

*A User Comment Draft of the Joint Committee on the NTCIP
(Second Review)*

NTCIP 2305 v01.11

National Transportation Communications for ITS Protocol (NTCIP) Application Profile for CORBA (AP-CORBA)

January 18, 2000

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FOREWORD

This document uses only metric units.

This publication defines an application profile for communications between management systems. It defines requirements and optional and conditional clauses that are applicable to specific environments for which they are intended. This standard contains one annex, Annex A, which is defined as normative.

During initial development was referred to as TS3.AP-CORBA. However, in order to provide a more organized numbering scheme and to reflect the joint copyright of AASHTO, ITE, and NEMA, the document is now labeled NTCIP 2305.

This document is an NTCIP Application Profile. NTCIP Application Profiles define the upper three layers of the ISO seven-layer Open Systems Interconnect (OSI) Reference Model. They are formally approved by AASHTO, ITE, and NEMA through a ballot process, after a formal recommendation by the NTCIP Joint Committee. An NTCIP Application Profile equates to the following standard types:

AASHTO – Standard

ITE – Standard

NEMA – Standards Publication

For more information about NTCIP standards, visit the NTCIP Web Site at <http://www.ntcip.org>. For a hardcopy summary of NTCIP information, contact the NTCIP coordinator at the address below.

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INTRODUCTION

This publication provides an NTCIP Application Profile for communications between transportation management systems using the Common Object Request Broker Architecture (CORBA), usually with object-oriented applications software. This publication is the second *Application Profile* developed by the Center-to-Center Working Group. Prior to AP-CORBA, the working group developed AP-DATEX (NTCIP 2304-01-03, December 22, 1997) which provides a structured approach for data exchanges between management systems.

This standard defines requirements that are applicable to all NTCIP environments and it also contains optional and conditional clauses that are applicable to specific environments for which they are intended.

The following keywords apply to this document: AASHTO, ITE, NEMA, NTCIP, application, center, C2C, profile.

The effort to develop NTCIP began in 1992 with the 3-TS Transportation Management Systems and Associated Control Devices Section of NEMA. Their original desire was to address a user need for extending the TS 2 Standards for traffic control hardware to include standardized systems communication. Under the guidance of the Federal Highway Administration's (FHWA) NTCIP Steering Group, the NEMA effort was expanded to include the development of communications standards for all transportation field devices that could be used in an Intelligent Transportation Systems (ITS) network. This effort then grew to include communications between management systems dealing with transportation. As a result, in July 1996, the NTCIP Steering Group held the first workshop to address center-to-center communication issues.

In 1996, a formal agreement was reached among NEMA, ITE, and AASHTO to jointly develop, approve, and maintain NTCIP Standards. One of the first actions of this joint effort was to establish the Center-to-Center Working Group. The first meeting of the working group was in July, 1996. The first efforts to develop this document occurred in September, 1997.

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Section 1 GENERAL

1.1 SCOPE

This standard is applicable to communications between any two management subsystems within the Intelligent Transportation Systems (ITS) environment.

This application profile lists the requirements for a data exchange among systems using the Common Object Request Broker Architecture (CORBA) as a mechanism for information interchange among transportation management and information centers.

1.2 GENERAL

1.2.1 OSI Reference Model

The OSI Reference Model defines seven layers, each performing a particular role in the transmission of data over a medium. Application profiles define the upper three layers.

The top layer of the OSI seven layer model, the Application Layer, handles issues like network transparency, resource allocation and problem partitioning. The application layer is concerned with the user's view of the network (e.g. formatting electronic mail messages).¹

The second highest layer in the OSI seven layer model, also known as layer 6 or the Presentation Layer, performs functions such as text compression, code conversion, or format conversion to try to smooth out differences between hosts.²

Layer 5, the Session Layer, handles security and creation of the session.

1.2.2 Scenario

AP-CORBA should be used when there is a connection between two ITS management subsystems. An example of this is a traffic operations center connected to a transit operations center (see Figure 1: Example for this AP-Scenario).

¹ Free On-Line Dictionary of Computing. <http://wombat.doc.ic.ac.uk/foldoc/index.html>, 12 January 1995.

² Ibid.

In general, each central system can be viewed as consisting of the following interfaces.

- 1) Application Interface
- 2) Operator Interface
- 3) Communications Interface
- 4) Database Interface

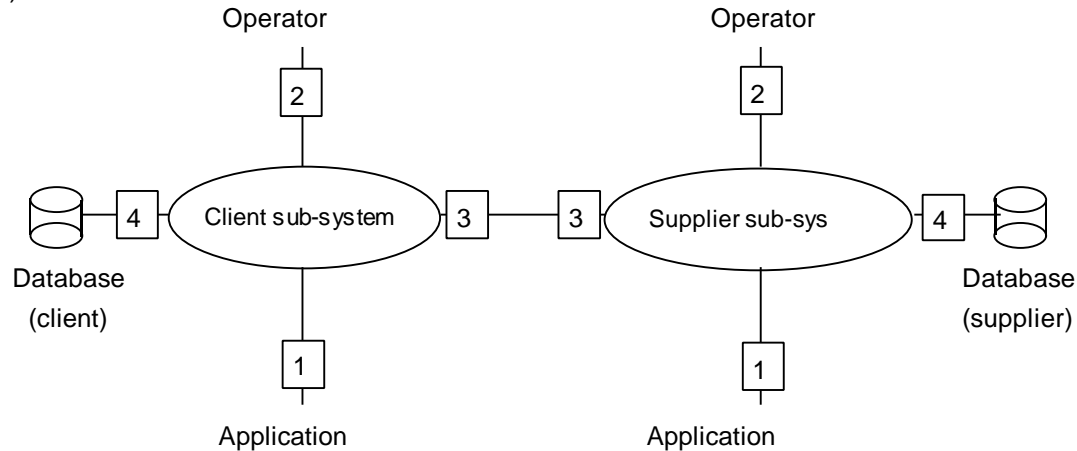


Figure 1: Example for this AP-Scenario

The definition of Application Profiles and their functions and responsibilities are defined within clause 2 of NTCIP 8003:1999. This profile references CORBA standards for the Application, Presentation and Session Layers of the OSI Reference Model. Note that CORBA specifications do not map precisely to the OSI Reference Model. Application, Presentation and Session Layer requirements are all defined in Common Object Request Broker: Architecture and Specifications. Also, aspects of Transport Layer functionality are covered in Session Layer Base Standards. The bulk of Transport Layer functionality is supplied by Internet protocols, as referenced in TP-Internet.

OSI Layers	Base Standard	Taxonomy
APPLICATION LAYER	CORBA: Architecture & Specifications (exclusive of Chapters 15-16) CORBA: Facilities CORBA: Services	AP-CORBA Application Profile
PRESENTATION LAYER	CORBA: Architecture & Specifications, Chapter 15-16 (exclusive of Chapter 15.7, 15.8.1)	
SESSION LAYER	CORBA: Architecture & Specifications, Chapter 15.7, 15.8.1	

**Figure 2
AP-CORBA - APPLICATION PROFILE SCENARIO**

The profile is designed for relatively-high-speed connections between centers such as those used with direct connections on the Internet. CORBA will function on low speed communications links, although performance may be limited. Lower layer functionality such as routing, segmentation, packet error checking and byte-level transmission of data packets, are addressed by Transport and Subnet Profiles.

1.3 REFERENCES

For approved revisions, contact:

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For draft revisions of this document, which are under discussion by the relevant NTCIP Working Group, and recommended revisions of the NTCIP Joint Committee, visit the World Wide Web at <http://www.ntcip.org>.

The following standards (normative references) contain provisions which, through reference in this text, constitute provisions of this Standard. Other documents and standards (other references) are referenced in these documents, which might provide a complete understanding of the entire protocol and the relations between all parts of the protocol. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this Standard are encouraged to investigate the possibility of applying the most recent editions of the standard listed below.

1.3.1 Normative References

The Common Object Request Broker: Architecture and Specifications, The Object Management Group, Inc., July 1995, revised October 7, 1999. (CORBA version 2.3).

Common Facilities Architecture, Object Management Group, Framingham, Massachusetts, November 1995, revised November 6, 1997.

CORBA Services: Common Object Services Specifications, The Object Management Group, Inc., 1995, revised December 9, 1998.

NTCIP 2202 Transport Profile – INTERNET (TP INTERNET), NTCIP Profiles Working Group.

1.3.2 Other References

NTCIP 8003:1999, *Framework and Classification of Profiles*

ISO 7498:1984, *Information processing systems - Open Systems Interconnection - Basic Reference Model*.

National Transportation Communications for ITS Protocol (NTCIP) Application Profile - Data Exchange-ASN.1 (AP-DATEX), NTCIP Center-to-Center Working Group, NTCIP 2304-01-03, December 22, 1997.

1.3.3 Contact Information

1.3.3.1 Object management Group

Members of the Object Management Group (OMG) maintain all current CORBA Standards. The OMG may be contacted as follows:

Object Management Group, Inc.
492 Old Connecticut Path
Framingham, Massachusetts 01701 USA
(508) 820-4300
<http://www.omg.org>

1.3.3.2 NTCIP Documents

National Electrical Manufacturers Association

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1.4 DEFINITIONS

The following definitions shall be used throughout the scope of this document.

Application layer	That portion of an OSI system responsible for transferring information over the communications stack.
Client	An object or program that accesses a server through one of its interfaces.
Communication Network	A collection of interconnected equipment's that provides a data communications service for devices, often computers attached to the equipment.
Data Link Layer	The level of protocol as defined by ISO that provides service to transfer data between network layer entities, usually in adjacent nodes. The data link layer provides error detection (and may provide error correction) for errors occurring in the physical layer.
Domain	A realm or range of knowledge, often characterized by uniquely defined terms or acronyms.
Intelligent Transportation Systems	A major national initiative to improve information, communication and control technologies in order to improve the efficiency of surface transportation.
International Organization for Standardization	An international standards organization. ANSI is the primary interface to ISO within the United States. Often thought to be International Standards Organization because of the usage ISO for short.
Java	An interpreted computer application-development language which is portable across hardware platforms (often using software or hardware interpreters). The language is designed to support World-Wide Web / Internet applications development.
Layer	A group of services, and functions that is conceptually complete, that is one of a set of hierarchical levels forming a complete domain, and that extends to all system nodes which are compliant with the network

	architecture.
Level	See Layer. Most commonly used in European Communications Standards
Network	A collection of nodes, domains, clients, servers, communications channels interfaces and applications connected together physically and logically
Network Layer	OSI Model Level 3. Carries out routing of data through a communications network.
Object Reference	Instance of an interface, defined in IDL. A client holding it may use it to access the server which provides the implementation object to obtain access to its attributes.
Open Systems Interconnection	An international effort to facilitate communications among computers of different manufacture and technology.
OSI Reference Model	The 7-layer model that describes the conceptual organization of protocols for communications and interconnection of computer systems.
Physical layer	ISO model Layer 1. Covers the electrical, mechanical and timing aspects of signal transmission over a physical medium of communication.
Service	In communications, a series of messages defined between applications level protocols, which, in the aggregate, carry out a single activity understandable to a user of the communications system.

1.5 ABBREVIATIONS AND ACRONYMS

The abbreviations used in this Standard Publication are defined as follows:

AASHTO	American Association of State Highway and Transportation Officials
ANSI	American National Standards Institute
AP	Application Profile
C2C	Center to center communications standard
CORBA	Common Object Request Broker Architecture
COSS	CORBA Object Service Specifications. OMG Specifications for Services.
DATEX-ASN	Data Exchange in ASN.1
ESIOP	Environment-Specific Inter-ORB Protocol. ESIOPs support mapping of GIOP messages to a proprietary (non-TCP/IP (see IIOP)) network
FHWA	Federal Highway Administration
FTP	File Transfer Protocol
GIOP	General Inter-ORB Protocol (formerly General Input-Output Protocol), used as part of the Presentation layer in CORBA middleware. A collection of messages which ORBs can send to other ORBs over a heterogeneous computer network and be understood by receiving ORBs independent of the ORB vendor.
IDL	Interface Definition Language. A descriptive language used in CORBA to specify the interface through which clients may access servers to obtain

	access to objects.
IIOB	Internet Inter-ORB Protocol. Application and Presentation software for CORBA. Uses GIOP as the Presentation layer and maps messages to TCP/IP networks.
IOR	Interoperable Object Reference. Object reference protocol associated with IIOB
IR	Interface Repository. Standard CORBA Service for storing IDL definitions. Most especially, a national repository or registry, connected to the internet, containing in a database, descriptions for objects and their attributes, including that data attributed to data dictionaries and message catalogs.
ISO	International Organization for Standardization; International Standards Organization
ITE	Institute of Transportation Engineers
ITS	Intelligent Transportation Systems
NEMA	National Electrical Manufacturers Association
NRTDS	Near-real-time Services. An non-standard addition to the use of CORBA within NTCIP Center-to-Center Compliant Systems to provide timely access to frequently changing data (down to a granulation of about 1 second)
NS	Naming Service. Standard CORBA Service for location of objects by name.
NTCIP	National Transportation Communications for ITS Protocol
OMG	Object Management Group. Industrial consortium working to standardize open distributed object-based computing
ORB	Object Request Broker.
OSF	Open Software Foundation, an organization of major computer manufacturers and software vendors which support the development of standards for interoperability of computer hardware, communications and software systems.
OSI	Open Systems Interconnection
PRL	Profile Requirements List
PICS	Profile Implementation Conformance Statement
TCP	Transport Control Protocol, an Internet Transport layer protocol using sessions.
TMC	Transportation Management Center, also called Center
TS	Trader Service. Standard CORBA service for locating objects by attributes
WG	Working Group. The NTCIP Center-to-Center working group tasked with developing this standard (or other standards) as a part of the overall NTCIP initiative

Section 2 CONFORMANCE

2.1 GENERAL REQUIREMENTS

2.1.1 Stack Definition

AP-CORBA is one of the Application Profiles defined for data exchanges between ITS management subsystems. Implementations claiming conformance to this Application Profile shall support the following elements as stated.

- a. All of the constraints defined in Sections 2.2 through 2.4.
- b. All mandatory requirements specified in Annex A.3
- c. All mandatory requirements of the standards referenced by this profile.

2.1.2 Optional Features

This profile provides an identification of specific communications requirements. It also identifies optional requirements, which, under specific circumstances, are required. End-users should assume that implementations will not support optional features unless specific references to particular circumstances are made. For example, CORBA centers are not required to support the Query Service.

2.1.3 Co-residence

A particular implementation may add functions and services but they must work in conjunction and not interfere with the capabilities stated herein. For example, if a management subsystem can meet the requirements for AP-CORBA and AP-DATEX, then it conforms to each of these APs.

2.2 APPLICATION LAYER REQUIREMENTS

2.2.1 General Requirements

The Application Layer shall conform to the following specifications

The Common Object Request Broker: Architecture and Specifications (exclusive of Chapters 15-16)(see clauses 2.3 and 2.4 below)

2.2.2 Language Binding Requirements

The Application Layer shall conform to one or more of the language mappings contained in the set of volumes:

Ada Language Mapping,
C Language Mapping,
C++ Language Mapping,
COBOL Mapping,
IDL to Java Mapping,
Java to IDL Mapping,
Smalltalk Language Mapping.

Note — Most of these language binding documents were previously chapters in the Common Object Request Broker: Architecture and Specifications. As of CORBA 2.3, they have been made into independent documents.

The language mappings are requirements for the interface between CORBA and applications code written to augment the capabilities of the Center being developed. Therefore, the language mapping(s) chosen shall match the computer programming language(s) being used for center development.

2.2.3 IDL Repository

NTCIP compliant centers shall have a CORBA compliant IDL repository. In addition to meeting the requirement to define all public object interfaces in IDL, NTCIP-compliant centers shall make this IDL available to other centers (with which they desire to exchange information) by maintaining this IDL in a publicly-available CORBA-compliant IDL Repository, either within their system or on some other, publicly-available system.

2.2.4 CORBA Services

2.2.4.1 Naming Service

NTCIP compliant centers shall implement a CORBA-compliant Naming Service. NTCIP-compliant centers shall utilize the object naming conventions described in the *NTCIP Center-to-Center Naming Specification*, and shall register all public object classes and instances with the Naming Service.

Note – The *NTCIP Center-to-Center Naming Specification* is being developed by the Center to Center working group.

2.2.4.2 Trader Service

NTCIP compliant centers shall implement the object naming conventions described in *NTCIP Center-to-Center Naming Specification*, and shall register category names for all public object classes with a publicly-available Trader Service. Centers shall either host their own Trader Service, or may register objects with a Trader Service located at a publicly-available, interconnected system.

2.2.4.3 Security Service

There is no security requirement at this time.

Note – The working group is considering the use of secure IIOP as defined in *CORBA Services: Common Object Services Specifications*.

2.2.4.4 Event Service

NTCIP compliant centers shall implement CORBA-compliant Event Services. The structure of the events themselves shall be defined as part the domain object models.

2.3 PRESENTATION LAYER REQUIREMENTS

2.3.1 Host-to-Host Protocols

The implementation of the General Inter-ORB Protocol (GIOP) on top of the IIOP-TCP session/transport-level protocol is mandatory for CORBA compliance. The Presentation Layer shall conform to the Presentation Layer requirements contained in:

The Common Object Request Broker: Architecture and Specifications, Chapter 15 “General Inter-ORB Messaging Protocol (exclusive of pp. 48-15 and pg. 54)(see below) with no modifications or exceptions.

2.3.2 Environment-specific Inter-ORB Protocol

Use of the Environment-specific Inter-ORB Protocol (ESIOP) is prohibited.

Note – ESIOP is optional under the CORBA standard, and its use would thwart inter-operability.

2.4 SESSION LAYER REQUIREMENTS

The implementation of the Internet Inter-ORB Protocol (IIOP) shall conform to the requirements contained in:

The Common Object Request Broker: Architecture and Specifications, Chapter 15, pp. 48-15 and pg. 54,
with no modifications or exceptions.

2.5 TRANSPORT LAYER REQUIREMENTS

The Transport Layer shall conform to the transport level protocols as defined in TP-Internet

Annex A APPLICATION PROFILE FOR CORBA PROFILE REQUIREMENTS LIST (Normative)

A.1 INTRODUCTION

This annex provides the Profile Requirements List (PRL) for implementations of the Application Profile for CORBA. A Profile Implementation Conformance Specification (PICS) for an implementation is generated by an implementer or supplier by indicating the appropriate level of support provided by an implementation.

To claim conformance with this profile, an implementation shall satisfy the mandatory conformance requirements of this profile.

An implementation's completed PRL is called the PICS. The PICS states which capabilities and options of the protocol have been implemented. The following can use the PICS:

- a. The protocol implementer, as a checklist to reduce the risk of failure to conform to the standard through oversight.
- b. The supplier and user, as a detailed indication of the capabilities of the implementation.
- c. The user, as a basis for initially checking the possibility of interworking with another implementation (note that, while interworking can never be guaranteed, failure to do so can often be predicted from incompatible PICSs).
- d. A user, as the basis for selecting appropriate tests against which to assess the claim for conformance of the implementation.

A.1.1 Notation

The following notations and symbols are used to indicate status and conditional status in the PRL and PICS within all NTCIP standards. Not all of these notations and symbols may be used within this standard.

A.1.1.1 Status Symbols

The following symbols are used to indicate base standard and profile status:

m	Mandatory
m.<n>	support of every item of the group labeled by the same numeral <n> required, but only one is active at time
o	Optional
o.<n>	optional, but support of at least one of the group of options labeled by the same numeral <n> is required
c	Conditional
n/a	not-applicable (i.e. logically impossible in the scope of the profile)
x	excluded or prohibited

The o.<n> notation is used to show a set of selectable options (i.e., one or more of the set must be implemented) with the same identifier <n>. Two character combinations are used for dynamic conformance requirements. In this case, the first character refers to the static (implementation) status, and the second refers to the dynamic (use); thus "mo" means "mandatory to be implemented, optional to be used." Base standard requirements are shown using the equivalent notations in upper case (e.g., M, O, X).

The classification of the requirements and options in Internet RFCs does not correspond to the convention described in above, and shall be mapped into the profile as follows:

RFC	Profile
MUST	Mandatory ³
SHOULD	Mandatory ³
MAY	Optional
SHOULD NOT	Prohibited
MUST NOT	Prohibited

A.1.1.2 Conditional Status Notation

The following predicate notations are used:

<predicate>:	This notation introduces a single item that is conditional on the <predicate>.
<predicate>::	This notation introduces a group of items, all of which are conditional on the <predicate>.

The <predicate>: notation means that the status following it applies only when the PRL or PICS states that the feature or features identified by the predicate are supported. In the simplest case, <predicate> is the identifying tag of a single PICS item. The <predicate>:: notation means that the when the group predicate is true then the associated clause should be completed. The symbol <predicate> also may be a Boolean expression composed of several indices. "AND", "OR", and "NOT" shall be used to indicate the Boolean logical operations.

A.1.1.3 Support Column Symbols

This profile is in the form of a PICS and, therefore, includes a support column. An implementer claims support of an item by circling the appropriate answer (Yes, No, or N/A) in the support column:

Yes	Supported by the implementation.
No	Not supported by the implementation.
N/A	Not applicable

A.1.1.4 Footnotes

Footnotes to the proforma are indicated by superscript numerals. The footnote appears on the page of the first occurrence of the numeral. Subsequent occurrences of a numeral refer to the footnote of the first occurrence.

³ In the course of adapting communications industry standards to the transportation industry, there may be exceptions where specific mandatory requirements are not applicable to the new environment. Where these exceptions are made, a justification shall be provided.

A.1.1.5 Instructions for Completing the PRL

A Profile implementer shows the extent of compliance to a Profile by completing the PRL. The implementer indicates whether mandatory requirements are complied with, and whether optional functions are supported. The resulting completed PRL is called a PICS. Where this profile refines the features of the base standards, the requirements expressed in this PRL shall be applied (as indicated in PRL items with no "Profile Support" column) to constrain the allowable responses in the base standard PICS proforma. When this profile makes additional requirements, the "Support" column for such PRLs shall be completed. In this column, each response shall be selected either from the indicated set of responses, or it shall comprise one or more parameter values as requested. If a conditional requirement is inapplicable, use the Not Applicable (NA) choice. If a mandatory requirement is not satisfied, exception information must be supplied by entering a reference Xi, where i is a unique identifier, to an accompanying rationale for the noncompliance. When the profile requirement is expressed as a two-character combination (as defined in A.1.1 above), the response shall address each element of the requirement; e.g., for the requirement "mo," the possible compliant responses are "yy" or "yn."

A.2 STANDARDS REFERENCED

This profile uses the standards found in Section 1.3.1 of this document.

A.3 PROFILE REQUIREMENTS LIST (PRL)

A.3.1 Implementation Identification

Ref	Question	Response
1	Supplier	
2	Contact point for queries about the profile	
3	Implementation Name(s) and Version(s)	
4	Date of statement	
5	Other Information: Machine Name, Operating Systems, System Name	

A.3.2 Application Layer Requirements

The following table lists the basic requirements for the Application Layer of an AP-CORBA implementation, and asks if the listed protocols or standards have been implemented:

Item	Protocol Feature	Base Standard		Profile		Support
		Reference	Status	Clause	Status	
objmodel	Does the implementation support the CORBA object model?	CORBA Spec. Ch. 1	M		m	Yes
arch	Does the implementation conform to the CORBA architecture overview?	CORBA Spec. Ch. 2	M		m	Yes
idl	Does the implementation support OMG IDL syntax and semantics?	CORBA Spec. Ch. 3	M		m	Yes
orb-intfr	Does the implementation support the ORB interface?	CORBA Spec. Ch. 4	M		m	Yes
valsem	Does the implementation support value type semantics?	CORBA Spec. Ch. 5	M		m	Yes

Item	Protocol Feature	Base Standard		Profile		Support
		Reference	Status	Clause	Status	
abstsem	Does the implementation support abstract interface semantics?	CORBA Spec. Ch. 6	M		m	Yes
Invintf	Does the implementation support the dynamic invocation interface?	CORBA Spec. Ch. 7	M		m	Yes
Skelintf	Does the implementation support dynamic skeleton interface?	CORBA Spec. Ch. 8	M		m	Yes
dynany	Does the implementation support Dynamic Management of Any Values?	CORBA Spec. Ch. 9	M		m	Yes
Intf-repos	Does the implementation support the Interface Repository?	CORBA Spec. Ch. 10	M		m	Yes
portoadd	Does the implementation support the Portable Object Adapter?	CORBA Spec. Ch. 11	O.1		o.1	Yes / No / NA
basoadd	Does the implementation support the Basic Object Adapter?	CORBA Spec. Ch. 11	O.1		o.1	Yes / No / NA
interopf	Does the implementation support general interoperability features?	CORBA Spec. Ch. 12	O		o	Yes / No
Interopa	Does the implementation support ORB interoperability architecture?	CORBA Spec. Ch. 13	O		o	Yes / No
orbbridge	Does the implementation support Inter-ORB bridges?	CORBA Spec. Ch. 14	O		o	Yes / No
Interwork	Does the implementation support the interworking architecture?	CORBA Spec. Ch. 17	O		o	Yes / No
Com	Does the implementation support COM-CORBA interworking	CORBA Spec. Ch. 18	O		o	Yes / No
Ole	Does the implementation support OLE automation-CORBA interworking?	CORBA Spec. Ch. 19	O		o	Yes / No
Noncorba	Does the implementation support inter-operability with non-CORBA systems?	CORBA Spec. Ch. 20	O		o	Yes / No
Intercept	Does the implementation support Interceptors?	CORBA Spec. Ch. 21	O		O	Yes
Idltags	Does the implementation support OMG IDL tags?	CORBA Spec. Appendix A	M		M	Yes
javabind	Does the implementation support a Java language mapping / binding?	Java Mapping	O.2		o.2	Yes / No / NA
Cbind	Does the implementation support an C language mapping / binding?	C Mapping	O.2		o.2	Yes / No / NA
c++bind	Does the implementation support an C++ language mapping / binding?	C++ Mapping	O.2		o.2	Yes / No / NA
Cobolbind	Does the implementation support an COBOL language mapping / binding?	COBOL Mapping	O.2		o.2	Yes / No / NA
Idljavabind	Does the implementation support an Ada language mapping / binding?	IDL-Java Mapping	O.2		o.2	Yes / No / NA
Javaidlbind	Does the implementation support an Ada language mapping / binding?	Java-IDL Mapping	O.2		o.2	Yes / No / NA

Item	Protocol Feature	Base Standard		Profile		Support
		Reference	Status	Clause	Status	
Smlltkbind	Does the implementation support an Smalltalk language mapping / binding?	Smalltalk Mapping	O.2		o.2	Yes / No / NA
Desprin	Does the implementation support all of the CORBA Services General Design Principles?	CORBA Services, Ch. 2	O		M	Yes
Name	Does the implementation support a Naming Service?	CORBA Services, Ch. 3	O		M	Yes
Event	Does the implementation support all an Event Service?	CORBA Services, Ch. 4	O		M	Yes
Persist	Does the implementation support the Persistent Object Service Spec.?	CORBA Services, Ch. 5	O		O	Yes / No
Lifecycle	Does the implementation support the Life-Cycle Service Spec.?	CORBA Services, Ch. 6	O		O	Yes / No
Concur	Does the implementation support the Concurrency Control Service?	CORBA Services, Ch. 7	O		O	Yes / No
Extern	Does the implementation support the Externalization Service Spec.?	CORBA Services, Ch. 8	O		O	Yes / No
Relation	Does the implementation support the Relationship Service Spec.?	CORBA Services, Ch. 9	O		O	Yes / No
Trans	Does the implementation support the Transaction Service Spec.?	CORBA Services, Ch. 10	O		O	Yes / No
Query	Does the implementation support the Query Service Spec.?	CORBA Services, Ch. 11	O		o	Yes / No
License	Does the implementation support the Licensing Service Spec.?	CORBA Services, Ch. 12	O		o	Yes / No
Property	Does the implementation support the Property Service Spec.?	CORBA Services, Ch. 13	O		o	Yes / No
Time	Does the implementation support the Time Service Spec.?	CORBA Services, Ch. 14	O		o	Yes / No
trader	Does the implementation support a Trading Service?	CORBA Services, Ch. 16	O		m	Yes
collect	Does the implementation support an Object Collection Service?	CORBA Services, Ch. 17	O		o	Yes / No

A.3.3 Presentation Layer Requirements

The following table lists the basic requirements for the presentation layer of an AP-CORBA implementation, and asks if the listed protocols or standards have been implemented:

Item	Protocol Feature	Base Standard		Profile		Support
		Reference	Status	Clause	Status	
Giopdata	Does the implementation support the GIOP Common Data Representation?	CORBA Spec, Ch. 15-3	M		m	Yes
Msghdr	Does the implementation support the GIOP Message Header?	CORBA Spec, Ch. 15-29	M		m	Yes
Msgtypes	Does the implementation support the GIOP Message Types?	CORBA Spec, Ch. 15-32	M		m	Yes
reqmsg	Does the implementation support Request Message?	CORBA Spec, Ch. 15-32	M		m	Yes
replymsg	Does the implementation support Reply Message?	CORBA Spec, Ch. 15-35	M		m	Yes
cancelmsg	Does the implementation support Cancel Request?	CORBA Spec, Ch. 15-38	M		m	Yes
locreqmsg	Does the implementation support Locate Request reply?	CORBA Spec, Ch. 15-39	M		m	Yes
locrplmsg	Does the implementation support Locate Reply reply?	CORBA Spec, Ch. 15-40	M		m	Yes
closemsg	Does the implementation support Close Connection message?	CORBA Spec, Ch. 15-42	M		m	Yes
errmsg	Does the implementation support Message Error message?	CORBA Spec, Ch. 15-42	M		m	Yes
fragmsg	Does the implementation support Fragment message?	CORBA Spec, Ch. 15-42	M		m	Yes
bidirgiop	Does the implementation support Bi-Directional GIOP	CORBA Spec, Ch. 15-52	O		o	Yes / No
bidirgiop-p	Does the implementation support the Bi-Directional GIOP Policy	CORBA Spec, Ch. 15-55	O		o	Yes / No
esiop	ESIOP	CORBA Spec, Ch. 16-1	O		x	x

A.3.4 Session / Transport Layer (additions via IIOp)

The following table lists the basic requirements for the session layer (with extensions into the transport layer) of an AP-CORBA implementation, and asks if the listed protocols or standards have been implemented:

Item	Protocol Feature	Base Standard		Profile		Support
		Reference	Status	Clause	Status	
iiop	Does the implementation support the Internet Inter-ORB Protocol (IIOP)?	CORBA Spec, Ch. 15-48	M		m	Yes
liop-tcp	Does the implementation support TCP/IP Connection Usage facilities?	CORBA Spec, Ch. 15-48	M		m	Yes
liopior	Does the implementation support IIOP IOR Profiles?	CORBA Spec, Ch. 15-49	M		m	Yes
liopiorcmp	Does the implementation support IIOP IOR Profile Components?	CORBA Spec, Ch. 15-36	M		m	Yes
bidiriior	Does the implementation support bi-directional IIOP?	CORBA Spec, Ch. 15-54	O		o	Yes / No