ILDG Middleware Project Status

ILDG-4 Workshop, May 2004

Overview

- Progress is slow (manpower issues)
- Consensus on component architecture
- SRM v2.1 component defined (external project) and implemented
- Other components in various states of proposal or prototyping

Slow Progress

- Priority given to other significant activities; examples:
  - SciDAC: focus on lattice application functionality and performance (qmp, qdp, …)
  - UK: focus on QCDOC
  - Everyone: meta-data schema definition
- External SRM project took longer than expected to reach consensus on version 2.1

- Consequence: only about 1/4 of proposed work accomplished.

Growing use of the Wiki

The ILDG web site is an interactive Wiki, see

http://www.lqcd.org/ildg/

And the Middlware group has begun to populate a number of pages:

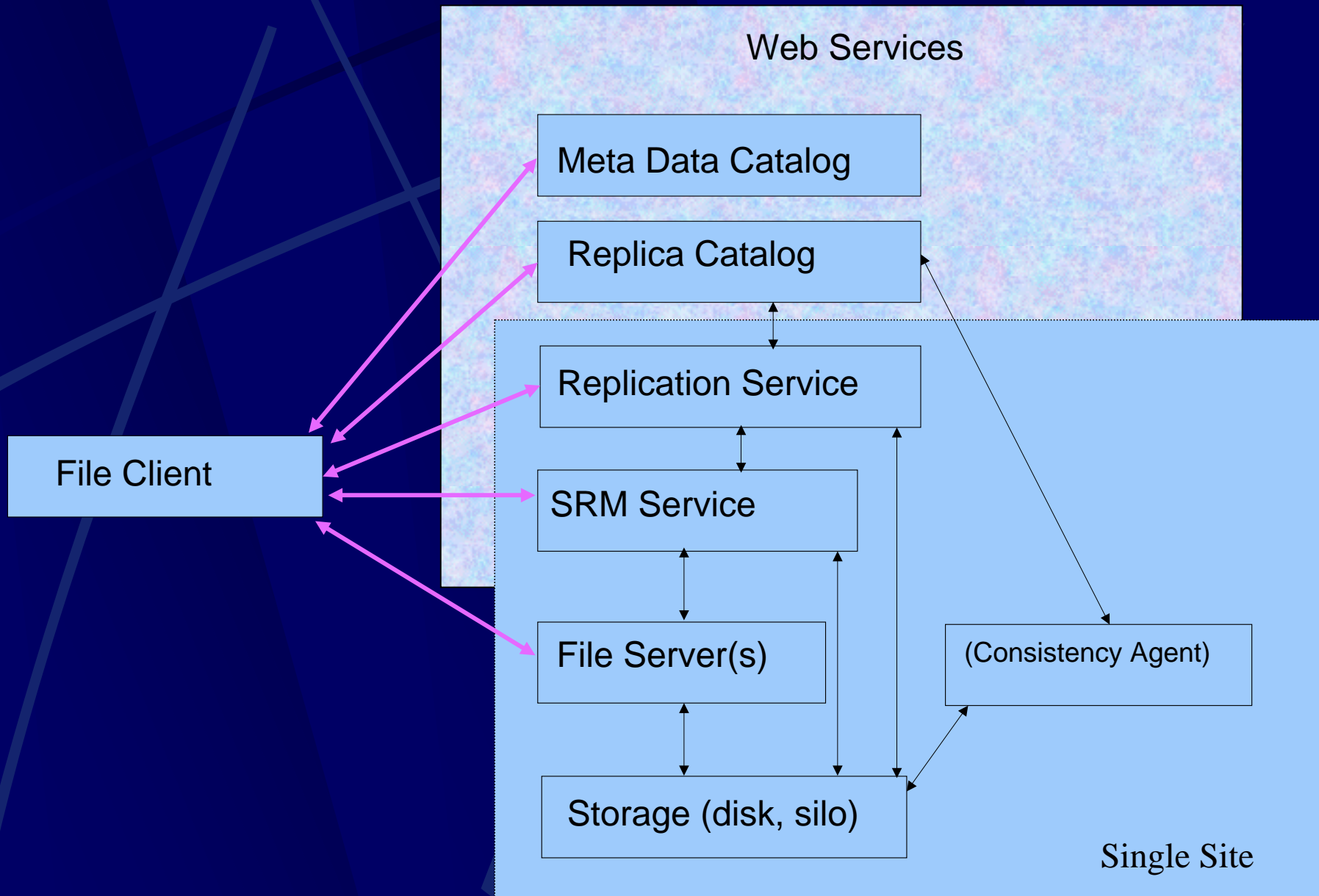http://www.lqcd.org/ildg/tiki-index.php?page=Middleware
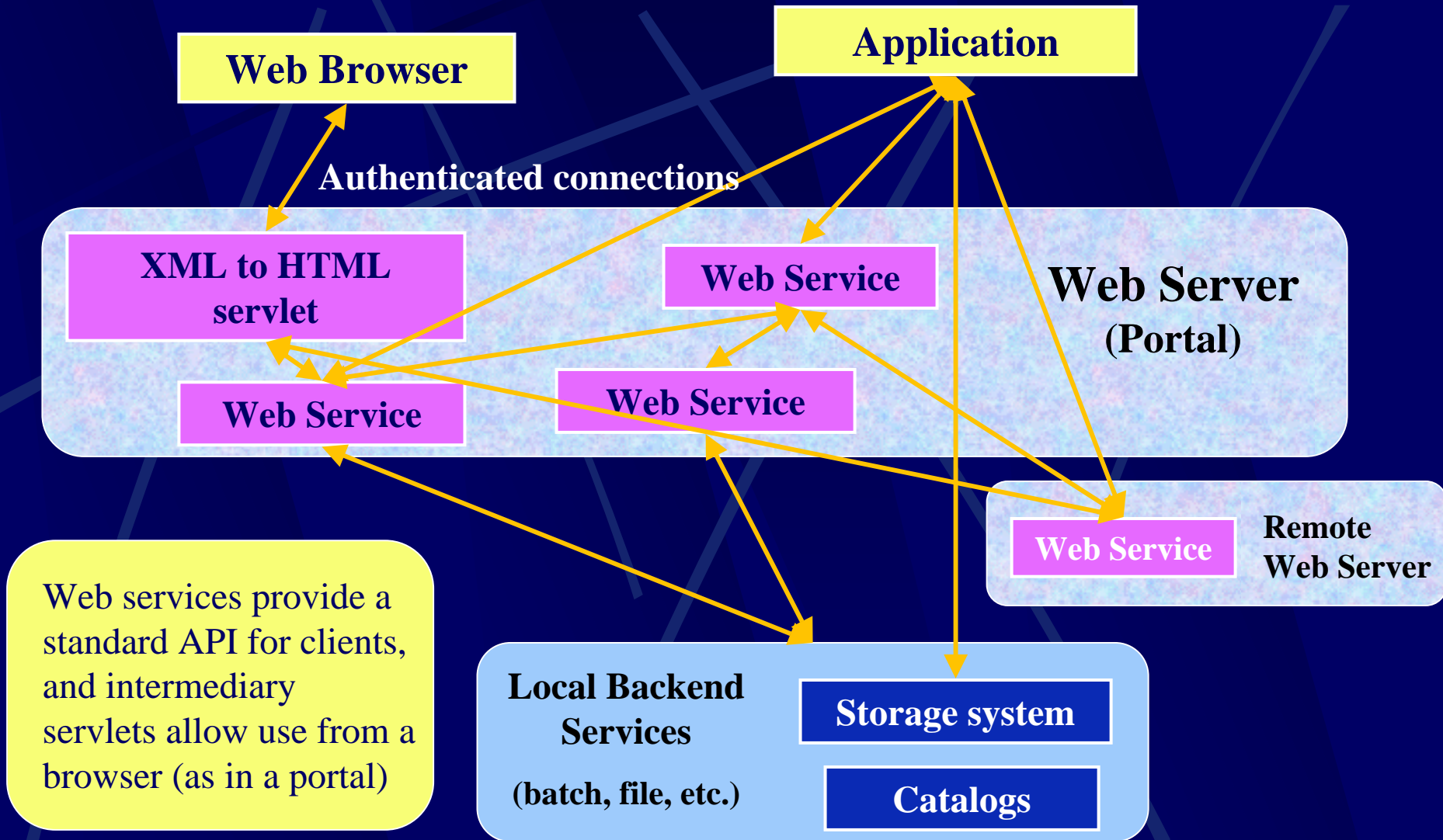
Architecture Agreement

There was a consensus (no objections, quiet list) on the use of stateless web services as the component architecture. The set of components has not changed:

- Meta-data Catalog

- Replica Catalog

- Storage Resource Manager

- Miscellaneous components (not web services):
  - Web servers
  - File transfer daemons

Review: Data Grid Web Services Architecture

Review: A Three Tier Web Services Architecture

Web Browser

Application

Authenticated connections

XML to HTML servlet

Web Service

Web Server (Portal)

Web Service

Web Service

Web Service   Remote Web Server

Web services provide a standard API for clients, and intermediary servlets allow use from a browser (as in a portal)

Local Backend Services

**(batch, file, etc.)**

Storage system

Catalogs

Components: Meta Data Catalog

Hold metadata for files

- Hold metadata for a set of files (data set)

- Process query lookup

- Queries return (sets of) GFN, (Global File Name = key), and optionally full metadata for each match

- See also

  http://www.lqcd.org/ildg/tiki-index.php?page=MetaData%20Catalog

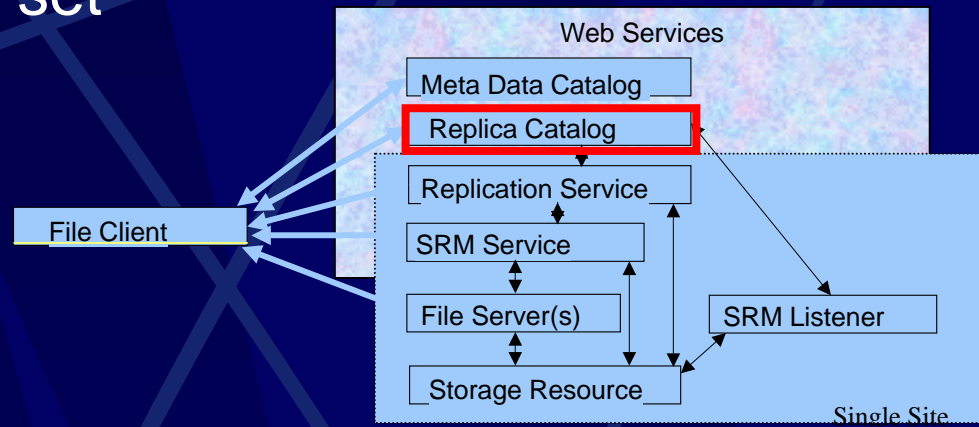- And also later presentations from Tsukuba, Fermilab
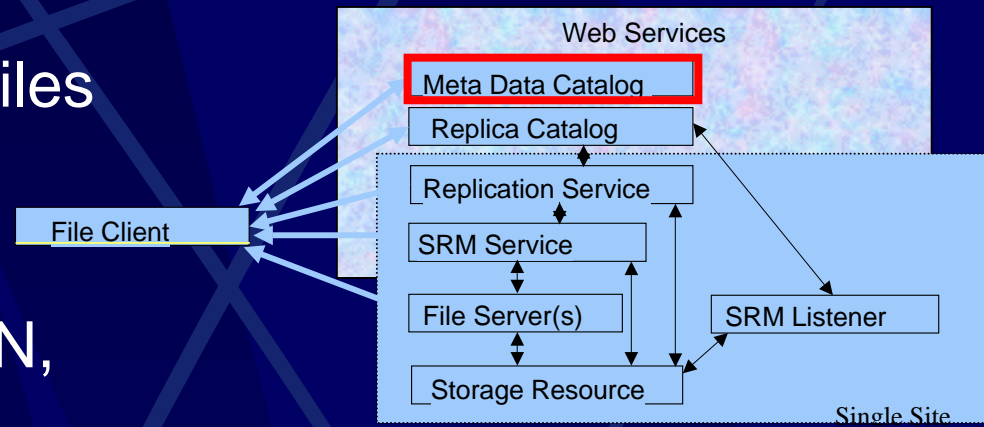
Components: Replica Catalog

Track all copies of a file / data set

- Get replicas

- Create replica

- Remove replica

- Prototypes exist at
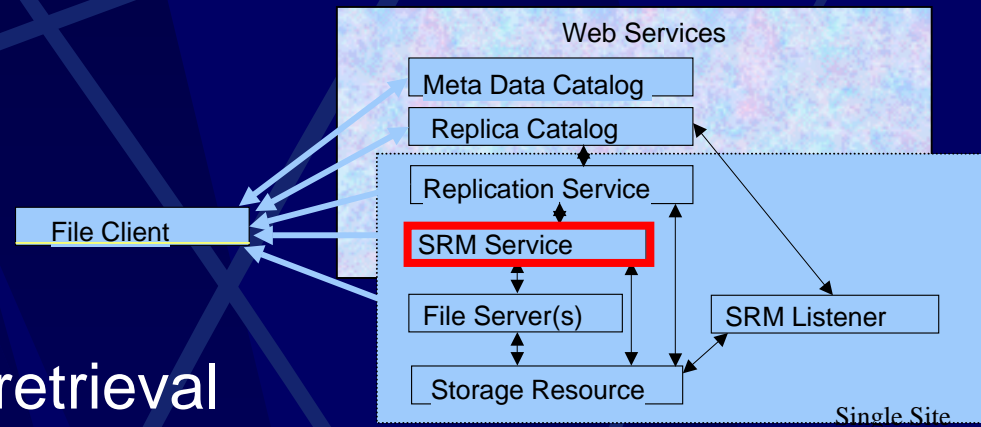 - Jefferson Lab
  - Fermilab

- See also:

http://www.lqcd.org/ildg/tiki-index.php?page=Replica%20Catalog

Web Services

Meta Data Catalog

Replica Catalog

Replication Service

SRM Service

File Server(s)

SRM Listener

Storage Resource

File Client

Single Site

Components: Storage Resource Manager

Manage storage system

- Disk only
- Disk plus tape

3 party file transfers

Negotiate protocols for file retrieval (select a file server)

Auto stage a file on get (asynchronous operation)

Version 2.1 defined (collaboration)

- JLab has nearly finished implementation

See also:

http://www.lqcd.org/ildg/tiki-index.php?page=Storage%20Management

Web Services

Meta Data Catalog

Replica Catalog

Replication Service

SRM Service

File Client

File Server(s)

SRM Listener

Storage Resource

Single Site

ILDG Components

MetaData Catalog (MDC)

- Each collaboration deploys one
- A mechanism (not defined yet, under discussion) exists for searching all (a virtual MDC)

Replica Catalog (RC)

- (same comments)

Storage Resource Manager (SRM)

- Each collaboration deploys one or more
- At each SRM site, there are one or more file servers: http, ftp, gridftp, jparss, bbftp, …