
Web Services Architecture for a Fusion Data Grid

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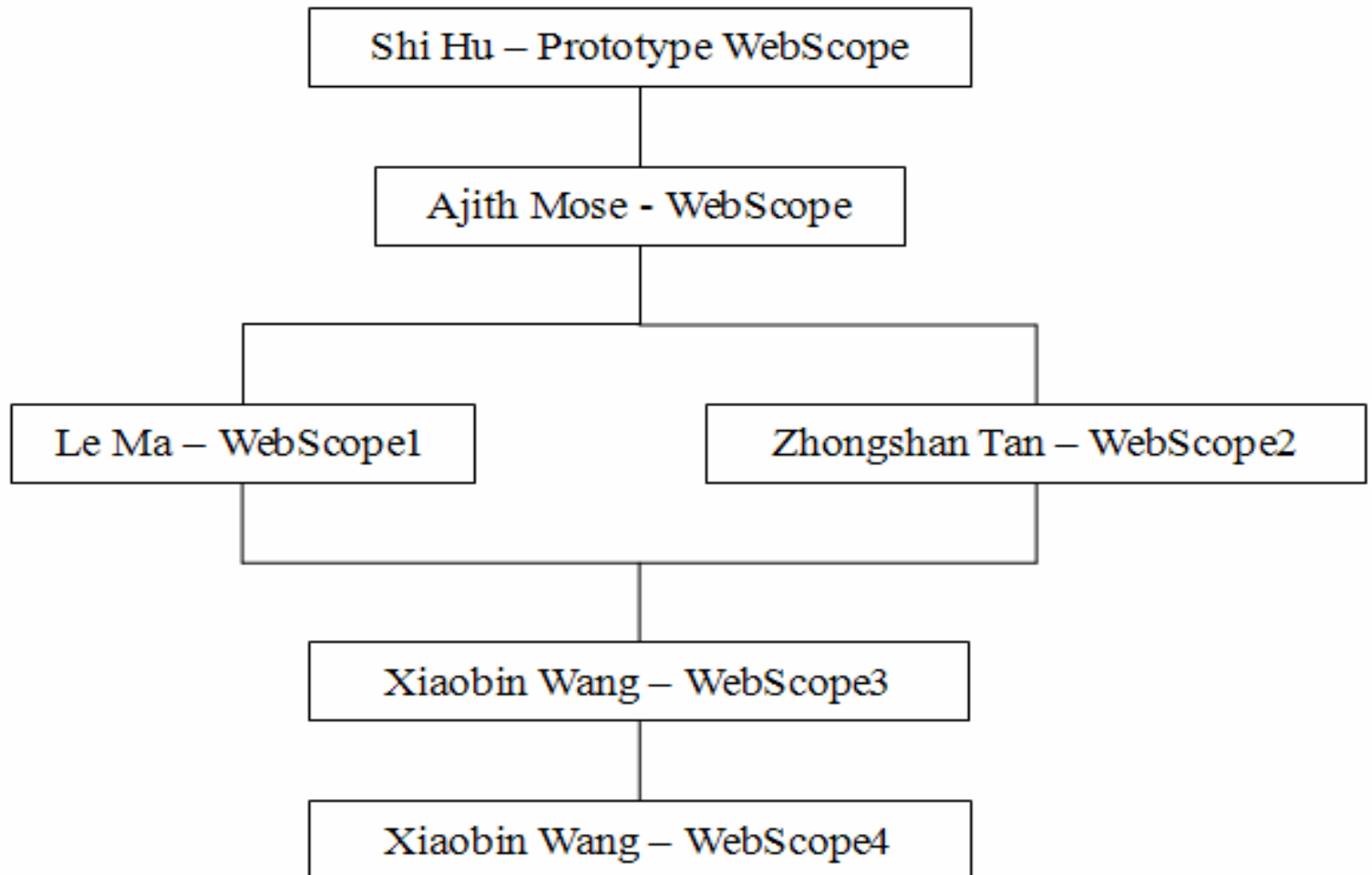
Outline

- Introduction to WebScope systems
- Requirements
- Key Technologies
- Software Structure Evolution
- New features & components
- Schedule & Effort
- Contribution
- Demonstration
- Q&A

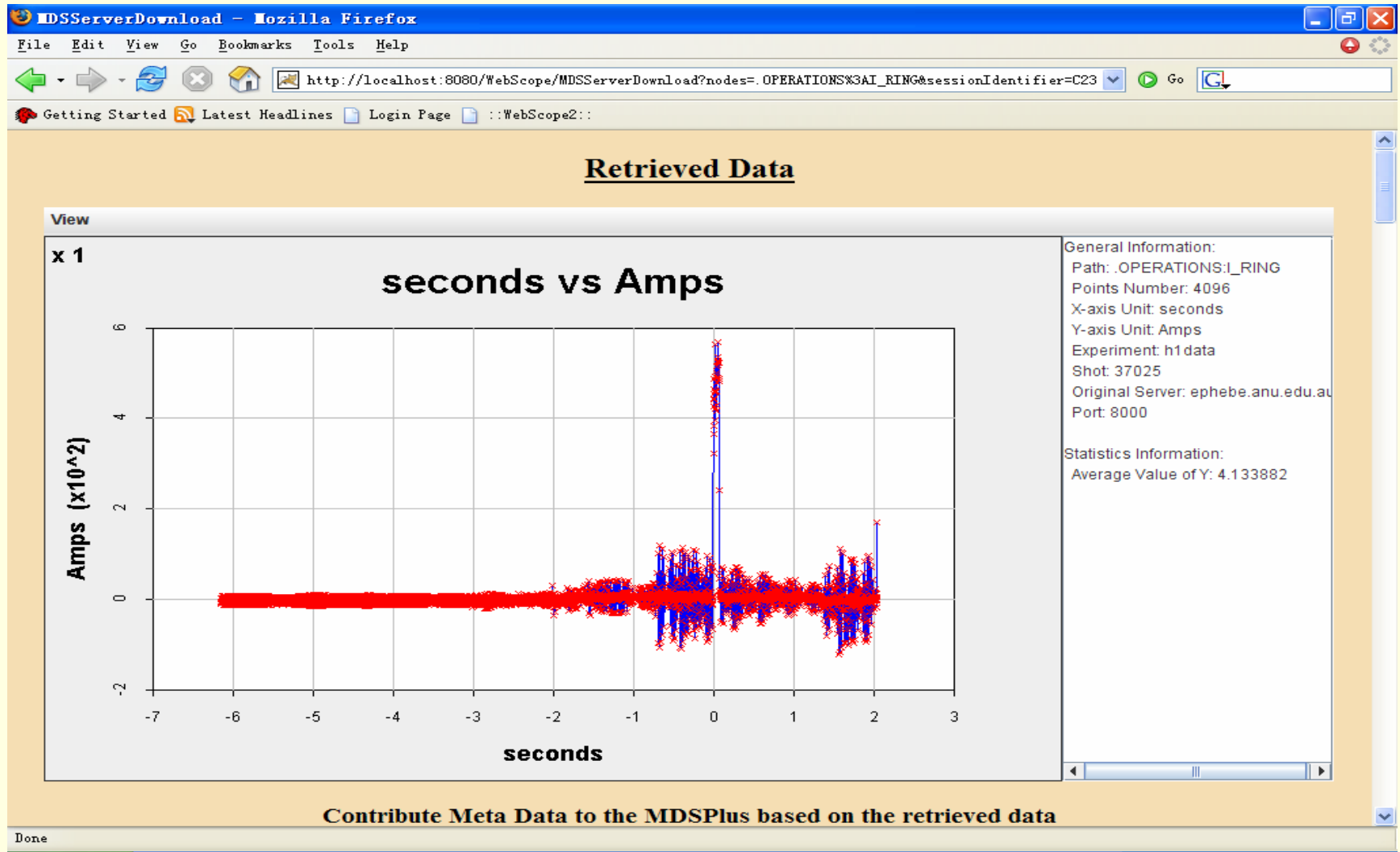
WebScope System

- “A web-based, dynamic metadata interface to MDSplus”, Henry. J. Gardner, Raju Karia and Gabriele Manduchi, Fusion Engineering and Design, 83 (2008) 448-452.

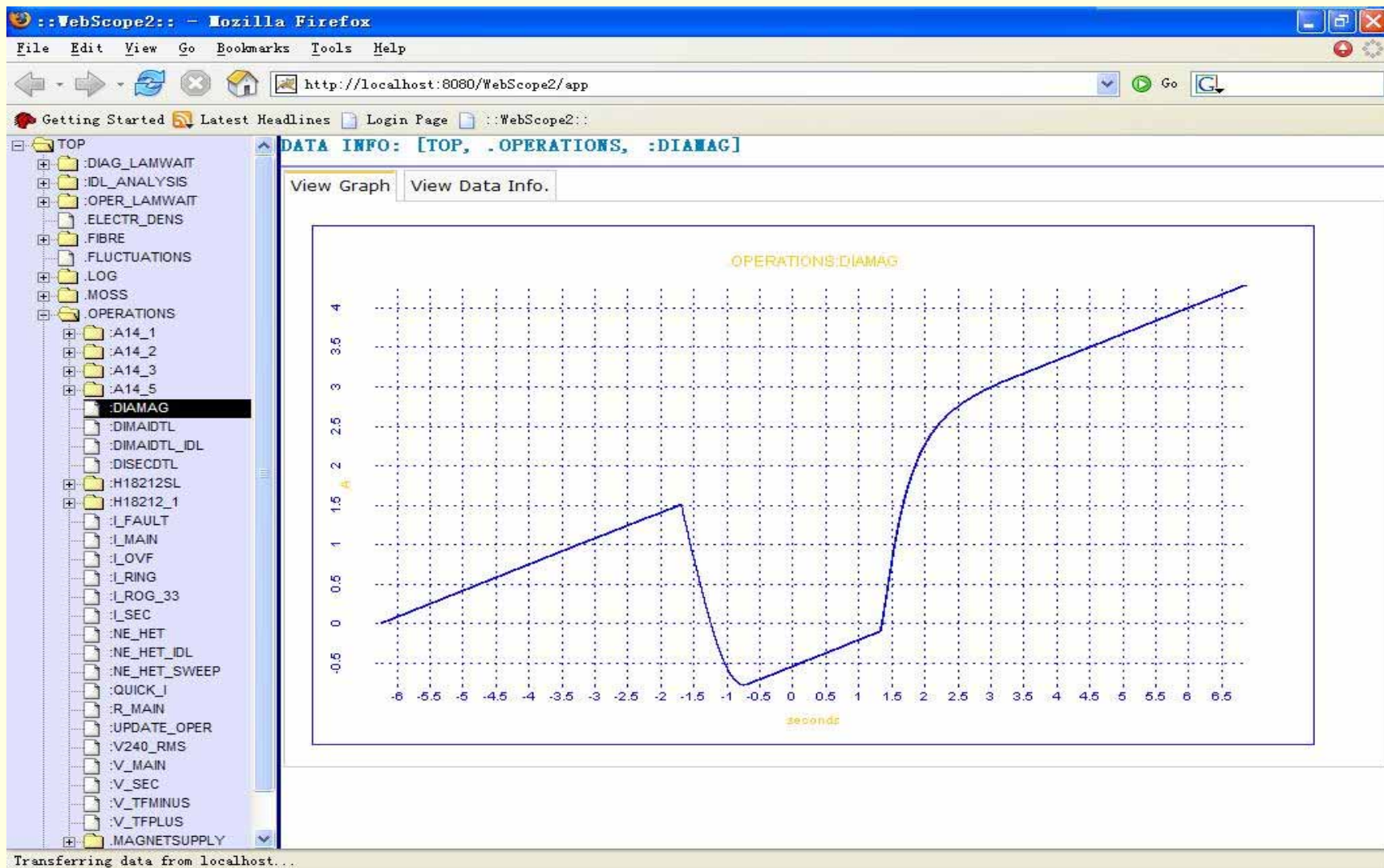
The Genealogy of WebScope



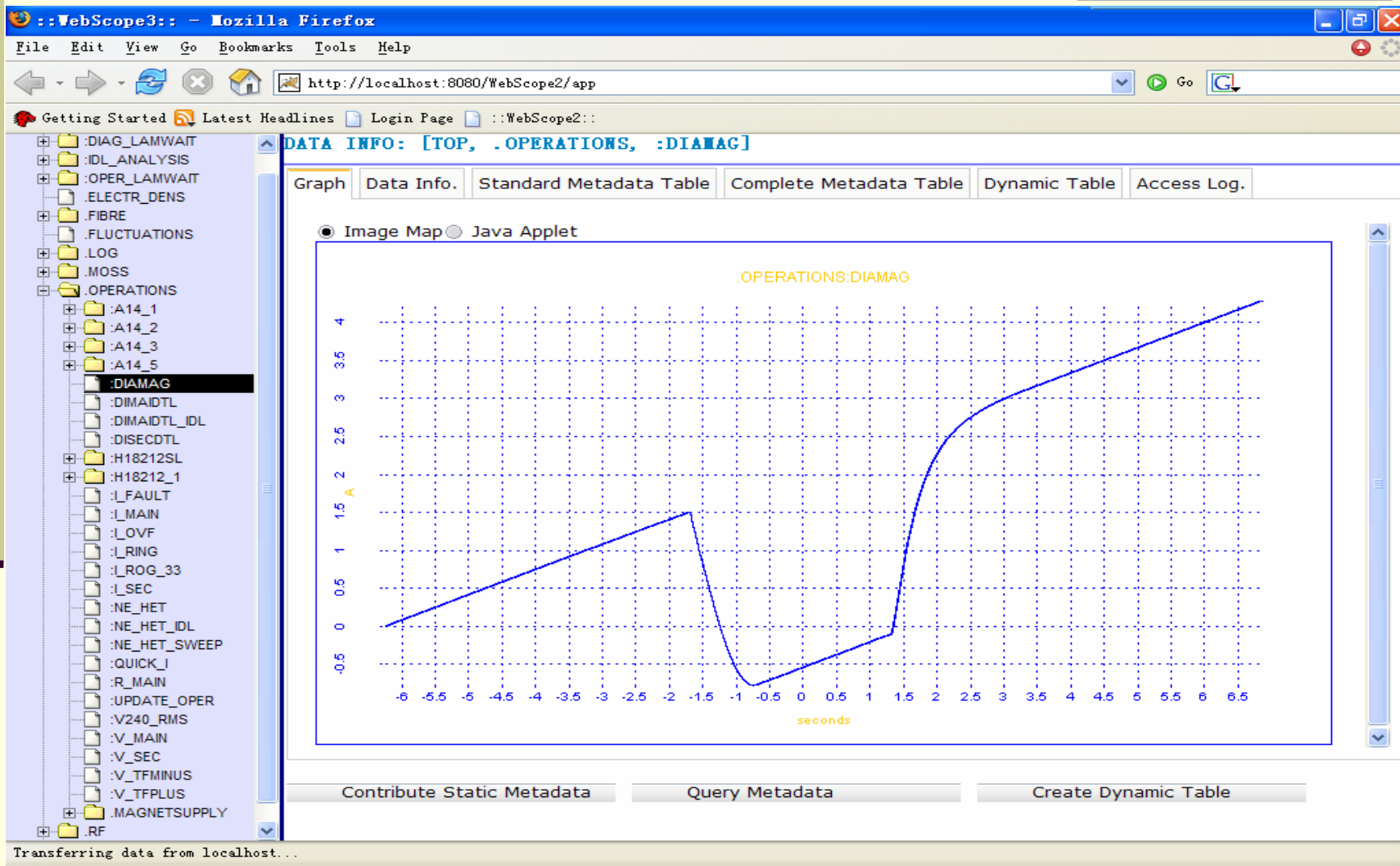
WebScope1



WebScope2



WebScope3



Next...WebScope4?

- **What do we need?**

- Security
- Flexibility
- Efficiency
- A system instead of a web application!

- **How will we achieve this?**

- Jini
- CAS
- MySQL

Jini

- **What is Jini?**

- Jini™ enables the construction of secure, distributed systems consisting of federations of well-behaved network services and clients.

- **Why Jini?**

- Jini helps to make the WebScope4 system more flexible and available
- Jini is quite light-weight in comparison to other Web Services

CAS

- **What is CAS?**

- Central Authentication Service

- **Why CAS?**

- Improved security
- Single Sign-on

MySQL

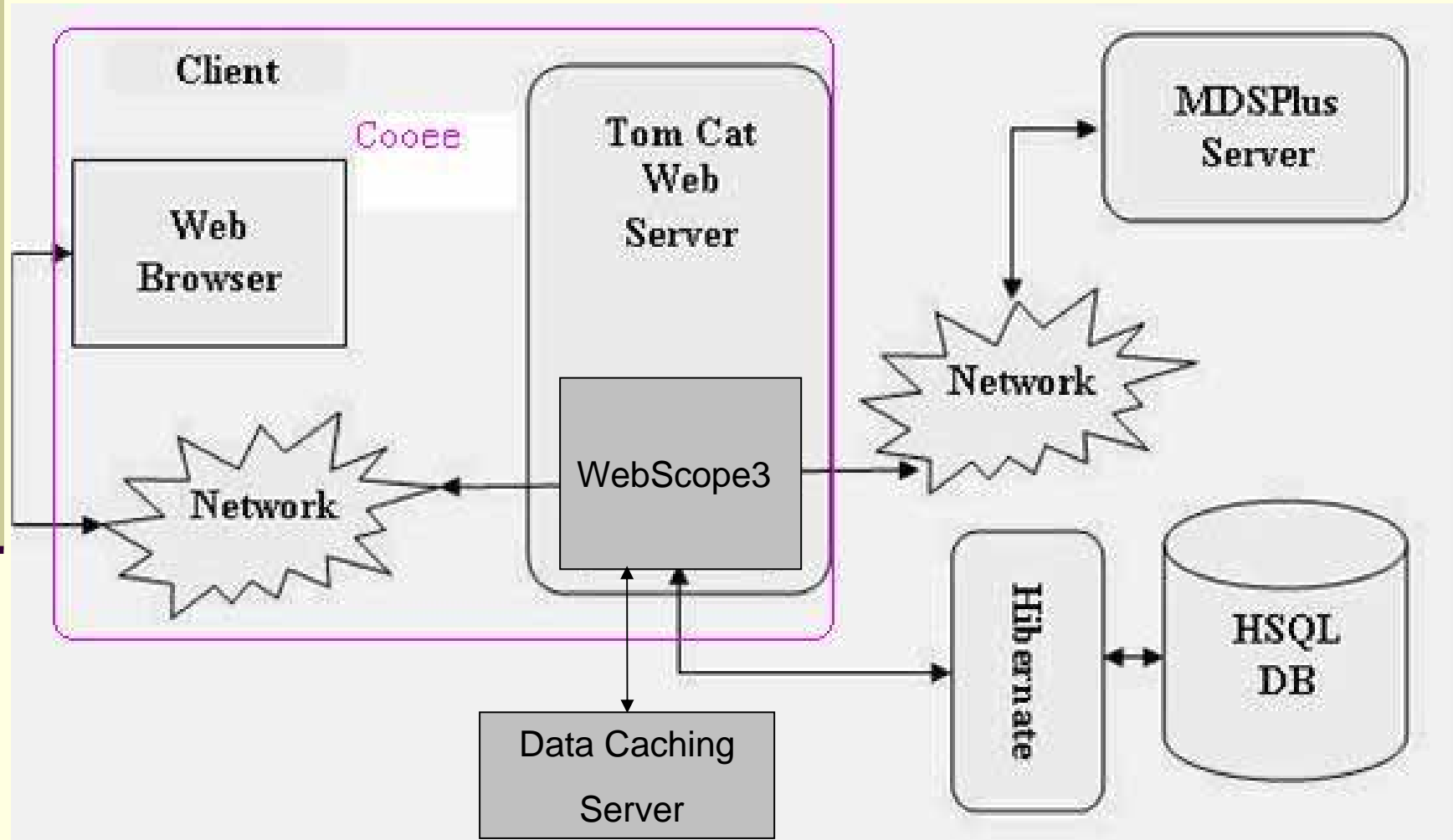
- **From HSQLDB to MySQL**
 - Why?
 - Performance
 - Security
 - Stability

What is WebScope4?

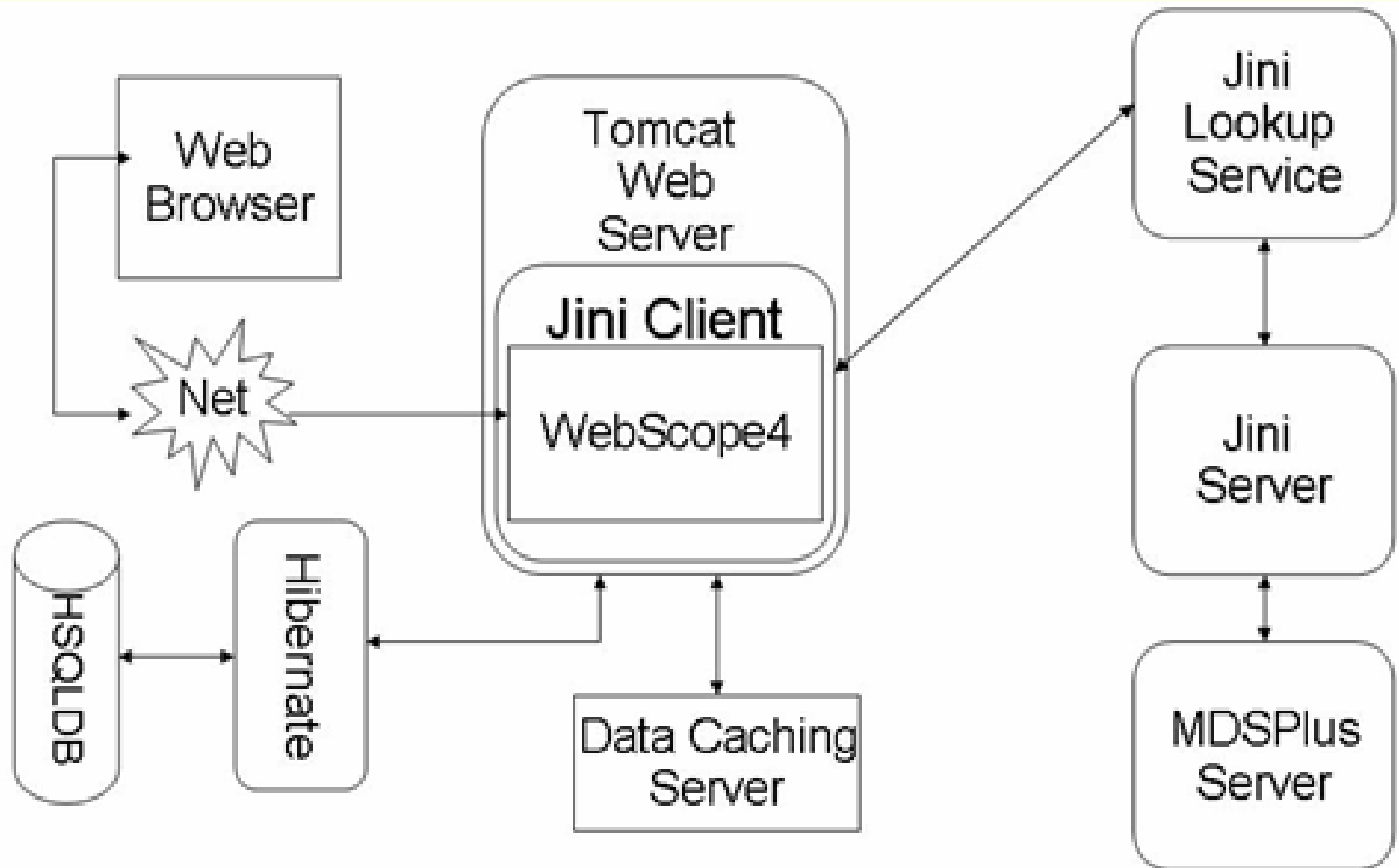
- **A Data Grid**

- Jini-embedded MDSPlus Server
- Jini-embedded Metadata Server (MetaScope)
- CAS Server
- WebScope4 Client
- Jini Lookup Service

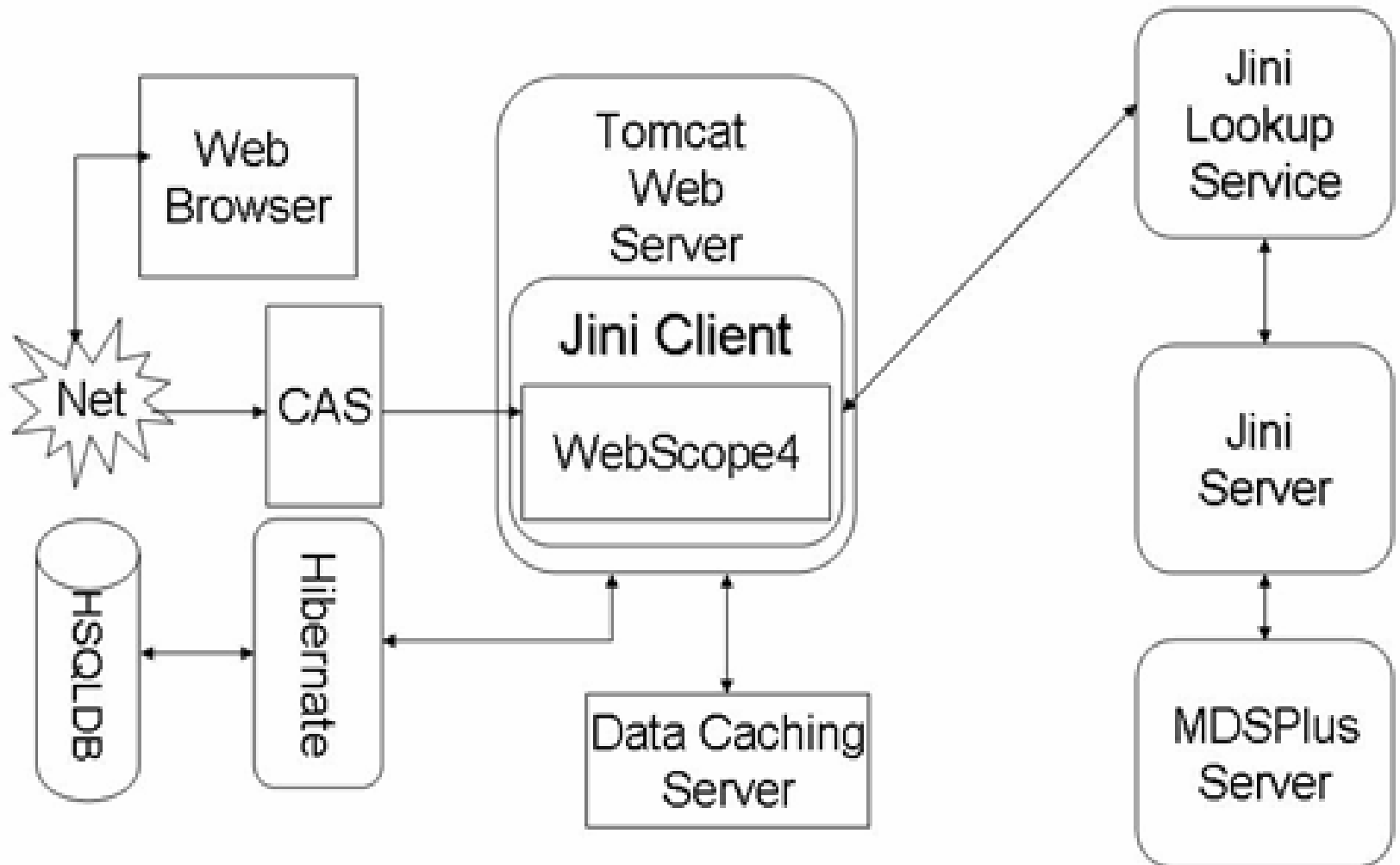
WebScope3 Software Structure



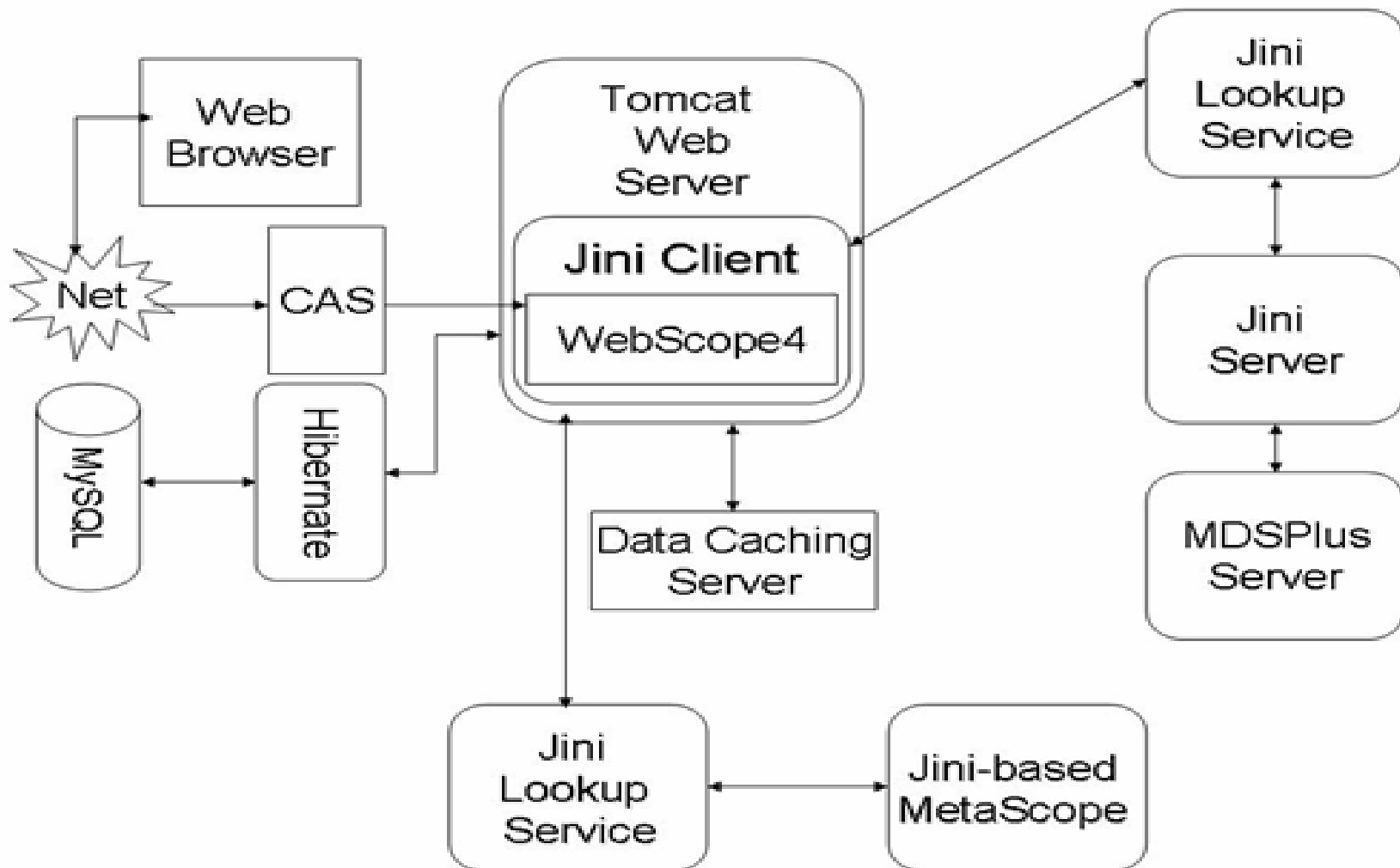
WebScope4 Structure 1



WebScope4 Structure 2



WebScope4 Structure 3



MetaScope

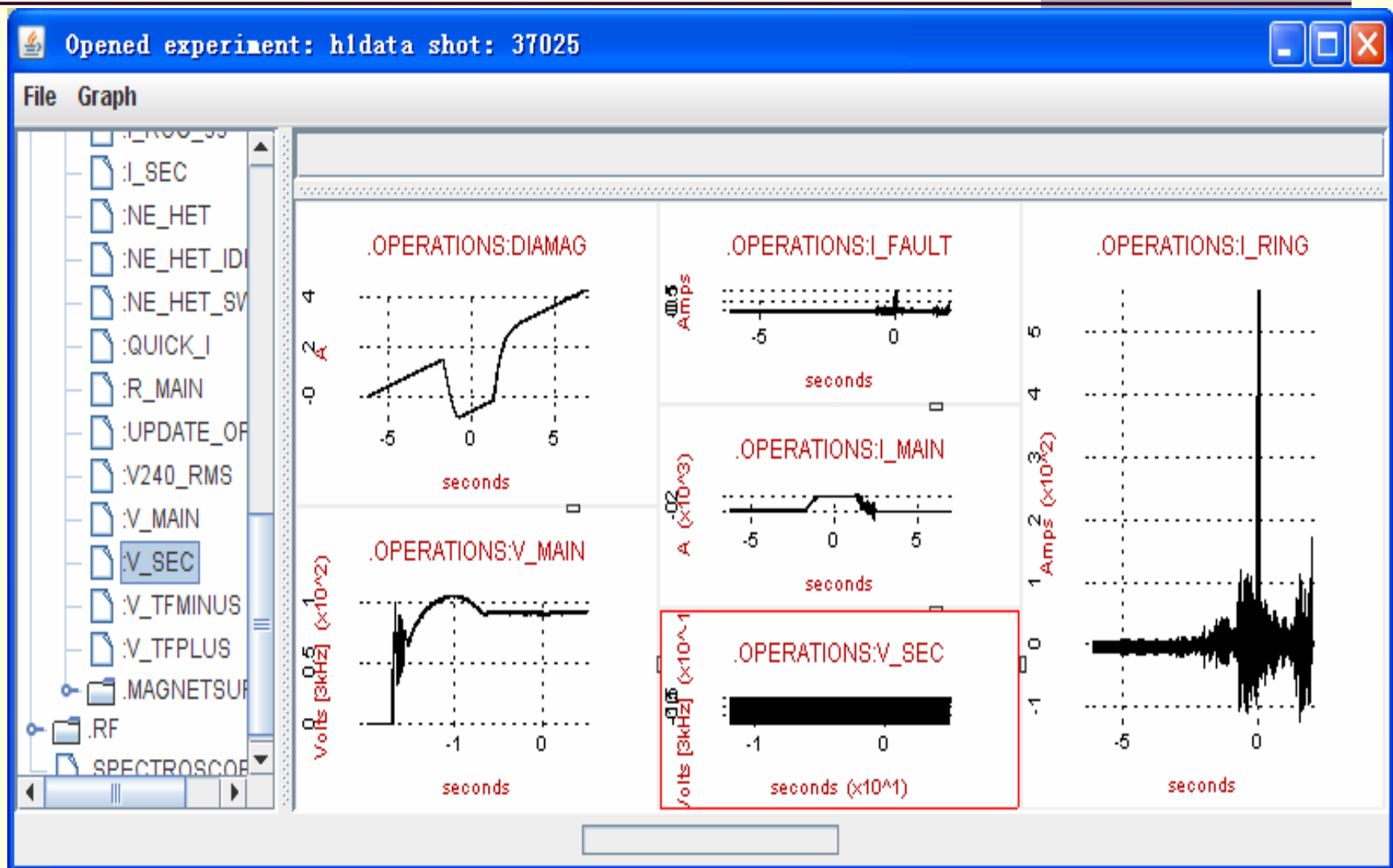
- What is MetaScope?
 - a web service to centrally control the access and modifying of metadata
- How does it help?
 - Increased flexibility of the WebScope4 system
 - Metadata Authorization

Collaboration Space

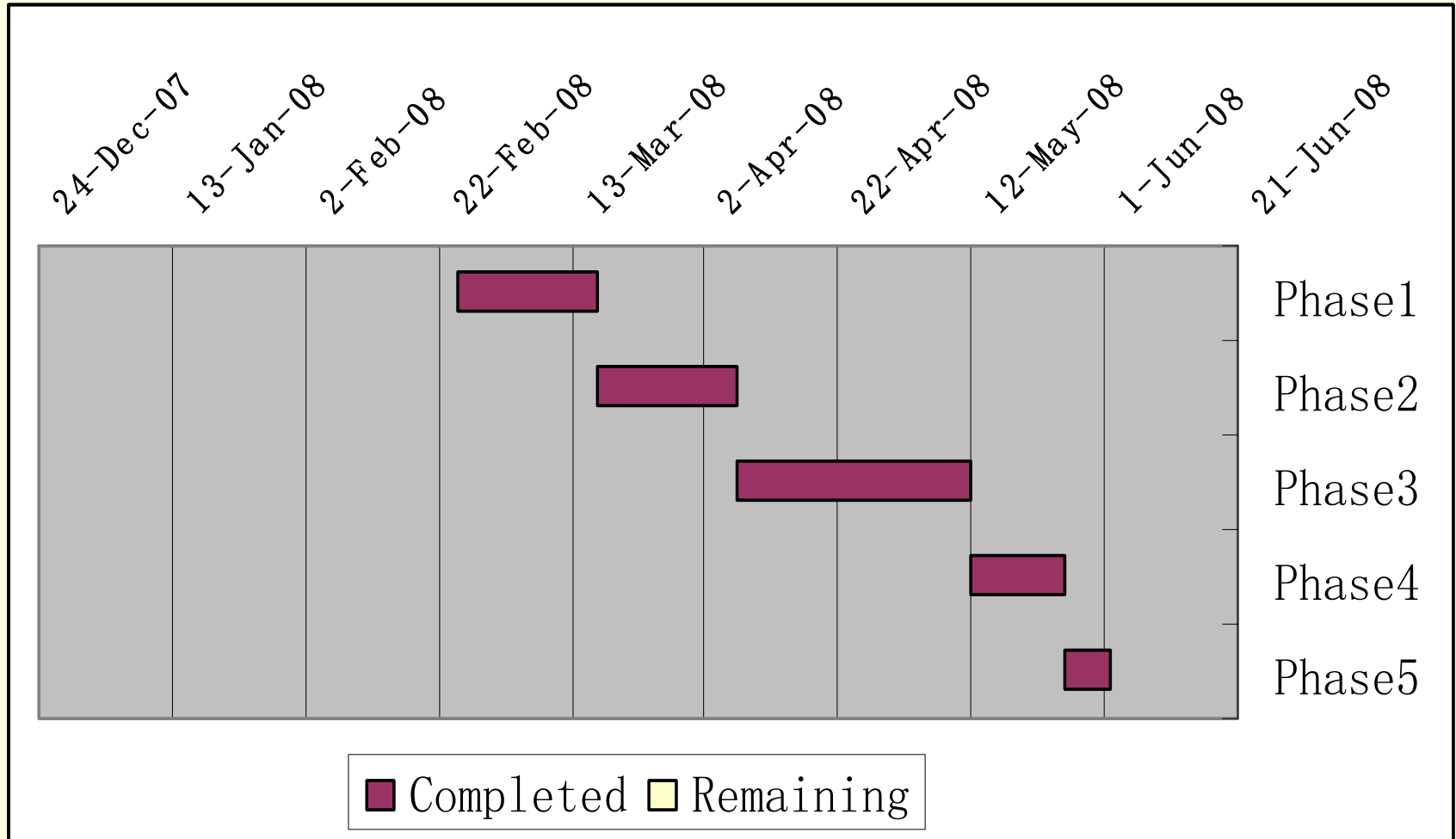
- Purpose

- Enable two or more scientists to share private experimental data between themselves
- Scientists from different locations can now work on the same data at the same time

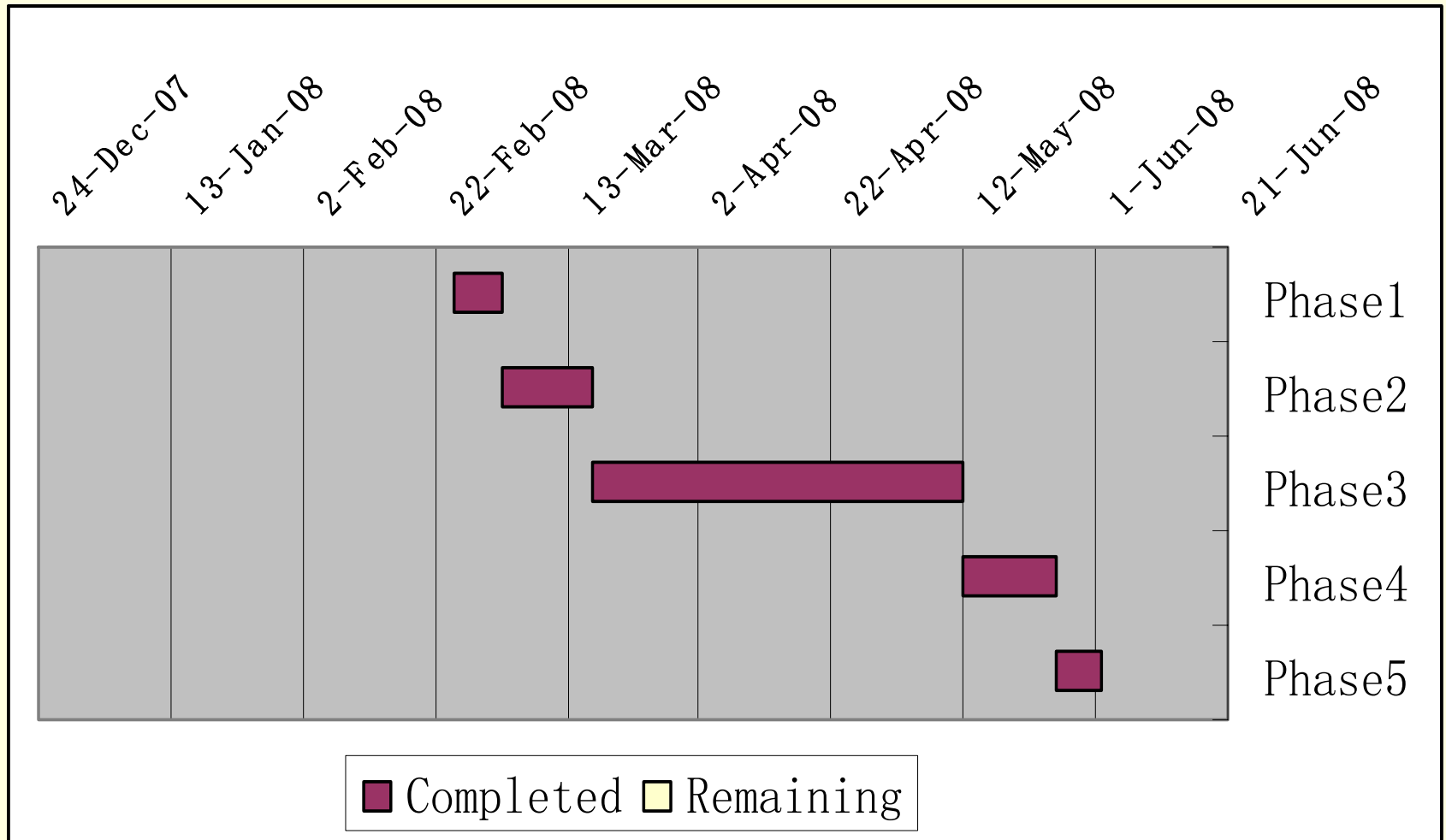
EScope12 Jini Client



Planned Schedule



Actual Progress



Effort

Component	Lines of Code
WebScope4 Client	Original codes + 6500 lines
Jini-embedded MDSPlus Server	1000 lines
MetaScope	2600 lines
EScope12 Jini Client	Original codes + 500 lines

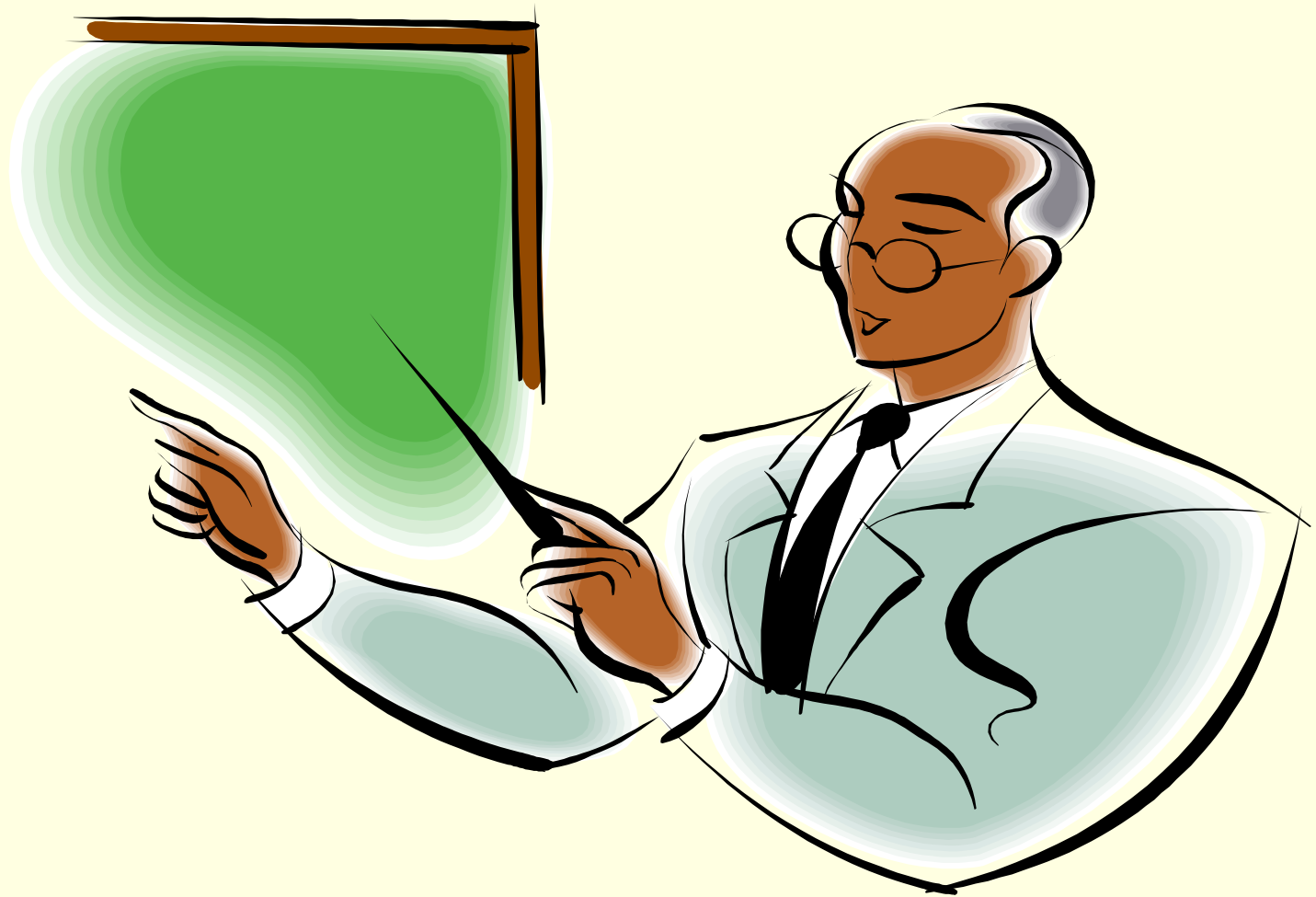
Contributions

- WebScope has been built up as a “System” instead of an “Application”
- The WebScope4 Data Grid has been completed
- The system will be deployed to real Nuclear Fusion Laboratories!

Acknowledgement

- **Dr. Henry Gardner**
- **Dr. Raju Karia**
- **Mr. Ajith M. Jose**
- **Mr. Ian Wood**

Demonstration



Q & A



Thank you!