

UNICORE

Version 6

<http://www.unicore.eu>

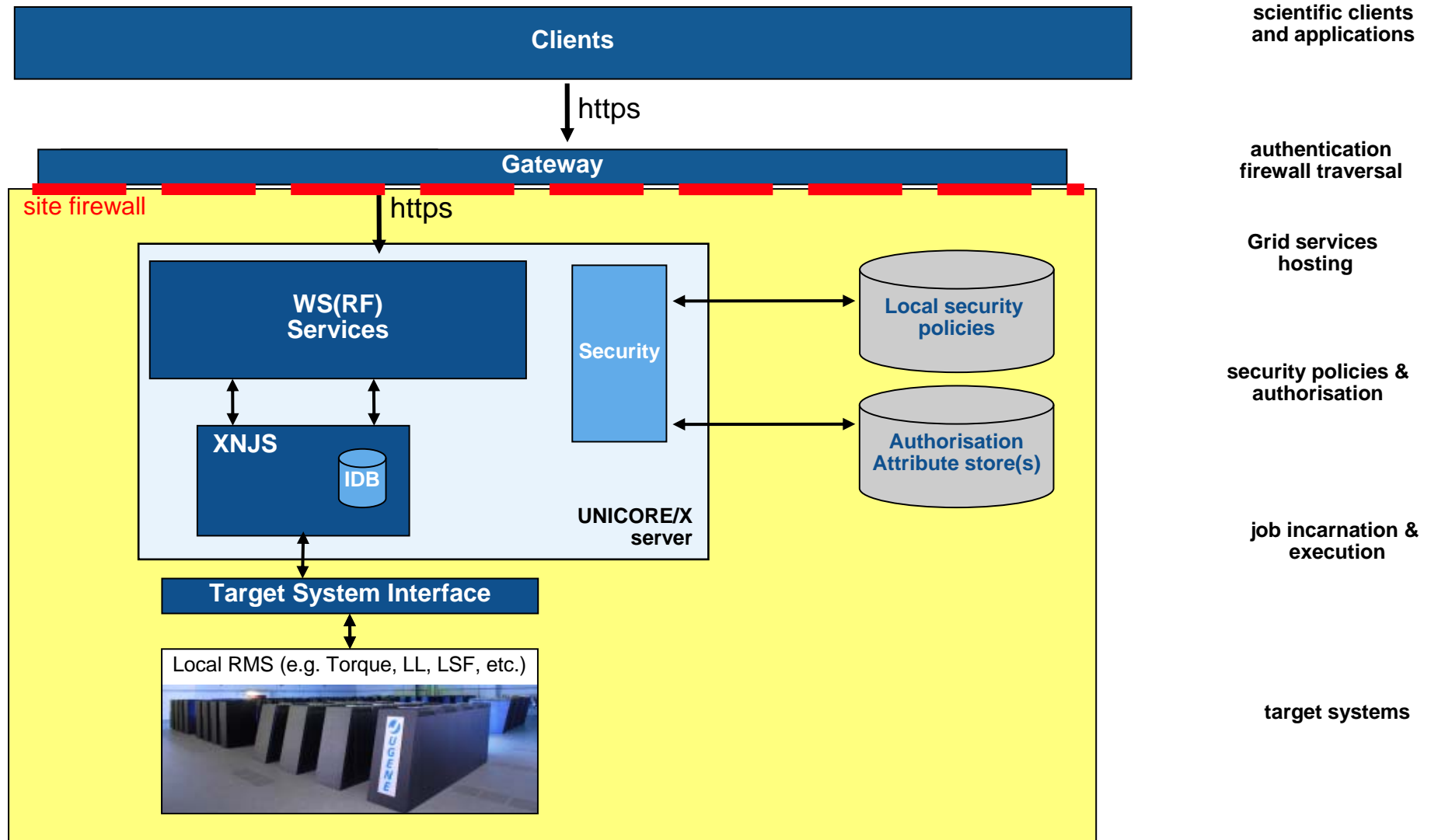
Outline

- Architecture overview
- Some feature highlights
- Outlook

Roadmap to the next release

- Roadmap and status
- Architecture overview
- Some feature highlights
- Comparison to UNICORE 5

UNICORE 6 architecture



UNICORE 6 „design principles“

- Integrated, complete stack
- Easy installation and configuration
- Excellent application support
- Workflows
- Graphical clients
- Command line client
- Support many operating and batch systems
 - Existing TSI installations can be re-used

Improvements over UNICORE 5

- Openness, extensibility, interoperability
 - Service-oriented
 - Web services foundation
 - Communications are no longer tied to the Java platform
 - Highly extensible core engine

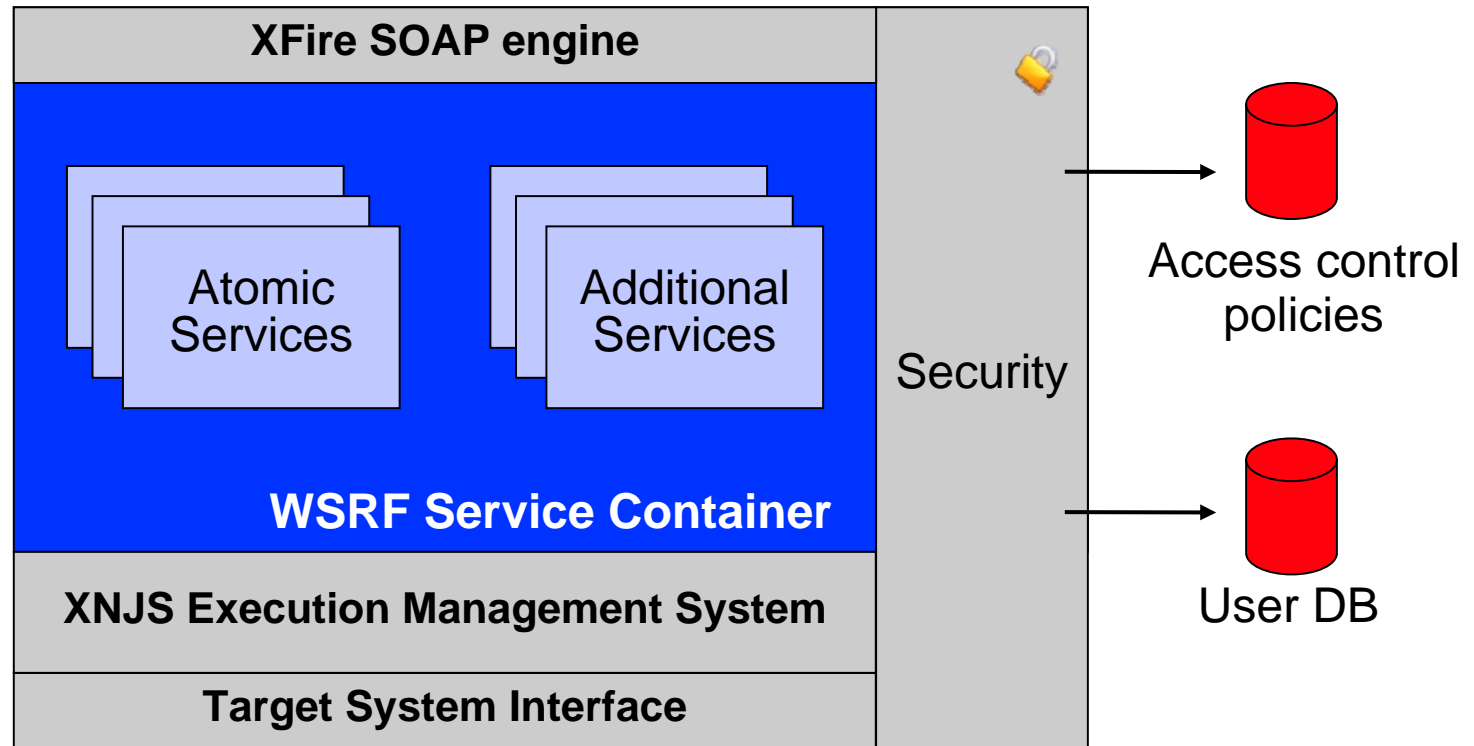
Improvements over UNICORE 5 (cont.)

- Performance and scalability
 - Fast default file transfer
 - Tested and proven scalability of core components
- State of the art software
 - Uses Java 5 features (generics, JMX)
 - Jetty 6, XFire, ...

Feature highlights

- Fast WSRF 1.2 hosting environment
- XNJS: scalable and extensible execution engine
- Plugable file transfers
- Java management extensions (JMX) support
- GPE: flexible client framework
- Simple, lightweight installation

Detailed view: VSite



Base Services

- UNICORE Atomic Services
 - Target system creation
 - Job submission and job management
 - File system access
 - File import/export control
- Registry
 - Publish services (address, service description)
 - Shareable between sites
 - Single point of entry for clients

Base Services (cont.)

- State of the art web services tools:
 - XFire, XmlBeans, Jetty
- Specifications
 - WSRF (version 1.2 final)
 - WS ServiceGroup
 - WS BaseNotification
 - WS-I „plain“ web services
- Characteristics:
 - High performance
 - Ease of configuration
 - Developer friendly, embeddable, flexible

XNJS execution engine

- Execution management system
 - Submit and manage jobs
 - Control file transfers
- JSDL 1.0 support
- UNICORE concepts
 - TSI, USpace, abstraction, incarnation
- Scalable and fast
- Extensible
 - Logging, tracing, monitoring
 - Notifications
 - Third-party system integration

Security

- Web service layer
 - Extract security info from message
 - Currently X.509 certificates for user, endorser, consignor
 - Lookup security attributes („XUUDB“)
 - xlogin, role, projects, ...
 - Authorise request
 - Which service, which method
 - Decision based on XACML 1.0 policy
 - Optional: SAML-VOMS
- XNJS uses xlogin to perform work
- All components are pluggable

File transfer

- Plugable mechanisms
 - Both for client-server and server-server transfers
 - Default mechanism: OGSA Bytelo
 - Sends data as SOAP messages
 - Single port, full stack (Gateway, SSL connections)
 - Performance of ~400kB/sec
 - BFT transfer (HTTP based)
 - single port, full stack
 - Performance of ~9Mb/sec
 - ~18Mb/sec when bypassing the gateway
- Plus: room for improvements
 - Parallel HTTP, TCP/IP, UDP, GridFTP...

Monitoring and managing a VSite

- Java management extensions (JMX) support

The image displays two overlapping screenshots of the J2SE 5.0 Monitoring & Management Console. The left window shows the 'Summary' tab with the following data:

Summary	
Uptime:	2 hours 4 minutes
Total compile time:	28,791 seconds
Threads	
Live Threads:	44
Daemon threads:	12
Memory	
Current heap size:	42,946 kbytes
Maximum heap size:	126,272 kbytes
Objects pending for finalization:	0
Garbage collector:	Name = 'PS MarkSweep'
Garbage collector:	Name = 'PS Scavenge'
Classes	
Current classes loaded:	4,726
Total classes loaded:	4,766
Operating System	
Total physical memory:	2,074,580 kbytes
Committed virtual memory:	397,088 kbytes

The right window shows the 'MBeans' tree with 'Service<FileTransferRBYTEIO>' selected. The 'Attributes' tab is active, showing the following data:

Name	Value
InstanceCount	9
ServerTime	Mittwoch, 18. April 2007 19:35 U...

Installation: server bundle

IZPACK - Installation of UNICORE_Quickstart

Select the packs you want to install:
Note: greyed out packs are required.

<input checked="" type="checkbox"/>	Base	56,96 KB
<input checked="" type="checkbox"/>	UNICORE/X	20,05 MB
<input checked="" type="checkbox"/>	Gateway	12,22 MB
<input checked="" type="checkbox"/>	XUADB	8,4 MB
<input checked="" type="checkbox"/>	TSI	793,06 KB
<input checked="" type="checkbox"/>	Doc	13,4 KB

Description
The UNICORE 6 Gateway acts as a web-services firewall for a set of UNICORE/X servers.

Total space Required: 41,51 MB
Available space: 10,84 GB

(Made with IZPack - <http://www.izforge.com/>)

Previous Next Quit

Installation: configuration dialog

IZPACK - Installation of UNICORE_Quickstart

Please check the settings for the server host and port values and edit them to fit your wishes.

Please enter the host and port where the gateway will be running.

Gateway Host:

Gateway Port:

Please enter information about the UNICORE/X server.

Server Host:

Server Port:

Vsite Name:

Please enter the host and port where the XUADB server that will be used.

XUADB Host:

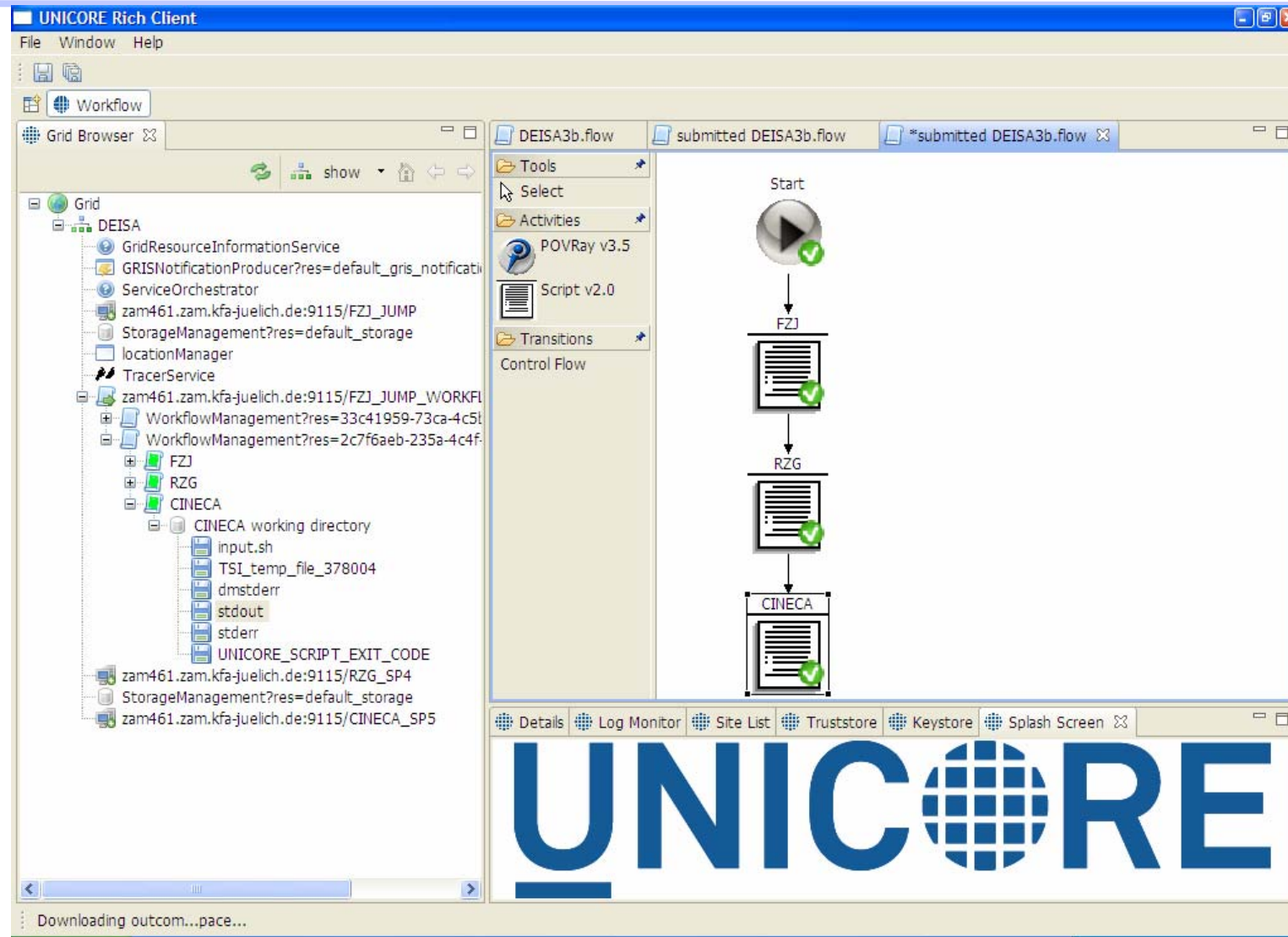
XUADB Port:

(Made with IZPack - <http://www.izforge.com/>)

Clients

- GUI Clients
 - Eclipse client
 - Workflows
 - Highly flexible and extensible
 - Application client
 - Single application
- Command line client (UCC)
- Grid APIs
 - HiLA (available today)
 - GAT/SAGA (future)
- Web-based clients

Rich Client based on Eclipse

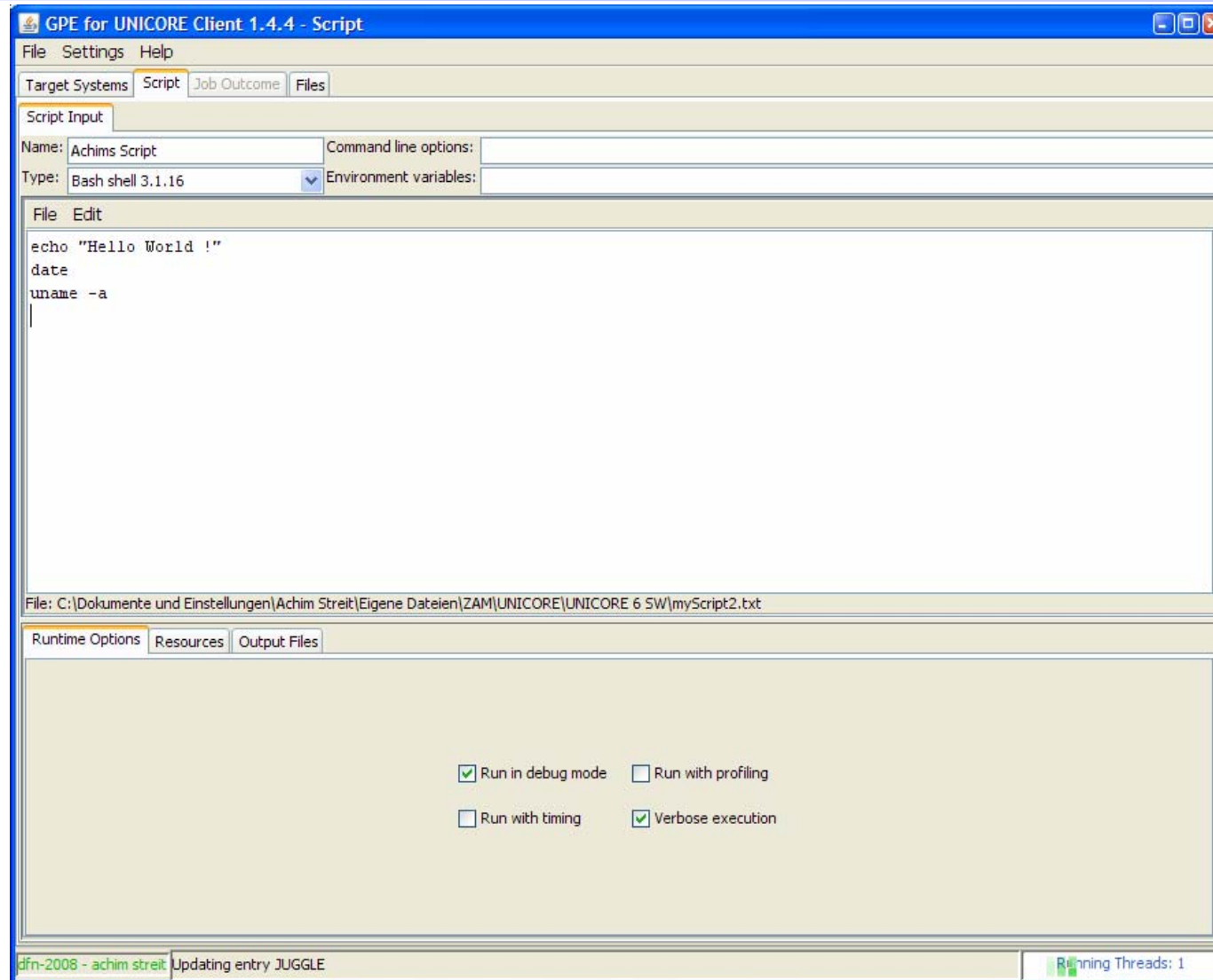


GPE Application Client

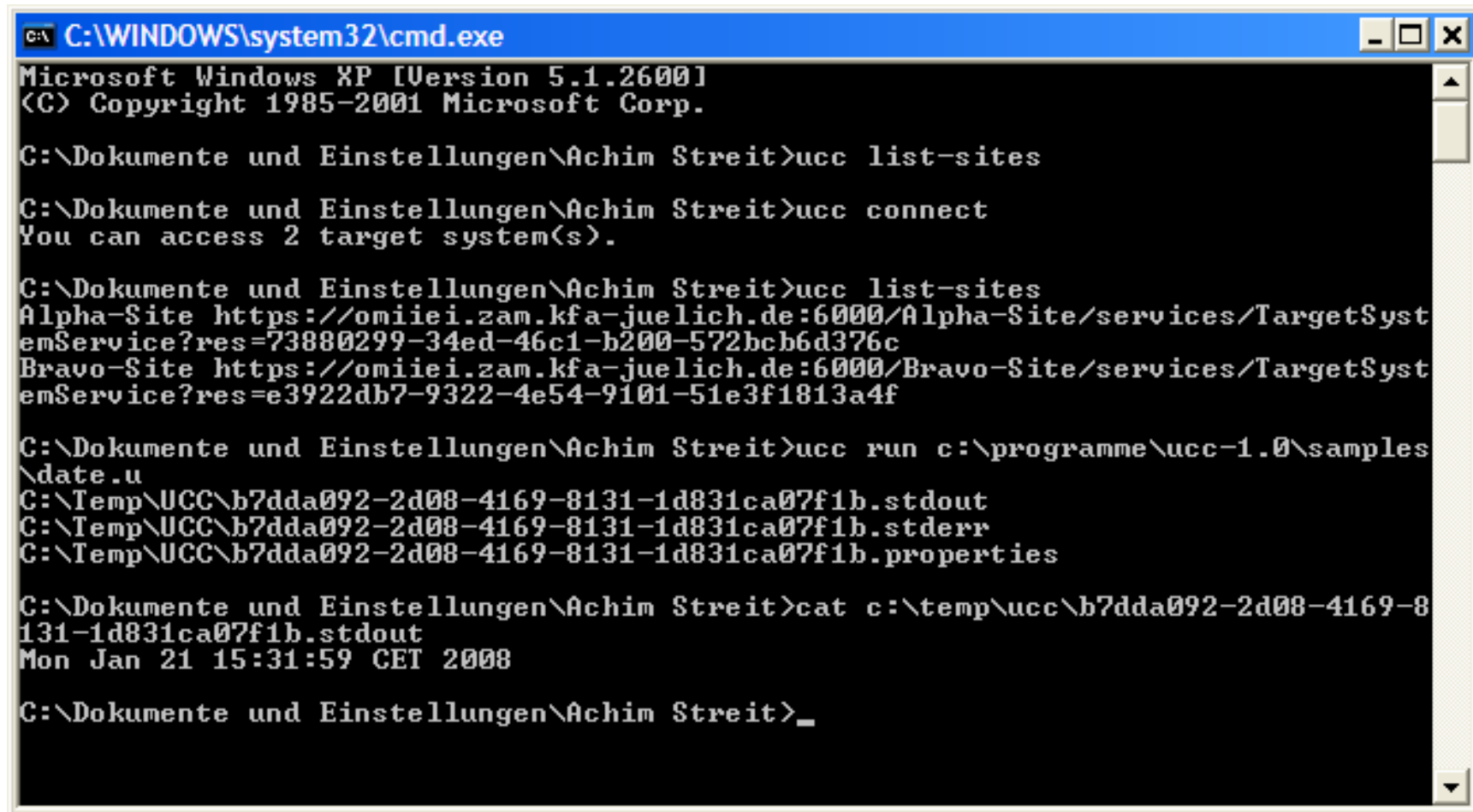
The screenshot shows the 'GPE for UNICORE Client 1.4.4 - Script' application window. It features a menu bar with 'File', 'Settings', and 'Help'. Below the menu bar are tabs for 'Target Systems', 'Script', 'Job Outcome', and 'Files'. The 'Script' tab is active, displaying a table of job results. On the left side, there are two tree views: 'Registries' containing 'GROW - OMII-Europe EI' and 'JUGGLE - D-MON', and 'Target Systems' containing 'JUGGLE'. The 'JUGGLE - D-MON' registry is selected. The table below shows two jobs: 'Achims Script' with application 'Bash shell-3.1.16', one 'SUCCESSFUL' and one 'RUNNING'. The status 'SUCCESSFUL' is in green, and 'RUNNING' is in blue. The UNICORE logo is at the bottom left, and a status bar at the bottom shows 'dfn-2008 - achim.streit Getting jobs from JUGGLE finished' and 'Running Threads: 0'.

Job Name	Application	State	Submission Time
Achims Script	Bash shell-3.1.16	SUCCESSFUL	21.01.2008 13:41:51
Achims Script	Bash shell-3.1.16	RUNNING	21.01.2008 13:42:09

Script GridBean – Options Panels



UCC – Commandline Client



```
C:\WINDOWS\system32\cmd.exe
Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.

C:\Dokumente und Einstellungen\Achim Streit>ucc list-sites

C:\Dokumente und Einstellungen\Achim Streit>ucc connect
You can access 2 target system(s).

C:\Dokumente und Einstellungen\Achim Streit>ucc list-sites
Alpha-Site https://omiiei.zam.kfa-juelich.de:6000/Alpha-Site/services/TargetSystemService?res=73880299-34ed-46c1-b200-572bcb6d376c
Bravo-Site https://omiiei.zam.kfa-juelich.de:6000/Bravo-Site/services/TargetSystemService?res=e3922db7-9322-4e54-9101-51e3f1813a4f

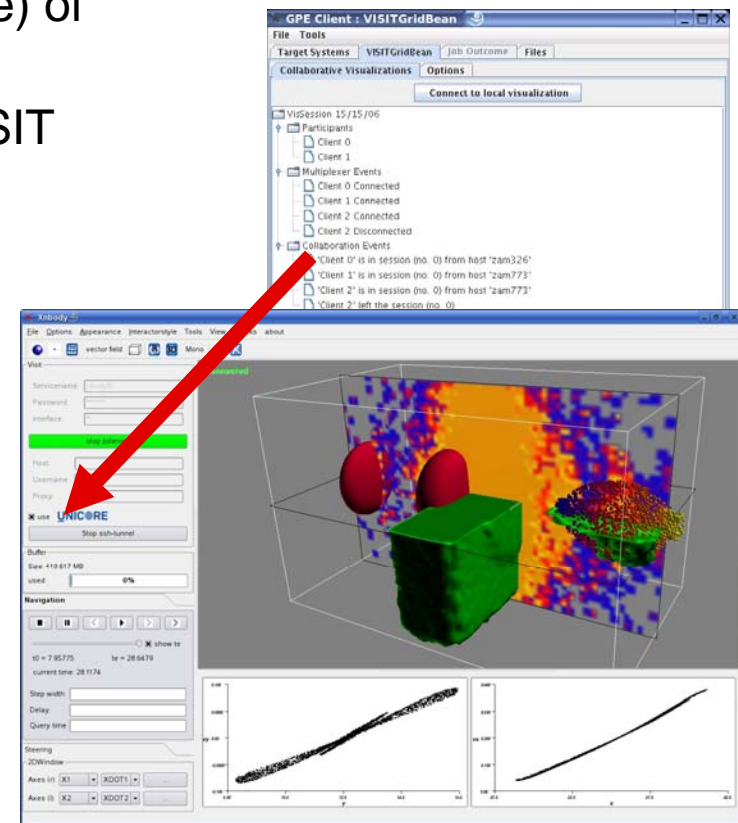
C:\Dokumente und Einstellungen\Achim Streit>ucc run c:\programme\ucc-1.0\samples\date.u
C:\Temp\UCC\b7dda092-2d08-4169-8131-1d831ca07f1b.stdout
C:\Temp\UCC\b7dda092-2d08-4169-8131-1d831ca07f1b.stderr
C:\Temp\UCC\b7dda092-2d08-4169-8131-1d831ca07f1b.properties

C:\Dokumente und Einstellungen\Achim Streit>cat c:\temp\ucc\b7dda092-2d08-4169-8131-1d831ca07f1b.stdout
Mon Jan 21 15:31:59 CET 2008

C:\Dokumente und Einstellungen\Achim Streit>_
```

Use case: visualisation and steering

- Collaborative Online Visualization and Steering
 - A framework for scientific simulations and visualizations
 - In addition to usual post-processing (offline) techniques
 - Enables to view the actual status (online) of parallel simulations
 - Based on the communication library VISIT
 - Works with all VISIT-enabled scientific visualizations
 - Implemented as an additional UNICORE service
 - Collaboration server + multiplexer for geographically dispersed clients
 - Usage of UNICORE security infrastructure for single sign-on
 - Successfully demonstrated at Europar'07, SC'07, OGF 22, ...



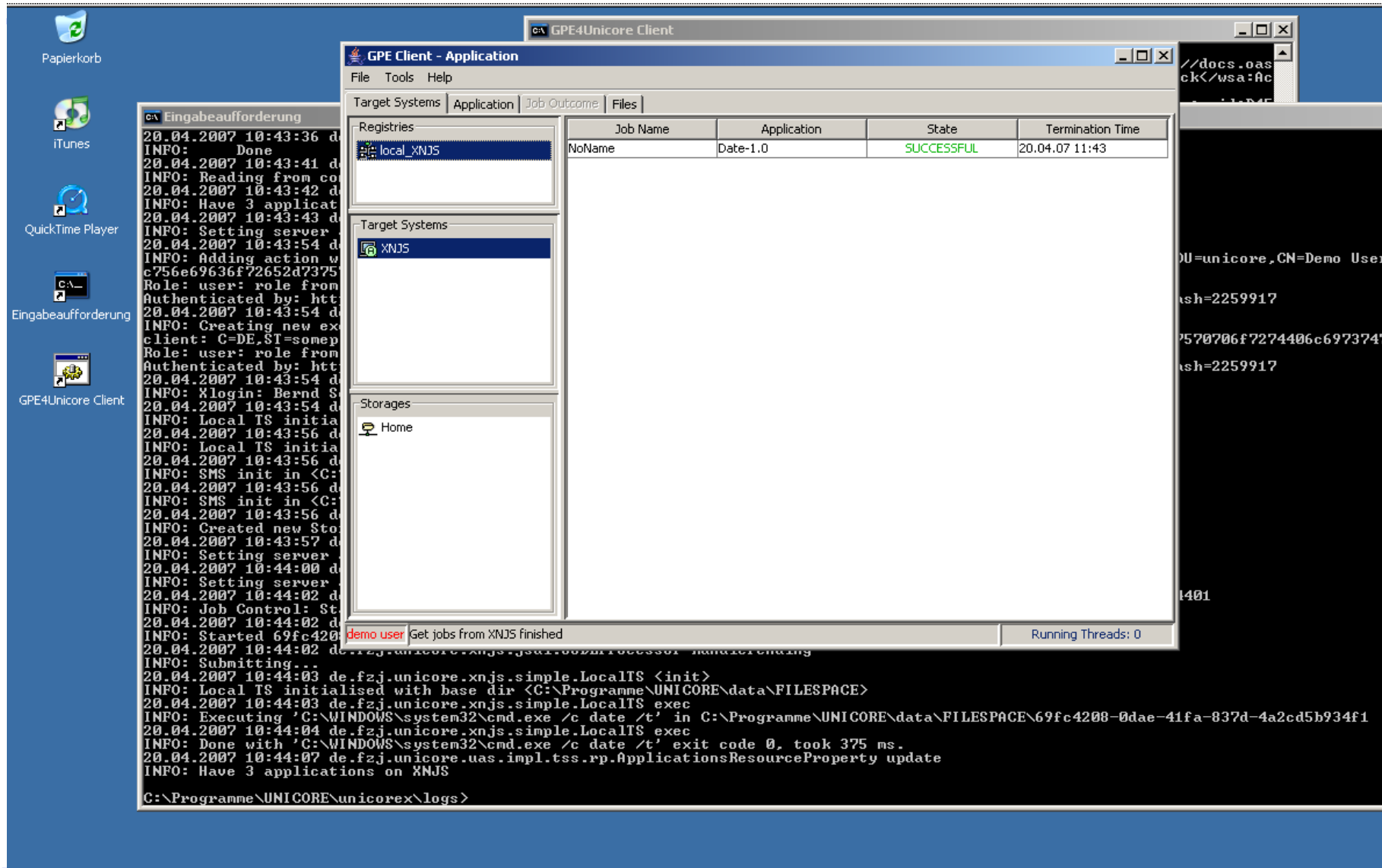
UNICORE 6 status

- Stable release 6.1 from March 20, 2008
- Core Features:
 - Basic services (incl. OGSA-BES)
 - Security infrastructure (trust delegation, message signing, SAML-VOMS support)
 - OGSA BytelO and http based file transfer
 - First release of workflow system
 - First release of Eclipse client
- Add-on features
 - UVOS virtual organisation management service

Outlook to the next release

- UNICORE 6.2, estimated mid 2008
- New features
 - Enhanced workflow (conditions, loops, ...)
 - Enhanced Eclipse client
 - Security (proxy certificates, fine grained access control on storages)
 - UDT high performance file transfer
- Add-ons
 - CIS Information service
- ... and much more

... and it even works on Windows



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- Join the developer community ...
 - Find software, source code, documentation, tutorials, mailing lists, community links, and more ...

... at <http://www.unicore.eu>