



# IMS Enterprise Services Specification: Overview

Colin Smythe, IMS Chief Specification  
Strategist

# Contents

- Specification goals & requirements
- Documentation set
- Core use-cases
- Information models review
- WSDL bindings review
- Best practices & implementation guide
- Conformance specification
- Future work

# Goals & Requirements

- Add behaviors to the Enterprise v1.1 data model
- Adopt Web Services binding
- Maintain the Enterprise v1.1 data models
  - Person, Group, Membership
- Out-of-scope activity
  - IMS LIP <identification> reconciliation
  - New functionality i.e. Gradebook, Course Catalog, etc.
  - Query-based behaviors

# Documentation Set

- Set of Enterprise Service documents are:
  - a) Enterprise Services Core Use Cases
  - b) Enterprise Services Specification
  - c) Enterprise Services Conformance Specification
  - d) Enterprise Services Best Practice & Implementation Guide
  - e) Person Management Service Information Model
  - f) Group Management Service Information Model
  - g) Membership Management Service Information Model
  - h) Enterprise Services Common Data Definitions
  - i) Person Management Service WSDL Binding
  - j) Group Management Service WSDL Binding
  - k) Membership Management Service WSDL Binding
  - l) WSDL Binding Files, Example Files, XMI File, Code Stubs
  - m) Enterprise Services Overview (this presentation)

# Reviewing the Specification

- Recommended review approach:
  - Start with Enterprise Service Specification (All, detail)
  - Enterprise Service Core Use-cases (All, partial)
  - Enterprise Service Best Practice & Implementation (All, detail)
  - Information Model & WSDL Binding pairing (As required)
    - Person Management Services
    - Group Management Services
    - Membership Management Services
    - Common Data Definitions
  - Enterprise Service Conformance Specification (All, detail)
  - WSDL Binding Files, Example Files, Code Stubs (As required)

# Core Use-cases

- Separate document containing:
  - Set of Person behavior use-cases
  - Set of Group behavior use-cases
  - Set of Membership behavior use-cases
- Out-of-scope
  - Query-based use-cases

# The Component Services

- Person Management Service (PMS)
  - Manipulation of Individual-based data
- Group Management Service (GMS)
  - Manipulation of collections of things
- Membership Management Service (MMS)
  - Members (Groups or Persons) of Groups
- Enterprise Service Common Data Definitions
  - Objects that are used by more than one component and available to all Enterprise Service specifications

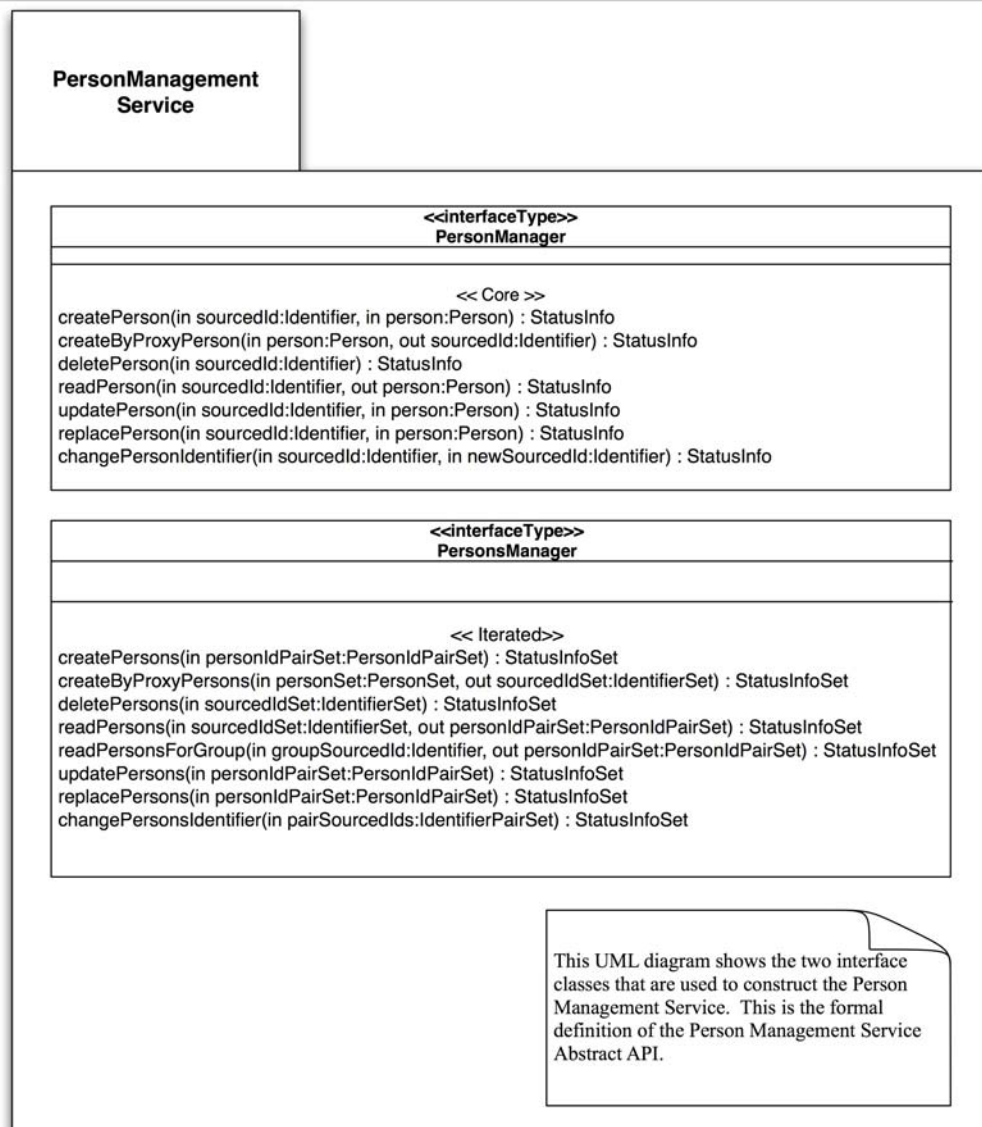
# Behaviors & Data Models

- New behaviors
  - Exchange of information not the end-system storage of information
  - Constrain the manipulation of the data model
  - Establish permitted sequence of events and data persistence
  - Define error conditions and status reporting
  - Implemented as exchange of messages
- Established data models
  - Expressed using UML but converted to XML
  - XML expressed as 'elements' only
  - Request/response message structures also defined using XML
  - XML Schema Definition (XSD) used to capture the UML classes and data-types

# Person Management Service

- Enterprise v1.1. Person Data Model
- Person data consists of:
  - FormatName, Name, Address, RecordInfo, UserId, URL, Email, Tel, Photo, Demographics, SystemRole, InstitutionRole, DataSource, Extension
- Basic Create/Read/Update/Delete operations
- Two sets of operations
  - Single object manipulation (7)
  - Set of objects manipulation (8)

# PMS UML Representation



# Group Management Service

- Enterprise v1.1. Group Data Model
- Group data consists of:
  - GroupType, RecordInfo, URL, Email, Org, TimeFrame, Description, EnrollControl, Relationship, DataSource, Extension
- Basic Create/Read/Update/Delete operations
- Two sets of operations
  - Single object manipulation (8)
  - Set of objects manipulation (9)

# GMS UML Representation

## GroupManagement Service

**<<interfaceType>>  
GroupManager**

**<< Core >>**

```
createGroup(in sourcedId:Identifier, in group:Group) : StatusInfo
createByProxyGroup(in group:Group, out sourcedId:Identifier) : StatusInfo
deleteGroup(in sourcedId:Identifier) : StatusInfo
deleteGroupRelationship(in sourcedId:Identifier, in relationId:Identifier) : StatusInfo
readGroup(in sourcedId:Identifier, out group:Group) : StatusInfo
updateGroup(in sourcedId:Identifier, in group:Group) : StatusInfo
replaceGroup(in sourcedId:Identifier, in group:Group) : StatusInfo
changeGroupIdentifier(in sourcedId:Identifier, in newSourcedId:Identifier) : StatusInfo
```

**<<interfaceType>>  
GroupsManager**

**<< Iterated>>**

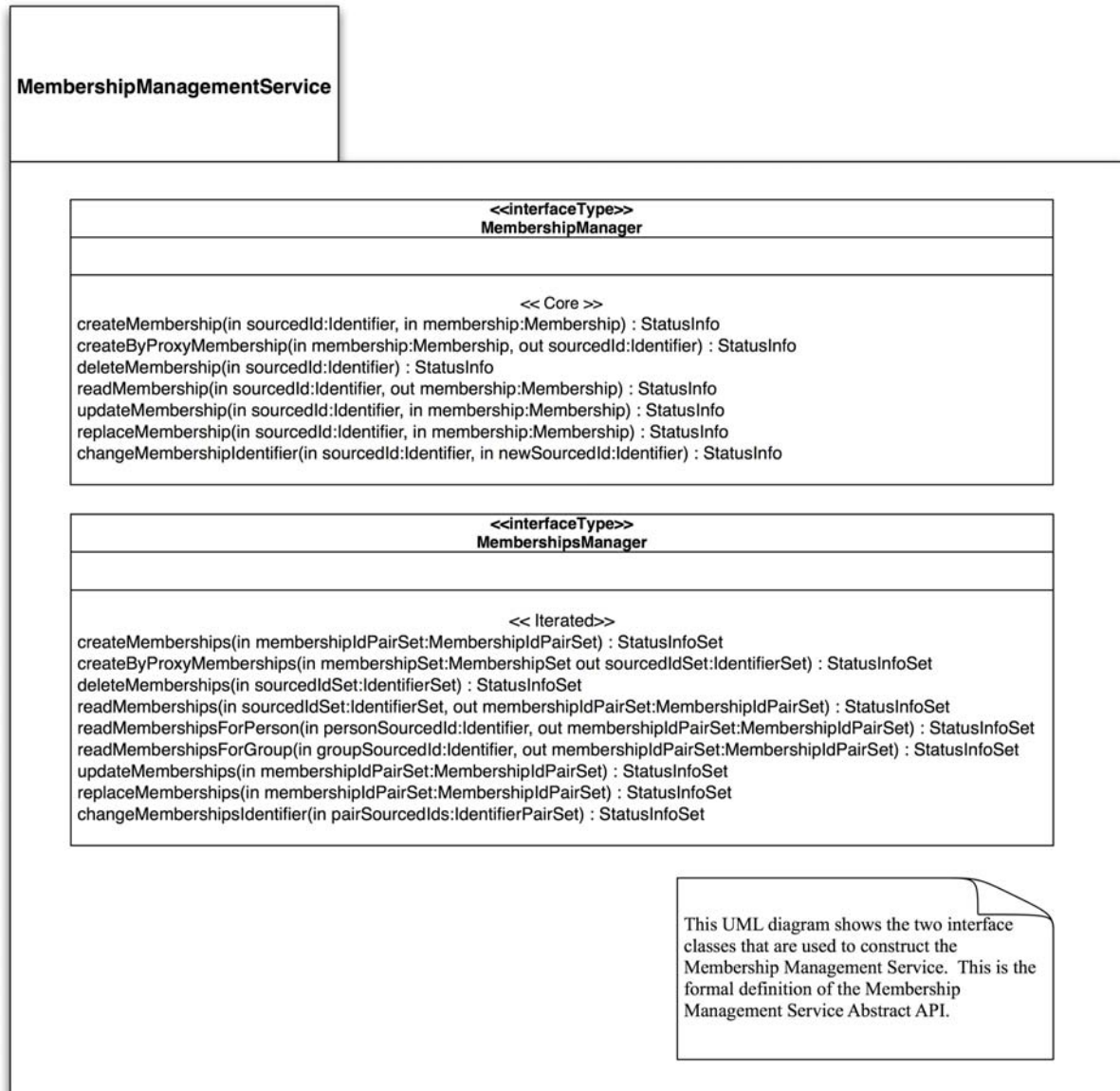
```
createGroups(in groupIdPairSet:GroupIdPairSet) : StatusInfoSet
createByProxyGroups(in groupSet:GroupSet out sourcedIdSet:IdentifierSet) : StatusInfoSet
deleteGroups(in sourcedIdSet:IdentifierSet) : StatusInfoSet
deleteGroupsRelationship(in pairSourcedIdSet:IdentifierPairSet) : StatusInfoSet
readGroups(in sourcedIdSet:IdentifierSet, out groupIdPairSet:GroupIdPairSet) : StatusInfoSet
readGroupsForPerson(in personSourcedId:Identifier, out groupIdPairSet:GroupIdPairSet) : StatusInfoSet
updateGroups(in groupIdPairSet:GroupIdPairSet) : StatusInfoSet
replaceGroups(in groupIdPairSet:GroupIdPairSet) : StatusInfoSet
changeGroupsIdentifier(in pairSourcedIds:IdentifierPairSet) : StatusInfoSet
```

This UML diagram shows the two interface classes that are used to construct the Group Management Service. This is the formal definition of the Group Management Service Abstract API.

# Membership Management Service

- Enterprise v1.1. Membership Data Model
- Group data consists of:
  - GroupSourcedId, Member, MemberSourcedId
  - Role, RoleType, SubRole, RecordInfo, UserId, Email, TimeFrame, Status, DateTime, FinalResult, InterimResult, DataSource, Extension
- Basic Create/Read/Update/Delete operations
- Two sets of operations
  - Single object manipulation (7)
  - Set of objects manipulation (9)

# MMS UML Representation



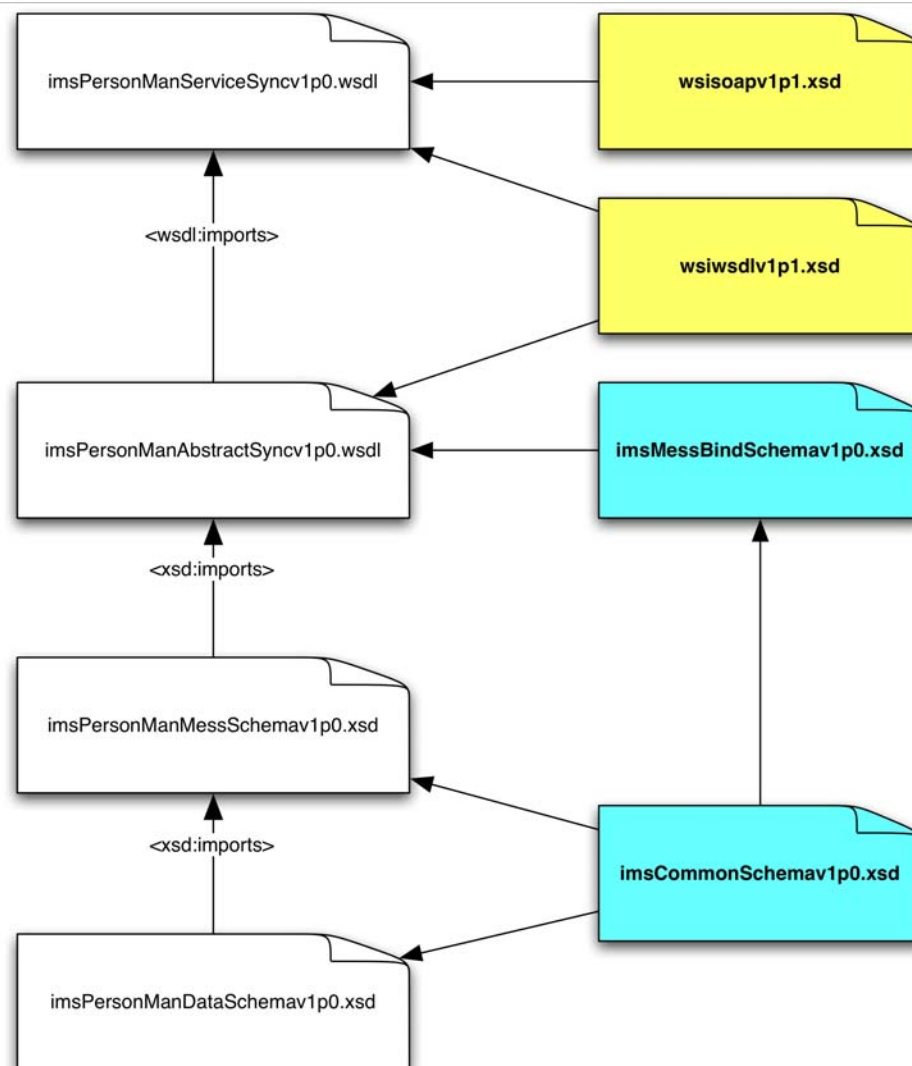
# Binding to Web Services

- Based upon WS-I Organization Base Profile 1.0a
  - WSDL v1.1
  - SOAP v1.1
  - HTTP v1.1
- Characteristics
  - Support for SOAP faults
  - Status information in SOAP header
- Security - use HTTPS

# The WSDL Bindings

- Synchronous binding available only
- The set of service WSDL files
  - Service Specific WSDL Files
  - Abstract Definition WSDL Files
- The set of service XSD files
  - Message Formats XSDs
  - Data Model XSDs
- The set of common XSD files
  - Message Header Schema XSD
  - Common Objects Schema XSD

# WSDL Binding File Set



# Best Practices Guide

- How to implement the Enterprise Services
- Describes simple SOAP/HTTP messages
- Describes relationship to:
  - IMS Enterprise Specification v1.1
  - OKI OSIDs
  - vCard, LDAP, eduPerson/Internet2, IMS LIP
- Provides
  - Glossary of Terms
  - Design patterns for Java and .NET implementations
  - Examples for creating extensions

# Conformance Specification

- Based upon the Information Models i.e. binding independent
- System orientation
  - Service Requester ('Request' message generator)
  - Service Provider ('Response' message generator)
- Levels
  - 1 - 'Unsupported' by Provider
  - 2 - Mandatory elements in the data models only
  - 3 - Subset of optional elements in the data models
  - 4 - All elements in the data model

# Conformance Statements

Service Requester	Service Provider			
	Level 1	Level 2	Level 3	Level 4
Level 1	No Interop	No Interop	No Interop	No Interop
Level 2	No Interop	Partial Interop	Requester Constrained	Requester Constrained
Level 3	No Interop	Provider Constrained	Partial Interop	Requester Constrained
Level 4	No Interop	Provider Constrained	Provider Constrained	Full Interop

# Migration from Enterprise v1.1

- All of the core data model aspects have been maintained
- Features changed
  - <property> element is unnecessary
  - 'recstatus' attribute is unnecessary
  - No sub-groups in Groups
  - Memberships have their own 'sourcedId'
  - Single Member object per Membership object
  - Strong data-typing and constraints applied in the XSDs
- NOTE: The v1.0, v1.01, 1.1 DTDs are NOT valid expression of the Enterprise Services data models.

# Support Files

- Example files
  - Hand generated SOAP/HTTP messages
- UML 2.0 XMI file
  - Source tool is 'Poseidon 2.0'
- Code stubs
  - Sourceforge/CETIS for Java

# Future Work

- Asynchronous binding
  - Published when testing is complete (unknown timetable)
- New behaviors
  - Querying (start work in Sept 2005?)
- Other services
  - Gradebook
  - Course management

# Summary

- ES specification consists of 11 documents
  - Person Management Service
  - Group Management Service
  - Membership Management Service
- Key requirement
  - Provide behaviors to support the IMS Enterprise Specification v1.1 data model
- WSDL & support files now available
- Asynchronous binding for future release



# Questions, Comments, or Issues ?