IVOA Registry Working Group

Recommendations for Revisions to the VOResource XML Schema



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Lessons Learned in 2003

- 2003: prototyping the Registry Framework
 - Based on framework presented in Cambridge
 - NVO prototype described at ADASS 03
- Based on VOResource v0.9 schema and its extensions
- Prototyping largely a success
 - NVO Registry supports real app: Data Inventory Service
 - Support publishing, harvesting, searching
- Support for VOResource not without difficulty
 - Challenges outlined in IVOA Note: "Lessons Learned using VOResource in the NVO"



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VOResource Model v0.9

Family of XML Schemas: core + extensions

- Core model: VOResource-v0.9.xsd

 - generic Resource and Service
- Extensions covering specific kinds of resources
 - VOCommunity organizations and projects
 - VODataServices data collections and service types

 - Standard services: SIA, ConeSearch
- Each schema is standardized separately

Extension model

- Generic < Resource > element contains core metadata
- Specific resource types inherit from core

 - adding metadata that only applies to that typeInheritance & polymorphism based on substitution groups



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Challenges Using VOResource

Learning Curve

- Insufficient publisher oriented documentation
- Substitution groups as an extension mechanism
- Departure from names and structure from RM document was a source of confusion

Complexity

- Cost of hierarchy (vs. flat model)
- Are all features necessary?
 - · Cost of elements never used

Support for tools

- XML binding tools still maturing
- Substitution groups support late
- Debate regarding use of global elements

Addressing these requires fundamental changes



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Motivation for a Revision

- Real end-user applications that depend on VOResource are now appearing
 - NVO's Data Inventory Service, Publishing registries, Sky Portal
- Second generation standards
 - DAL, Data Models
- Expansion of the VO community
 - New VO-related projects, archives
 - NVO Summer School

Entrenchment: the more VOResource records in use, the harder it will be to make fundamental changes

We have narrow window of opportunity to fix real problems



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Proposal for Revision

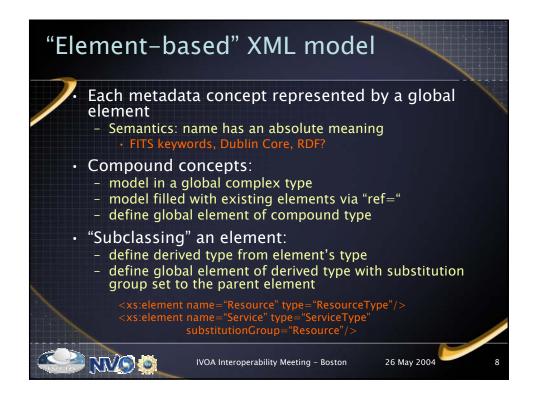
- Metadata Telecon of registry developers:
 - Examine difficulties of VOResource data model
 - Propose solutions that can be quickly prototyped
 - Discuss action plan to migrate registries to revised schema
 - Focus on issues that affect core VOResource model
- Recommendations
 - Move from element-based to type-based model
 - Substitution groups → xsi:type
 - Adopt names and structure that is closer to RM standard
- Wait and see: hiding namespace prefixes



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```
Substitution groups vs. xsi:type
Using substitution groups:
   <Resource>
                                   <Service>
     <Title>...</Title>
                                     <Title>...</Title>
   </Resource>
                                      <Interface>...</Interface>
                                   </Service>
Using xsi:type
   <resource>
                                   <resource xsi:type="Service">
     <title>...</title>
                                     <title>...</title>
                                     <interface>...</interface>
   </resource>
                                   </resource>
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```



"Type-based" XML Model

- Based on Gerard Lemson's "Model-based Schema"
 - Set of patterns for mapping UML to XSD
 - PPT posted on Twiki: VOResource010RevNotes
- Reusable component: global type
 - Semantics: name-meaning association is definition of type components
- Component concepts:
 - Types reused via "type="
 - Elements are locally defined only
 - Application defines a (single) global element as necessary
- Using subclasses
 - Standard type derivation
 - Use xsi:type mechanism in instance document



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Substitution groups vs. xsi:type

Using substitution groups:

<Resource>

<Title>...</Title>

<Service> <Title>...</Title>

</Resource>

<Interface>...</Interface> </Service>

Using xsi:type

<resource> <title>...</title> <resource xsi:type="Service"> <title>...</title>

</resource>

<interface>...</interface> </resource xsi:type="Service">

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Type-based model: Advantages

- xsi:type better supported by tools
- · Clearer to understand:
 - Avoid mystery of substitution groups
 - Instance documents make clear type-subtype relationship
- · One global element
- Straight-forward mapping from UML-based model supported by tools
- · Captures context-specific semantics



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Reducing complexity

- Reducing the hierarchy
 - V0.9 attempts to take advantage of XML structures
 - Provide potentially reusable nodes of related metadata
 - Support references to other resources that may be registered with an ID
 - Recommendation: flatten to match hierarchy suggested by RM standard
 - Simpler resource reference model:

<Publisher ivo-id="ivo://rai.ncsa/rai">
NCSA Radio Astronomy Imaging Group

- Names that match RM
 - V0.9 altered names to accommodate altered structure
 - Recommendation: return to RM names



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Strawman Revision: v0.10

Schemas and examples available via Twiki: VOResource010RevNotes

Examples:

organisation.xm registry.xml authority.xml collection.xml webform.xml conesearch.xml sia.xml

- Call for endorsement to incorporate recommendations into revision to VOResource
 - Settle v0.10 by June
 - NVO: desire to update registries & applications by end of summer



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Other questions

- Where to identify standard services:
 - Currently: specialization of Capability element
 - Rational: element to collect service-specific metadata
 - Would people prefer to associate std service type as a sub-class of Resource?

<resource xsi:type="SimpleImageAccess">

</resource>

Lose Capability element (or not enforce its existance)



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Other questions

- Move Organisation Resource type into core VOResource; drop VOCommunity schema
 - "Project" resource type currently not used
 - Organisation is a "core" concept
 - Referred to in RM document
 - Registering Organisations is critical to tracing responsibility
 - IVOA ID is only unambiguous way to uniquely identify a Publisher

<Publisher>HST</Publisher>

 Organisation-specific metadata draws from RM Facility, Instrument



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