 board needed (X.25 can use the serial line)

PC (Intel)
for X.25: X.25 board needed

SOFTWARE PLATFORMS

SINIX 5.42 + CMX + XTI
for X.25: WAN-CCP needed

Pyramid Nile 100/150 DC/OSx1.1

Windows NT 3.51

AIX 4.1
for X.25: OSI/6000 needed

HP-UX 10.0
for X.25: OTS 9000 needed

Solaris 2.5
for X.25: SunLink X.25 and SunLink OSI needed

NUMBER OF IMPLEMENTATIONS IN THE FIELD

Field testing to be started in Summer 1996.

AVAILABILITY

DIR.X V4.0 can be delivered as a binary product or as source to OEM customers. It is commercially available from:

Siemens Nixdorf Informationssysteme AG
ASW BA COM 1
D-81730 Munich
Germany

Please contact

Giovanni Rabaioli
Voice: +49/89-636-41095
Fax: +49/89-636-42552
Mail: Giovanni.Rabaioli@mch.sni.de

DATE LAST UPDATED or CHECKED

April 1996

ADDITIONAL INFORMATION and/or COMMENTS

The following X.500 products are also part of SNI's X.500 product family:

DIR.X V3.1	1988 X.500 Directory Service
DIR.D V2.6	LDAP browser for information retrieval
ORG.D V2.1	Full administrative LDAP browser
DIR.X-SYNC	V2.0 Directory synchronization

NAME

DIR.X-SYNC (tm) V2.0 Siemens Nixdorf Informationssysteme AG

ABSTRACT

DIR.X-SYNC V2.0 enables the synchronization of existing e-mail address directories in the X.500-based DIR.X directory service. The standard DIR.X, DIR.X-SYNC and DIR.D (all available from Siemens Nixdorf) products are the foundations on which the corporate directory solutions can be tailored to meet the customer's needs. The corporate directory then becomes the universal information system within the company.

The user can access corporate directory information in different ways:

- * Using DIR.D, SNI's Windows client for the X.500 service, PC users can gain easy access to the DIR.X server containing the corporate directory data. The data found can be transferred to other applications by means of DDE, drag and drop or cut and paste. (See DIR.D V2.6 for further information).
- * Query by mail: Authorized users can access data stored in the central or distributed directory system over their own mail system. DIR.X-SYNC retrieves the inquiry transmitted by mail and directs it on to the X.500 service. The search results are then delivered back to the user by mail. Using a WWW interface based on TCL scripts

Query by mail does not require additional software on the end system. Each mail system connected to the X.400 backbone (e.g. MS-Mail, cc:Mail etc.) can use this function. DIR.X-SYNC currently supports the address formats of the following e-mail systems:

- * MAIL.X-OD V2.3
- * MAIL.2000 V1.2, AKOM
- * MS-Mail
- * cc:Mail
- * Intelligent Messaging Mail (Banyan)

The standardized ISO-10021 interface for X.400 addresses is supported, enabling need for extension. This means that any type of system capable of generating this format (e.g. WordPerfect, Lotus Notes) can be connected. Address acknowledgment is carried out in ISO format.

Functions for the administrator:

- * **Export:** Addresses can be exported from local directories. They are delivered as mail messages in ASCII format to the DIR.X-SYNC server.
- * **Upload:** The upload server stores the exported local addresses in DIR.X as globally valid X.400 addresses.
- * **Query by Mail:** DIR.X-SYNC enables mail members to send a search to the DIR.X-SYNC server by e-mail. Using this function, authorized administrators of the synchronized directories can acquire copies of the corporate directory data.
- * **Administration of the DIR.X-SYNC server with an administration tool** which can be used via command line or a command file.

Other features include:

- * **Replication and distribution:** In addition to the central solution with a single corporate directory server, DIR.X-SYNC also supports replicated or distributed data storage in DIR.X-SYNC server.
- * **Authentication/Authorization:** To prevent unauthorized use of the corporate directory system, the O/R addresses of the authorized administrators and users are configured by the DIR.X-SYNC administrator. When a query by mail or an update arrives, the sender address is compared with this address.
- * **Logging:** In the case of error, e.g. incorrect file format, the sender (and the administrator configurable) are informed of the fault by mail. At the same time, the error message is saved in a log file for the DIR.X-SYNC administrator. In addition, a "history file" enables the monitoring of the uploads that have run or are currently running

COMPLIANCE with X.500-1988 (applicable only for DSAs and DUAs)

DIR.X-SYNC is a directory application.

COMPLIANCE with X.500-1993 (applicable only for DSAs and DUAs)

DIR.X-SYNC is a directory application.

CONFORMANCE WITH PROPOSED INTERNET STANDARDS

[No information provided. -- Ed.]

CONSISTENCE WITH INFORMATIONAL AND EXPERIMENTAL RFCs

[No information provided. -- Ed.]

INTEROPERABILITY

[No information provided. -- Ed.]

PILOT CONNECTIVITY

[No information provided. -- Ed.]

BUGS

To report bugs and/or to retrieve additional information on SNI's directory products please send mail to infoline-com@s41.mchl.x400scn.sni.de.

CAVEATS AND GENERAL LIMITATIONS

The DIR.X-SYNC server runs with SNI's mail service products MAIL.X V2.3 or MAIL.X V3.0.

INTERNETWORKING ENVIRONMENT

[No information provided. -- Ed.]

HARDWARE PLATFORMS

SNI platforms (RM200/300/400/600, MX300i/500i)

HP 9000

SOFTWARE PLATFORMS

SINIX 5.42

HP-UX 10.0

NUMBER OF IMPLEMENTATIONS IN THE FIELD

100

AVAILABILITY

DIR.X-SYNC V2.0 can be delivered as a binary product. It is commercially available from:

Siemens Nixdorf Informationssysteme AG ASW BA COM 1 D-
81730 Munich Germany

Please contact

Giovanni Rabaioli
Voice: +49/89-636-41095
Fax: +49/89-636-42552
Mail: Giovanni.Rabaioli@mch.sni.de

DATE LAST UPDATED or CHECKED

April 1996

ADDITIONAL INFORMATION and/or COMMENTS

The following X.500 products are also part of SNI's X.500 product family:

DIR.X V4.0	1993 X.500 Directory Service
DIR.X V3.1	1988 X.500 Directory Service
DIR.D V2.6	LDAP browser for information retrieval
ORG.D V2.1	Full administrative LDAP browser

NAME

DX500 OpenDirectory(tm)

Datacraft Australia Pty Ltd

ABSTRACT

DX500 OpenDirectory is a family of carrier grade, version 1993 X.500 conformant products

COMPLIANCE with X.500-1988 (applicable only for DSAs and DUAs)

[No information provided. -- Ed.]

COMPLIANCE with X.500-1993 (applicable only for DSAs and DUAs)

See WEB page: <http://www.datacraft.com.au/dx500ovr.html> for up to date details.

PICS are available upon request.

CONFORMANCE WITH PROPOSED INTERNET STANDARDS

[No information provided. -- Ed.]

CONSISTENCE WITH INFORMATIONAL AND EXPERIMENTAL RFCs

[No information provided. -- Ed.]

INTEROPERABILITY

OpenDirectory DSA supports:

- * DX-plorer, 93 full DAP stack, [RFC 1006] client over Winsock
- * ISOPRO 1.5+ messaging clients
- * ISOPRO for MAPI messaging clients
- * ISOPLEX Navigator
- * ISOPLEX Management Centre
- * ISOPLEX DS
- * ISOPLEX Web Gateway

- * Uni of Mich. - WAX500

- * Quipu emulation mode

PILOT CONNECTIVITY

[No information provided. -- Ed.]

BUGS

[No information provided. -- Ed.]

CAVEATS AND GENERAL LIMITATIONS

[No information provided. -- Ed.]

INTERNETWORKING ENVIRONMENT

[No information provided. -- Ed.]

HARDWARE PLATFORMS

[No information provided. -- Ed.]

SOFTWARE PLATFORMS

[No information provided. -- Ed.]

NUMBER OF IMPLEMENTATIONS IN THE FIELD

[No information provided. -- Ed.]

AVAILABILITY

The software is commercially available from Datacraft, or its distributors.

DATE LAST UPDATED or CHECKED

March, 96

ADDITIONAL INFORMATION and/or COMMENTS

Capable of supporting a million entries, with subsecond response time, on small Unix, with 32 mbytes of ram, due to a unique patented meta-data design.

NAME

Forum LOOK'UP (tm)

Telis Systemes & Communications

ABSTRACT

Forum LOOK'UP (tm) is a Corporate directory solution based on the X.500 recommendations. It includes:

- * a Directory System Agent (DSA),
- * Directory User Agents (DUAs).
- * local network connections
- * remote workstation access
- * a WEB and videotex access
- * data updating tools
- * a directory editing tool

Forum LOOK'UP is a product based on PIZARRO, the research prototype developed at INRIA by Christian Huitema's team, and commercialized by Telis, a member of the France Telecom group.

Characteristics of the DSA are:

- * The DAP and DSP protocols are provided conformant with X.500 (88).
- * The DIB is maintained in ASN.1 encoded format in the Unix file system.
- * Utilities are provided to load and dump the DIB from and to ASCII text files.
- * As an option, an ORACLE V7 database can also be used.
- * The DIT structure is held in main memory. Frequently used attributes may be held in inverted tables in memory to speed up searches.
- * Knowledge management: knowledge on managed domains is stored in Forum LOOK'UP specific attributes of the DSA entries.

- * Schema: The X.500 (88), X.400 (88) and most of the Cosine and Internet Schema are supported. Object class and attribute definitions are enforced. Users may define their own.
- * Simple authentication is provided strong authentication and signed operations have been tested operationally through Telis's participation in PASSWORD, a VALUE project with aim to pilot a European security infrastructure for network applications.
- * Access control : the DSA offers a mechanism defined by Telis that is functionally equivalent to a profile of the X500 '93 access control mechanism. The mechanism is based on the notion of administrative domains (autonomous and semi-autonomous). A domain defines the user groups (categories) and their access rights (consult, modify) to specified attribute types. The access rights are defined in prescriptive and entry ACI attributes.
- * Phonetic searches : administrators may specify a language (English, French, ...) for a subtree of the DIT. Approximate (phonetic) searches will then be carried out in the given language. The software loads a rule database to which new languages and new rules may be added easily.
- * Management: a Forum LOOK'UP DSA object has been defined to allow operational parameters of the DSA to be managed via DAP. Forum LOOK'UP conforms to X.500 (88) as specified in poaragraph 9 of X.519 Administration tools are provided :
 - * to generate usage statistics automatically and distribute these by mail to administrators
 - * to replicate subtrees of the DIT to other FORUM LOOK'UP DSAs and automatically update shadow copies,
 - * to extract hardcopy listings from the database in an Excel compatible format for "paper" directories, all the management tasks are performed through a GUI (X/Motif).
- * The GUI includes a "dashboard" for monitoring of servers and the hardware they are installed on.
- * The DUAs include a graphical directory browser with powerful search functionality for PCs and Macintosh.

COMPLIANCE with X.500-1988 (applicable only for DSAs and DUAs)

Forum LOOK'UP conforms to X.500 (88) as specified in paragraph 9 of X.519

COMPLIANCE with X.500-1993 (applicable only for DSAs and DUAs)

[No information provided. -- Ed.]

CONFORMANCE WITH PROPOSED INTERNET STANDARDS

[RFC 1274], [RFC 1277], [RFC 1778], [RFC 1779] are supported

CONSISTENCE WITH INFORMATIONAL AND EXPERIMENTAL RFCs

[RFC 1278], [RFC 1279] are supported

INTEROPERABILITY

Through the use of Forum LOOK'UP in the French Paradise pilot, interoperability has been informally but extensively tested with Quipu, Marben, SNI DIR/X.

PILOT CONNECTIVITY

DSA connectivity to the PARADISE pilot.

BUGS

Forum LOOK'UP is a commercial product. As such, it is supported and bugs are fixed when detected.

Bug reports can be sent to our support team via electronic mail.

CAVEATS AND GENERAL LIMITATIONS

- * The DIT structure and inverted attribute tables are stored in main memory.
- * The recommended main memory size for a DSA is 1kb per node, i.e., 10 Mb for a database of 10,000 objects.
- * The current recommended maximum for the proprietary database (based on the Unix file system) is a database size of the order of 100,000 objects.
- * For a larger database one unique server (up to 300,000 objects), the use of the Oracle database is recommended

- * Of the selected attribute types defined in X.500 (88), the searchGuide attribute is not supported
- * neither are the following attributes from the Cosine and Internet Schema [RFC 1274]: OtherMailbox, MailPreferenceOption and the various quality attributes.

INTERNETWORKING ENVIRONMENT

Forum LOOK'UP includes a transport stack for TP0 with TCP/IP [RFC 1006] and X.25. The stack has been ported to SunNet OSI for TP4 with CLNP.

DUAs on a LAN (Novell Netware, Microsoft Lan Manager, IBM Lan Server) can access the DSA without the need for IP on every Workstation. A module (called SOLO server) available on Novell, OS/2 and UNIX allows to have an IP or X.25 stack only on the file server. It is in charge of forwarding the request to a DSA.

A direct access (DUA / DSA) through IP, X.25, PSTN or ISDN is also available.

HARDWARE PLATFORMS

Forum LOOK'UP can easily be ported to any UNIX machine.

It currently runs on: Sun Solaris and Hewlett Packard.

A port on IBM AIX is to be completed.

SOFTWARE PLATFORMS

The Forum LOOK'UP server is portable to any UNIX-like operating system. X/Motif is the interface used for management.

The DUAs are available on Windows and Macintosh.

ORACLE V7 can be used as a database (option).

NUMBER OF IMPLEMENTATIONS IN THE FIELD

30 servers

AVAILABILITY

Forum LOOK'UP is commercially available. For further information contact:

Laurence Puvilland, Product manager
Email: C=fr A=atlas P=telis-sc O=telis-sc OU1=paris S=puvilland
laurence.puvilland@paris.telis-sc.fr

or:

Ascan Woermann, X.500 development manager
Email: C=fr A=atlas P=telis-sc O=telis-sc OU1=sophia S=Woermann
ascan.woermann@sophia.telis-sc.fr

DATE LAST UPDATED or CHECKED

April 1996

ADDITIONAL INFORMATION and/or COMMENTS

[No information provided. -- Ed.]

NAME

FX*500

Firefox International Limited

ABSTRACT

FX*500 is a core component of Firefoxs product suite for mail, messaging and directories.

FX*500 provides a Directory System Agent (DSA) which adheres to the latest 1993 X.500 standards.

FX*500 may be used in conjunction with the Firefox FX*400 messaging products or may be combined with a range of Directory User Agent and Gateway products in order to satisfy a broad range of directory requirements.

FX*500 affords unique integration opportunities with Novell's NetWare Directory Service (NDS) by offering the option of true dynamic directory integration between NDS and X.500.

FX*500 provides support for key features of the X.500 1993 standard while continuing to support interworking with 1988 based directory user agents and system agents. The main 1993 features of X.500 supported by FX*500 are:

- * Basic Access Control
- * The 1993 DSA Information Model
- * Replication and Shadowing

In summary, FX*500 supports:

- * 1988 and 1993 X.500 Directory Access Protocol (DAP)
- * 1988 and 1993 X.500 Directory System Protocol (DSP)
- * 1993 X.500 Directory Information Shadowing Protocol (DISP)
- * 1993 Basic (or Simplified) Access Control
- * the Lightweight Directory Access Protocol (LDAP), as defined by [RFC 1777]

- * configuration of knowledge information for distributed operation using 1993 operational attributes
- * local management services, including a knowledge configuration application and extensive diagnostic facilities
- * an extended set of management applications
- * operation in a wide variety of network environments including connectivity over X.25, TCP/IP [RFC 1006] and OSI LANs.
- * an application developer's toolkit

The optional application developer's toolkit includes:

- * the X/Open Directory Services (XDS) API to support directory user agent applications
- * a Gateway (G-XDS) API which is based on a simplified version of the XDS API syntax and allows developers to implement gateways to existing/ proprietary directory databases
- * a Network Management Interface (NMI) to support management applications and integration with management services.

FX*500 is delivered with a schema defined to support the Common Use and MHS (X.402) Schemas defined by UK GOSIP V4. The subschema for FX*500 can be modified by the customer and updated dynamically.

FX*500 provides for search optimisation by supporting keyed search whereby specific attributes can be identified as 'keyed' through local configuration data. This optimisation avoids the need to do a "brute force" search which requires a traversal of all the nodes of a subtree. Approximate match search filters are also supported by using a phonetic search based on the "Soundex" algorithm.

COMPLIANCE with X.500-1988 (applicable only for DSAs and DUAs)

FX*500 meets both the static and dynamic requirements implied by section 9.2 of X.519 1988.

From section 9.2 of X.519 1988 regarding DSA conformance:

- * FX*500 supports both the directoryAccessAC and directorySystemAC application contexts.
- * The FX*500 DSA can act as a first level DSA

- * The chained mode of operation is supported.
- * The security levels "none" and "simple" are supported, the "strong" security level can be supported with the addition of an appropriate security module.
- * The attribute types defined in X.520 and the object classes defined in X.521 are supported.

COMPLIANCE with X.500-1993 (applicable only for DSAs and DUAs)

FX*500 meets both the static and dynamic requirements implied by sections 9.2, 9.3 and 9.4 of X.519 1993 regarding the conformance of DSA, Shadow Supplier and Shadow Consumer.

From section 9.2 of X.519 1993 regarding DSA conformance:

- * FX*500 supports both the directoryAccessAC and directorySystemAC application contexts
- * the FX*500 DSA can act as a first level DSA
- * the chained mode of operation is supported.
- * the security levels "none" and "simple" are supported, the "strong" security level can be supported with the addition of an appropriate security module.
- * the selected attribute types defined in X.520 are supported. The UNIVERSAL STRING choice for DirectoryString is supported but cannot be used for matching rules.
- * the selected object classes defined in X.521 are supported.
- * FX*500 supports the following 1993 extensions to the DAP and DSP protocols:
 - * subentries
 - * copyShallDo
 - * attributeSizeLimit
 - * extraAttributes
 - * useAliasOnUpdate
 - * newSuperior

- * FX*500 supports the following operational attributes:
 - * structural object class
 - * governing structural rule
 - * create timestamp
 - * modify timestamp
 - * creators name
 - * modifiers name
 - * prescriptive ACI
 - * entry ACI
 - * subentry ACI
 - * myAccessPoint
 - * superiorKnowledge
 - * supplierKnowledge (supported by local mechanism)
 - * consumerKnowledge (supported by local mechanism)
 - * secondaryShadows (supported by local mechanism)
 - * specificKnowledge
 - * nonSpecificKnowledge
- * FX*500 supports return of alias names and indication that returned entry information is complete
- * support is given to modifying the object class attribute to add and/or remove values identifying auxiliary object classes
- * FX*500 supports both Basic Access Control and Simplified Access Control
- * FX*500 supports the name bindings defined in X.521

From section 9.3 and 9.4 of X.519 1993 regarding conformance of a Shadow Supplier and Shadow Consumer respectively:

- * FX*500 supports the shadowSupplierInitiatedAC and shadowConsumerInitiatedAC application contexts
- * the security levels "none" and "simple" are supported, the "strong" security level can be supported with the addition of an appropriate security module.
- * FX*500 supports the following UnitOfReplication:
 - * Entry filtering on object class
 - * Inclusion of subordinate knowledge in the replicated area
 - * Inclusion of extended knowledge in addition to subordinate knowledge
- * FX*500 can act as a secondary shadow supplier.

CONFORMANCE WITH PROPOSED INTERNET STANDARDS

Supports [RFC 1274], [RFC 1567],[RFC 1777],[RFC 1778],[RFC 1779]

FX*500 maintains statistics that are a superset of those defined by [RFC 1567] "X.500 Directory Monitoring MIB".

CONSISTENCE WITH INFORMATIONAL AND EXPERIMENTAL RFCs

[No information provided. -- Ed.]

INTEROPERABILITY

Firefox are members of EurOSInet and test FX*500 by direct links with other members and at interoperability workshops.

PILOT CONNECTIVITY

Firefox are participating in the NameFLOW-Paradise project, which is the successor to the Paradise European X.500 directory pilot.

BUGS

[No information provided. -- Ed.]

CAVEATS AND GENERAL LIMITATIONS

[No information provided. -- Ed.]

INTERNETWORKING ENVIRONMENT

FX*500 utilises the Firefox FX*STACK product to provide an OSI stack for use over local or wide-area networks. This enables the X.500 DAP, DSP and DISP protocols operate over a range of different network types. The current network options are:

- * OSI LANs are supported by Transport Class 4 over CLNP (ISO 8473), including the ES-IS routing protocol.
- * X.25 networks are supported in either a Connection-Oriented Network Service (CONS) or a Connection-Less Network Service (CLNS) environment.
 - * For CONS, Transport Classes 0, 2 and 4 are supported over X.25(1984).
 - * For CLNS, Transport Class 4 is supported over CLNP (ISO 8473) utilising X.25 as a subnetwork.
- * TCP/IP networks are supported by an implementation of [RFC 1006], which supports Transport Class 0 over TCP/IP.

HARDWARE PLATFORMS

Intel 386, 486, Pentium

SOFTWARE PLATFORMS

FX*500 is available on NetWare 3.12 and 4.1, UnixWare 1.1.

NUMBER OF IMPLEMENTATIONS IN THE FIELD

[No information provided. -- Ed.]

AVAILABILITY

FX*500 is commercially available.

For further details please contact:

Keith Vallance
Product Manager
Firefox International Limited
668 Hitchin Road
Stopsley
Bedfordshire LU2 7UH
UK

Tel: +44 (0)1582 29007
Fax: +44 (0)1582 29107
email: keithv@firefox.co.uk

Ken Sanofsky
Firefox (U.S.) Inc.
Seventh Floor
2099 Gateway Place
San Jose
CA 95110-1017

Tel: +1 408 321 8344
Fax: +1 408 321 8311
email: kens@firefox.com

DATE LAST UPDATED or CHECKED

April 1996

ADDITIONAL INFORMATION and/or COMMENTS

[No information provided. -- Ed.]

NAME

Global Directory Server

Control Data Systems, Inc.

ABSTRACT

Control Data's X.500 implementation, called the Global Directory Server, is compliant with the 1993 ITU-T Recommendations X.500-X.521, except for DOP, schema publication, and non-specific subordinate references. Features include:

- * 1993 administrative framework
 - * 1993 operational attributes
 - * 1993 reference structure
 - * 1993 distributed operations
 - * 1993 incremental and full replication including:
 - * Supplier or consumer initiated
 - * Periodic (by update interval) or onchange replication
 - * Complete subtree specification to select replicated area
 - * Reference replication
 - * 1993 basic access control including:
 - * Prescriptive, entry and subentry ACI supported
 - * Item first and user first specification
 - * All user classes supported including users by subtree specification
 - * Access control by entry, attribute, and attribute value
 - * All priority levels supported
 - * 1993 collective attributes
 - * 1993 hierarchical attributes

- * 1993 operational extensions
- * 1993 modifyDN operation
- * Full interoperability with "quipu" implementations including:
 - * quipu replication for designated portions of DIT
 - * quipu reference model for designated portions of DIT
 - * enhanced quipu access controls (ACLs)
 - * quipu operational attributes for designated portions of DIT
 - * Can "automatically" migrate quipu DIT to 1993 DIT:
 - * Migration process is dynamic, can occur while DSA is operating
 - * Process preserves quipu attributes if desired

Also:

- * Directory API based on the X.400 API
- * Support for X.400 objects including those to support MHS use of directory to support MHS routing
- * Integration with Control Data's Mail*Hub standards-based E-mail and directory integration products
- * DUA interfaces that support the full set of directory operations
- * A DUA daemon that provides directory access for applications
- * Directory synchronization tools for synchronizing PC/Mac/DEC/IBM mail directories and other sources of information, such as human resources databases, with X.500
- * Hash indexing for fast string search
- * dixie, dad, finger, whois, and ph.x500 support
- * SNMP based monitoring and management of DSAs
- * Support for DAP, LDAP, DSP, and DISP

- * Can be browsed via standard World Wide Web browsers

Control Data Systems offers complete integration services to design, plan, install, configure, tailor and maintain X.500 services. These services may include the preparation of customer unique DUAs and tools for X.500 integration, synchronization, operational control and management.

COMPLIANCE with X.500-1988 (applicable only for DSAs and DUAs)

The Global Directory Server complies with the 1988 CCITT Recommendations X.500-X.521 [CCITT-88] and the 1988 NIST OIW Stable Implementation Agreements [NIST-88]. It also complies with all static and dynamic requirements of X.519.

The Global Directory Server also provides:

- * Full interoperability with "quipu" implementations including:
 - * quipu replication for designated portions of DIT
 - * quipu reference model for designated portions of DIT
 - * enhanced quipu access controls (ACLs)
 - * quipu operational attributes for designated portions of DIT
- * Can "automatically" migrate quipu DIT to 1993 DIT:
 - * Migration process is dynamic, can occur while DSA is operating
 - * Process preserves quipu attributes if desired

COMPLIANCE with X.500-1993 (applicable only for DSAs and DUAs)

The Global Directory Server complies with the 1993 ITU-T Recommendations X.500-X.521, except for DOP, schema publication, and non-specific subordinate references. It also complies with the 1994 NIST OIW Stable Implementation Agreements. And it complies with all static and dynamic requirements of X.519. Compliance features:

- * 1993 administrative framework
- * 1993 operational attributes
- * 1993 reference structure

- * 1993 distributed operations
- * 1993 incremental and full replication including:
 - * Supplier or consumer initiated
 - * Periodic (by update interval) or onchange replication
 - * Complete subtree specification to select replicated area
 - * Reference replication
- * 1993 basic access control including:
 - * Prescriptive, entry and subentry ACI supported
 - * Item first and user first specification
 - * All user classes supported including users by subtree specification
 - * Access control by entry, attribute and attribute value
 - * All priority levels supported
- * 1993 collective attributes
- * 1993 hierarchical attributes
- * 1993 operational extensions
- * 1993 modifyDN operation

CONFORMANCE WITH PROPOSED INTERNET STANDARDS

Global Directory Server is compliant with the following RFCs: [RFC 1274], [RFC 1276], [RFC 1277], [RFC 1567], [RFC 1778], [RFC 1777], [RFC 1779]

CONSISTENCE WITH INFORMATIONAL AND EXPERIMENTAL RFCs

Global Directory Server is compliant with the following RFCs: [RFC 1202], [RFC 1249], [RFC 1275], [RFC 1278], [RFC 1279], [RFC 1558], [RFC 1562], [RFC 1617], [RFC 1781], [RFC 1801], [RFC 1802], [RFC 1803], [RFC 1836], [RFC 1837], [RFC 1838]

INTEROPERABILITY

Control Data X.500 has successfully interoperated with other X.500 implementations including those from HP, DEC, ESL, ISODE Consortium, Telstra, ICL, Marben (HP), Nexor, Unisys, and Siemens.

PILOT CONNECTIVITY

Control Data's X.500 implementation interoperates with other implementations in the Internet X.500 pilots. It also provides the base routing tree for the MHS Use of the Directory pilot (Longbud) on the Internet.

BUGS

Control Data provides complete software maintenance services with products.

CAVEATS AND GENERAL LIMITATIONS

None.

INTERNETWORKING ENVIRONMENT

[RFC 1006] with TCP/IP, TP4 with CLNS, TP0 with X.25.

HARDWARE PLATFORMS

Global Directory Server is supported on UNIX for SUN SPARC, HP 9000, and IBM RS/6000 platforms, and on Windows NT for Intel platforms. Other platforms are pending.

SOFTWARE PLATFORMS

Distributed and supported for SUN Solaris 2.x, HP-UX 10.x, IBM AIX 4.x, and Windows NT.

NUMBER OF IMPLEMENTATIONS IN THE FIELD

Product was introduced in December 1995. 5 implementations in the field to date.

AVAILABILITY

Commercially available from:

Control Data Systems Inc.
Electronic Commerce Solutions, ARH290
4201 Lexington Avenue North
Arden Hills, MN 55126-6198 U.S.A.

1-800-257-OPEN (U.S. and Canada)
1-612-482-6736 (worldwide)
FAX: 1-612-482-2000 (worldwide)
EMAIL: info@cdc.com
or
s=info p=cdc a=attmail c=us

DATE LAST UPDATED or CHECKED

July 1996

ADDITIONAL INFORMATION and/or COMMENTS

[No information provided. -- Ed.]

NAME

i500 Enterprise Directory Server

ICL

ABSTRACT

ICL's i500 Enterprise Directory Server (simply termed "i500") is a high performance X.500 distributed Directory system providing features such as:

- * multi-protocol support covering 1993-edition DAP, DSP and DISP plus LDAP and WWW client access
- * dynamically configurable schema (object classes, attributes, structure rules etc.) including support for user-defined schema items and auxiliary object classes
- * a scalable, disk-based database incorporating configurable indexing facilities to enable rapid, large-scale searching, including approximate matching
- * storage of a variety of information types including text, image and sound
- * the capability to operate as a "first-level" DSA
- * 1993-edition replication of information (both primary and secondary shadowing using DISP and supporting total refresh, incremental or on-change updates)
- * information security, using X.509 authentication techniques together with either 1993-edition Basic or Simplified Access Controls
- * gateway facilities to enable X.500, LDAP and WWW client access to non-X.500 based information
- * a variety of APIs and associated development toolkits including LDAP and X/Open XDS/XOM Directory access APIs
- * support of the [RFC 1567] "MADMAN" systems management MIB
- * a Windows (3.11, 95 or NT) based management station

COMPLIANCE with X.500-1988 (applicable only for DSAs and DUAs)

i500 is compliant with the 1993-edition of X.500 and interoperates with 1988-edition DUAs and DSAs.

COMPLIANCE with X.500-1993 (applicable only for DSAs and DUAs)

i500 is compliant with the 1993-edition of X.500 and is implemented in-line with the ISO/ITU-T Directory Implementor's Guide and the emerging 1993 International Standardized Profiles (ISPs) being produced by the NIST OIW, EWOS and AOW workshops.

Full Protocol Implementation Conformance Statements (PICS) are available on request to either:

i500@reston.icl.com or k.richardson@man0523.wins.icl.co.uk

CONFORMANCE WITH PROPOSED INTERNET STANDARDS

i500 supports a variety of proposed Internet standards and in particular, [RFC 1274] (schema), [RFC 1567] (MIB) and [RFC 1777] (LDAP).

CONSISTENCE WITH INFORMATIONAL AND EXPERIMENTAL RFCs

i500 is developed in-line with any necessary informational and experimental RFCs, e.g. [RFC 1278] and [RFC 1558] are supported.

INTEROPERABILITY

ICL are members of EuroSinet and EEMA. As such, i500 is regularly tested for interoperability at EuroSinet workshops and has also been included in public demonstrations of X.500 interoperability at EEMA annual exhibitions. Other X.500 products with which i500 has been proven to interoperate include those from the following vendors:

- * Boldon-James
- * Control Data
- * DCL
- * Digital
- * ISOCOR
- * ISODE

- * Net-Tel
- * NeXor
- * SNI
- * Unisys
- * WorldTalk

PILOT CONNECTIVITY

i500 operates within the Internet PARADISE network controlled by DANTE.

BUGS

No known bugs. World-wide software maintenance services are provided with primary support desks based in North America and Europe.

CAVEATS AND GENERAL LIMITATIONS

None.

INTERNETWORKING ENVIRONMENT

TCP/IP for LDAP and WWW client (HTTP) access
TCP/IP with [RFC 1006]
OSI TP0, TP2, TP3, (X.25, CONS) and TP4 (CLNP)

HARDWARE PLATFORMS

HP, Intel PC, ICL, SUN, Pyramid and platforms which support UNIXWARE 2.0

SOFTWARE PLATFORMS

HP UX-9.04 and 10.0, Windows NT 3.51, ICL DRS/NX 7, SUN Solaris 2.4 and 2.5, Pyramid OSx, UNIXWARE 2.0

NUMBER OF IMPLEMENTATIONS IN THE FIELD

[No information provided. -- Ed.]

AVAILABILITY

i500 is commercially available from ICL High Performance Systems.
For further information please contact either:

i500 Marketing Manager, or ICL Inc., 11490 Commerce Park Drive, Suite 500, Reston, VA 22091-1532 USA	David Longley (i500 Business Manager), ICL, Wenlock Way, West Gorton, Manchester, M12 5DR, UK
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Information on i500 is also provided at
<http://www.icl.com/hps/i500.html>.

DATE LAST UPDATED or CHECKED

July 29, 1996

ADDITIONAL INFORMATION and/or COMMENTS

None.

NAME

ISODE Consortium Release 3.0 X.500(1993) Directory ISODE Consortium Ltd.

ABSTRACT

This implementation is a source release of an X.500(1993) Directory System Agent (DSA). It has been designed and implemented as an X.500 1993 DSA not as a 1988 DSA with '93 extensions. Emphasis has been placed on providing support for a flexible information model, access control, X.509 security features, and standard replication.

The 1993 DSA offers a strong technical foundation on which to build an information and messaging infrastructure that relies on robust and scalable directory services. The implementation of this DSA incorporates the experience gained through the development, support, and maintenance of the earlier QUIPU, as well as operational experience and standards support.

COMPLIANCE with X.500-1988 (applicable only for DSAs and DUAs)

The DSA is aligned to the 1988 ISO IS and the NIST OIW Directory Implementors Guide Version 1. X.500(1993) features such as replication, access control, as well as X.509 certification are also available. Interoperability testing with other DSAs has been performed.

COMPLIANCE with X.500-1993 (applicable only for DSAs and DUAs)

Please contact the ISODE Consortium if you wish to obtain our protocol information conformance statements. PICS may also be available from member organizations for their binary products.

CONFORMANCE WITH PROPOSED INTERNET STANDARDS

[RFC 1781],[RFC 1779],[RFC 1778],[RFC 1777], [RFC 1274], [RFC 1277].

CONSISTENCE WITH INFORMATIONAL AND EXPERIMENTAL RFCs

[RFC 1838], [RFC 1837], [RFC 1836],[RFC 1801], [RFC 1275], [RFC 1278], [RFC 1279].

INTEROPERABILITY

Interoperability with several other DSAs has been demonstrated in pilot operation and at Eurosinet in October 1995.

At Eurosinet, X.500 interoperability testing used the X.500 DAP (Directory Access) and DSP (Directory System) protocols. Successful testing was done between the ISODE Consortium X.500(1993) DSA and DSAs from four other vendors including Siemens-Nixdorf and Bull. The ISODE Consortium was the only vendor to bring an X.500(93) compliant DSA to the workshop for the scheduled X.500(93) testing.

PILOT CONNECTIVITY

Connectivity to the global research pilots (PARADISE etc.) has been demonstrated. It is expected that this system will be used extensively in a wide range of pilot activities. DUA Connectivity, and DSA Connectivity.

BUGS

Bugs should be reported to the ISODE Consortium via email.

CAVEATS AND GENERAL LIMITATIONS

None

INTERNETWORKING ENVIRONMENT

The IC R3.0 release is application level code, and assumes vendor provided lower layers. It provides the following modules with support for a range of APIs to handle associated lower layers:

- * [RFC 1006] (vendor supplied TCP/IP using sockets or TLI)
- * Transport service (vendor supplied transport, which may be any class and use any network service. TLI, XTI and various vendor-specific APIs).
- * TP0 (Vendor supplied X.25 or CONS using NTI and various vendor specific APIs).

HARDWARE PLATFORMS

Reference platform is SUN SPARC Solaris 2. The software has been ported to various other platforms by the IC and by member organizations. Contact the ISODE Consortium for a complete member product list.

SOFTWARE PLATFORMS

Reference OS is Solaris 2.3/2.4. It is also known to run on various other UNIX platforms. Contact the ISODE Consortium for a complete member product list.

NUMBER OF IMPLEMENTATIONS IN THE FIELD

[No information provided. -- Ed.]

AVAILABILITY

Available to members of the ISODE Consortium. Membership is open to any organisation. An earlier version of the source release is available under licence (zero cost) to universities and equivalent educational institutions.

Contact:

ISODE Consortium
The Dome, The Square
Richmond
TW9 1DT
UK

Phone: +44-181-332-9091
Fax: +44-181-332-9019

Email: <ic-info@isode.com>

DATE LAST UPDATED or CHECKED

January 1996

ADDITIONAL INFORMATION and/or COMMENTS

More information may be obtained by contacting the ISODE Consortium, or by visiting our WWW site, <http://www.isode.com/>

Our X.400 address is s=ic-info; o=ISODE Consortium; p=ISODE;
a=MAILNET; c=FI

NAME

ISOPLEX DS (tm) DSA

ISOCOR

ABSTRACT

ISOCOR's ISOPLEX DS Directory Services Product Family also includes:

ISOPLEX DS Import/Export Utility for Windows

ISOPLEX DS Navigator

ISOPLEX DS Directory Access XDS/XOM APIs

ISOGATE DS (tm) Oracle

The ISOPLEX DS provides a 1988 X.500 conformant Directory System Agent (DSA), a Lightweight Directory Access Protocol (LDAP) daemon to service Directory requests via LDAP, a UNIX Directory shell user agent (DISH), a Motif Directory Administrator interface to configure the first level and subordinate DSAs, and supporting utilities to handle bulk loading of the Directory, maintain statistics, and provide logging information.

In addition to supporting memory-based Directory Information Bases (DIBs), the ISOPLEX DS includes the optional configuration of delegate DSA processes for storing selected subtrees of the Directory Information Tree (DIT) in disk-based index and data files.

The ISOPLEX DS includes a set of utilities integrating it with key technology. The most important of these tools is the World Wide Web to X.500 gateway, which supports Hyper-Text Markup Language (HTML)-based DUA bindings to the ISOPLEX DS DSA via the ISOPLEX DS LDAP daemon process.

The ISOPLEX DS additionally provides Simple Network Management Protocol (SNMP) functionality that works in conjunction with an existing SNMP environment. The ISOPLEX DS functionality is specifically designed to monitor a DSA's DSP and DAP connections from a network management system and uses the X.500 Directory monitoring Management Information Base (MIB), which is based on [RFC 1567].

COMPLIANCE with X.500-1988 (applicable only for DSAs and DUAs)

The ISOPLEX DS conforms to the 1988 CCITT Recommendations X.500-X.521 as detailed in the Protocol Implementation Conformance Statements X.581 (1988) and X.582 (1988). It conforms in part to Version 7 of the NIST OIW Stable Implementation Agreements.

COMPLIANCE with X.500-1993 (applicable only for DSAs and DUAs)

The ISOPLEX DS does not conform to the 1993 ITU-T Recommendations X.500-X.521.

CONFORMANCE WITH PROPOSED INTERNET STANDARDS

The ISOPLEX DS conforms with the following proposed Internet Standard RFCs: [RFC 1274], [RFC 1276], [RFC 1277], [RFC 1567], [RFC 1777], [RFC 1778], [RFC 1779], and [RFC 1798].

CONSISTENCE WITH INFORMATIONAL AND EXPERIMENTAL RFCs

The ISOPLEX DS is consistent with the following informational and experimental RFCs: [RFC 1275], [RFC 1278], [RFC 1279], [RFC 1558], [RFC-1617], [RFC 1781], [RFC-1801], [RFC-1803], and [RFC-1804].

INTEROPERABILITY

The ISOPLEX DS interoperates with the following systems: Control Data, Digital Equipment, Hewlett Packard, Marben, Nexor, The Wollongong Group, and Unisys.

PILOT CONNECTIVITY

The ISOPLEX DS provides DUA Connectivity and DSA Connectivity via the PARADISE project in Europe and via the Internet in North America.

BUGS

If problems arise with the ISOPLEX DS, the customer can report these to the relevant ISOCOR reseller or contact ISOCOR Technical Support directly. ISOCOR Technical Support staffs are available in two locations: one in the US at +1 (310) 581-8100 (phone), +1 (310) 581-8111 (fax), and helpdesk@isocor.com; the other in Ireland at +353 (1) 284-3802 (phone), +353 (1) 280-0365, and helpdesk.isocor.ie.

CAVEATS AND GENERAL LIMITATIONS

Not applicable.

INTERNETWORKING ENVIRONMENT

Though the internetworking capability of the product depends on the specific hardware/software platform, the ISOPLEX DS in general supports the following environments:

[RFC 1006] with TCP/IP

TP2 over X.25, CONS (ISO 8878), APS on Async

TP4 over CLNS, PAD (X.29) Server

HARDWARE PLATFORMS

Hewlett Packard

Intel 486/Pentium

Sun

Stratus

SOFTWARE PLATFORMS

Hewlett Packard HP-UX v9.x/v10.x, HP OSI Transport Services 9000

SCO v3.2.4, v3.2.5, SCO OpenDesktop, TCP/IP, IEEE 802.3, Eicon R3.1 for X.25 networking software and hardware

Solaris v2.4, Sunlink OSI 8.0.2, Sunlink X.25 8.0.2

Stratus ftx v2.2, OSI Open Networking Platform (ONP), Stratus Window Manager 1.2 End User System, MIT X11R5 Graphics End User System, MIT X11R5 Graphics Fonts package, MIT X11R5 Graphics Openlook Software package

Motif/X11R5 runtime support

NUMBER OF IMPLEMENTATIONS IN THE FIELD

[No information provided. -- Ed.]

AVAILABILITY

The ISOPLEX DS is commercially available either directly from ISOCOR or from a licensed ISOCOR reseller.

DATE LAST UPDATED or CHECKED

December 31, 1995.

ADDITIONAL INFORMATION and/or COMMENTS

Not applicable.

NAME

LDAP

University of Michigan

ABSTRACT

UM-LDAP is an implementation of the Lightweight Directory Access Protocol. LDAP is a draft Internet standard directory service protocol that runs over TCP/IP. It can be used to provide a stand-alone directory service, or to provide lightweight access to the X.500 directory. LDAP is defined by [RFC 1777] and [RFC 1778].

The UM-LDAP package includes the following components:

- * slapd - a stand-alone LDAP directory server
- * slurpd - a stand-alone LDAP replication server
- * ldapd - an LDAP-to-X.500 gateway server
- * centipede - an LDAP centroid generation and maintenance program
- * libldap - an LDAP client library
- * liblber - a lightweight BER/DER encoding/decoding library
- * ldif tools - data conversion tools for use with slapd
- * in.xfingerd - a finger-to-LDAP gateway server
- * go500 - a gopher-to-LDAP gateway server for searching
- * go500gw - a gopher-to-LDAP gateway server for searching and browsing
- * rcpt500 - an email-to-LDAP query responder
- * mail500 - an LDAP-capable mailer
- * fax500 - an LDAP-capable mailer that supports remote printing
- * LDAP tools - A collection of shell-based LDAP utility programs

In addition, there are some contributed components:

- * web500 - an HTTP-to-LDAP gateway
- * whois++d - a WHOIS++-to-LDAP gateway
- * saucer - a simple command-line oriented client program

The latest information about LDAP can always be found on the LDAP Home Page at this URL:

<http://www.umich.edu/~rsug/ldap/>

COMPLIANCE with X.500-1988 (applicable only for DSAs and DUAs)

The U-M LDAP distribution is a complete implementation of the LDAP protocol. The LDAP protocol does not support access to all X.500 features and operations. The operations supported are bind, search, compare, add, delete, modify, modify RDN, and abandon. Note that read and list operations can be emulated using the search operation. Size and time limits may be specified, as may alias dereferencing and searching, but all X.500 service controls are not supported.

COMPLIANCE with X.500-1993 (applicable only for DSAs and DUAs)

Since the LDAP protocol itself has not yet been updated to support any 1993-specific X.500 features, this implementation does support any 1993 features yet either.

CONFORMANCE WITH PROPOSED INTERNET STANDARDS

Believed to be compliant with:

[RFC 1274], [RFC 1777], [RFC 1778], [RFC 1779], [RFC 1781]

CONSISTENCE WITH INFORMATIONAL AND EXPERIMENTAL RFCs

Includes an implementation of the LDAP API, as defined in [RFC 1823]. Search filters used within UM-LDAP comply with [RFC 1558].

INTEROPERABILITY

The current implementation of the X.500-backed LDAP server (ldapd) is known to work with ISODE-based DAP libraries and the QUIPU DSA.

PILOT CONNECTIVITY

DUA connectivity should be possible to all pilots.

BUGS

Bug reports should be sent to bug-ldap@umich.edu.

CAVEATS AND GENERAL LIMITATIONS

None, aside from those mentioned above under completeness.

INTERNETWORKING ENVIRONMENT

LDAP clients use TCP to communicate with the LDAP server. The LDAP server normally uses [RFC 1006] with TCP/IP to communicate with the DSA, though any other transport mechanism for DSA communication supported by ISODE should be possible.

HARDWARE PLATFORMS

The complete UM-LDAP package has been ported to a wide variety of UNIX systems, including: Sun3 and SPARCs running SunOS 4.1.x or Solaris 2.x, DECstations running Ultrix 4.3, HP 9000 series running HP-UX 9.05, IBM RS6000 running AIX 3.2.5, PCs running SCO, FreeBSD, NetBSD, or LINUX, DEC Alphas running OSF/1, and NeXTstatio running NeXTSTEP 3.2. The complete package has also been ported to VMS. In addition, the LDAP client libraries and some client programs have been ported to Apple Macintosh and PCs running MSDOS or Windows.

SOFTWARE PLATFORMS

The complete UM-LDAP package has been ported to a wide variety of UNIX systems, including: SunOS 4.1.x, Solaris 2.x, Ultrix 4.3, HP-UX 9.05, AIX 3.2.5, SCO, FreeBSD, NetBSD, LINUX, OSF/1, and NeXTSTEP 3.2. It has also been ported to VMS. In addition, the LDAP client libraries and some clients have been ported to Macintosh (System 7), MSDOS (some TCP/IP stacks), and Microsoft Windows 3.1, 95, and NT.

NUMBER OF IMPLEMENTATIONS IN THE FIELD

Unknown; used by almost all Internet X.500 sites.

AVAILABILITY

This software is openly available for all to use. It may be obtained by anonymous FTP from [terminator.rs.itd.umich.edu](ftp://terminator.rs.itd.umich.edu) in the /ldap/ directory (URL: <ftp://terminator.rs.itd.umich.edu/ldap/>). The latest information about LDAP can always be found on the LDAP Home Page at this URL:

<http://www.umich.edu/~rsug/ldap/>

Send e-mail to ldap-support@umich.edu for additional assistance.

This software was developed at the University of Michigan by Tim Howes with help from Mark Smith, Bryan Beecher, Gordon Good, Steve Rothwell, Lance Sloan as well as many others around the Internet. It is subject to the following copyright:

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DATE LAST UPDATED or CHECKED

December 1995

ADDITIONAL INFORMATION and/or COMMENTS

[No Information Provided -- Ed.]

NAME

maX.500 :: Macintosh DUA Interface

University of Michigan

ABSTRACT

maX.500 is a Directory User Agent (client) for Apple Macintosh. It is widely used within Paradise and other Internet X.500 pilots. maX.500 supports searching, browsing, and modifying directory entries. Display of textual information, playing of audio, and viewing of both black-and-white (fax) and color (JPEG) images are supported. Communication with directory servers is via the Lightweight Directory Access Protocol (LDAP) over TCP/IP. maX.500 works both with standalone LDAP directory servers (such as slapd) and with X.500-backed LDAP servers (such as ldapd).

maX.500 is a native Macintosh application, and has a friendly interface. It requires System Software version 6.0.5 or later and Apple's MacTCP or Open Transport TCP/IP networking. The current version of maX.500 is 2.0.2, although version 2.1 is in beta test.

The latest information about maX.500 can always be found on the maX.500 Home Page at this URL:

<http://www.umich.edu/~rsug/ldap/max500/>

COMPLIANCE with X.500-1988 (applicable only for DSAs and DUAs)

maX.500 works over LDAP, and is subject to LDAP's limitations. The bind, search, compare, add, delete, abandon, modify, and modifyrdn operations are all used by maX.500. Size and time limits may be specified, as may alias dereferencing control.

COMPLIANCE with X.500-1993 (applicable only for DSAs and DUAs)

maX.500 currently uses LDAP as defined in [RFC 1777], which does not support any 1993-specific X.500 features.

CONFORMANCE WITH PROPOSED INTERNET STANDARDS

Believed to be compliant with:

[RFC 1274], [RFC 1777], [RFC 1778], [RFC 1779], [RFC 1781]

CONSISTENCE WITH INFORMATIONAL AND EXPERIMENTAL RFCs

Search filters comply with [RFC 1558].

Uses the LDAP API, as defined in [RFC 1823].

INTEROPERABILITY

maX.500 is known to work with the U-M LDAP servers (ldapd and slapd). It has also been tested with other commercial LDAP servers, such as Control Data's server. maX.500 has been used with a wide variety of DSAs (always through an LDAP server).

PILOT CONNECTIVITY

DUA connectivity should be possible to all pilots.

BUGS

Bug reports should be sent to max500-bugs@umich.edu.

CAVEATS AND GENERAL LIMITATIONS

maX.500 does not support modification of "photo" (fax), "jpegPhoto", or "audio" attributes. Versions of maX.500 before 2.1 did not support a fully functional browse facility.

INTERNETWORKING ENVIRONMENT

maX.500 is an LDAP client, and as such it uses TCP to communicate with the LDAP server. Apple's MacTCP control panel or Open Transport TCP/IP networking is required.

HARDWARE PLATFORMS

maX.500 runs on Apple Macintosh Plus or later Macintosh computers, including PowerMacs. It requires 600K of free RAM.

SOFTWARE PLATFORMS

maX.500 requires Apple System Software 6.0.5 or later (System 7 preferred) and MacTCP 1.1 or later (2.0.6 preferred). maX.500 2.1, which is currently in beta test, will run natively on the PowerMac and use the native Open Transport networking interface if it is installed.

NUMBER OF IMPLEMENTATIONS IN THE FIELD

[No information provided. -- Ed.]

AVAILABILITY

This software is openly available for all to use. It may be obtained by anonymous FTP from terminator.rs.itd.umich.edu in the /ldap/max500 directory (URL: ftp://terminator.rs.itd.umich.edu/ldap/max500). The latest information about maX.500 can always be found on the maX.500 Home Page at this URL:

<http://www.umich.edu/~rsug/ldap/max500/>

Send e-mail to max500@umich.edu for additional assistance.

This software was developed at the University of Michigan by Mark Smith with help from Tim Howes and many others around the Internet. It is subject to the following copyright:

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DATE LAST UPDATED or CHECKED

December 1995

ADDITIONAL INFORMATION and/or COMMENTS

[No Information Provided -- Ed.]

NAME

Messageware DSA

NEXOR

ABSTRACT

Messageware DSA is a high performance X.500(93) DSA. Characteristics of the DSA are:

- * DAP access
- * DISP for replication and shadowing information
- * DSP access
- * LDAP
- * Full 1993 Basic and Simple Access Control
- * Support for X.400, X.500, and [RFC 1274] attributes and object classes
- * Approximate match based on Soundex.
- * Flexible schema management
- * Anti-trawling access control
- * Knowledge management mapped onto DIT
- * Attribute inheritance
- * Remote management

COMPLIANCE with X.500-1988 (applicable only for DSAs and DUAs)

Messageware DSA is an X.500 1993 compliant DSA

XT-QUIPU is a X.500 1988 compliant DSA conforming to NIST SIA version 2.

COMPLIANCE with X.500-1993 (applicable only for DSAs and DUAs)

Messageware DSA isn X.500 1993 compliant DSA implementing standard access control, replication and shadowing, X.509, for a full conformance statement see the NEXOR web site(<http://www.nexor.com>).

CONFORMANCE WITH PROPOSED INTERNET STANDARDS

The following are supported: String DN format [RFC 1485], [RFC 1274], [RFC 1276], and [RFC 1277].

CONSISTENCE WITH INFORMATIONAL AND EXPERIMENTAL RFCs

The following are supported: UFN [RFC 1781], [RFC 1278], and [RFC 1279].

INTEROPERABILITY

MessageWare DSA has been extensively interoperability tested at Eurosinet workshops and at the EEMA X.500 demonstration. Other vendors DSAs/DUAs interoperated with include:

ICL, Control Data, Unisys, Digital, Isocor, DCL, SNI, Boldon James

It is also in operation with DSAs used in the PARADISE and other pilot projects.

PILOT CONNECTIVITY

MessageWare DSA is fully connected to the PARADISE and PSI White Pages X.500 Pilots.

BUGS

No known bugs. Support is given via phone or email to "support@nexor.co.uk"

CAVEATS AND GENERAL LIMITATIONS

None.

INTERNETWORKING ENVIRONMENT

OSI TP4 with CLNP
OSI TP0 with X.25 or CONS
[RFC 1006] with TCP/IP

HARDWARE PLATFORMS

Sun: SunOS
Solaris
X86
IBM RS/6000: AIX
HP 9000

It is available on a number of other UNIX platforms

SOFTWARE PLATFORMS

SunOs 4.1.3 Solaris 2.4 AIX 3.2 DRS/NX 6000 HP-UX 9.01

Other software platforms are available.

NUMBER OF IMPLEMENTATIONS IN THE FIELD

[No information provided. -- Ed.]

AVAILABILITY

Messageware DSA is available from NEXOR and NEXOR partners. For more details contact:

NEXOR
PO Box 132
Nottingham
NG7 2UU
UK

DN: c=GB@o=NEXOR Ltd
Telephone: +44 115 952 0510
Fax: +44 115 952 0519
E-Mail: info@nexor.co.uk

DATE LAST UPDATED or CHECKED

Dec 95

ADDITIONAL INFORMATION and/or COMMENTS

[No Information Provided--Ed.]

NAME

MESSAGEWARE PC-DUA

NEXOR

ABSTRACT

PC-DUA provides a MS Windows based user interface to the X.500 Directory.

Features include:

- o Modify - allows users and administrators alike to add, change or delete directory entries
- o Searching - powerful searching tool so specific information can be quickly located. Also lists close matches
- o Highly flexible - can be customised to suit an organisations particular requirements
- o Directory Browser - to enable user to identify directory entries
- o History - allowing quick access to previously referenced parts of the DIT.
- o User Friendly Name (UFN) based searching
- o Hypertext-like navigation.
- o Friendly names for attribute labels.
- o Intelligent choice of entries to display when moving to a new location in the DIT.
- o On-line hypertext help.

COMPLIANCE with X.500-1988 (applicable only for DSAs and DUAs)

Compliant with LDAP 3.

COMPLIANCE with X.500-1993 (applicable only for DSAs and DUAs)

Compliant with 1993 versions of ITU X.500/ISO 9594 services and protocols

CONFORMANCE WITH PROPOSED INTERNET STANDARDS

The following are supported: [RFC 1006]
 [RFC 1202]
 [RFC 1274]
 [RFC 1277]
 [RFC 1777]

CONSISTENCE WITH INFORMATIONAL AND EXPERIMENTAL RFCs

[No information provided--Ed.]

INTEROPERABILITY

PC-DUA has interoperated with LDAP 2.0 and 3.0 distributions.

Eurosinet Workshop:

SNI, CDS, AT&T, ICL, Digital, ISOCOR, UNISYS and QUIPU.

PILOT CONNECTIVITY

Full DUA connectivity to the NADF, PARADISE and PSI White Pages X.500 Pilots.

BUGS

No known bugs. Support is given via phone or email to "support@nexor.co.uk"

CAVEATS AND GENERAL LIMITATIONS

None.

INTERNETWORKING ENVIRONMENT

WinSock based TCP/IP stacks

HARDWARE PLATFORMS

386 PC or greater WITH 4MGBYTES RAM

SOFTWARE PLATFORMS

MS WINDOWS 3.1
Windows NT
Windows95

NUMBER OF IMPLEMENTATIONS IN THE FIELD

[No information provided. -- Ed.]

AVAILABILITY

PC-DUA is commercial software. For more details contact:

NEXOR
PO Box 132
Nottingham
NG7 2UU
UK

DN: c=GB@o=NEXOR Ltd
Telephone: +44 (0) 115 952 0510
Fax: +44 (0) 115 952 0519
E-Mail: info@nexor.co.uk

DATE LAST UPDATED or CHECKED

Dec 95

ADDITIONAL INFORMATION and/or COMMENTS

[No Information Provided--Ed.]

NAME

NonStop Directory Services (NSDS)
Tandem Computers, Inc.

ABSTRACT

The Tandem NonStop Directory Services (NSDS) product provides a distributed open directory service on Tandem platforms. It is an industrial strength implementation incorporating the Tandem product fundamentals of resilience, linear extensibility, fault-tolerance, and continuous availability. NSDS runs on the NonStop Kernel Guardian Personality which includes support for Tandem system characteristics such as data integrity, process persistence, and server classes. NSDS supports access over X.25 WAN, LAN and TCP/IP networks.

NSDS is a port of OSF's DCE GDS Reference Implementation, with Tandem enhancements including 1993 X.500 Simplified Access Control. Tandem server class management provides fault events, tracing, accounting and configuration services for NSDS. TM/MP (Transaction Management) is used to protect all file operations that affect the integrity of the directory entries in the DIB.

Major Features Include:

- * X/Open Directory Services (XDS) API and X/Open Object Management (XOM) interface in conformance with X/Open CAE Specifications, and an additional Tandem extension package
- * 1988 Edition X.500 Conformant DAP and DSP, capable of inter-operating with 1993 Edition DUA or DSA implementations
- * Simplified Access Control as specified in the 1993 edition of the X.500 standard.
- * Unprotected Simple Authentication (name and password in clear)
- * Character set support for T61 Printables, IA5 and Teletex Strings
- * The DSA-SC server class performs the functions of a DSA. Multiple processes are used for fault tolerance and load balancing.
- * The DUA-ACCESS server class handles communications between local applications and remote DSA's using DAP across an OSI stack.

- * The DSA-ACCESS server class handles communications from remote DUAs or DSAs to the DSA-SC server class using the Tandem OSI stack implementation which includes [RFC 1006] support for TCP/IP networks.
- * The DSA-CHAIN server class handles chaining communications between the DSA-SC server class and remote DSAs.
- * NSDS GUI Viewer supports administration/management of an NSDS DIB on a PC Windows workstation. The NSDS GUI Viewer is supported by a persistent server process on the Tandem NonStop Kernel. The GUI Viewer allows a directory entry and a complete set of attributes and values to be inserted anywhere in the directory tree (DIT), to be deleted or changed, read or searched based on distinguished name components, with or without wild-card.
- * NSDS SCRIPTOR allows customers to explore features of the XDS programmatic interface in advance of writing their XOM/XDS application. NSDS SCRIPTOR is a menu-driven batch interface to XDS functions.
- * A BulkUnload/BulkLoad utility allows a branch of the DIB to be dumped to an editable flat file and restored from that file. The flat file can be modified before being bulk-loaded into a DIB which may conform to a different schema definition.
- * Support for the LDAP protocol.
- * Messaging-Based Directory Query (MDQ) provides a text-based query interface to the directory from an X.400 messaging system, such as Tandem OSI/MHS, via the XAPIA compliant GPI interface.

COMPLIANCE with X.500-1988 (applicable only for DSAs and DUAs)

NSDS complies with the '88 CCITT X.500 and ISO 9594 standard, and part of '93 X.500 standard.

NSDS DSA and DUA are compliant with OIW Agreements, with the following features yet to be implemented:

- * Strong Authentication (Sections 6.6.2 and 8.4e)
- * Priority Service Control (Section 7.4)

- * Digital Signature, Replication and Shadowing (Sections 8.8-8.12)
- * Authentication (Sections 9.1.7 and 14.1-14.2)
- * Directory Trace Information (Section 9.2.2)
- * Abandon and ROSE operation class 2 (Section 10.1)

COMPLIANCE with X.500-1993 (applicable only for DSAs and DUAs)

- * NSDS supports the directoryAccessAC (DAP) and directorySystemAC (DSP) application contexts.
- * The DSA is capable of acting as a first-level DSA.
- * Chaining is supported.
- * security levels of simple unprotected password and none are supported.
- * All attribute types defined in ISO/IEC 9594-6:1993 are supported except for collective attributes and enhancedSearchGuide. Customer defined attributes can also be added. UNIVERSAL STRING is not supported.
- * All object classes defined in ISO/IEC 9594-7:1993 are supported. Customer defined object classes can be also be added.
- * Name forms defined in ISO/IEC 9594-7:1993 are all supported. Customer defined name forms can also be added.
- * Simplified Access Control is supported.
- * Support for collective attributes is not provided.

CONFORMANCE WITH PROPOSED INTERNET STANDARDS

[RFC 1277], [RFC 1777], [RFC 1779], [RFC 1778]

CONSISTENCE WITH INFORMATIONAL AND EXPERIMENTAL RFCs

[RFC 1279]

INTEROPERABILITY

NSDS DSAs interoperate with various 1988 X.500 and 1993 X.500 conformant DUAs with unrecognized features of the incoming 1993-based request ignored.

PILOT CONNECTIVITY None at the present time.

BUGS

Information is provided with the production installation guide.

CAVEATS AND GENERAL LIMITATIONS

The OSF/DCE "GDS Extension Package" is not supported by NSDS. A Tandem "NDS Extension Package" is provided to support 1993 Simplified Access Control.

INTERNETWORKING ENVIRONMENT

The underlying protocols carrying DAP and DSP protocols are provided by OSI higher layer stack over X.25, LAN and/or TCP/IP via [RFC-1006].

HARDWARE PLATFORMS

Tandem NonStop Himalaya Systems

SOFTWARE PLATFORMS

D30.02 NonStop Kernel. The operator's GUI runs under Microsoft Windows 3.1 or later.

NUMBER OF IMPLEMENTATIONS IN THE FIELD

[No information provided. -- Ed.]

AVAILABILITY

The NSDS Rev 1.0 production version has been available since October 1995.

For more details, please contact:

Don S. Jones
NSDS Product Manager
Phone: (408) 285-6480
Fax: (408) 285-6004
e-mail: JONES_S_DON@TANDEM.COM

DATE LAST UPDATE or CHECKED

July 1996.

ADDITIONAL INFORMATION and/or COMMENTS

None.

NAME

ORG.D (tm) V2.0 / V2.1

Siemens Nixdorf Informationssysteme AG

ABSTRACT

ORG.D V2.0 is Siemens Nixdorf's administrative directory client product. Through its file manager like user interface retrieval and DIT administration operations are supported. ORG.D offers a DDE interface and with ORG.D V2.1 additionally OLE / OCX / MAPI interfaces are supported. ORG.D V2.1 is an MS-Windows application acting as an LDAP client.

Among others, ORG.D has the following features:

- * Comprehensive, simple-to-use search and positioning options
- * complex searches, including approximate search
- * Several databases visible at the same time in an interface
- * Private address books: available on every desktop
- * Optional use of distribution lists and private address book
- * Support for MS-Word mail merge by means of special export format
- * adaptable print listings and comfortable list&label functionality
- * customizing tool in order to adapt to any directory schema
- * Configurable user interface
- * Automatic unbind after idle time
- * Anonymous and simple unprotected bind
- * Data transfer to Windows applications via file, Drag&Drop, and DDE
- * Central administration of distribution lists/groups
- * "Domain administrators" with limited rights defined only for home site/department

- * Direct modification / creation of DIT entries from the user interface
- * Choice of a proposal list when new employee data is added

Tight integration in SNI4s X.400/SMTP-MIME mail service and CIT products

- * DDE connection and drag&drop data transfer to SNI's X.400 user agent MAIL.D and SNI4s CIT product ComfoPhone
- * Setting up and administering mailboxes on remote mailbox servers
- * Central administration of server addresses and logon data

COMPLIANCE with X.500-1988 (applicable only for DSAs and DUAs)

ORG.D V2.1 is an LDAP client.

COMPLIANCE with X.500-1993 (applicable only for DSAs and DUAs)

ORG.D V2.1 is an LDAP client.

CONFORMANCE WITH PROPOSED INTERNET STANDARDS

ORG.D V2.1 is compliant with the following RFCs: [RFC 1777], [RFC 1778], [RFC 1779].

CONSISTENCE WITH INFORMATIONAL AND EXPERIMENTAL RFCs

ORG.D V2.1 is compliant with the following RFCs: [RFC 1278], [RFC 1558].

INTEROPERABILITY

ORG.D V2.1 is based on University of Michigan's LDAP implementation V3.0. It can interoperate with any LDAP server.

PILOT CONNECTIVITY

In future ORG.D will be used to browse in the European NameFLOW-PARADISE pilot network. Currently SNI's directory client product DIR.D V2.6 is used to browse in the European NameFLOW-PARADISE pilot network.

BUGS

To report bugs and/or to retrieve additional information on SNI's directory products please send mail to infoline-com@s41.mch1.x400scn.sni.de.

CAVEATS AND GENERAL LIMITATIONS

[No information provided. -- Ed.]

INTERNETWORKING ENVIRONMENT

LDAP with TCP/IP

HARDWARE PLATFORMS

PC (Intel)

SOFTWARE PLATFORMS

Windows 3.1 + Winsockets
Windows for Workgroups 3.11 + Winsockets
Windows 95
Windows NT 3.5
OS/2 3.0 + Windows for OS/2 + Winsockets

NUMBER OF IMPLEMENTATIONS IN THE FIELD

Field testing is to be started in Spring 1996.

AVAILABILITY

ORG.D V2.0 / V2.1 can be delivered as a binary product. It is commercially available from:

Siemens Nixdorf Informationssysteme AG
ASW BA COM 1
D-81730 Munich
Germany

Please contact

Giovanni Rabaioli
Voice: +49/89-636-41095
Fax: +49/89-636-42552
Mail: Giovanni.Rabaioli@mch.sni.de

DATE LAST UPDATED or CHECKED

April 1996

ADDITIONAL INFORMATION and/or COMMENTS

DIR.X V4.0	1993 X.500 Directory Service
DIR.X V3.1	1988 X.500 Directory Service
DIR.D V2.6	LDAP browser for information retrieval
DIR.X-SYNC V2.0	Directory synchronization

NAME

OSIAM X.500-88

MARBEN

ABSTRACT

OSIAM X.500-88 is Marben's 1988 compliant directory product. It provides:

- * DUA, offering X/Open XOM and XDS APIs
- * Pocket DUA, providing Microsoft MAPI(tm)
- * DSA and C-ISAM based DIB
- * LDAP Server

OSIAM DUA is a portable Directory User Agent implement, which implements DAP engine. It provides X/Open XOM and XDS APIs. It works on multiple lower layer stacks (OSI Transport or TCP/IP). An LDAP Server may be provided with the DUA.

Pocket DUA is a light DUA implement which offers full DAP access, but light in terms of code size and memory occupation, and is mainly designed for PC environments. It provides MAPI(tm) interface, as an address book provider. It provides multiple network connectivities: X.25, [RFC 1006] over TCP/IP, and APS.

OSIAM X.500 DSA provides full X.500 1988 functionality. Main features include: chaining/multicasting, extensible schema, proprietary access control list, comprehensive administration facilities.

MARBEN is currently developing a new generation of directory product, providing X.500 1993 functionality. Main targets are:

- * high performance
- * robustness and administration facility with DIB on commercial RDBMS
- * replication
- * access control
- * extended information models

Please contact MARBEN for more information on '93 product.

COMPLIANCE with X.500-1988 (applicable only for DSAs and DUAs)

OSIAM X.500-88 DUA and DSA implement CCITT X.500 (1988) an ISO 9594 standards.

Compliant with EWOS and NIST OIW Stable Implementor's Agreement.

COMPLIANCE with X.500-1993 (applicable only for DSAs and DUAs)

1993 product is under development.

Please contact MARBEN for more information on '93 product.

CONFORMANCE WITH PROPOSED INTERNET STANDARDS

Compliant with the following Internet Standards:

- * [RFC 1274]: the COSINE and Internet X.500 Schema (partially supported)
- * [RFC 1277]: encoding of network addresses
- * [RFC 1778], [RFC 1777], [RFC 1779]: LDAP and related standards

CONSISTENCE WITH INFORMATIONAL AND EXPERIMENTAL RFCs

None is supported at the present time.

INTEROPERABILITY

Have successfully interoperated, both on DAP and DSP, with QUIPU, E3X and other implementations involved in Paradise pilot project.

PILOT CONNECTIVITY

Connected to Paradise pilot project.

BUGS

[No Information Provided--Ed.]

CAVEATS AND GENERAL LIMITATIONS

[No Information Provided--Ed.]

INTERNETWORKING ENVIRONMENT

[RFC 1006] with TCP/IP, TP0 with X.25, TP4 with CLNS

HARDWARE PLATFORMS

OSIAM X.500-88 is highly portable, and has been ported to a wide range of platforms, including:

- * HP9000 series
- * SUN SPARC Stations
- * SCO UNIX
- * Tandem
- * MARK III, etc.

MARBEN Pocket DUA runs on PC/Windows and NT.

SOFTWARE PLATFORMS

See HARDWARE PLATFORMS.

NUMBER OF IMPLEMENTATIONS IN THE FIELD

[No information provided. -- Ed.]

AVAILABILITY

Commercially available from:

MARBEN
11 Rue Curie
92150 Suresnes, France

Contact Person: Karim Jammal or Shaofeng Li
Phone: (33 - 1) 41 38 10 00
Fax: (33 - 1) 41 38 10 01
X.400: C=FR;A=Atlas;P=Marben;O=Suresnes;OU1=MxMs;S=KJammal
E-Mail:sli@wtk.suresnes.marben.fr

Also available from:

MARBEN Products Inc.
2105 Hamilton Avenue, Suite 320
San Jose, CA95125, USA

Contact Person: Jean-Francois Chapuis
Phone: (408) 879 4000
Fax: (408) 879 4001
E-Mail: jfchapuis@marben.com

DATE LAST UPDATED or CHECKED

October 1995

ADDITIONAL INFORMATION and/or COMMENTS

[No Information Provided--Ed.]

NAME

OSIAM X.500-93

MARBEN

ABSTRACT

OSIAM X.500-93 is Marben's 1993 compliant directory product.

Open Directory

- * OSIAM X.500-93 provides both DAP and LDAP access
- * Support for distribution using the DSP protocol
- * Support for replication using the DISP protocol
- * Pocket DUA, providing Microsoft MAPI0(tm) and MAPI1(tm) interface to MS-Mail(tm) or Exchange(tm)
- * WEB gateway to access Directory information from WEB browsers
- * X/Open XOM/XDS API
- * High performance direct API

High Capacity

- * Mapped on a RDBMS
- * Over 1.000.000 entries
- * Use of transaction, to ensure robustness
- * Can run on high-available hardware systems
- * Isolated interface, to be customized for various RDBMS

High Performance

- * Use of cache at DUA level
- * Use of cache at DSA level

- * Use of replication. Can act as shadow supplier, shadow consumer or secondary shadow supplier. Support for total or incremental refresh. Support for both scheduled update and "on change" update.
- * Based on an indexed database, to ensure high-performance elaborated search.

Security

- * Anonymous bind, simple and simple protected authentication
- * X.509 certificates storage
- * Access control

Ease of administration

- * Extensible schema
- * Backup-recovery
- * Event logging
- * Statistics information about Directory use
- * Billing dockets generation

Ease of integration

- * Provided as binary product or as portable source code
- * MARBEN services: training, consulting, system integration, hot-line support, maintenance.

COMPLIANCE with X.500-1988 (applicable only for DSAs and DUAs)

OSIAM X.500-93 DUA and DSA implement CCITT X.500 (1988) and ISO 9594 standards.

Compliant with EWOS and NIST OIW Stable Implementor's Agreement.

COMPLIANCE with X.500-1993 (applicable only for DSAs and DUAs)

OSIAM X.500-93 DUA and DSA implement CCITT X.500 (1993) and ISO 9594 standards.

CONFORMANCE WITH PROPOSED INTERNET STANDARDS

Compliant with the following Internet Standards:

- * [RFC 1274]: the COSINE and Internet X.500 Schema (partially supported)
- * [RFC 1277]: encoding of network addresses
- * [RFC 1778], [RFC 1777], [RFC 1779]: LDAP and related standards

CONSISTENCE WITH INFORMATIONAL AND EXPERIMENTAL RFCs

None is supported at the present time.

INTEROPERABILITY

Have successfully interoperated, both on DAP and DSP, with QUIPU, E3X and other implementations involved in Paradise pilot project.

PILOT CONNECTIVITY

Connected to Paradise pilot project.

BUGS

[No Information Provided--Ed.]

CAVEATS AND GENERAL LIMITATIONS

[No Information Provided--Ed.]

INTERNETWORKING ENVIRONMENT

[RFC 1006] with TCP/IP, TP0 with X.25, TP4 with CLNS

HARDWARE PLATFORMS

OSIAM X.500-93 is highly portable, and has been ported to a wide range of platforms, including:

- * Windows NT
- * HP-UX
- * IBM AIX

- * SUN Solaris
- * SCO UNIX
- * IBM MVS

MARBEN Pocket DUA runs on PC/Windows and NT.

SOFTWARE PLATFORMS

See HARDWARE PLATFORMS.

NUMBER OF IMPLEMENTATIONS IN THE FIELD

[No information provided. -- Ed.]

AVAILABILITY

Commercially available from:

MARBEN
11 Rue Curie
92150 Suresnes, France

Contact Person: Marc Chauvin or Olivier Gatine
Phone: (33 - 1) 41 38 10 00
Fax: (33 - 1) 41 38 10 01
E-Mail: sales@suresnes.marben.fr

Also available from:

MARBEN Products Inc.
2105 Hamilton Avenue, Suite 320
San Jose, CA95125, USA

Contact Person: Jean-Francois Chapuis
Phone: (408) 879 4000
Fax: (408) 879 4001
E-Mail: jfchapuis@marben.com

DATE LAST UPDATED or CHECKED

July 1996

ADDITIONAL INFORMATION and/or COMMENTS

[No Information Provided--Ed.]

NAME

PMDF-X500

from:

Innosoft International, Inc. 1050 East Garvey Ave. South West
Covina, California 91790

Phone: +1 818-919-3600 email: sales@innosoft.com

ABSTRACT

PMDF-X500 is Innosoft's implementation of the X.500 standards for Directory Services. PMDF-X500 is based upon the ISODE Consortium code-base. The core of PMDF-X500 is the Directory System Agent (DSA) server. This server provides directory information to Directory User Agents (DUA) using either OSI or TCP/IP networking protocols. Since PMDF-X500 is based on a widely used implementation, it interoperates particularly well with a whole host of X.500-based products from other sources.

In order to facilitate initial loading of directory data as well as ongoing coordination with other directory services, PMDF-X500 includes tools to import from and export directory information to Entry Description File (EDF) files. EDF files are flat text files. PMDF-X500 provides directory coordination functions using EDF files for the following directories:

- * X.500 DSAs supporting LDAP access
- * cc:Mail
- * Digital's DDS
- * GroupWise
- * Microsoft Mail
- * PMDF generic databases

COMPLIANCE with X.500-1988 (applicable only for DSAs and DUAs)

OSI directory services as specified in CCITT X.500 Recommendations and ISO 9594 use the Directory Access Protocol (DAP) and the Directory System Protocol (DSP).

COMPLIANCE with X.500-1993 (applicable only for DSAs and DUAs)

PMDF-X500 does not yet support the 1993 changes to the X.500 standard. Support for the 1993 X.500 recommendations is planned for a future release of PMDF-X500.

CONFORMANCE WITH PROPOSED INTERNET STANDARDS

PMDF-X500 supports DAP and DSP accesses using Internet protocols as specified in [RFC 1006]. In addition, the Internet community has proposed two lightweight alternatives to DAP called Lightweight Directory Access Protocol (LDAP), which is specified in [RFC 1777], and Connectionless Lightweight Directory Access Protocol (CLDAP), which is specified in [RFC 1798]. LDAP and CLDAP, which are currently specified to run over TCP/IP, are much simpler protocols than DAP and were designed to reduce the cost of entry associated with using X.500 protocols in client applications. PMDF-X500 includes both LDAP and CLDAP servers.

The LDAP server accesses X.500 directory information using DAP to communicate with X.500 DSAs. PMDF-X500 provides an LDAP server which translates LDAP requests into DAP requests to communicate with X.500 DSAs. CLDAP defines a very low overhead method for accessing X.500 directory information. CLDAP is suitable for providing access to information that does not require access controls.

CONSISTENCE WITH INFORMATIONAL AND EXPERIMENTAL RFCs

[No information provided. -- Ed.]

INTEROPERABILITY

PMDF-X500 interoperates with a large number of DUAs and DSAs. This is demonstrated by the fact that PMDF-X500 is DSA used by several Internet White Pages Project participants. PMDF-X500 DSA interoperability includes at least all of the DSA that are used in the White Pages Project.

PMDF-X500 is delivered with several DUAs and in addition is known to support the DUAs from Unisys and Digital Equipment Corporation as well as the publically available DUAs MaX500, Cello, Swix, and the NASA DUA.

PILOT CONNECTIVITY

PMDF-X500 is used by several sites that are participants of the Internet White Pages Project include the Innosoft DSA.

BUGS

[No information provided. -- Ed.]

CAVEATS AND GENERAL LIMITATIONS

[No information provided. -- Ed.]

INTERNETWORKING ENVIRONMENT

DAP and DSP are layered on top of the OSI protocol suite. PMDF-X500 supports this protocol suite over multiple network transports. For a pure OSI protocol stack, DECnet/OSI can be used to provide the lower layers of the stack. In addition, PMDF-X500 supports running OSI upper layer protocols over a TCP/IP transport in accordance with [RFC 1006]. It is important to note that while [RFC 1006] specifies TCP/IP as a transport, all of the OSI upper layer protocols are always used with DAP and DSP.

HARDWARE PLATFORMS

Digital VAX systems
Digital Alpha/AXP systems

SOFTWARE PLATFORMS

OpenVMS/VAX
OpenVMS/AXP
Digital UNIX

NUMBER OF IMPLEMENTATIONS IN THE FIELD

[No information provided. -- Ed.]

AVAILABILITY

PMDF-X500 is a commercial product that is part of the PMDF family of eMail Interconnect products. PMDF-X500 requires the presence of PMDF-MTA, Innosoft's SMTP/MIME mailer. PMDF-X500 and PMDF-MTA can be obtained from:

Innosoft International, Inc.
1050 East Garvey Ave. South
West Covina, California 91790

Phone: +1 818-919-3600
FAX: +1 818-919-3614
email: sales@innosoft.com

DATE LAST UPDATED or CHECKED

December 1995

ADDITIONAL INFORMATION and/or COMMENTS

No information provided. -- Ed.]

NAME

TransIT 500 Unisys Corporation

ABSTRACT

TransIT 500 is a commercial-grade implementation of the 1993 X.500 directory standards (ITU X.500 Directory Services and ISO 9594) including replication, extensible schemas and access control. TransIT 500 is designed for performance, scalability, conformance and interoperability for enterprise-wide usage and is available for Microsoft Windows NT, Hewlett Packard HP/UX, Unisys U6000 and as portable source code. TransIT 500 is comprised of the following:

TransIT 500 Directory Services

TransIT 500 Directory Services is a high-performance, 1993 standards based Directory System Agent (DSA). TransIT 500 includes many features required by today's enterprise for global access and mission-critical applications:

- * Adheres to the 1993 ITU & ISO 9594 X.500 Directory Services standards
- * Full support for Replication (X.525/DISP)
- * Access controls and extensible schemas
- * Support of all X.520 attribute types & syntaxes, all X.521 object classes & attribute sets
- * Automated loading of directory entries
- * Support for Basic Access Control and Simplified Access Control
- * High performance, commercial-grade operations
- * Integration with popular databases such as Microsoft SQL Server, Informix, and Oracle
- * Multi-platform availability
- * Authentication services
- * Support of industry standard APIs, including LDAP, DAP, DSP, DISP, XDS/DOM and XAP

- * High-capacity network integration with both TCP/IP (RFC 1006) and OSI networks.

TransIT 500 Administrator

TransIT 500 Administrator is an extremely powerful tool designed to assist administrators in all directory administration, maintenance and security functions. Available for Microsoft Windows NT, Windows 95 and Windows 3.1.1 based systems, TransIT 500 Graphical Administration is the first tool of its kind to provide fully graphical X.500 directory management. All functions are provided and multiple DSAs can be managed simultaneously from a single administrative console:

- * Directory Service Operations
- * Directory Controls Management
- * Access Control Management
- * Schema Management & Maintenance
- * Directory Information Tree Management
- * Knowledge References & Information
- * Replication Agreements & Information
- * Logging, Tracing and System Logs
- * Directory System Configuration
- * Data Import & Export
- * Directory Backup & Restore Operations

TransIT 500 Browser

TransIT Browser is a powerful, graphical information retrieval tool designed to make navigating directories as simple as possible. The Browser interface makes detailed directory searches and retrievals easy while the unique Directory Lookup interface provides extra ease-of-use for simple lookups. TransIT Browser is available for Microsoft Windows 3.1, Windows 95 and Windows NT systems.

- * Browse multiple directories from a single console
- * Two interfaces to directories:

- * Tree-oriented Browser
- * Tabular Directory Lookup
- * Object classes mapped to icons to enhance object recognition
- * Extensive attribute search capabilities
- * Save/Load scratchpad for search criteria & prefix criteria
- * LDAP support
- * Configurable cache to speed data delivery

TransIT 500 Developer

TransIT 500 Developer is a development toolkit which provides programming interfaces, utilities and documentation for the development of directory enabled applications. The Directory Information Tree (DIT) can be extended and re-compiled for the addition of application-specific information to the directory. The Administration application provides for the verification and installation of new schemas and the maintenance of directory tree items. Utilities are provided for the bulk importation or exportation or directory information from and to external sources.

TransIT 500 also supports user-written programs using the X/Open Directory Services Application Program Interface (XDS API).

COMPLIANCE with X.500- 1988

The TransIT 500 implementation conforms to the specifications outlined in the ISO/IEC 9594-1 to ISO 9594-9, CCITT X.500 standards.

COMPLIANCE with X.500- 1993

TransIT 500 makes the following claims of conformance as outlined in ISO/IEC 9594-5:

Conformance by DUAs:

Statement Requirements

Conformance is claimed for the following operations:

- * DirectoryBind
- * DirectoryUnbind

- * Read
- * Compare
- * Abandon
- * List
- * Search
- * AddEntry
- * RemoveEntry
- * ModifyEntry
- * ModifyDN

Conformance is claimed for the following security-levels:

- * None
- * Simple

Conformance is claimed for the following extensions:

- * subentries
- * copyShallDo
- * extra attributes
- * useAliasOnUpdate
- * newSuperior

Static Requirements

The DUA supports the application contexts `directoryAccessAC` and `directorySystemAC`.

The DUA conforms to the following extensions for which the DUA is capable of initiating:

- * subentries
- * copyShallDo

- * extra attributes
- * useAliasOnUpdate
- * newSuperior

Dynamic Requirements

The DUA conforms to the mapping of the DAP services (i.e., DirectoryBind, DirectoryUnBind) onto the used services of the ACSE.

The DUA conforms to the versions and rules of extensibility as outlined in clause 7.5.1 of X.519.

Conformance by DSAs:

Statement Requirements

The DSA supports the application contexts directoryAccessAC and directorySystemAC.

The DSA does not make any claims for operational binding types.

The DSA is capable of acting as a first-level DSA as defined in ITU-T Rec. X.518 ISO/IEC 9594-4.

The DSA supports the application context directorySystemAC and the chained mode of operation.

Conformance is claimed for the following security-levels:

- * None
- * Simple

Conformance is claimed for all attribute types defined in ITU-T Rec. X.520 ISO/IEC 9594-6.

Conformance is claimed for all object classes defined in ITU-T Rec. X.521 ISO/IEC 9594-7.

Conformance is claimed for the following extensions:

- * subentries
- * copyShallDo

- * extra attributes
- * useAliasOnUpdate
- * newSuperior

Conformance is not claimed for collective attributes as defined in X.501 and X.511.

Conformance is not claimed for hierarchical attributes as defined in X.511.

Conformance is claimed for the following operational attribute types defined in X.501:

- * createTimestamp
- * modifyTimestamp
- * creatorsName
- * modifiersName
- * administrativeRole
- * subtreeSpecification
- * collectiveExclusions
- * accessControlScheme
- * prescriptiveACI
- * entryACI
- * subentryACI
- * dseType
- * myAccessPoint
- * superiorKnowledge
- * specificKnowledge
- * nonSpecificKnowledge
- * supplierKnowledge

- * consumerKnowledge
- * secondaryShadows
- * dITStructureRules
- * nameForms
- * dITContentRules
- * objectClasses
- * attributeTypes
- * matchingRules
- * matchingRuleUse

Conformance is claimed for return of alias names as defined in 7.7.1 of X.511 ISO/IEC 9594-3.

Conformance is claimed for indicating that returned entry information is complete, as described in 7.7.6 of X.511 ISO/IEC 9594-3.

Conformance is claimed for modifying the object class attribute to add and/or remove values identifying auxiliary object classes, as described in 11.3.2 of X.511 ISO/IEC 9594-3.

Conformance is claimed for Basic Access Control.

Conformance is claimed for Simplified Access Control.

Conformance is claimed for the DSA s ability to administer the subschema for its portion of the DIT, as defined in X.501 ISO/IEC 9594-2.

Conformance is claimed for all name bindings defined in X.521 ISO/IEC 9594-7.

Conformance is claimed for the DSA s ability to administer collective attributes, as defined in X.501 ISO/IEC 9594-2.

Static requirements

The DSA supports the application contexts directoryAccessAC and directorySystemAC.

The DSA conforms to the information framework defined by X.501 ISO/IEC 9594-2.

The DSA conforms to the minimal knowledge requirements defined in ISO/IEC 959-4.

The DSA operates as a first-level DSA and conforms to the requirements support of the root context as defined in X.518 ISO/IEC 9594-4.

The DSA supports the attributes for which conformance is claimed above.

The DSA supports the object classes for which conformance is claimed above.

The DSA conforms to the following extensions for which conformance is claimed:

- * subentries
- * copyShallDo
- * extra attributes
- * useAliasOnUpdate
- * newSuperior

Conformance is claimed for the DSA s ability to administer the subschema for its portion of the DIT, as defined in X.501 ISO/IEC 9594-2.

Conformance is not claimed for collective attributes, as defined in X.501 ISO/IEC 9594-3.

Conformance is not claimed for hierarchical attributes, as defined in X.501 ISO/IEC 9594-3.

The DSA supports the operational attribute types for which conformance is claimed above.

The DSA supports Basic Access Control and is capable of holding ACI items that conform to the definitions of Basic Access Control.

The DSA supports Simplified Access Control and is capable of holding ACI items that conform to the definitions of Simplified Access Control.

Dynamic Requirements

The DSA conforms to the mapping onto used services as defined in clause 8.

The DSA conforms to the procedures for distributed operations of the Directory related to referrals, as defined in X.518 ISO/IEC 9594-4.

The DSA supports application-context directoryAccessAC and conforms to the procedures of X.518 ISO/IEC 9594-4 as they relate to the referral mode of the DAP.

The DSA supports application-context directorySystemAC and conforms to the referral mode of operation, as defined in X.518 ISO/IEC 9594-4.

The DSA conforms to the chained mode of interaction as defined in X.518 ISO/IEC 9594-4.

The DSA conforms to rules of extensibility procedures as defined in clause 7.5.2 of X.518 ISO/IEC 9594-4.

The DSA supports Basic Access Control and has the capability to protect information within the DSA in accordance with the procedures of Basic Access Control.

The DSA supports Simplified Access Control and has the capability to protect information within the DSA in accordance with the procedures of Simplified Access Control.

Conformance is not claimed for shadowOperationalBindingID -- as such, conformance is not claimed for the procedures of X.525 ISO/IEC 9594-9 and X.501 ISO/IEC 9594-2 as they relate to DOP.

Conformance is not claimed for specificHierarchicalBindingID -- as such, conformance is not claimed for the procedures of X.518 ISO/IEC 9594-9 and X.501 ISO/IEC 9594-2 as they relate to operational bindings.

Conformance is not claimed for non-specificHierarchicalBindingID -- as such, conformance is not claimed for the procedures of X.518 ISO/IEC 9594-9 and X.501 ISO/IEC 9594-2 as they relate to operational bindings.

Conformance by a shadow supplier:

Statement Requirements

The DSA supports the application contexts shadowSupplierInitiatedAC.

Conformance is claimed for the following security-levels:

- * None
- * Simple

Conformance is claimed for UnitofReplication.

Static Requirements

The DSA supports the application contexts shadowSupplierInitiatedAC for which conformance is claimed.

Conformance is claimed for the operational attributes modifyTimestamp and createTimestamp.

Dynamic Requirements

The DSA conforms to the mapping onto used services as defined in clause 8.

The DSA conforms to the procedures of X.525 ISO/IEC 9594-9 as they relate to the DISP.

Conformance by a shadow consumer:

Statement Requirements

The DSA supports the application contexts shadowConsumerInitiatedAC.

Conformance is claimed for the following security-levels:

- * None
- * Simple

Static Requirements

The DSA supports the application contexts shadowConsumerInitiatedAC for which conformance is claimed.

The DSA supports operational attributes modifyTimestamp and createTimestamp.

The DSA supports the copyShallDo service control.

Dynamic Requirements

The DSA conforms to the mapping onto used services as defined in clause 8.

The DSA conforms to the procedures of X.525 ISO/IEC 9594-9 as they relate to the DISP.

CONFORMANCE with PROPOSED INTERNET STANDARDS

TransIT 500 supports the following standards: RFC-1777, RFC-1778, RFC-1779.

CONSISTANCE WITH INFORMATIONAL AND EXPERIMENTAL RFCs

RFCs supported include: RFC-1558.

INTEROPERABILITY

Interoperability has been achieved with numerous directory systems. TransIT 500 has participated in Eurosinet internetworking demonstrations involving DSAs from:

- * AT&T GIS
- * Bolden James
- * Control Data
- * DEC
- * ICL
- * Nex-tel
- * Nexor
- * Siemens Nixdorf

PILOT CONNECTIVITY

TransIT 500 is actively involved in pilot projects, including the COS X.500 Internetworking Project based at The Southern Company in Atlanta, Georgia, where interoperation was performed with directories from Digital, Control Data, Hewlett-Packard and Telstra.

BUGS

TransIT 500 products are fully supported category 1 software, which means:

- * These products are periodically updated, revised, and enhanced.
- * Unisys provides software corrections for these products as necessary.

CAVEATS AND GENERAL LIMITATIONS

[No information provided. -- Ed.]

INTERNETWORKING ENVIRONMENT

[No information provided. -- Ed.]

HARDWARE PLATFORMS

The TransIT 500 software operates on the following hardware platforms:

- * Unisys U6000 Series and Clearpath SMP
- * HP 9000 Series
- * 386 and above Intel platforms

SOFTWARE PLATFORMS

The DSA is supported on any of the following platforms:

- * System V Release 4 (SVR4)
- * HP-UX
- * Windows NT

The DUA is supported on any of the following platforms:

- * Windows 95
- * Windows for Workgroups
- * Windows NT

Additional software required to run TransIT 500 includes Database software:

- * SQL Server
- * Informix
- * Oracle

NUMBER OF IMPLEMENTATIONS IN THE FIELD

[No information provided. -- Ed.]

AVAILABILITY

TransIT 500 is commercially available through Unisys Corporation.
For further information, contact the following:

Unisys Corporation
Malvern Building, M.S. B221
2476 Swedesford Road
Paoli, PA 19301, USA
Phone: (800) 874-8647, ext. 584
Fax: (610) 695-5378
e-mail: transit@unisys.com

NAME

waX.500

University of Michigan

ABSTRACT

waX.500 :: Windows Access to X.500

waX.500 is a (currently 16-bit) DUA that run on Microsoft Windows (3.1, Win95, & WinNT). It uses libldap.dll which uses the winsock (v1.1) interface. It works on any vendors tcp/ip stack that I've seen so far (some configuration may be required).

waX.500 was developed by the University of Michigan for use by its faculty, staff and students. UM's online directory is an X.500 directory containing 50,000+ entries.

I keep the following Web page up to date with respect to latest release, etc.:

<http://www-personal.umich.edu/~rsug/ldap/wax500/>

COMPLIANCE with X.500-1988 (applicable only for DSAs and DUAs)

[No information provided. -- Ed.]

COMPLIANCE with X.500-1993 (applicable only for DSAs and DUAs)

[No information provided. -- Ed.]

CONFORMANCE WITH PROPOSED INTERNET STANDARDS

[No information provided. -- Ed.]

CONSISTENCE WITH INFORMATIONAL AND EXPERIMENTAL RFCs

[No information provided. -- Ed.]

INTEROPERABILITY

[No information provided. -- Ed.]

PILOT CONNECTIVITY

Can see and browse anything in the world as far as I know.

BUGS

report bugs to wax500.bugs@umich.edu

CAVEATS AND GENERAL LIMITATIONS

[No information provided. -- Ed.]

INTERNETWORKING ENVIRONMENT

Microsoft Windows (3.1, 95, & NT) Winsock (v1.1) tcp/ip (any vendor)

HARDWARE PLATFORMS

Any Windows machine with internet connectivity. Both ethernet and dialup PPP.

SOFTWARE PLATFORMS

Microsoft Windows (3.1, 95, & NT) Winsock (v1.1) tcp/ip (any vendor).

NUMBER OF IMPLEMENTATIONS IN THE FIELD

This implementation is distributed at no cost to the user; accurate numbers are not available.

AVAILABILITY

<http://www-personal.umich.edu/~rsug/ldap/wax500>
<ftp://terminator.rs.itd.umich.edu/ldap/wax500/wax...>

DATE LAST UPDATED or CHECKED

13 Dec 1995

ADDITIONAL INFORMATION and/or COMMENTS

[No information provided. -- Ed.]

NAME

X500-DS

X500-DUA

Bull S.A.

ABSTRACT

X500-DS and X500-DUA are integral part of the large Bull OSI offer. Although based on the DCE/GDS (Distributed Computing Environment/Global Directory Service) of OSF, those two products may be installed and used without the DCE environment. Some enhancements have been added for the user and the management facilities. X500-DS is designed to implement both the DUA and the DSA functions, whilst X500-DUA only provides the DUA functions.

The X500-DUA package contains:

- * The standards APIs XOM (X/Open OSI-Abstract-Data Manipulation API) and XDS (X/Open Directory Service API) for the development of portable applications,
- * A core DUA to translate all user's requests (bind, read, list, compare, modify, modifyRDN, search, add, remove, unbind ...) into the DAP protocol used for communication with distant DSAs,
- * The OSI standard high layers (ASN.1, ROSE, ACSE, Presentation and Session) for communication with the distant DSAs. The interface with the low layers is XTI. [RFC 1006] is supported under XTI or the OSI Session,
- * A DUA Cache to improve performances when accessing remote DSAs,
- * A powerful management application facilitating the configuration of the product and controlling the operations, logs and traces,
- * A user application for the manipulations of the database entries,
- * A generic tool to load and unload ASCII and binary files in/from distributed DSAs,

- * The support of the LDAP [RFC 1777] thanks to an LDAP Server,
- * A DUA Server that allows to use A-Window-To-Directory (refer to this DUA product description) on a PC.

The X500-DS package contains:

- * All components of the X500-DUA,
- * A core DSA to process all requests received from distant DUAs through DAP protocol or from distant DSAs through DSP protocol,
- * The support of the referral, chained and multi-casting modes of operation, access control lists and management of knowledge information (for distribution, shadows and copies of sub-trees),
- * The support of the simple authentication and of the DCE authentication,
- * A management application for managing the schema information (creation, deletion and modification of object classes and of attribute types, management of the rules of the DIT).
- * A C-ISAM database that is specially designed for high performances: e.g. less than 10 ms to read an entry on an Escala at the XOM/XDS interface.

These two products are easely installed, configured and administered thanks to the System Management Interface Tool (SMIT) screens of AIX.

COMPLIANCE with X.500-1988 (applicable only for DSAs and DUAs)

Compliant with EWOS and OIW Agreements

Consists of both DUA and DSA implementation according to the '88 CCITT X.500 and ISO 9594 standard. The X/Open standard XDS and XOM interface libraries are also provided. When the product is installed with the DCE environment, XDS and XOM interfaces are also used to access DCE/CDS (Local Cell Directory Service) transparently. A GDA (Global Directory Agent) serves then as the gateway between the DCE CDS and GDS.

COMPLIANCE with X.500-1993 (applicable only for DSAs and DUAs)

[New description field -- Ed.]

CONFORMANCE WITH PROPOSED INTERNET STANDARDS

Supports [RFC 1277], [RFC 1777].

CONSISTENCE WITH INFORMATIONAL AND EXPERIMENTAL RFCs

[No information provided--Ed.]

INTEROPERABILITY

This implementation of DAP and DSP can interoperate with other X.500 implementations from other CeBIT and EUROSINET demo participants including IBM, HP, ICL, Siemens-Nixdorf, SUN, Marben, NEXOR, etc. It also interoperates with ISODE QUIPU.

PILOT CONNECTIVITY

[No information provided--Ed.]

BUGS

Bull S.A. provides complete software maintenance with the products.

CAVEATS AND GENERAL LIMITATIONS

[No information provided--Ed.]

INTERNETWORKING ENVIRONMENT

OSI TP4 with CLNP (WAN - LAN)

OSI TP0, 2 & 4 with X.25 (WAN)

[RFC 1006] with TCP/IP

Either BSD sockets or XTI can be used to access the transports.

Through XTI, both OSI and TCP/IP protocols are possible on the same machine, thus permitting to build a Directory Service distributed on OSI and TCP/IP networks.

HARDWARE PLATFORMS

DPX/20, Escala SMP

SOFTWARE PLATFORMS

AIX 4.1.4

NUMBER OF IMPLEMENTATIONS IN THE FIELD

[No information provided. -- Ed.]

AVAILABILITY

The release 3.1 described here is commercially available since 2 Q 96

Please contact:

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Note that after October 18th 1996 (23:00), the telephon and fax numbers will be:

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Fax: + (33) 04 76 29 77 70

DATE LAST UPDATED or CHECKED

April 1996

ADDITIONAL INFORMATION and/or COMMENTS

[No information provided. -- Ed.]

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5. Security Considerations

Security issues are not discussed in this memo.

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