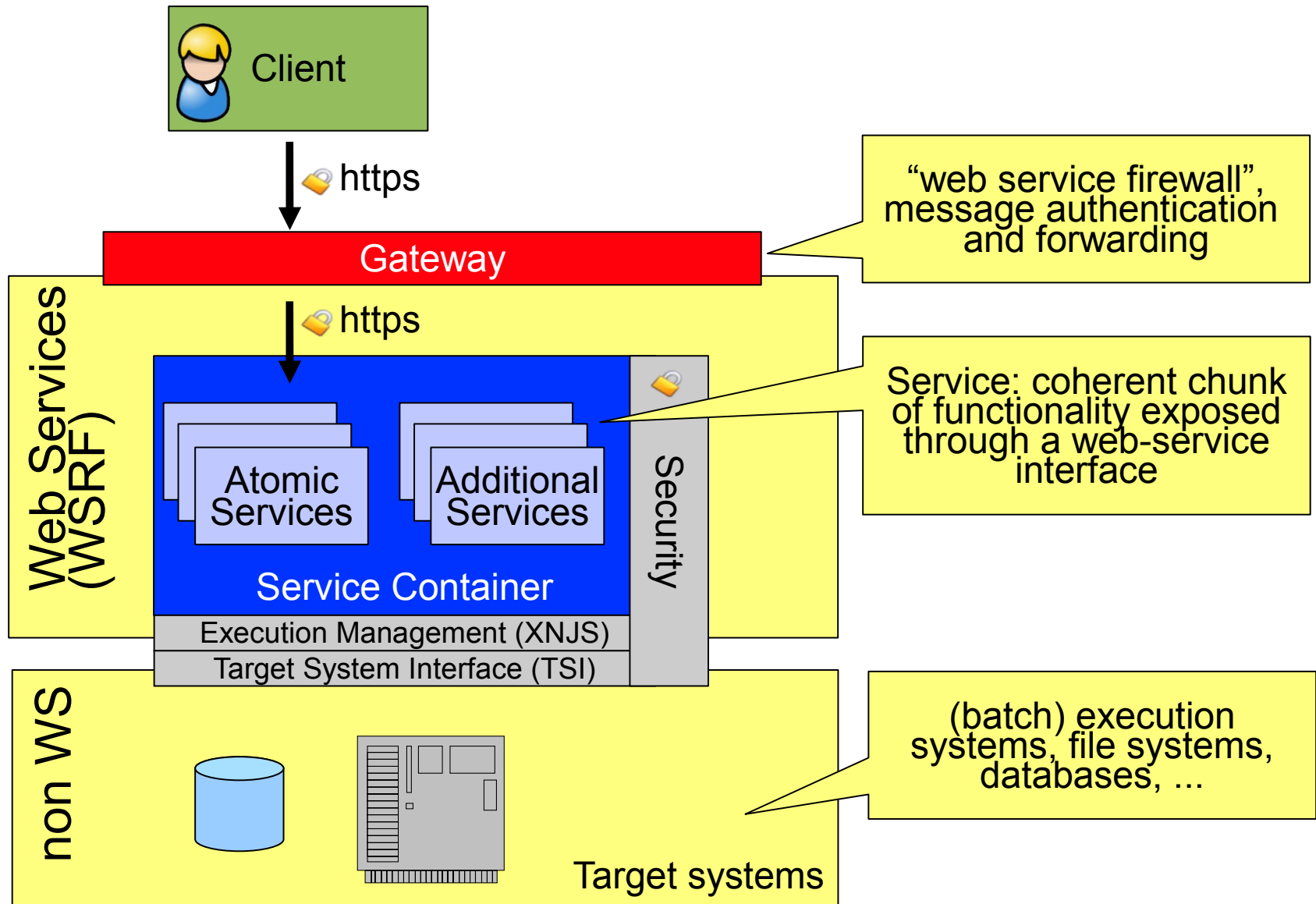


UNICORE Server Components - Detailed View

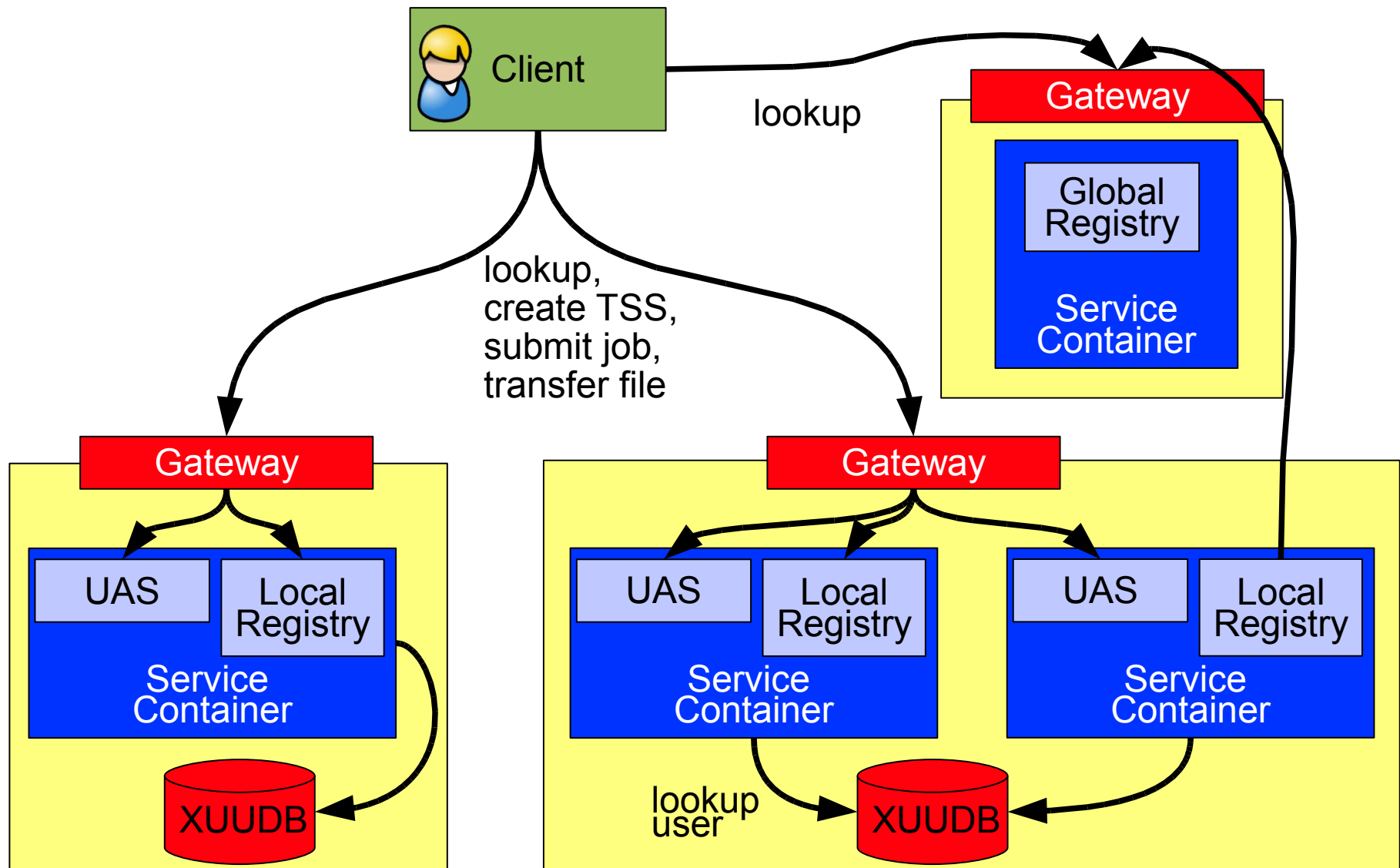
07/07/2009

Bastian Demuth
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Job Submission: Software Layers



Deployment Scenario: Workflow Services

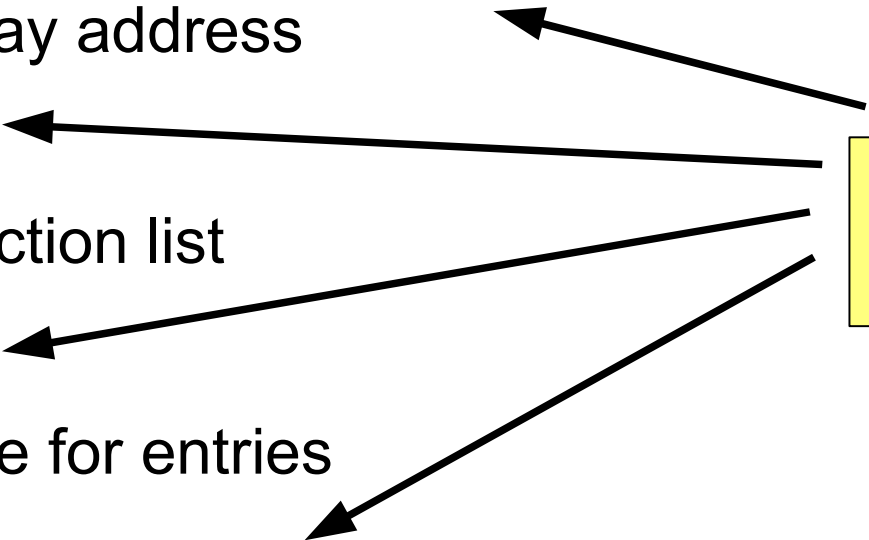


WSRF

- Web Services Resource Framework
- WS Resource
 - Stateful web service
 - Represented by an XML document
 - Resource properties
 - Standard methods: getter, setter, queries
 - Lifetime
- Service Group
 - List of WS addresses
 - Used for Registry
- WS-BaseFaults

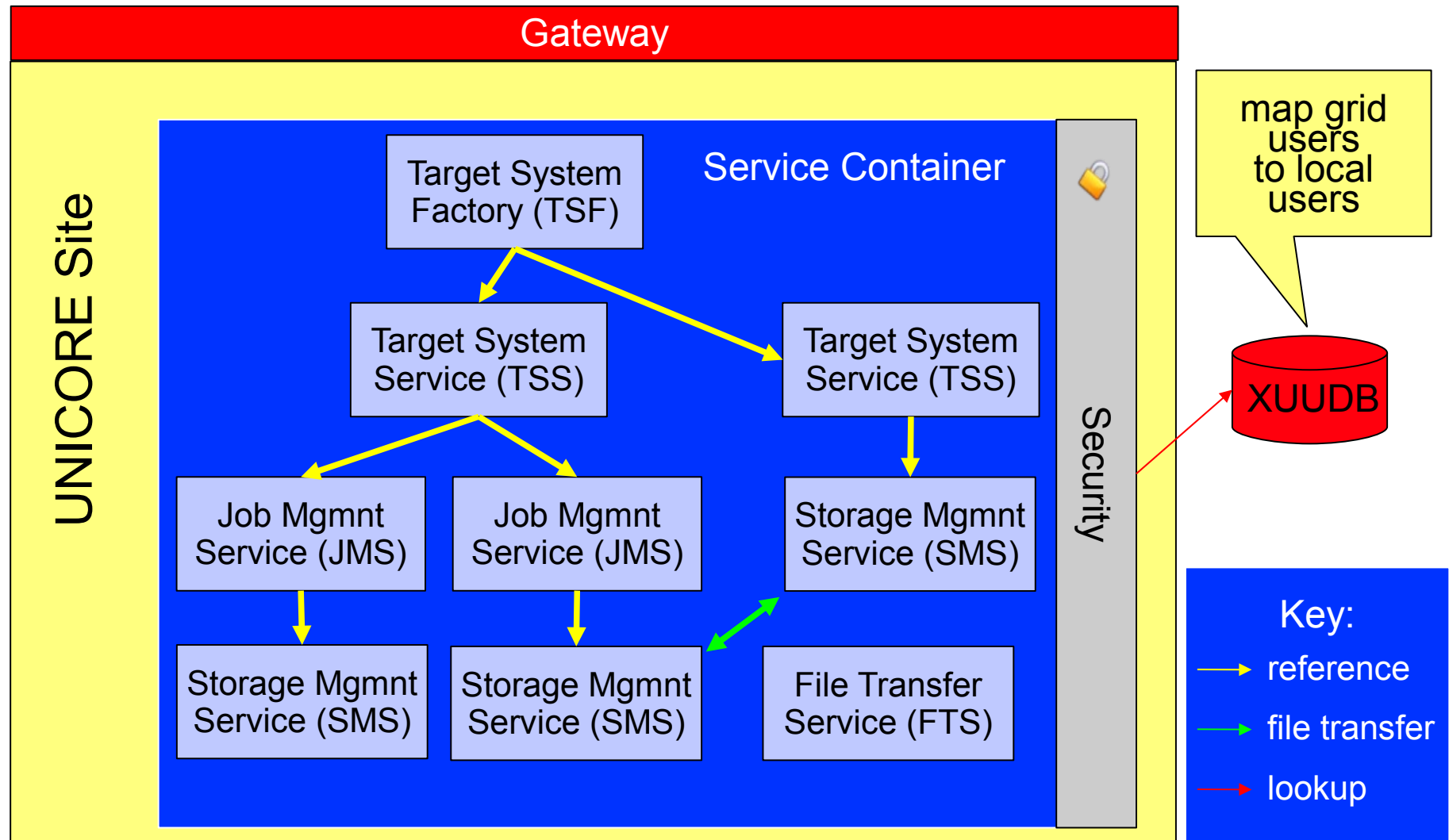
Configuration

- Service Container
 - Web Services to be deployed
 - Address of the shared Registry
 - XUADB address, “Grid Component ID“
 - Gateway address
- Gateway
 - Connection list
- Registry
 - Lifetime for entries
- Client
 - Registry Address

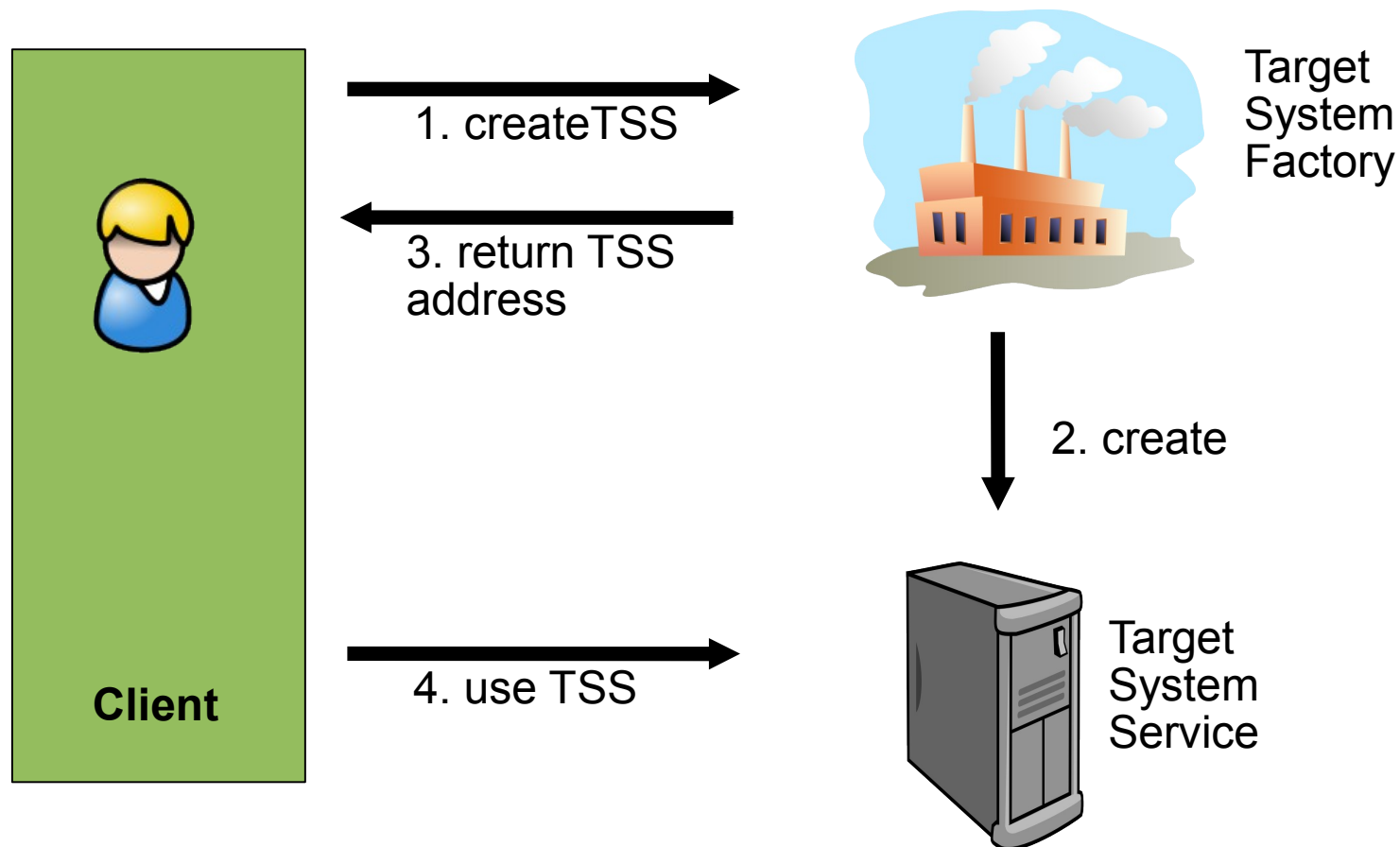


Everybody:
Security settings
(Keystore, certificate, ...)

UNICORE Atomic Services (UAS)



UAS: Target System Factory Service



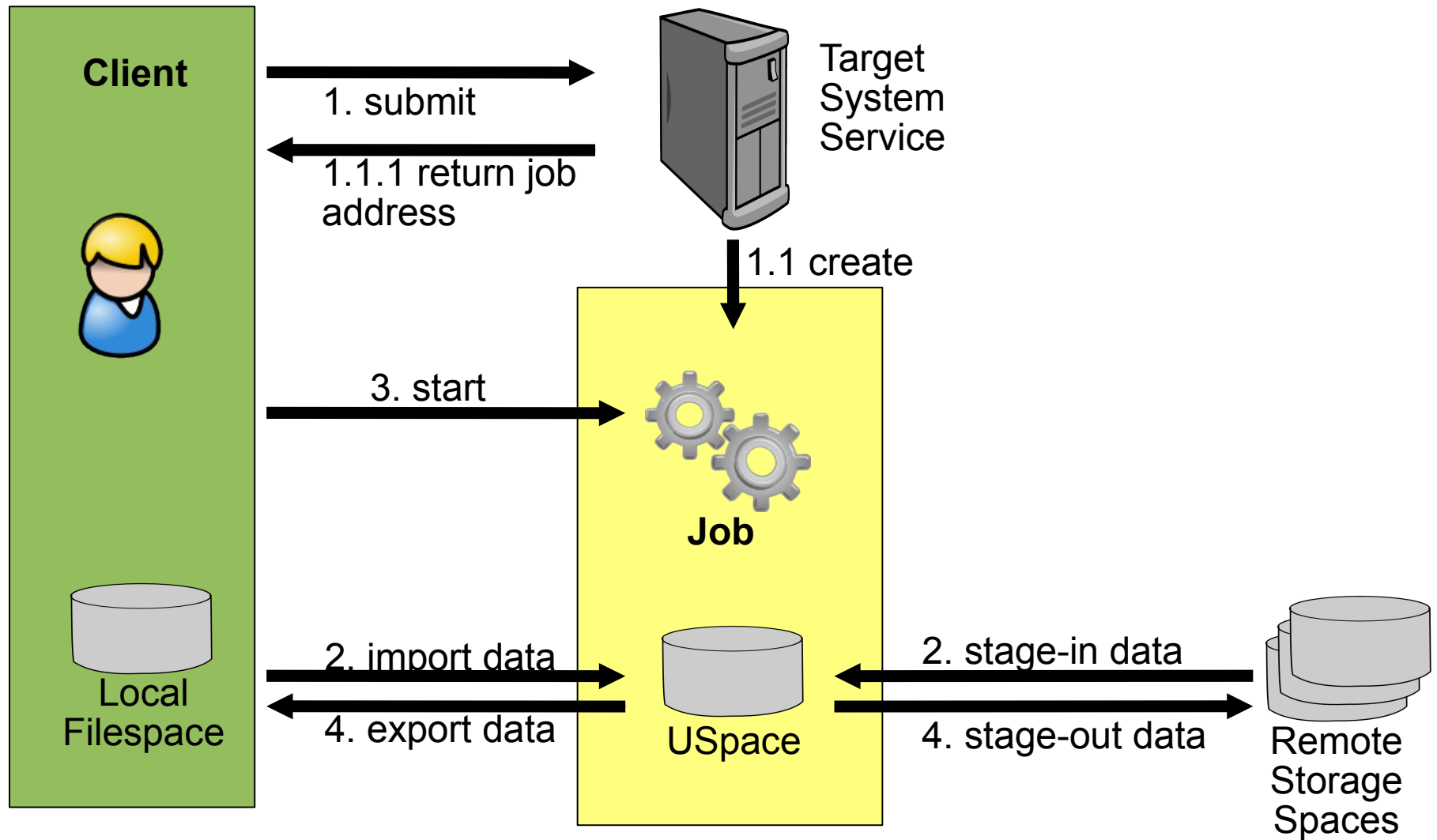
UAS: Target System Service

- Abstract web service interface to target system
 - List of applications
 - Links to jobs and storages (e.g. user home)
- Security
 - User authentication through XUADB
 - Authorization: Users' target system instances and jobs are protected by configurable XACML policy
 - Secure job submission through message signing
- Extensibility
 - Virtualization
 - Exclusive resource reservation

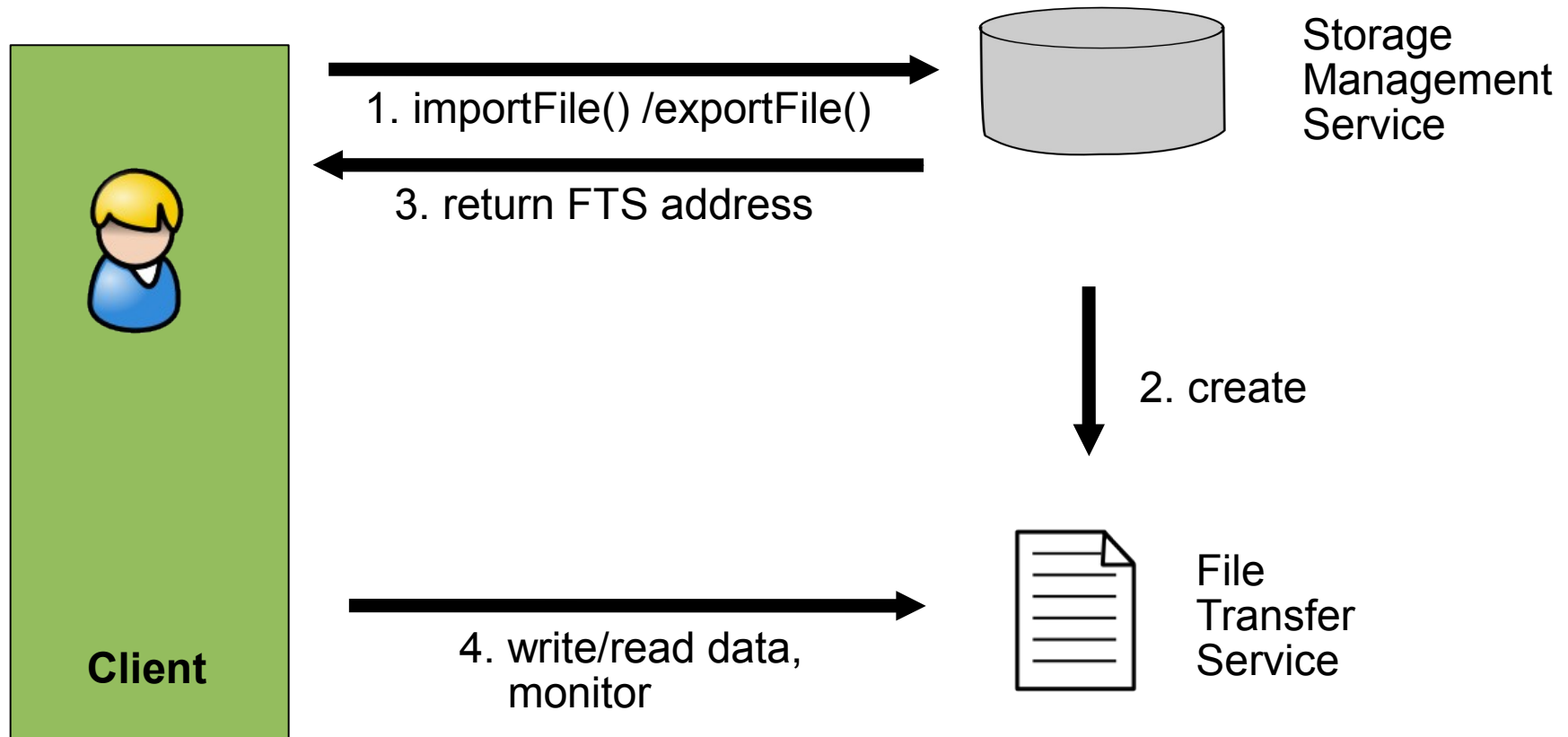
UAS: Job Management Service

- Abstract web service interface to submitted jobs
 - Jobs can be accessed and controlled from anywhere
- Job status (queued, running, finished, failed, ...)
- Link to storage that represents the working directory (uspace)
 - Used to securely access output files
- Detailed execution log, exit code of the application
- Applications are abstracted: path of executable invisible
- Provide a copy of the job description
 - Can be used for resubmission
- Have a lifetime (like all WS-Resources)
 - Used for automatic clean-up

UAS: Job Management and Storage Services



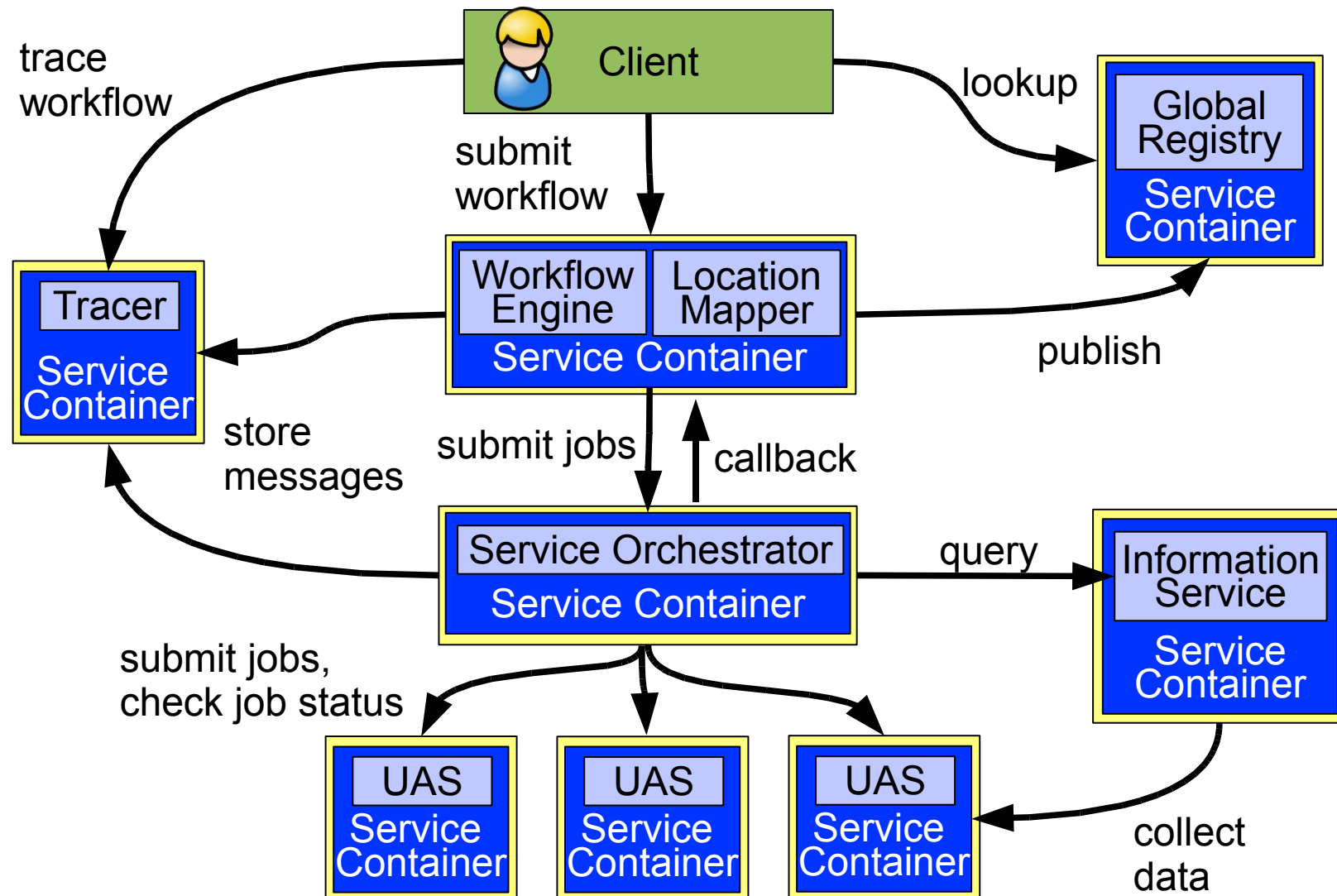
UAS: Storage and File Transfer Services



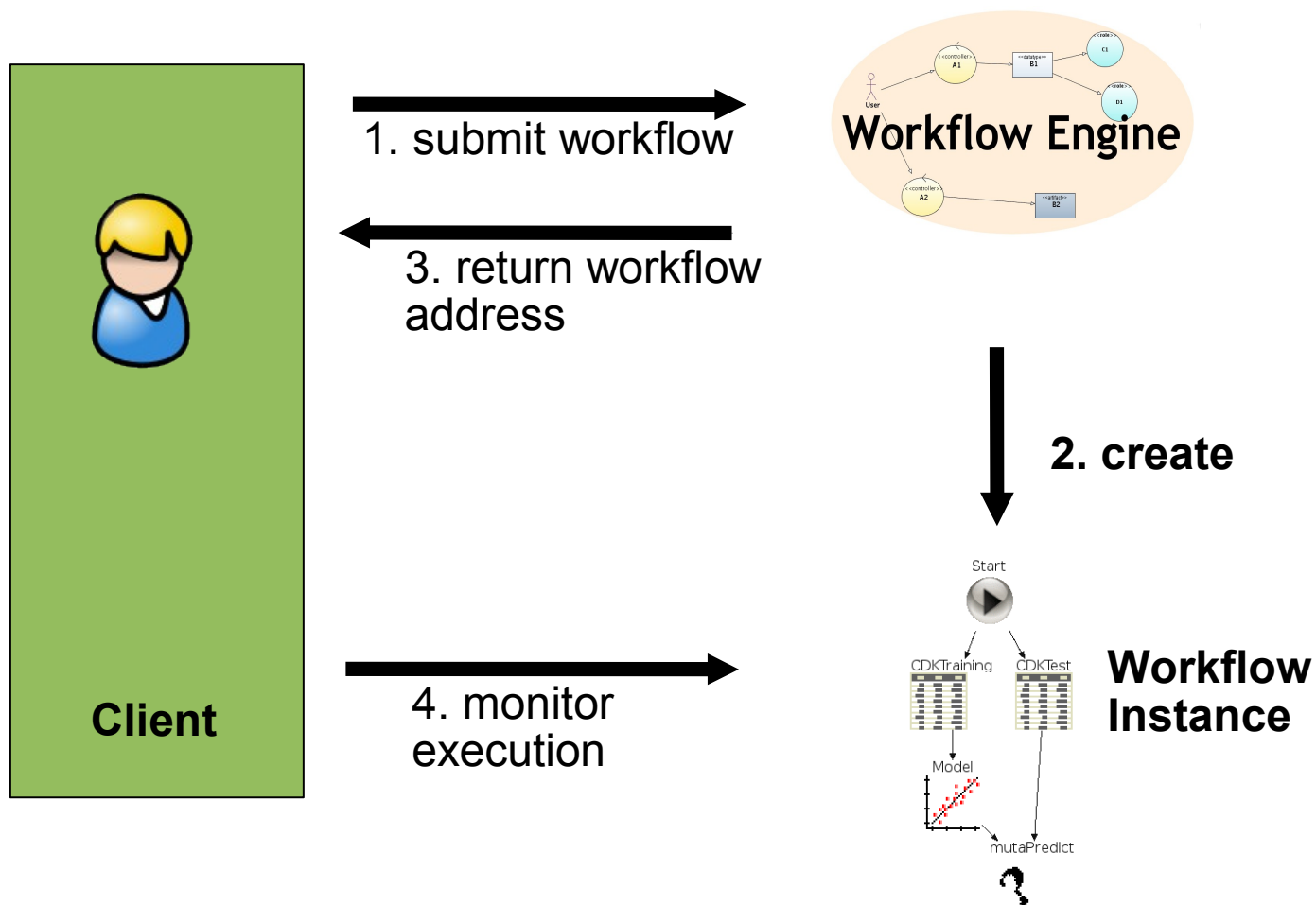
UAS: File Transfer Protocols

- Pluggable mechanisms
 - Both for client-server and server-server transfers
- Default mechanism: Simple OGSA ByteIO
 - Sends data as SOAP messages through the **full** stack
 - Needs no additional ports
 - No installation effort (pure Java)
 - Performance of ~400kB/sec
- Plain http: ~ 3MB/sec
- GridFTP: Speed depends on line & number of parallel TCP ports
 - Drawbacks: Lots of open ports, installation effort
- UDT: ~ 100MB/sec on 1Gbit/sec line, C++ Implementation

Deployment Scenario: Workflow Services



Workflow Engine

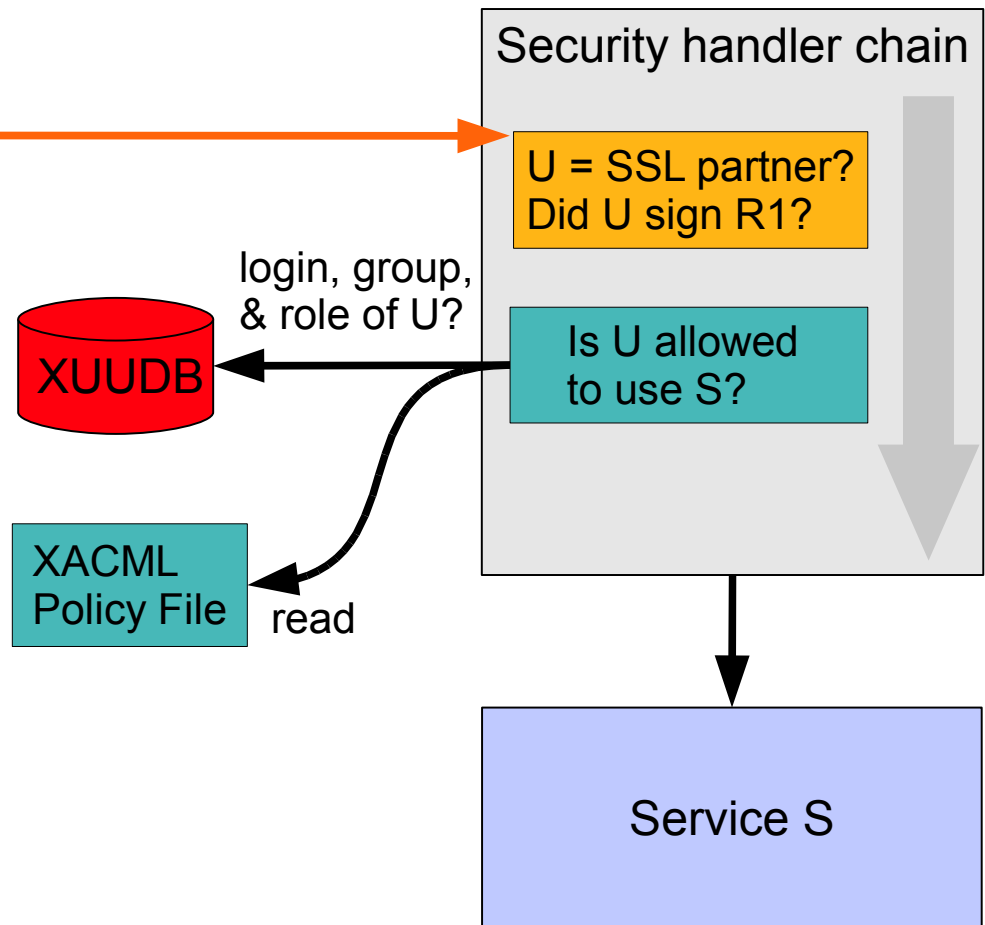
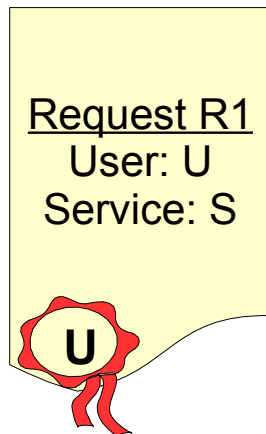


Configurable Security Handlers

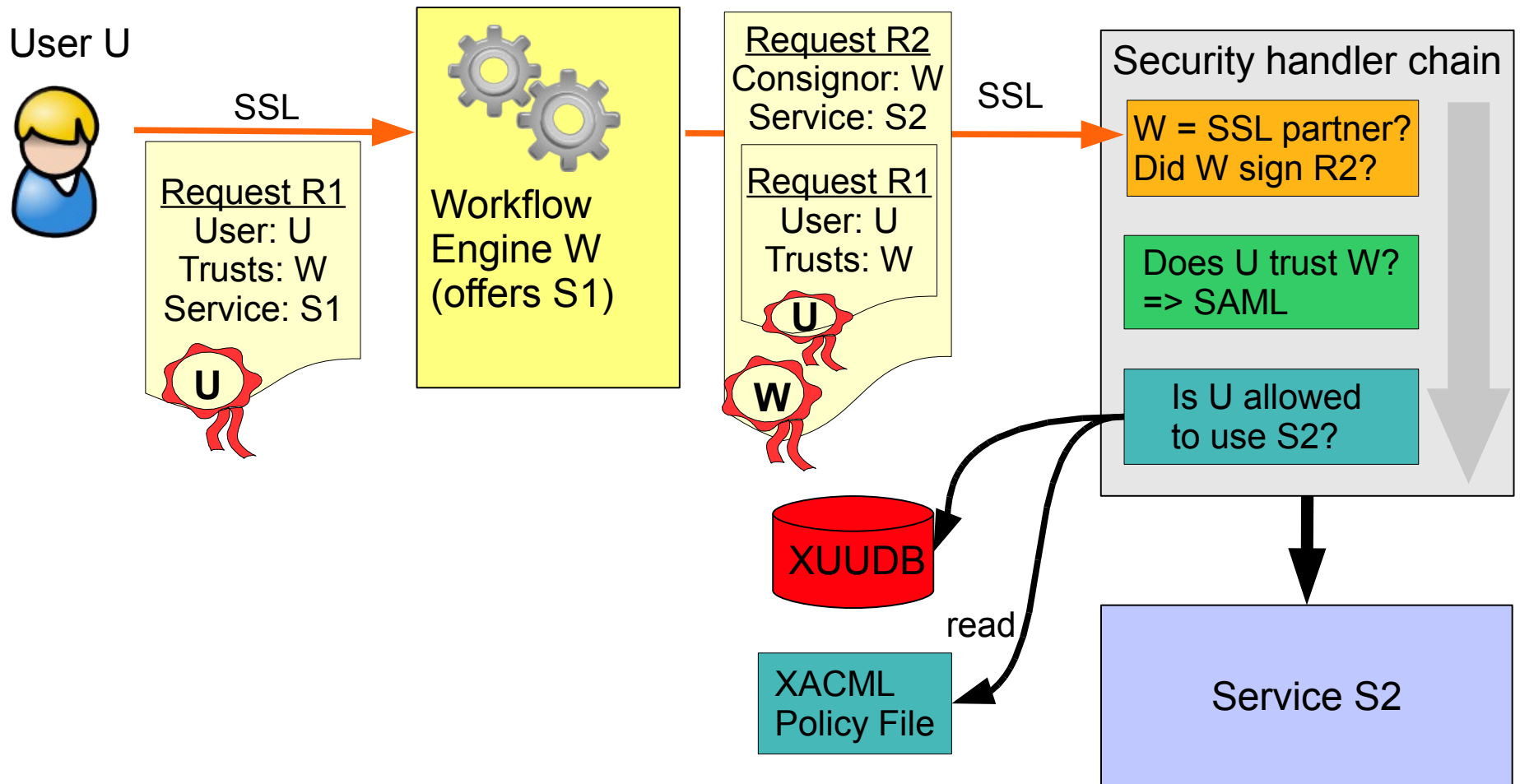
User U



SSL



Trust Delegation



UNICORE as a Web Service Hosting Environment

- Security
- Platform independence
- Lightweight and performing: Jetty, XFire
- High level programming APIs => Minimal effort
- Hot deployment of web services
- Transparent persistence layer using relational databases

Ongoing Development (Incomplete List!)

- European Projects
 - Smart LM: License management
 - Phosphorus: Meta-scheduling, network reservation
 - Etics: Tool for distributed builds on different platforms
- German Projects
 - D-Mon: Monitoring in the D-Grid
 - BIS-Grid: Business workflows using BPEL
 - WisNetGrid: Data Management
- Other Activities at the JSC
 - Information service (GLUE 2.0)
 - Purely Java based UDT implementation
 - Improved MPI support

Online Documentation

<http://www.unicore.eu>