



# GlobalGridForum

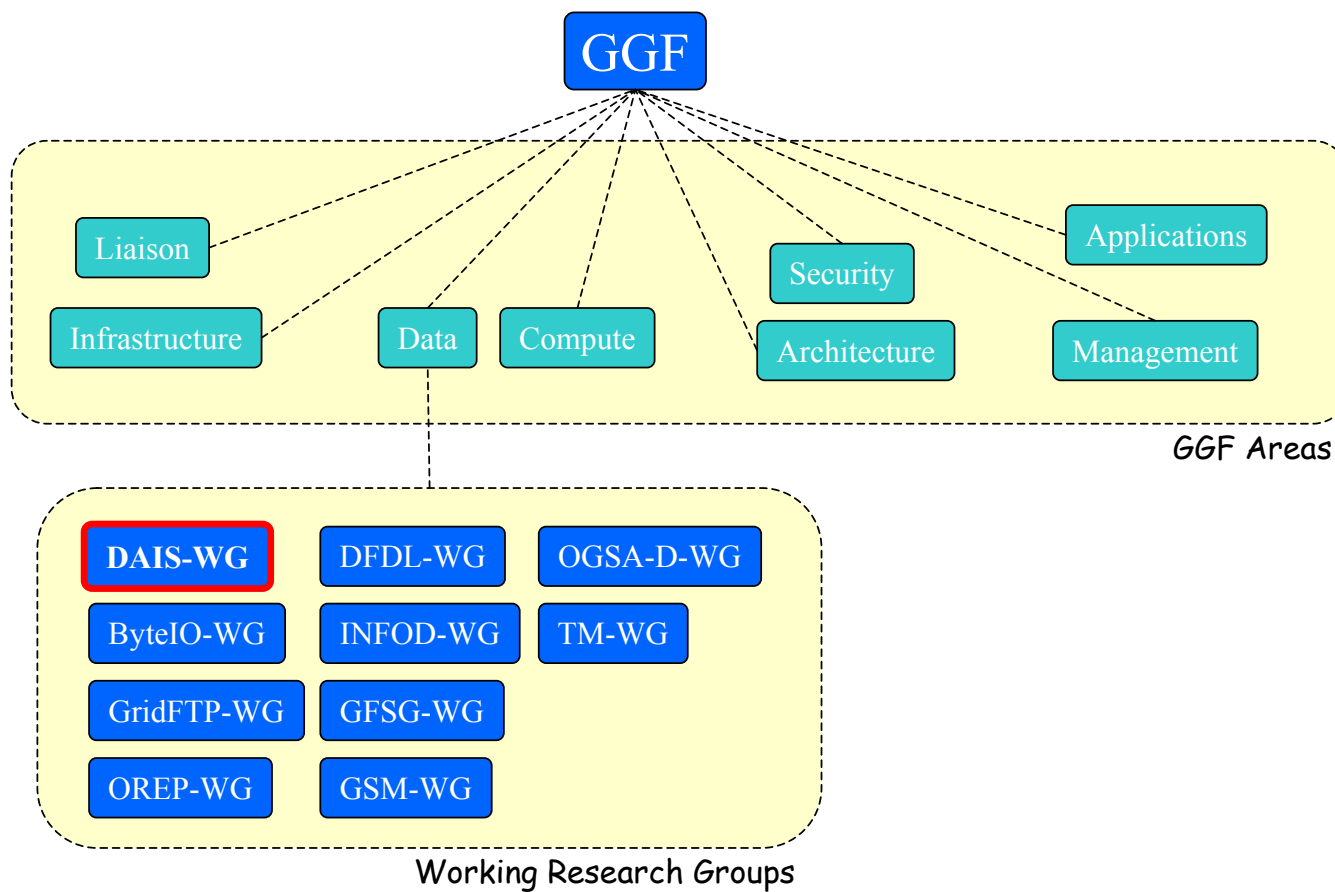
Leading the pervasive adoption of grid computing  
for research and industry

## **Update to the Community**

(Slides by DAIS Secretary - Mario Antonioletti)

Dave Pearson  
DAIS co-Chair

# Global Grid Forum

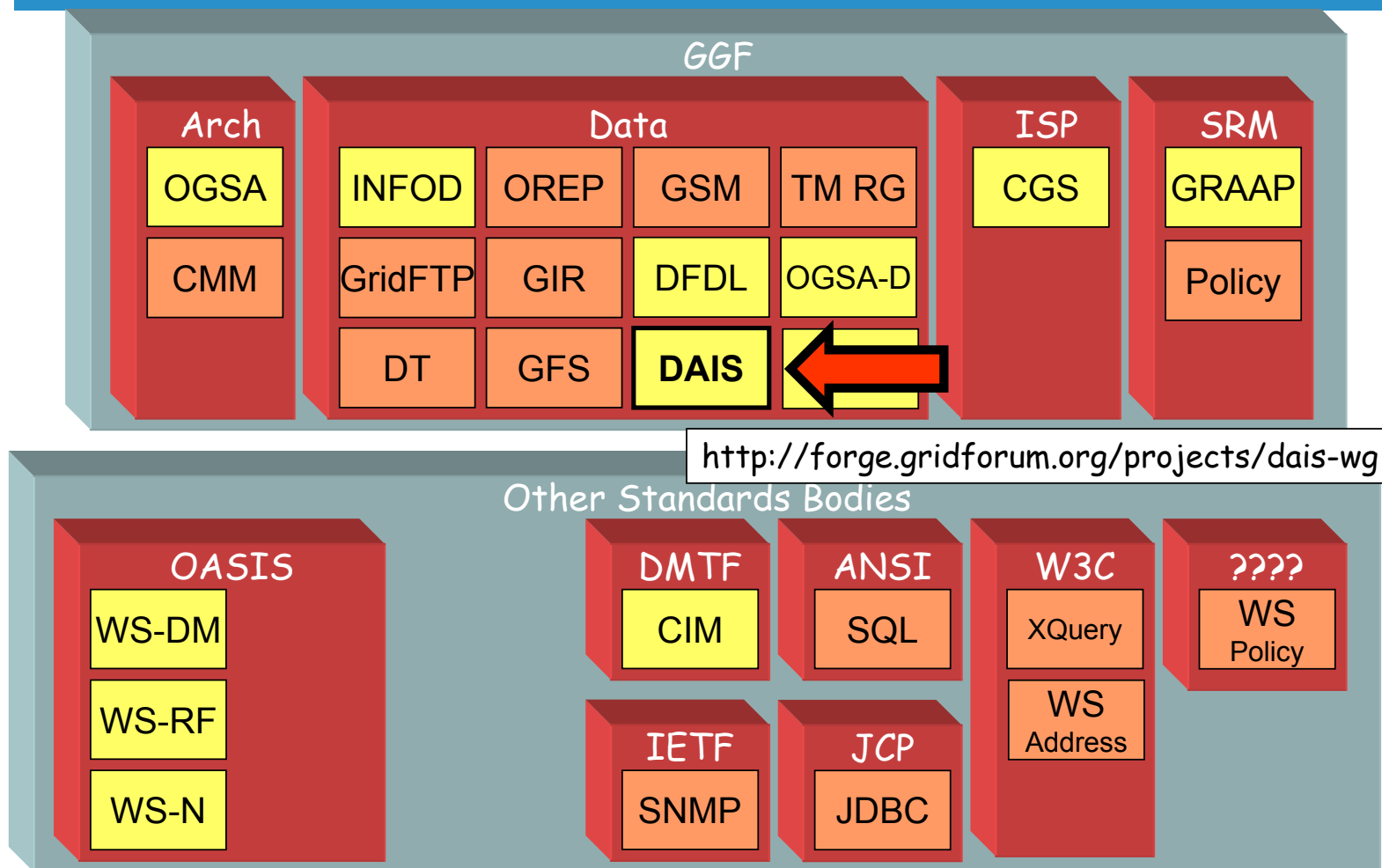


## DAIS Specifications

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- A consistent set of interfaces to access data resources
- Partial virtualization/abstraction of the data resource:
  - Still need to know what the underlying data resource is
    - Need to target the right kind of queries
  - Do not have to worry about data resource specific infrastructures
  - A framework consistent with other Grid technologies
- Aim to work within the Open Grid Services Architecture
  - Try to be good citizens
  - DAIS members have been putting effort in the OGSA Data WG
- Dependencies on other GGF working groups & SDOs

# DAIS Collaborations

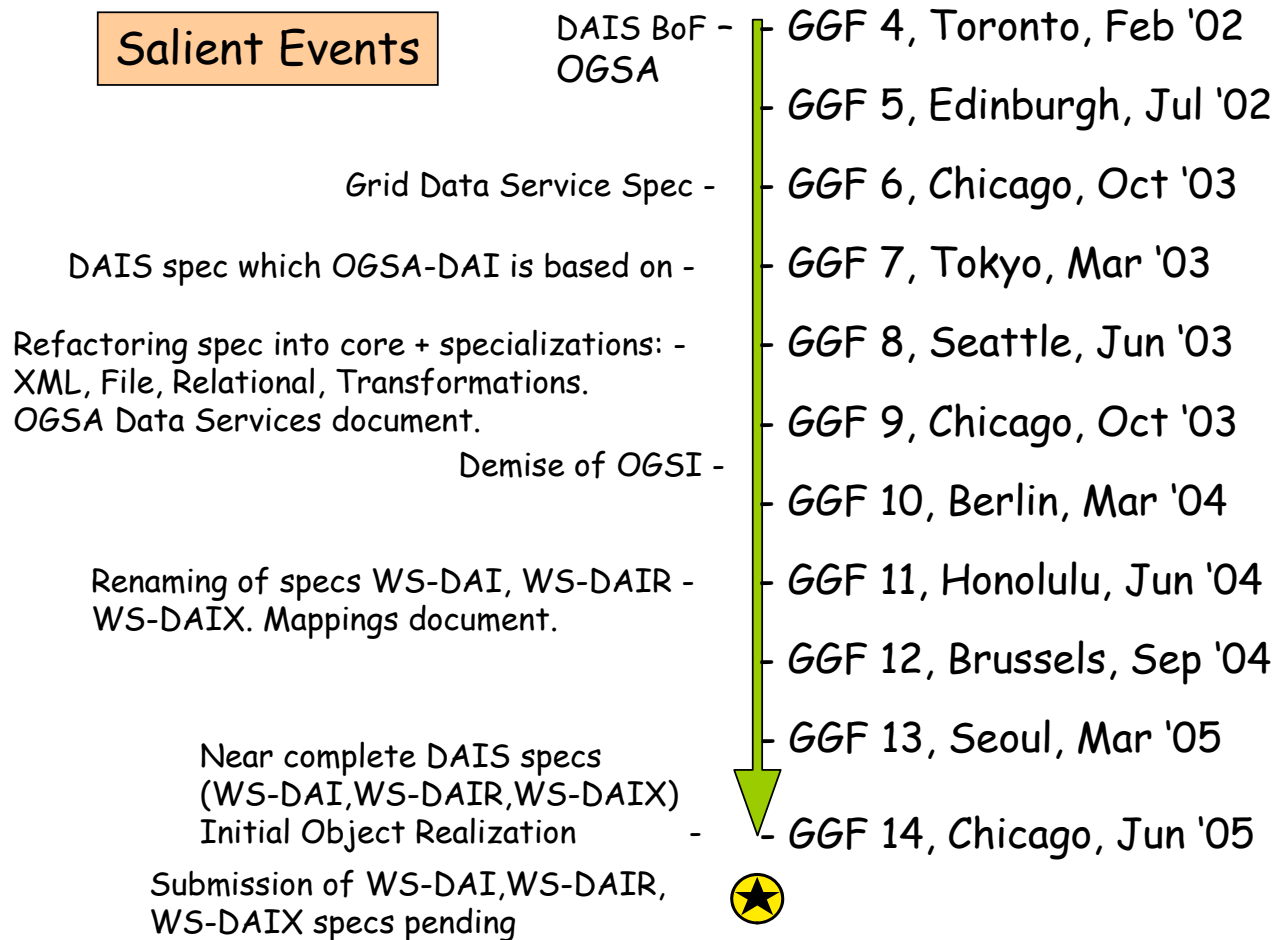


# DAIS Timeline

## Salient Events

DAIS BoF -  
OGSA

GGFs



## Some definitions

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- **Data resource:**
  - System that can act as a source/sink of data
  - Scope of DAIS currently is mainly restricted to relational and XML databases
  - Can further subclassify data resources into:
    - **Externally managed data resource**
      - Normally exists outside the scope of DAIS service
      - Lifetime management is not specified by DAIS
    - **Service managed data resource**
      - Does not normally exist outside the service-oriented middleware.
      - Lifetime management is specified in the WS-DAI specification
- A data resource has an **abstract name**
  - Unique and persistent
  - Taken as a URI in the DAIS specs
- **Data service:**
  - Implements a DAIS specified interface and corresponding properties
  - Mainly exposes data resource capabilities to a Grid
- **Data resource address**
  - End Point Reference (EPR) as in WS-Addressing
    - Abstract name contained in the reference parameters
- **Consumer:**
  - Application that exploits a data service to access a data resource

## DAIS and WSRF

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- Community:
  - All DAIS participants were scarred by OGSi
  - Not all DAIS participants are fully committed to WSRF
  - Not all database vendors have committed to WSRF
- Data resources:
  - Not all data resources are naturally modelled using WSRF
    - Lifetime management and naming outside the control of a service
  - Some types of data resource are suitable for WSRF
- Result:
  - Considerable experimentation with “mappings” of DAIS requirements onto different WS-\* specifications
  - [http://forge.gridforum.org/projects/dais-wg/document/Scenarios\\_for\\_Mapping\\_DAIS\\_Concepts/en/3](http://forge.gridforum.org/projects/dais-wg/document/Scenarios_for_Mapping_DAIS_Concepts/en/3)

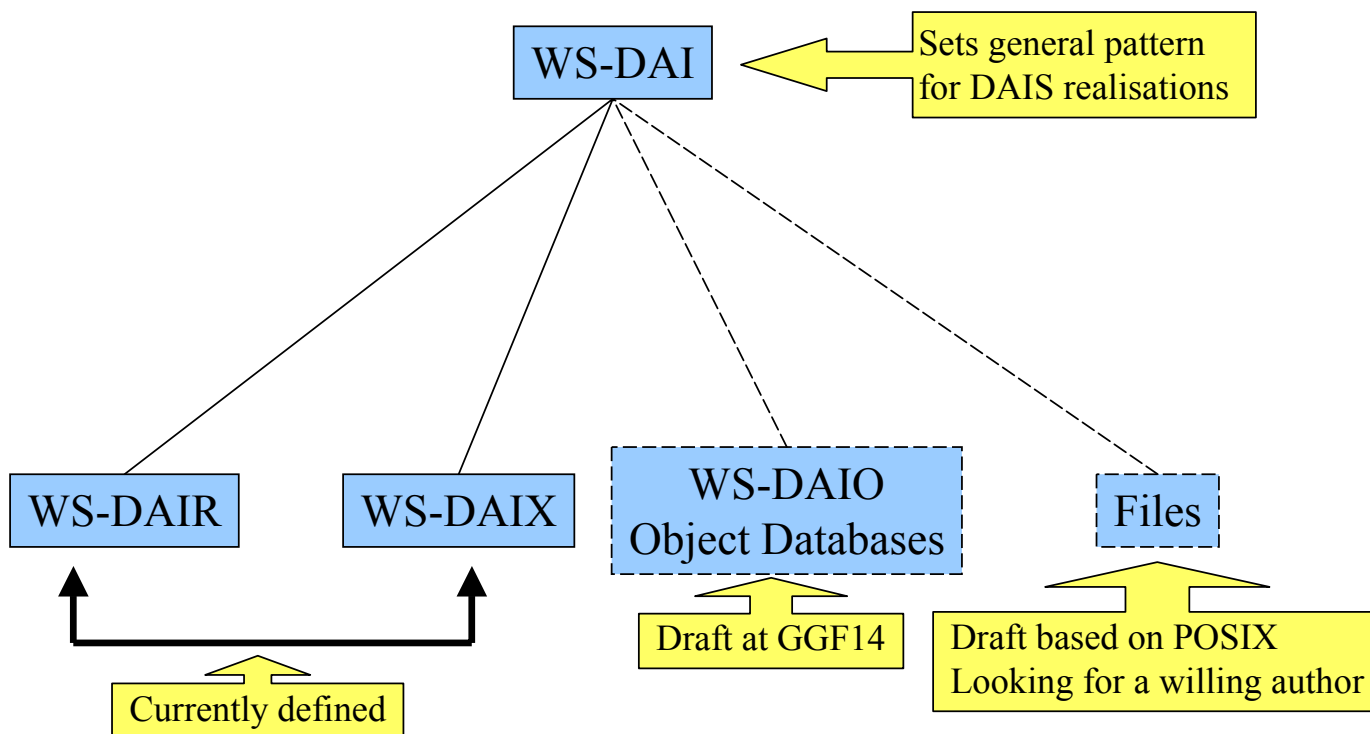


## WSRF in the current specs

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- There is core functionality that has no reliance on WSRF
  - Data access
  - Data factory
  - Properties
  - Explicit or no lifetime management
- Superset that has WSRF reliance which buys you:
  - Soft state lifetime management
  - Fine-grained property access
- Provides a migration path for those not ready to use WSRF
- Caveat
  - Require data resource name to be in the message body

## Specifications overview



## WS-DAI Specification

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- Defines:
  - Core properties of the data resources being accessed
  - Core messages for accessing the data resources
- These are extended by realisations
  - Cater for different underlying data models
    - Relational data resources
    - XML data resources
    - Possibly object and file based data resources
- Provides some base messages/operations
  - Retrieve a property document
  - Destroy relationship between a data service and a data resource
  - Performing generic query
- Defines some base message exchange patterns for realisations to use

## Interface types

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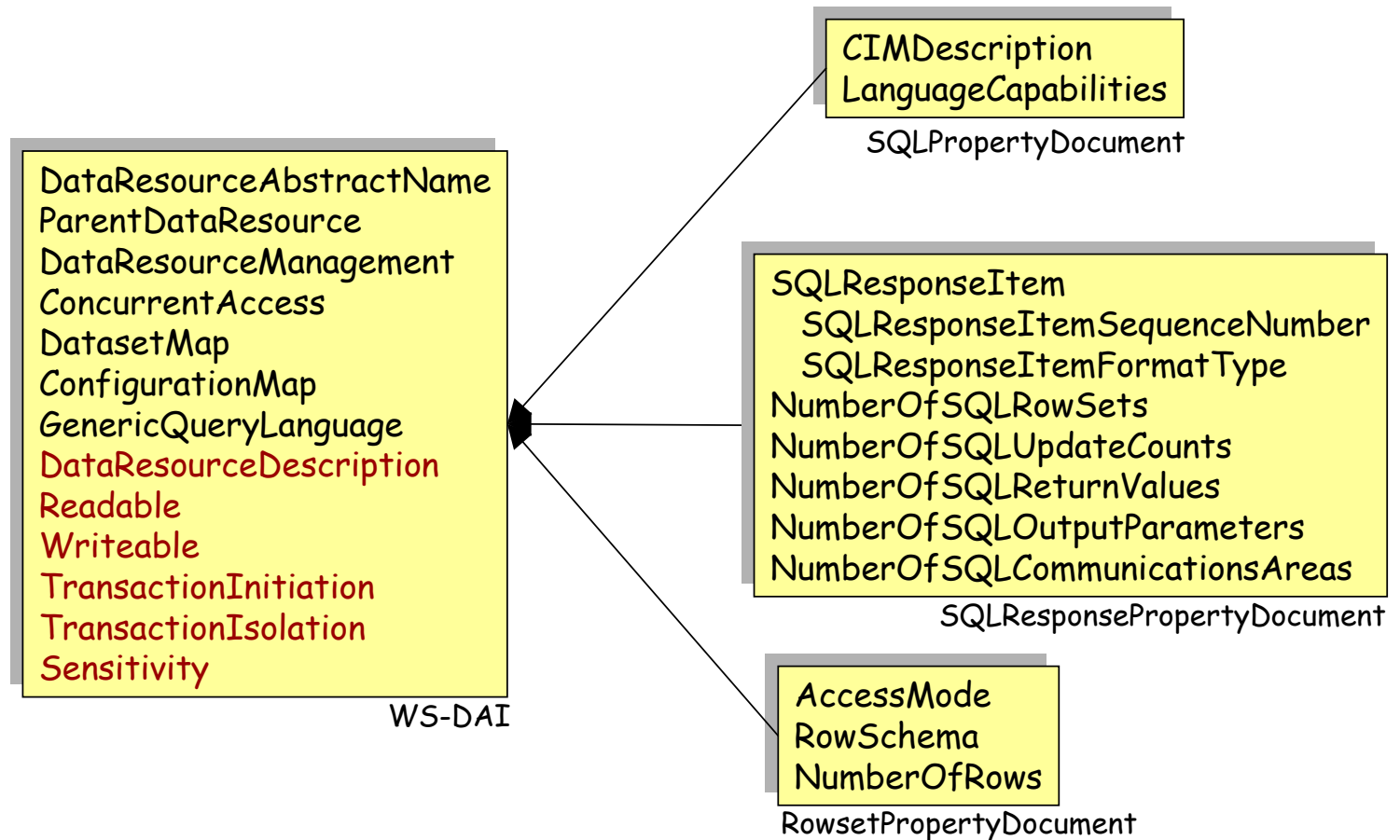
- Uses a classification of interface types
  - Originally postulated in the *OGSA Data Services* document
  - [http://forge.gridforum.org/projects/dais-wg/document/OGSA\\_Data\\_Services-ggf10/en/1](http://forge.gridforum.org/projects/dais-wg/document/OGSA_Data_Services-ggf10/en/1)
- Data description
  - Provides metadata about:
    - Data resource and
    - Relationship between the data resource and the data service
  - Implemented as a set of properties
- Data factory
  - Provides service interface for the creation of derived data resources
- Data access
  - Provides access to data through a service interface

## Data description

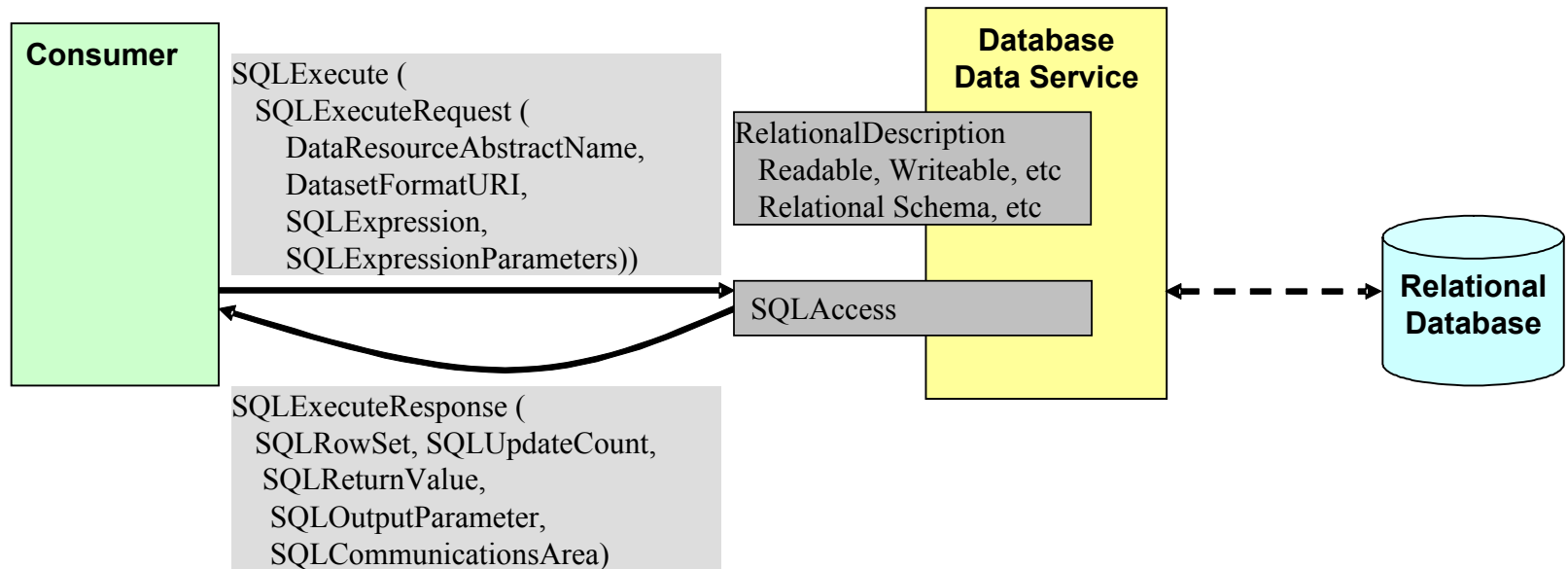
- Elements in a properties document
  - Static elements (black font)
  - Configurable elements (red font)
    - Factory pattern
- Most self explanatory
- DatasetMap
  - Allows different return types to be supported
- ConfigurationMap
  - Allows different data resources to result from factory messages
  - Factory pattern
- These are extended by the realisations

DataSourceAbstractName  
 ParentDataSource  
 DataSourceManagement  
 ConcurrentAccess  
 DatasetMap  
 ConfigurationMap  
 GenericQueryLanguage  
 DataSourceDescription  
 Readable  
 Writeable  
 TransactionInitiation  
 TransactionIsolation  
 Sensitivity

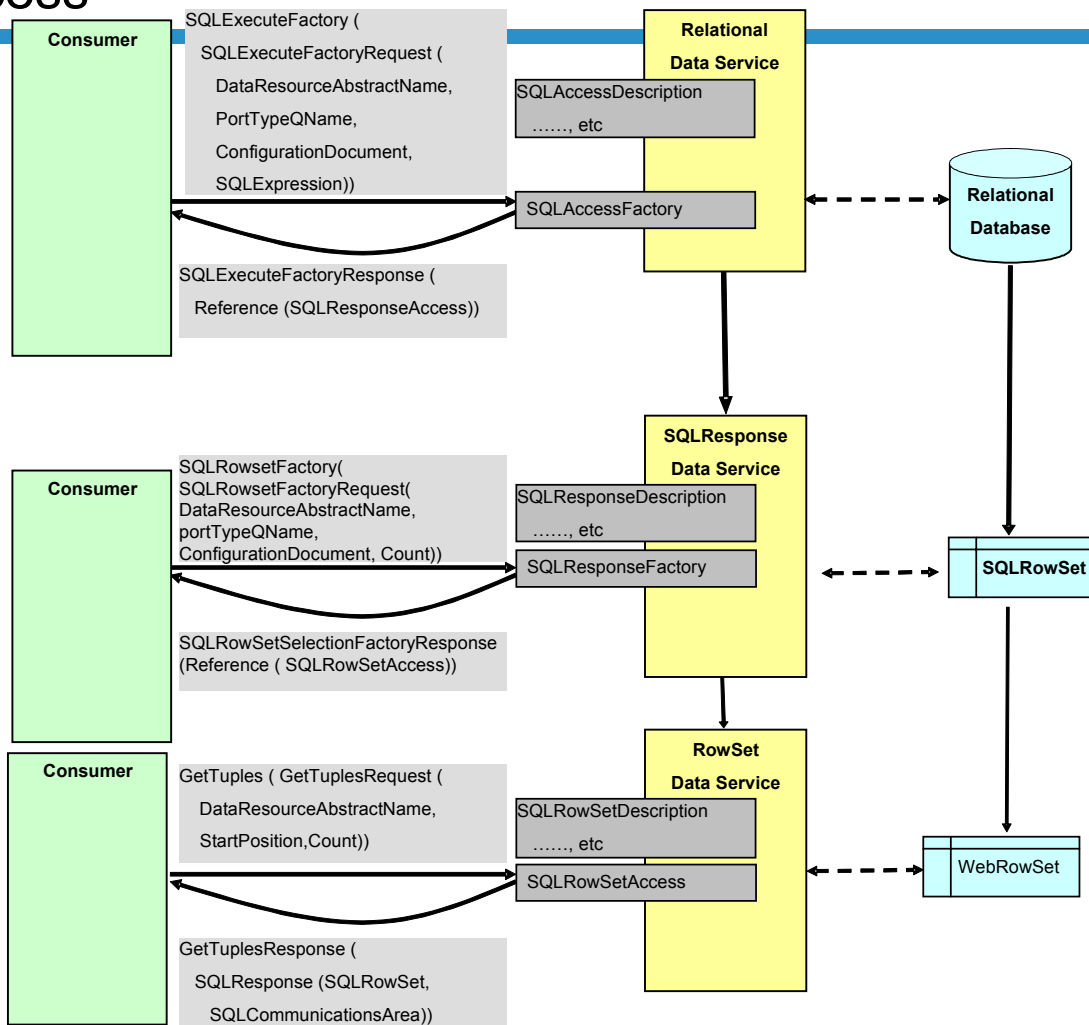
## Data description – relational extensions



# Direct Access

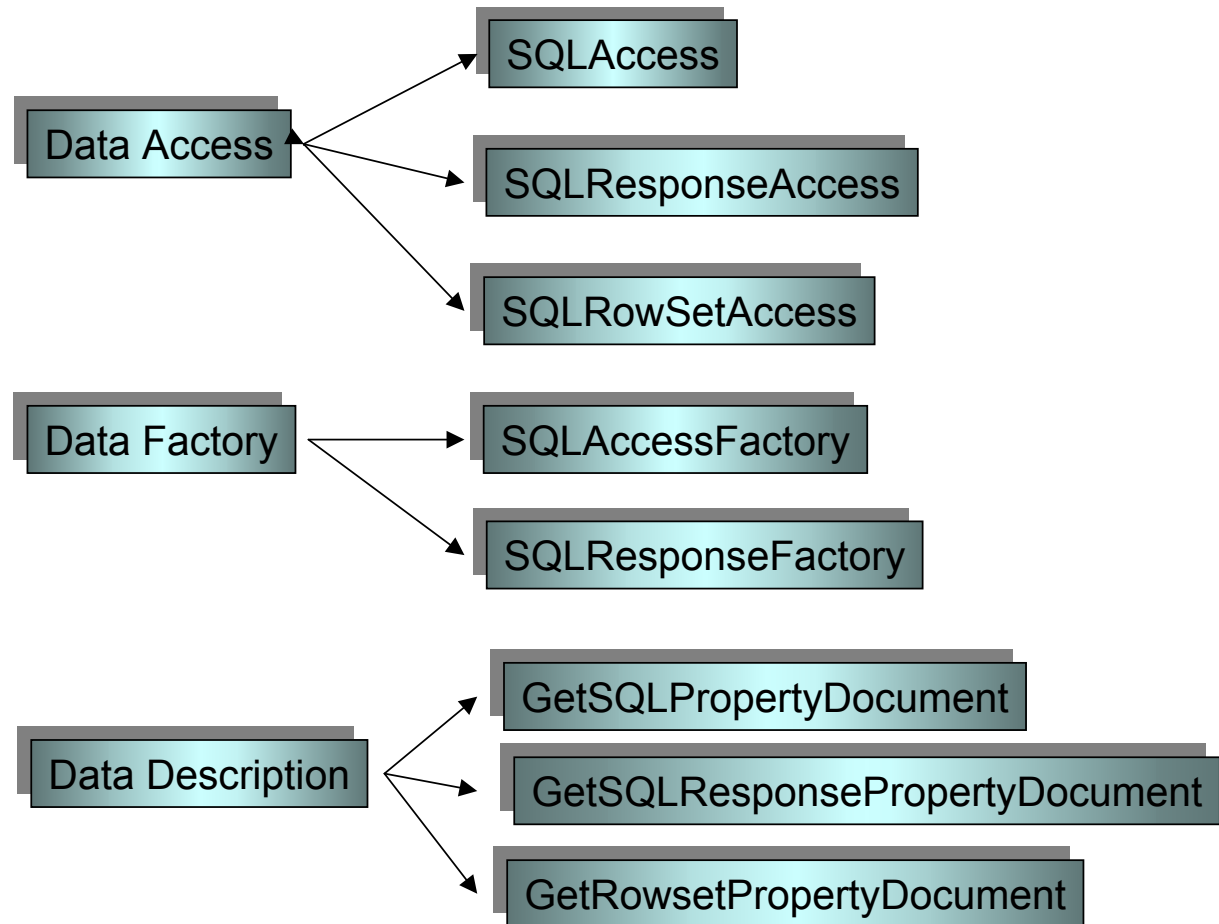


# Indirect Access

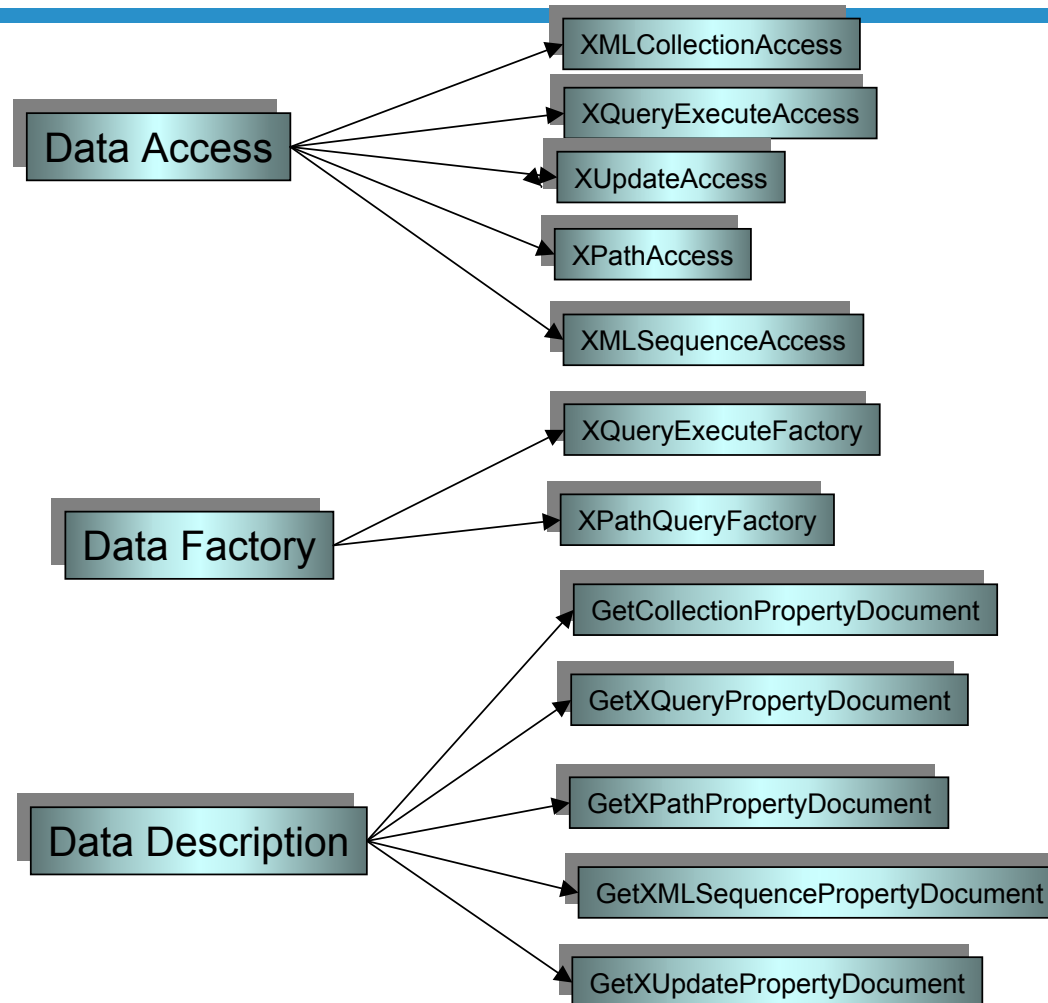


## Relational interface extensions

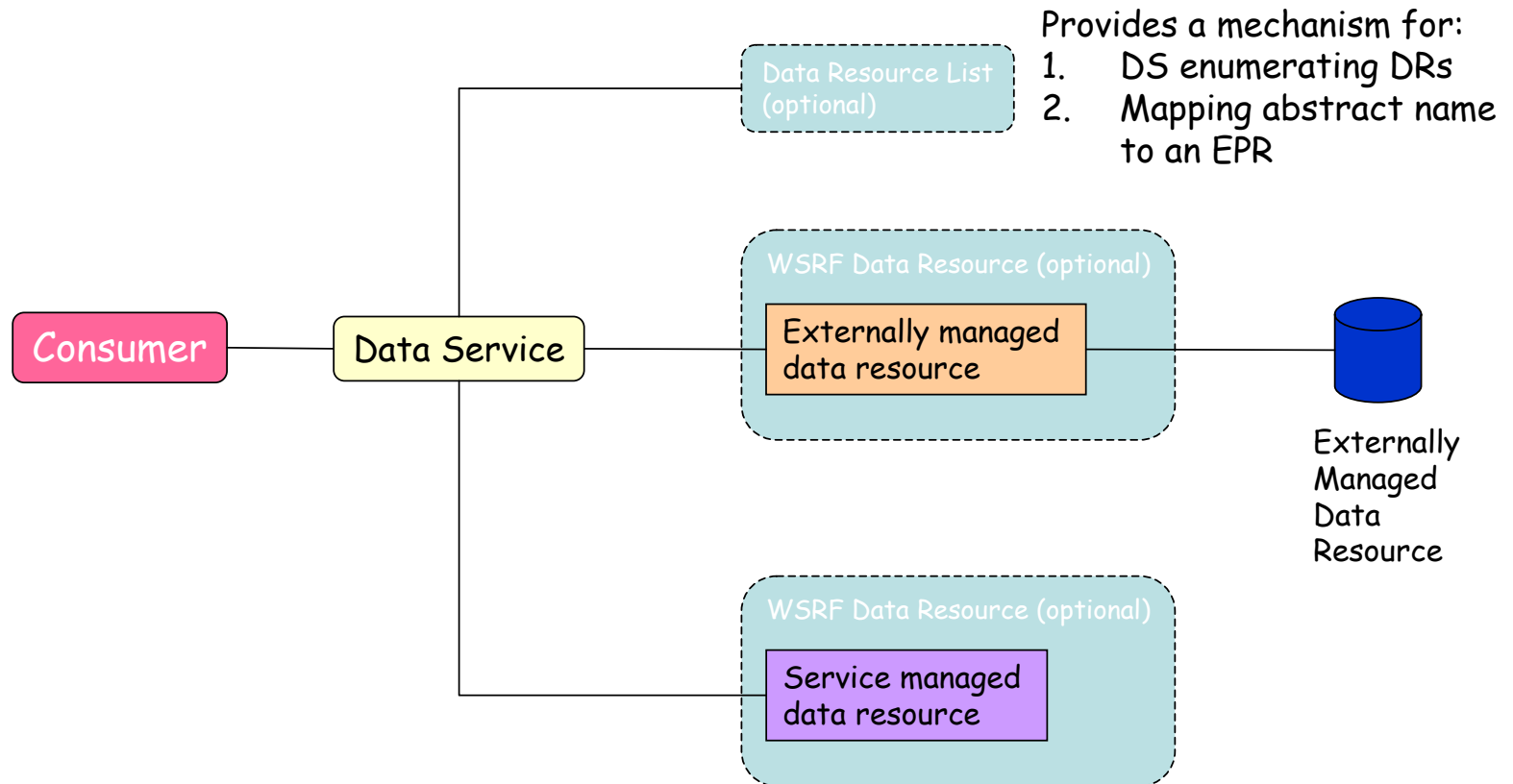
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## XML interface extensions



# WSRF DAIS extensions



## Usage

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- Specifications do not mandate how interfaces are composed into services
  - Interfaces may be used in isolation
  - Composed with others
- Expectation is that:
  - DAIS operations will be combined with others to form new portTypes
  - Best practices will emerge
- Implementations:
  - OGSA-DAI plan to implement specs
  - Ohio State University have interest in the XML specification

## Published Documents

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- Published GGF Documents to Date:
  - GFD.13: Grid Database Access and Integration: Requirements and Functionalities
    - <http://www.ggf.org/documents/GFD.13.pdf>
- Plan to submit the following as Proposed Recommendations:
  - Web Services Data Access and Integration (WS-DAI)
  - Web Services Data Access and Integration - The Relational Realisation (WS-DAIR)
  - Web Services Data Access and Integration - The XML Realisation (WS-DAIX)
- Submission should be happening real soon

## What Now

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- Read the draft specifications and comment

<http://forge.gridforum.org/projects/dais-wg/>

- Look under current documents:
  - Grid\_Data\_Service – WS-DAI
  - Relational\_Realisation – WS-DAIR
  - XML\_Realisation – WS-DAIX
- Looking for people to implement the specifications
  - Need two independent interoperable implementations to reach GGF recommendation status
- What next for DAIS Working Group?

## DAIS on data management

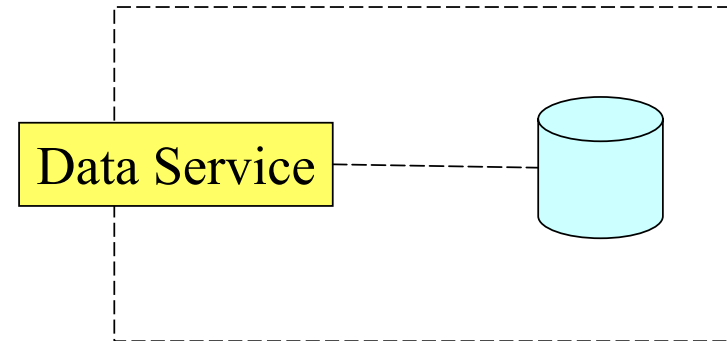
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- Data management was also originally in interface classification
- Lots of discussion, a management interface could generally be used to:
  - Manage the web service itself
  - Manage the data resource through the web service
  - Manage the relationship between the web service and the data resource
- People had many different opinions regarding this
  - Boundary between the different types of management fuzzy
  - Caused much heated debate ...
- In the end ruled the first two out of scope
  - General management principles wider than just for DAIS
  - OASIS WSDM TC covering similar ground
    - MOWS: Management of Web Services
    - MUWS: Management Using Web Services
    - [http://www.oasis-open.org/committees/tc\\_home.php?wg\\_abbrev=wsdm](http://www.oasis-open.org/committees/tc_home.php?wg_abbrev=wsdm)
- But management still creeps in ...

## Direct/Indirect Access

### Direct Access

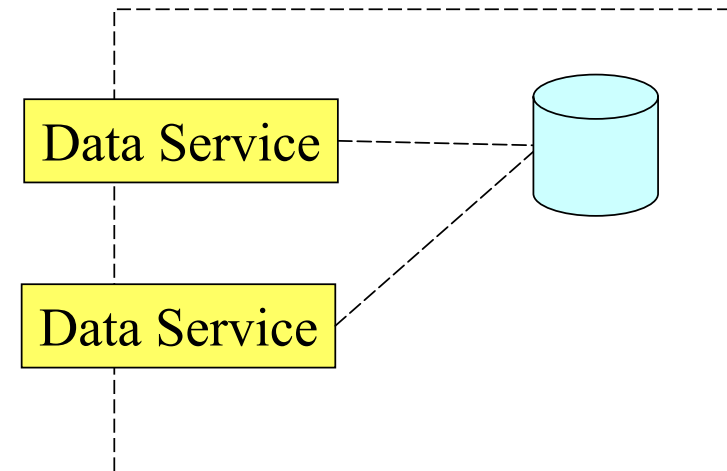
Consumer



### Indirect Access

Consumer

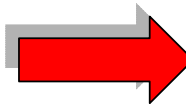
Consumer



## Direct access message patterns

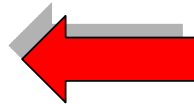
```
<RequestMessage>
  <wsdai:DataResourceAbstractName/>
  <wsdai:DatasetFormatURI/>?
  <RequestDocument/>
</RequestMessage>
```

Direct Access Request



```
<ResponseMessage>
  <wsdai:DatasetFormat/>
  <wsdai:DatasetData>
    Data goes here formatted according to the
    DatasetFormat uri in the request message.
  </wsdai:DatasetData>
</ResponseMessage>
```

Direct Access Response



## Factory message patterns

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```
<RequestMessage>  
  <wsdai:DataResourceAbstractName/>  
  <wsdai:PortTypeQName/>?  
  <wsdai:ConfigurationDocument/>?  
  <RequestDocument/>  
</RequestMessage>
```

Factory Access Pattern



```
<wsa:EndPointReference>  
  <wsa:ReferenceParameters>  
    <wsdai:DataResourceAbstractName/>?  
  </wsa:ReferenceParameters>  
</wsa:EndPointReference>
```

Factory Response Pattern

