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National Transportation Communications for ITS Protocol Application Profile for XML Message Encoding and Transport in ITS Center- to-Center Communications (NTCIP-C2C XML)

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In addition to the many volunteer efforts, recognition is also given to those organizations that supported the efforts of the working groups by providing comments and funding for the standard, including:

- ConSysTec
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Center Communications (an ITE / AASHTO joint standard), the Transit Communications Interface Profile (a standard of APTA), the Message Sets for Advanced Traveler Information Systems (SAE-J2354) (a standard of the Society of Automotive Engineers), IEEE-1512 - Standard for Common Incident Management Message Sets for Use by Emergency Management Centers (a standard of IEEE).

FOREWORD

This document uses only metric units.

This document defines an application profile for communications between transportation management systems, using Internet standards based on the Extensible Markup Language (XML). It defines requirements and optional and conditional clauses that are applicable to specific environments for which they are intended.

This document is an NTCIP Application Profile. An NTCIP Application Profile defines the upper three layers of the ISO seven-layer Open Systems Interconnect (OSI) Reference Model. A Joint NTCIP Application Profile standards publication is equivalent to these document types at the standards organizations:

AASHTO – [Standard Specification]
ITE – [Software Standard]
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Approvals

This standards publication was separately balloted and approved by AASHTO, ITE, and NEMA after recommendation by the Joint Committee on the NTCIP. Each organization has approved this standard as the following standard type, as of the date:

AASHTO – [Standard Specification; Month 200X]
ITE – [Software Standard; Month 200X]
NEMA – [Standard; Month 200X]

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Anyone using this document should seek information about the version number that is of interest to them in any given circumstance. The MIB, the PRL, and the PICS should all reference the version number of the standards publication that was the source of the excerpted material.

Compliant systems based on later, or higher, version numbers MAY NOT be compatible with compliant systems based on earlier, or lower, version numbers. Anyone using this document should also consult NTCIP 8004 for specific guidelines on compatibility.

INTRODUCTION

This is NTCIP 2306, *ITS Center-to-Center Communications Profile for XML Message Encoding and Transport* (hereafter referred to as NTCIP C2C XML). This document represents the first of two identified phases for the development of an XML communications standard for center-to-center communications in the transportation domain (real-time management of public roads and transit systems).

The purpose of this standard is to allow transportation agencies and center managers to specify and implement communications interfaces (message form, message usage, and transport) for transmitting information encoded in the Extensible Markup Language (XML) between their center and an external center. Message content is defined in other standards, such as the Advanced Traffic Management Data Dictionary and External Message Sets for Traffic Management Center Communications (an ITE/AASHTO joint standard), the Transit Communications Interface Profile (a standard of APTA), the Message Sets for Advanced Traveler Information Systems (SAE-J2354) (a standard of the Society of Automotive Engineers), IEEE-1512 - Standard for Common Incident Management Message Sets for Use by Emergency Management Centers (a standard of IEEE), and other standards defining XML messages content in the transportation domain.

A number of projects have begun to design and/or implement XML as part of their center-to-center communications efforts. This interim draft standard is being developed to provide projects a reasonably complete standard with which to specify XML message usage and transport, and to provide a basis for testing of center system interfaces that communicate with external centers.

This standard defines requirements that are applicable to all environments using NTCIP XML for center-to-center communications, and it also contains optional and conditional clauses that are applicable only to specific environments for which they are intended.

The following keywords apply to this document: AASHTO, ITE, NEMA, NTCIP, XML, WSDL, SOAP, C2C, data, message, center-to-center.

In 1992, the NEMA 3-TS Transportation Management Systems and Associated Control Devices Section began the effort to develop the NTCIP. The Transportation Section's purpose was to respond to user needs to include standardized systems communication in the NEMA TS 2 standard, *Traffic Controller Assemblies*. Under the guidance of the Federal Highway Administration's 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, and to center-to-center communications.

In 1996, an agreement was executed among AASHTO, ITE, and NEMA to jointly develop, approve, and maintain the NTCIP standards. In July 1996, the NTCIP Center-to-Center Working Group met for the first time, and began the effort to standardize C2C protocols. The working group first defined the DATEX-ASN and CORBA standards for center-to-center communications. In 2003, work began on a third center-to-center protocol based on web services and the Extensible Markup Language (XML).

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SECTION 1 GENERAL

1.1 SCOPE

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

This application profile lists the requirements for use of XML and related protocols for data exchange among ITS management systems.

1.2 REFERENCES

For approved amendments, contact the NTCIP Coordinator at the address shown above.

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

Normative references contain provisions which, through reference in this text, constitute provisions of this Standard. Other documents and standards (other references) referenced in these documents provide background information that may help the reader gain a complete understanding of the profile and the relations between parts of the profile. 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 standards listed below.

1.2.1 Normative References

Table 1-1. Normative References

Organization	Document Title	Date
W3C	Web Services Description Language (WSDL) 1.1 – W3C Note	March 15, 2001
W3C	Simple Object Access Protocol (SOAP) 1.1	May 8, 2000
W3C	Extensible Markup Language (XML) 1.0	February 4, 2004
W3C	Namespaces in XML	January 14, 1999
IETF	Hypertext Transfer Protocol HTTP/1.1 RFC 2616	June 1999
IETF	File Transfer Protocol (FTP) RFC 959	October 1985
IETF	GZIP File Format Specification, version 4.3 RFC 1952	May 1996
IETF	Multipart Internet Mail Extensions (MIME) RFCs 2045, 2046, 2047	November 1996
SAE	SAE J2354 – Message Sets for Advanced Traveler Information System (ATIS), Revision 2.0.	January 2004

1.2.2 Informative References

Table 1-2. Informative References

Organization	Document Title	Date
NTCIP	NTCIP 9010 v01.09 – Information Report, XML in Center-to-Center Communications	November 23, 2004
ITE/AASHTO	Traffic Management Center-to-Center Communications {Advanced Traffic Management Data Dictionary (TMDD) and	June 30, 2004

	Message Sets (MS)} version 2.1	
IETF	DEFLATE Compressed Data Format Specification, version 1.3 RFC 1951	May 1996

1.3 DOCUMENT ORGANIZATION

This document is comprised of 10 Sections and 3 Appendices.

- Section 1 - General. This section provides an overview of the document and introductory material.
- Section 2 - C2C Messaging Needs and Derived Requirements. This section identifies this Profile's needs as defined by the TMDD Volume II (Dialogs), and the NTCIP 9010 Information Report – XML in ITS Center-to-Center Communications.
- Section 3 - NTCIP C2C XML Profile Solutions. This section contains 1) a trace of requirements to solutions, and 2) a trace of solutions (sub profiles) to the document sections that apply (PRL).
- Section 4 - Message Encoding. This section provides a normative reference for the encoding of XML and SOAP messages.
- Section 5 - Message Transport. This section provides a normative reference for transport of XML and SOAP encoded messages over the HTTP and FTP.
- Section 6 - Sub Profiles Common. This section provides a normative reference for the description of a web service using the WSDL, message encoding, and transport common across the sub profiles,
- Section 7 - WSDL Sub Profile for SOAP over HTTP. This section provides a normative reference for the description of a web service using the WSDL for SOAP encoded messages using the HTTP. This section supports 2 transmission patterns: 1) request-response, and 2) publish-subscribe.
- Section 8 - WSDL Sub Profile for XML over HTTP. This section provides a normative reference for the description of a web service using the WSDL for XML encoded messages using the HTTP. This section supports the transmission of XML over HTTP with 2 transmission patterns: 1) request only, and 2) request-response.
- Section 9 - WSDL Sub Profile for XML over FTP. This section provides a normative reference for the description of a web service using the WSDL for file transfer of XML encoded messages using the FTP. This section supports 1 transmission patterns: 1) request only.
- Section 10 - Test Plan Development and Conformance Guidance. This section provides a brief overview of 1) WSDL development, 2) how WSDL can be used in the development of more comprehensive test plans for testing of center interfaces that use this standard, and therefore the WSDL, and 3) methods for testing the correctness of the syntax of the WSDL that conforms with this standard.
- Appendix A – Example WSDL Worksheet for TMDD Dialogs. Provides examples of TMDD dialogs and the XML version of the TMDD messages involved in each.
- Appendix B - Example WSDL for TMDD. Contains two examples of WSDL documents based on the contents of Appendix A. One example shows the use of qualified names and the other unqualified names. (A qualified name contains a prefix indicating the namespace.)
- Appendix C – Example TMDD Messages. Contains example TMMD messages showing proper encoding of messages for XML encoding (appropriate for the HTTP and FTP message transport), and SOAP encodings for both the SOAP request-response and SOAP subscription-publication message patterns.

1.4 CONFORMANCE CLAUSE

A center system conforms with this specification as follows:

1. WSDL document(s) SHOULD exist that conform with the normative sections of this standard. If the WSDL exists, then the XML Schema documents referenced by the WSDL SHALL exist.

2. The WSDL syntax can be shown to be correct per the method outlined in Section 10.
3. A center system can be shown to support the web services described in the conforming WSDL, including: 1) XML messages validate against a referenced schema, 2) message inputs and outputs described in the WSDL can be reproduced under a system test, 3) messages can be exchanged using the transports defined in the WSDL.

1.5 GLOSSARY OF TERMS

The following glossary defines terms and acronyms used in this standard.

Table 1-3. Glossary of Terms

Term	Definition
AASHTO	American Association of State Highway and Transportation Officials
ANSI	American National Standards Institute
AP	Application Profile
APTA	American Public Transportation Association
ASP	Active Server Pages
ATIS	Advanced Traveler Information Systems
C2C	Center-to-Center
DSRC	Dedicate Short Range Communications
FHWA	Federal Highway Administration
FTP	File Transfer Protocol, a file transfer protocol of the IETF.
GNU	GNU is Not Unix
GZIP	A file compression standard of the IETF.
HTTP	Hypertext Transfer Protocol
HTTPS	Secure HTTP (Hypertext Transfer Protocol)
IEEE	Institute of Electrical and Electronics Engineers
IEEE 1512	An IEEE family of message set standards for Incident Management
IETF	Internet Engineering Task Force
IM	Incident Management
ITE	Institute of Transportation Engineers
ITIS	International Traveler Information System (SAE J2540-1)
ITS	Intelligent Transportation Systems
JSP	Java Server Pages
LRMS	Location Referencing Message Specification
MIME	Multipurpose Internet Mail Extensions (IETF RFC 1521)
MS/ETMCC	Message Sets for External Traffic Management Center Communications
NEMA	National Electrical Manufacturers Association
NTCIP	National Transportation Communications for ITS Protocol
NTCIP 9010	NTCIP Information Report on ITS Center-to-Center Communications
OASIS	Organization for the Advancement of Structured Information Standards
PERL	Practical Extraction and Report Language
PHP	Hypertext Preprocessor
PICS	Profile Implementation Conformance Statement
PN	Profile Need
PR	Profile Requirement
PRL	Profile Requirements List
RFC	Request for Comment
SAE	Society of Automotive Engineers
SAE-J2354	An SAE Message Set standard for Advanced Traveler Information
SDO	Standards Development Organization
SOAP	Simple Object Access Protocol

Term	Definition
TCIP	Transit Communications Interface Profile, a standard of APTA
TMDD	Traffic Management Data Dictionary, a joint standard of ITE/AASHTO
UDDI	Universal Description, Discovery and Integration
W3C	World Wide Web Consortium
WS-I	Web Services Interoperability Organization
WSDL	Web Services Description Language
XML	eXtensible Markup Language

SECTION 2 C2C MESSAGING NEEDS AND DERIVED REQUIREMENTS

2.1 C2C COMMUNICATIONS ENVIRONMENTS

This document uses examples based on the concept of operations, dialogs, and messages defined in ITE/AASHTO Traffic Management Center-to-Center Communications {Advanced Traffic Management Data Dictionary (TMDD) and Message Sets (MS)} version 2.1, hereafter referred to as the TMDD. Similar messaging patterns can be found in the message set efforts of the other standards. The messages defined in the TMDD effort are used here as representative examples in the text that follows.

The dialogs and messaging patterns represented in the TMDD vary in complexity.

For example:

- 1) A center just wants to periodically retrieve one type of information (e.g., current incident data) from another center.*
- 2) A center wants to be automatically notified of new incidents as they occur, to retrieve traffic volume and traffic signal status data for the roadways adjacent to the incident, and sometimes to request the other center to change its signal timing plan or post a particular message on a nearby changeable message sign.*

The NTCIP 9010 Information Report – XML in ITS Center-to-Center Communications, identified two different XML-based communications mechanisms.

The first mechanism is called a Web Service, enabled by the use of XML-SOAP (Simple Object Access Protocol) and WSDL (Web Services Description Language). SOAP and WSDL are discussed later in this document. Web Services support consumer-initiated requests to a center and the corresponding responses to the consumer. Web Services also support subscription services, where a center can make a one-time request to another center that results in supplier-initiated messages being sent automatically at periodic intervals or whenever data changes. The data frames defined in message sets to support request-response and subscription dialogs fit well with the Web Services paradigm.

The second mechanism is called XML Direct, and allows a center to offer information to other centers by simply making it available as an XML file (document) at a known web address. The file contains one or more TMDD messages encoded as XML. The center providing the information updates this file when any data change. Other centers retrieve the file using plain HTTP or FTP whenever they need such information, or retrieve it regularly in order to monitor it for changes. All such exchanges are always data consumer-initiated. Using XML Direct, a center (data provider) can make information available, and other centers can retrieve it, without either party having to implement the more complex software needed to support XML SOAP. This represents a significant cost saving for centers that do not need to support complex messaging. And it is suitable for many legacy practices found in deployments today.

2.2 XML PROFILE NEEDS

Profile needs relevant to simple C2C environments (those satisfied by the XML Direct mechanism) are relatively straight forward. This mechanism needs only support consumer-initiated file transfers. Data publishing practices (file update rates, groupings of content, etc.) are typically known between the involved systems. However, because of its simplicity, no methods for the support for data recovery in the event of loss by the data consumer are provided.

Needs relevant to XML SOAP were derived from the ITE/AASHTO TMDD dialogs, and through liaison activities with working group and committee members of other message set standards.

A review of the TMDD messages and dialogs indicate the messaging patterns and encoding needs described in the table below. Sample TMDD message dialogs are described in Appendix A. The needs of other center-to-center domains and message sets (e.g., ATIS, Incident Management, and Transit) have been found to be similar, and this standard is intended to be applicable within and between all ITS domains.

The need for private connections derives from the use of the Internet for center-to-center communications that may involve transfers of sensitive data and device commands.

Table 2-1. Profile Needs

Profile Need (PN)	Description
PN 1.0	Message and File Transfer
PN 1.1	This profile needs a mechanism for the transfer of bulk data. This will allow an external center to initiate transfer of a file from the information supplier center.
PN 2.0	Message Encoding
PN 2.1	For this profile, messages need to be encoded as XML.
PN 2.2	Privacy. This profile needs a mechanism to allow messages to be privately transmitted over the Internet and other shared networks.
PN 3.0	Message Exchange Patterns
PN 3.1	Request-Response. This profile needs a request-response message transmission pattern, described as the communication of a single message sent from an external center (the request) and a single message response from the information supplier center.
PN 3.2	Subscription. This profile needs a message subscription pattern, described as the ability of an external center to subscribe for automatic and on-going publication of information from an information supplier center. A subscription is initiated by the external center using a single subscription request message. In response to a subscription request, the information supplier center shall indicate acceptance/rejection of the subscription as well as the reason for the request rejection (if rejected). The subsequent publication messages are the subject of the following need.
PN 3.3	Publication. This profile needs a message publication pattern, described as the communication of an asynchronous response message, from an information supplier center that provides or publishes information, to an external center that has previously subscribed for that information. This exchange is initiated by the publisher.

2.3 XML PROFILE REQUIREMENTS

The following table describes the XML profile requirements that derive from the above needs.

Table 2-2. Profile Requirements

Profile Requirement (PR)		PN	Requirement Dependencies
PR 1.0	Message Encoding		
PR 1.1	XML Encoding. The profile shall exchange messages that are encoded as XML.	PN 2.1	
	a) Text Encoding	PN 2.1	
	b) Gzip MIME Encoding.	PN 2.1	
PR 1.2	SOAP Encoding	PN 2.1	
PR 2.0	Message Transport		
PR 2.1	HTTP. The profile shall provide a mechanism to describe and accomplish the exchange of XML using the HTTP.	PN 1.1, 3.1, 3.2, 3.3	
	a) HTTP	PN 1.1, 3.1, 3.2, 3.3	
	b) HTTPS	PN 1.1, 3.1, 3.2, 3.3, 2.2	
PR 2.2	FTP. The profile shall provide a mechanism to describe and accomplish the exchange of XML documents using the FTP.	PN 1.1	
PR 3.0	Web Services General		
PR 3.1	Referencing External XML Schema. The profile shall provide a mechanism to reference one or more external schemas, which define a message set for deployment.	PN 1.1, 2.1, 3.1, 3.2, 3.3	
PR 3.2	a) XML Schema Version and Date. The profile shall provide a mechanism to describe the version and date of the referenced schema.	PN 1.1, 2.1, 3.1, 3.2, 3.3	PR 3.1
PR 3.3	Define which XML Schema Messages are supported. The profile shall provide a mechanism to describe which specific messages of the message set are supported by a center.	PN 1.1, 3.1, 3.2, 3.3	
PR 3.4	Frequency of XML file updates. The profile shall provide a mechanism to describe the frequency of XML file updates.	PN 1.1	
PR 4.0	Web Services Sub Profile Descriptions		
PR 4.1	Request-Response Message Transmission Pattern. The profile shall provide a mechanism to describe and accomplish the transmission between centers of a request message followed by a response message.	PN 3.1	
PR 4.1.1	Define Interfaces – Operations and Message Inputs and Outputs. The profile shall provide a mechanism to describe the operations and	PN 3.1	PR 3.3

Profile Requirement (PR)		PN	Requirement Dependencies
	associated message inputs and outputs for a request-response message pair.		
PR 4.1.2	Define Message Encoding and Transport. The profile shall provide a mechanism to describe and accomplish a request-response message transmission pattern for a) SOAP XML messages transmitted over the HTTP protocol, and b) XML messages transmitted over HTTP.	PN 2.1, 3.1	
	a) SOAP/HTTP	PN 2.1, 3.1	PR 1.1 PR 2.1
	b) XML/HTTP	PN 2.1, 3.1	PR 1.2 PR 2.1
PR 4.2	Subscription Message Transmission Pattern. The profile shall provide a mechanism to describe and accomplish one center to subscribe to a periodic or event-driven publication of another center. The subscription pattern shall be implemented as a request-response pattern.	PN 3.2	
PR 4.2.1	Define Interfaces – Operations, Message Inputs and Outputs. The profile shall provide a mechanism to describe the operation(s) and message inputs and outputs used in a subscription message transmission pattern.	PN 3.2	PR 3.3
PR 4.2.2	Defining Message Encoding and Transport. The profile shall provide a mechanism to describe and accomplish a subscription transmission for a) SOAP encoded messages transmitted over the HTTP protocol, and b) XML messages transmitted over HTTP.	PN 2.1, 3.2	
	a) SOAP/HTTP	PN 2.1, 3.2	PR 1.2 PR 2.1
	b) XML/HTTP	PN 2.1, 3.2	PR 1.1 PR 2.1
PR 4.3	Publication Message Transmission Pattern. The profile shall provide a mechanism for a center to transmit asynchronous responses to a subscription.	PN 3.3	
PR 4.3.1	Define Interfaces – Operations, Message Inputs and Outputs. The profile shall provide a mechanism to describe the operation(s) and message inputs and outputs used by a subscription to receive a publication transmission.	PN 3.3	PR 3.3
PR 4.3.2	Defining Message Encoding and Transport. The profile shall provide a mechanism to describe and accomplish the publication transmission for a) SOAP XML messages transmitted over the HTTP protocol, and b) XML messages transmitted over HTTP.	PN 2.1, 3.3	
	a) SOAP/HTTP	PN 2.1, 3.2	PR 1.1 PR 2.1
	b) XML/HTTP	PN 2.1, 3.2	PR 1.2 PR 2.1

Profile Requirement (PR)		PN	Requirement Dependencies
PR 4.4	File Retrieval (Request Only Pattern, XML Direct). The profile shall provide a mechanism to define and a file for retrieval by another center.	PN 1.1	
PR 4.4.1	Define Interfaces – Message Outputs. The profile shall provide a mechanism to describe the operation(s) and message outputs used to retrieve a file by another center.	PN 1.1	PR 3.3
PR 4.4.2	Define Message Encoding and Transport. The profile shall provide a mechanism to describe and accomplish the retrieval of a) an XML file using the FTP, and b) an XML message using the HTTP.	PN 1.1, 2.1	
	a) XML using HTTP 'Get'	PN 1.1, 2.1	PR 1.1 PR 2.1
	b) XML using FTP 'Get'	PN 1.1, 2.1	PR 1.1 PR 2.2

SECTION 3 NTCIP C2C XML PROFILE SOLUTIONS

3.1 SUB PROFILE SOLUTION DESCRIPTIONS

The NTCIP-C2CXML is divided into 3 separate sub profiles. A sub profile is an implementation bundle that consists of the following information:

- 1) WSDL Definition Requirements. This standard defines the format of the WSDL, and not the WSDL itself. Message set standards will develop WSDL for the messages defined in their message set standards.
- 2) Message Encoding
- 3) Message Transport

WSDL presents a way for a center to describe the basic format of request to their systems. WSDL is written in XML and is a specification.

The NTCIP-C2CXML allows WSDL specifications to be developed that cover the following combinations of message encoding plus transport. Each combination is called a *sub profile*.

The sub profiles of NTCIP-C2CXML are:

- 1) SOAP over HTTP. Using SOAP encoded messages over the hypertext transfer protocol (HTTP), centers will be able to describe and deploy center interfaces that support the request-response and subscription-publication message patterns.
- 2) XML over HTTP. Using XML encoded messages over the HTTP, centers will be able to describe and deploy interfaces that support the request-response (via HTTP POST) and request-only message patterns (HTTP GET). HTTP POST is suitable for the exchange of messages (request-response), while the HTTP GET is suitable for the request of an XML document by name.
- 3) XML over FTP. Using the file transfer protocol (FTP), centers will be able to describe interfaces that support XML document requests by name.

3.2 TRACEABILITY TO C2C XML PROFILE REQUIREMENTS

The following table shows the solutions that the profile shall use to meet each of the profile requirements. The table represents the NTCIP 2306 Profile Requirements List (PRL). The column labeled 'NTCIP 2306 Section' points to where additional normative material can be found in this document. The table facilitates the ability to customize the requirements and normative materials in this standard based on a sub profile that matches the design criteria and requirements of a specific implementation. A specific implementation is expected to select one or more of the sub profiles.

A 'Project Requirement' column has been added to facilitate use of the PRL by specification and PICS developers.

Table 3-1. Profile Requirements to Solution Trace (Profile Requirements List)

	Profile Requirements List (PRL)	NTCIP 2306 Section	Mandatory / Optional	Profile Requirement	Project Requirement
1.0	SOAP over HTTP				
	a) WSDL Request-Response		O		
	- WSDL General	6.1	M		
	- Definitions	6.2	M	PR 3.1	
	- Types/Schema	6.3	M	PR 3.1, 3.2	
	- Message	6.4	M	PR 3.3	
	- PortType (Interfaces)	7.1.1	M	PR 4.1.1	
	- Binding (Transport)	7.1.2	M	PR 4.1.2a	
	- Service (Transport)	7.1.3	M	PR 4.1.2a	
	b) WSDL Subscription-Publication		O		
	- WSDL General	6.1	M		
	- Definitions	6.2	M	PR 3.1	
	- Types/Schema	6.3	M	PR 3.1, 3.2	
	- Message	6.4	M	PR 3.3	
	- PortType (Interfaces)	7.2.2	M	PR 4.2.1	
	- Binding (Transport)	7.2.3	M	PR 4.2.2a	
	- Service (Transport)	7.2.4	M	PR 4.2.2a	
	c) Message Encoding		O		
	SOAP for Request-Response	4.2.1, 4.2.2.1, 4.2.2.3	M	PR 1.2, 4.2.1a, 4.2.1b	
	SOAP for Subscription-Publication	4.2.2.2, 4.2.2.3, 7.2.1	M	PR 1.2, 4.2.1a, 4.2.1b	
	d) Message Transport		O		
	HTTP	5.1.2	M	PR 2.1a, 4.1.2a, 4.2.2a	
	HTTPS	5.1.3, 6.5	O	PR 2.1b	
2.0	XML over HTTP				
	a) WSDL Request Only (HTTP GET)		O		
	- WSDL General	6.1	M		
	- Definitions	6.2	M	PR 3.1	
	- Types/Schema	6.3	M	PR 3.1, 3.2	
	- Message	6.4	M	PR 3.3	
	- PortType (Interfaces)	8.1.1	M	PR 4.4.1, 3.4	
	- Binding (Transport)	8.1.2	M	PR 4.4.2a	
	- Service (Transport)	8.3	M	PR 4.4.2a	
	b) WSDL Request-Response (HTTP POST)		O		
	- WSDL General	6.1	M		
	- Definitions	6.2	M	PR 3.1	
	- Types/Schema	6.3	M	PR 3.1, 3.2	
	- Message	6.4	M	PR 3.3	