

# UNICORE in Production is easy to do

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T-Systems

Solutions for Research GmbH

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# UNICORE in Production

Easy to use

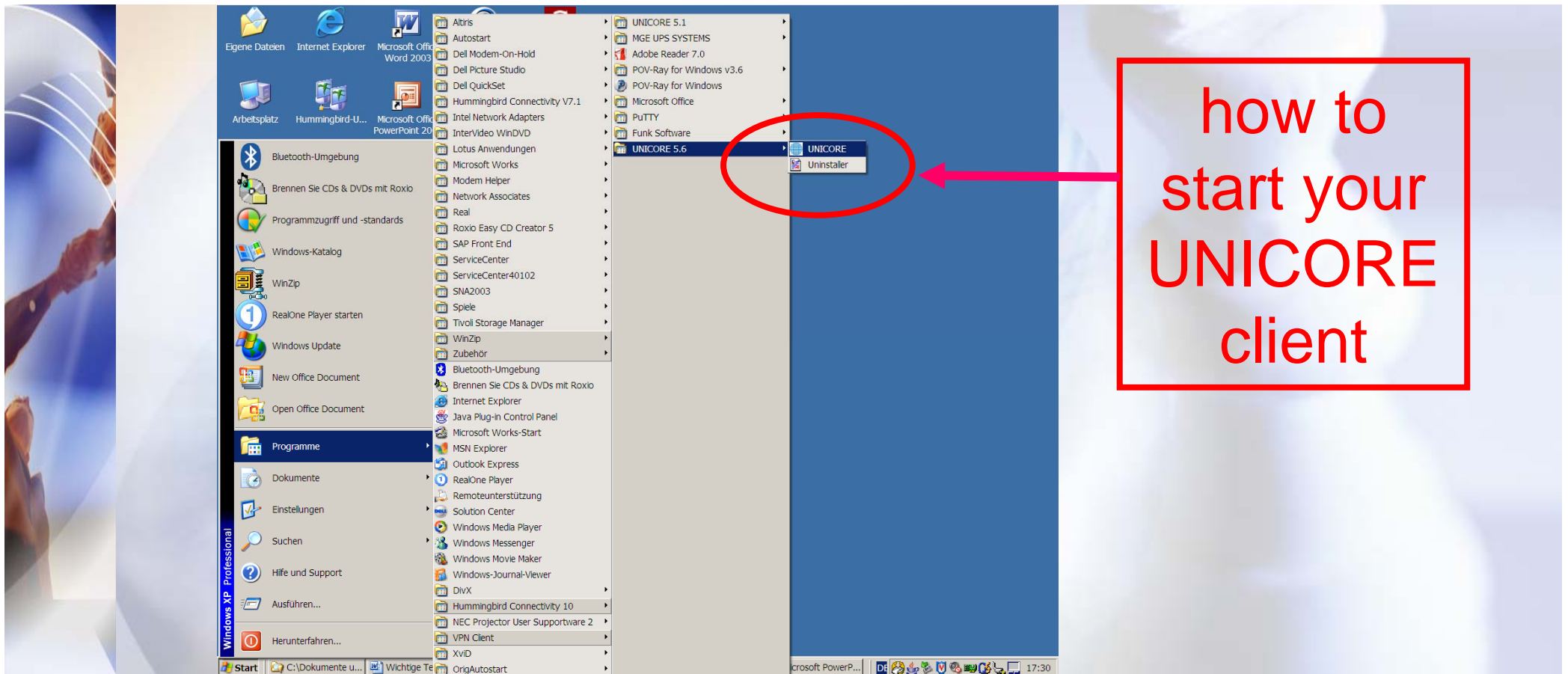


**ALL YOU NEED TO KNOW IS**

just ...

# UNICORE in Production

Easy to use



# UNICORE in Production

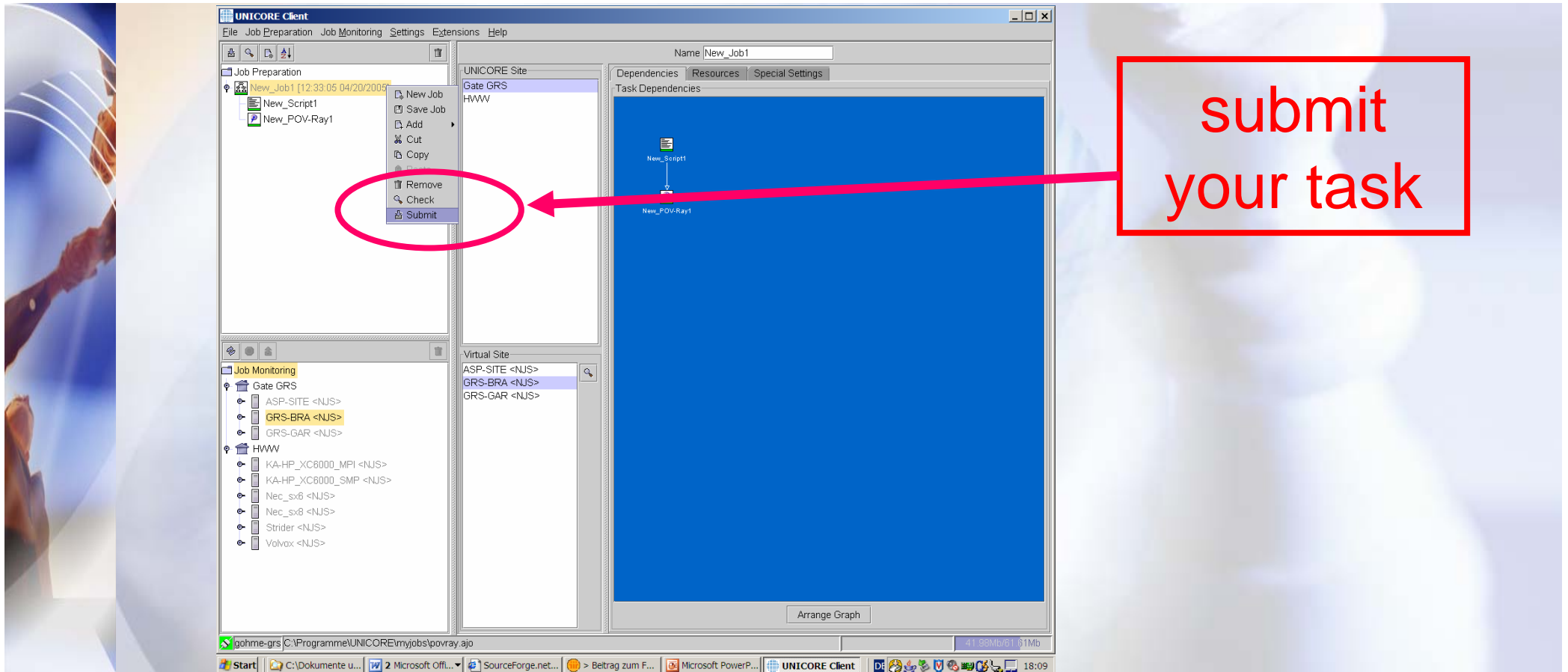
Easy to use

The screenshot shows the UNICORE Client software interface. The main window is titled "UNICORE Client" and has a menu bar with "File", "Job Preparation", "Job Monitoring", "Settings", "Extensions", and "Help". The "Job Preparation" tab is active, showing a tree view of jobs. A context menu is open over the "New\_Job1" job, with options: "New Job", "Save Job", "Add", "Cut", "Copy", "Paste", "Remove", "Check", and "Submit". The "New Job" option is highlighted. The "Task Dependencies" pane shows a graph with two nodes: "New\_Script1" and "New\_POV-Ray1", with an arrow pointing from "New\_Script1" to "New\_POV-Ray1". The "Virtual Site" pane shows a list of sites: "ASP-SITE <NJS>", "GRS-BRA <NJS>", and "GRS-GAR <NJS>". The "GRS-BRA <NJS>" site is selected. The status bar at the bottom shows the current directory as "C:\Programme\UNICORE\myjobs\povray ajo" and the time as "18:10".

describe  
your  
problem

# UNICORE in Production

Easy to use



The screenshot displays the UNICORE Client application window. The 'Job Preparation' pane on the left shows a tree view with 'New\_Job1' selected, containing 'New\_Script1' and 'New\_POV-Ray1'. A context menu is open over 'New\_Script1', with the 'Submit' option highlighted and circled in red. The 'Task Dependencies' pane on the right shows a dependency graph with 'New\_Script1' as a parent task and 'New\_POV-Ray1' as a child task. A red box on the right contains the text 'submit your task', with a red arrow pointing to the 'Submit' button in the context menu. The 'Virtual Site' pane at the bottom lists various sites like 'Gate GRS', 'ASP-SITE <NJS>', 'GRS-BRA <NJS>', and 'GRS-GAR <NJS>'. The taskbar at the bottom shows the Windows Start button and several open applications, including 'Microsoft Office Word' and 'Microsoft PowerPoint'.

# UNICORE in Production

Easy to use

The screenshot displays the UNICORE Client application window. The interface is divided into several sections:

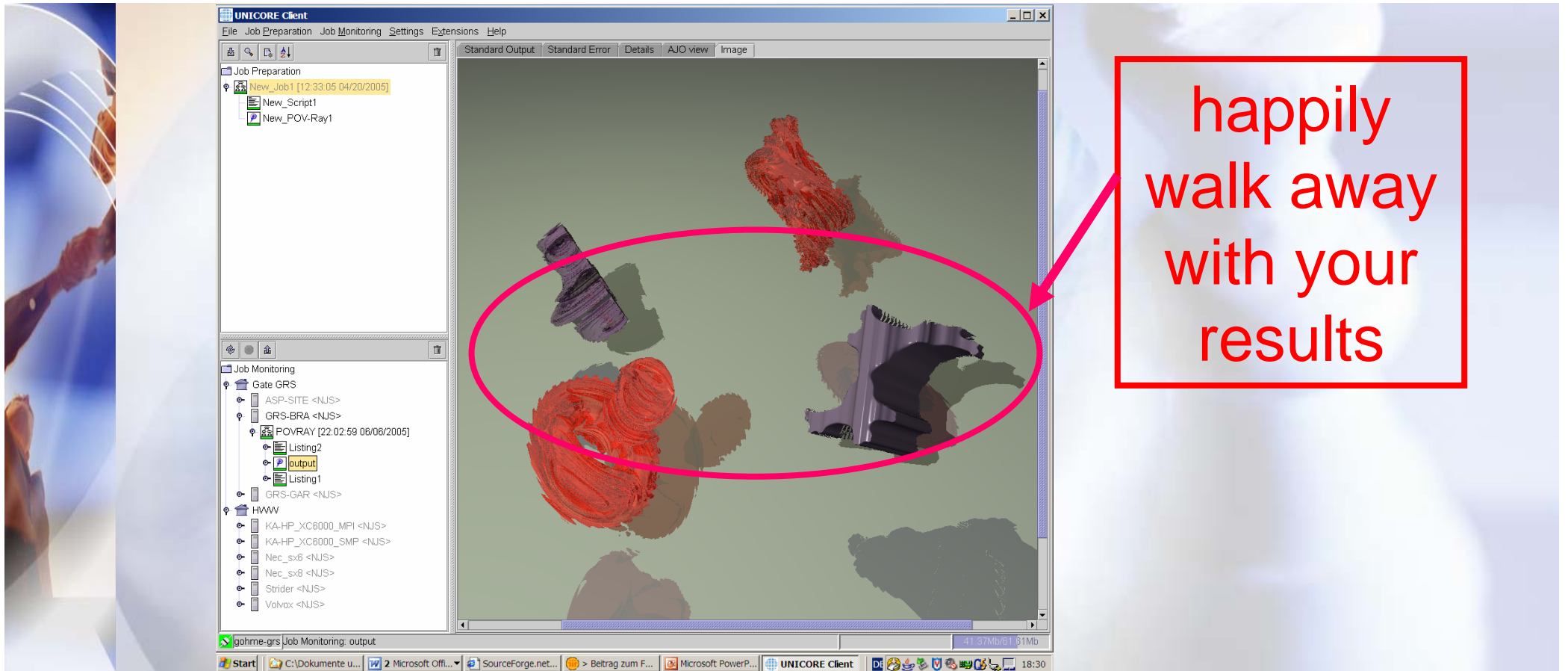
- Job Preparation:** Shows a tree view with a selected job 'New\_Job1 [12:33:05 04/20/2005]' containing 'New\_Script1' and 'New\_POV-Ray1'.
- Job Monitoring:** Shows a tree view with various job categories like 'Gate GRS', 'ASP-SITE <NJS>', 'GRS-BRA <NJS>', 'POVRAY', 'GRS-GR...', 'HWW', 'KA-HP\_X', 'Nec\_sx8', 'Strider <', and 'Valvox <'. A context menu is open over the 'POVRAY' job, with the 'Fetch Output' option highlighted. A red circle is drawn around this menu.
- Log View:** The main pane shows a log of system events. The top section is for 'Task Listing1\_INCARNATEFILES\_1118088179409\_767' and the bottom section is for 'Task Listing1\_MAKEPORTFOLIO\_1118088179409\_768'. The logs show the progression from 'Arrived at GRS-BRA' to 'SUCCESSFUL'.

A red arrow points from a red-bordered box containing the text 'fetch your output' to the 'Fetch Output' option in the context menu.

fetch your output

# UNICORE in Production

Easy to use



happily  
walk away  
with your  
results

# UNICORE in Production

Easy to use

Thanks for listening to all of You,  
which share the **view of our customers** 😊

**UNICORE is such as easy to use !**



# UNICORE in Production

## Easy to do: What next?

- UNICORE is easy to use (we have just seen)
- UNICORE is easy to understand
- UNICORE is easy to install
- UNICORE is easy to maintain

# UNICORE in Production

## Easy to do: What next?

- UNICORE is easy to use
- **UNICORE is easy to understand**
- UNICORE is easy to install
- UNICORE is easy to maintain

# UNICORE in Production

## Easy to understand

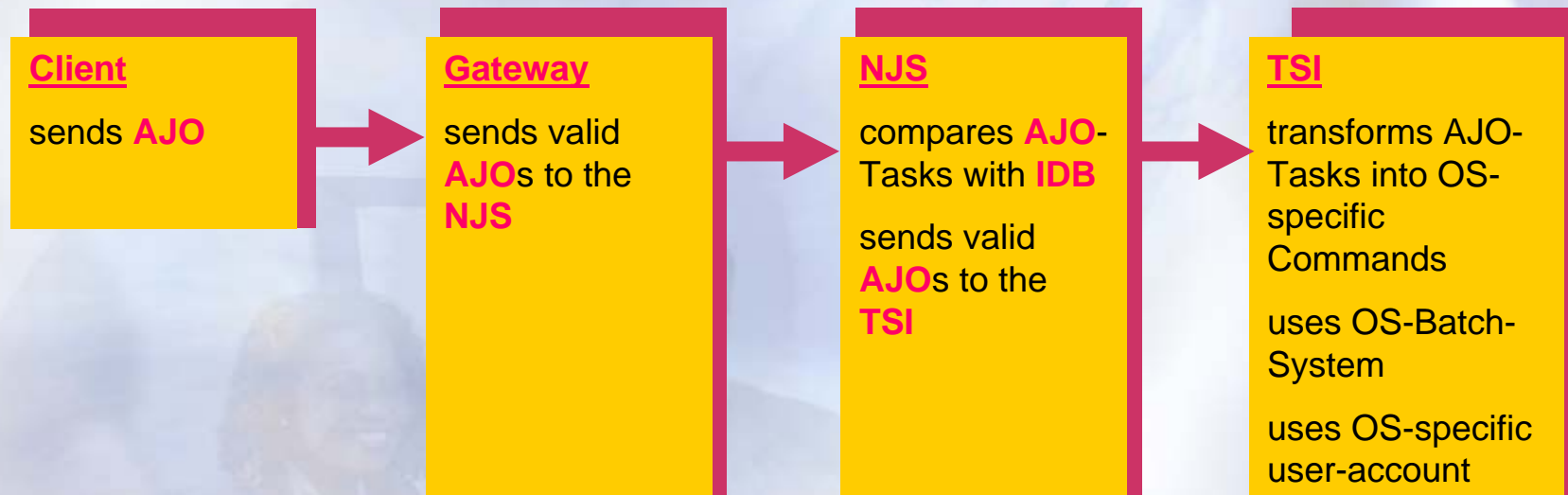
Two aspects are needed to understand most of UNICORE:

- functionality
- security

# UNICORE in Production

## Easy to understand : functionality

Simple UNICORE-Workflow for an Abstract Job Object (AJO)



# UNICORE in Production

## Easy to understand: functionality

UNICORE Vocabulary (the 9 technical terms) at a glance

- **Client**
- **AJO** (Abstract Job Object), messages between client and server
- **Server Infrastructure**
  - **Gateway** to **USite** (UNICORE Site)
  - **NJS** (Network Job Supervisor) manages
    - **UUDB** (Unicore User Database)
    - **IDB** (Incarnation Database)
  - **TSI** (Target System Interfac) on a **VSite** (virtual server)

# UNICORE in Production

## Easy to understand : functionality

### Building Blocks of UNICORE, Term 1

- Client

The User Interface.

You have already seen it.  
So we can go on.

# UNICORE in Production

## Easy to understand : functionality

### Building Blocks of UNICORE, Term 2

- **AJO** (Abstract Job Object)

This one contains either your requests or your results.

The UNICORE-client first sends the AJO to the target , i.e. the Grid-Resource on the server side, that you asked for.

The target sends the AJO back at the client, when you are asking for your results.

Because of its nature, UNICORE-users and maintainers mostly do not notice, that it exists. Only code-diggers see, that it is there.

# UNICORE in Production

## Easy to understand : functionality

### Building Blocks of UNICORE, Terms 3 and 4

- **IDB** (Incarnation Database)  
Data description of the target:  
The IDB describes the available resources at the target system.
- **TSI** (Target System Interface)  
Functional description of the target:  
The functional layer works on the target system and connects the real world operating system with the abstract UNICORE world.



# UNICORE in Production

## Easy to understand : functionality

### Building Blocks of UNICORE, Terms 5 and 6

- **UADB** (Unicore User Database)  
This database contains a table, which connects your certificate (i.e. your UNICORE-identity) with your user account on the operating system of the target.

- **NJS** (Network Job Supervisor)  
This code works like a servant of your UNICORE-task.

On the front side, he identifies you, talks to your client and (if satisfied) writes down, what your wishes are.

On the back side he acts as a shepherd, when your (sheepish?) task is handed over to the TSI of the target system.

# UNICORE in Production

## Easy to understand : functionality

### Building Blocks of UNICORE, NJS and its Databases

#### NJS

Network Job Supervisor uses the

- UUDB Unicore User Database
- IDB Incarnation Database

#### UUDB

UNICORE User Database connects in a table the Certificates with the OS-specific

Certificate 1	User-Account 1
Certificate 2	User-Account 2
...	...
Certificate n	User-Account n

#### IDB

Incarnation Database describes Resources of the Target System

Target has 16 CPU's with 2,4GHz
Target has 2 GByte of Memory
...
Target has Fortran installed

# UNICORE in Production

## Easy to understand : functionality

### Building Blocks of UNICORE, Terms 7, 8 and 9

- **Vsite** (Virtual Site)  
a server with its hardware and software, with least a TSI and the IDB is available, is called Vsite
- **Usite** (Unicore Site)  
a collection of Vsites in an intranet behind a firewall is called Usite
- **UNICORE-Gateway**  
the guard placed in the DMZ of a firewall, which pre-checks incoming AJO's.

# UNICORE in Production

Easy to understand: security

## SECURITY

Security Aspects of UNICORE

# UNICORE in Production

## Easy to understand: security

Following Components, are part of the UNICORE-Security System

- Client (and plugins)
- Gateway
- NJS

Password

Key-

**X.509-Certificates  
(with Public Keys)**

by CA of SfR and/or HWW

store

**Private Keys (secret)**

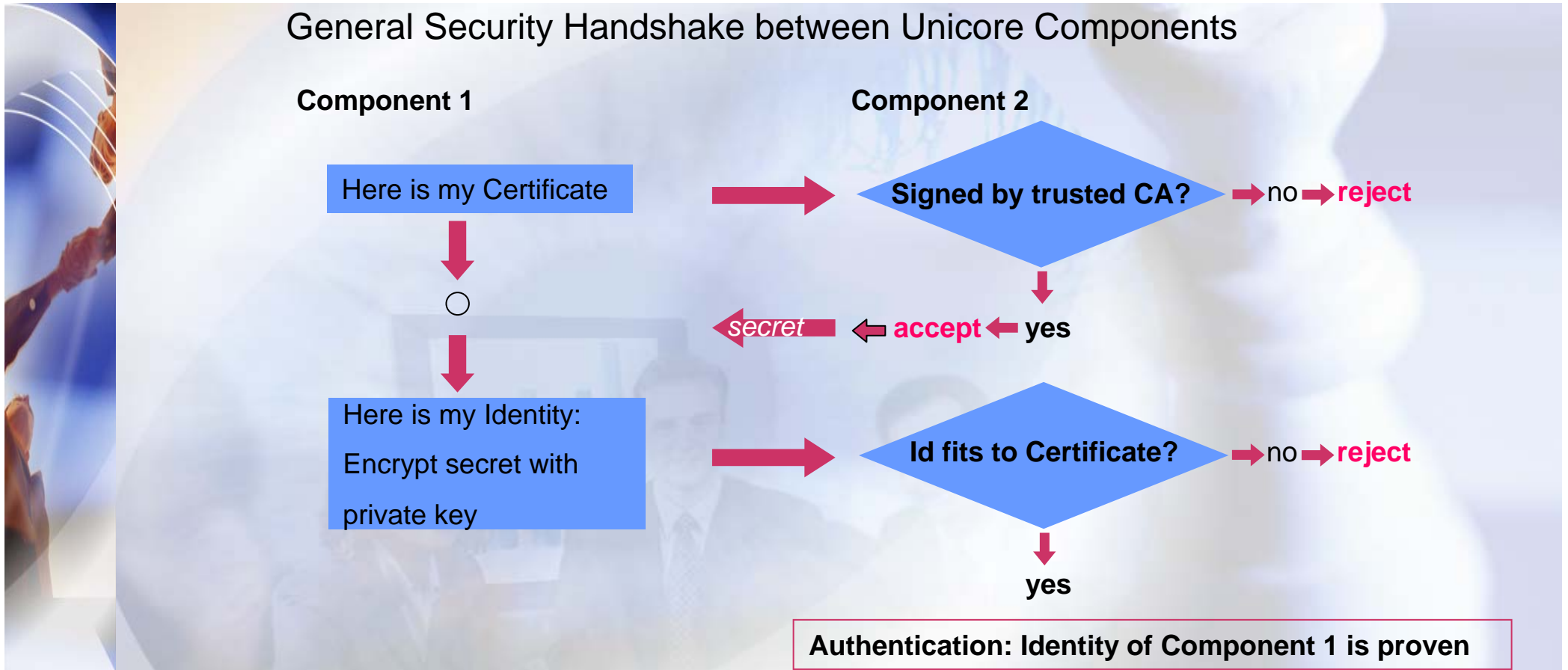
They all use a Keystore containing:

- Trust= Certs of trusted CA's
- Id-Prove= Id-Certs signed by CA's
- Identity= private keys fitting Id-Certs

The Keystore is protected by a single password

# UNICORE in Production

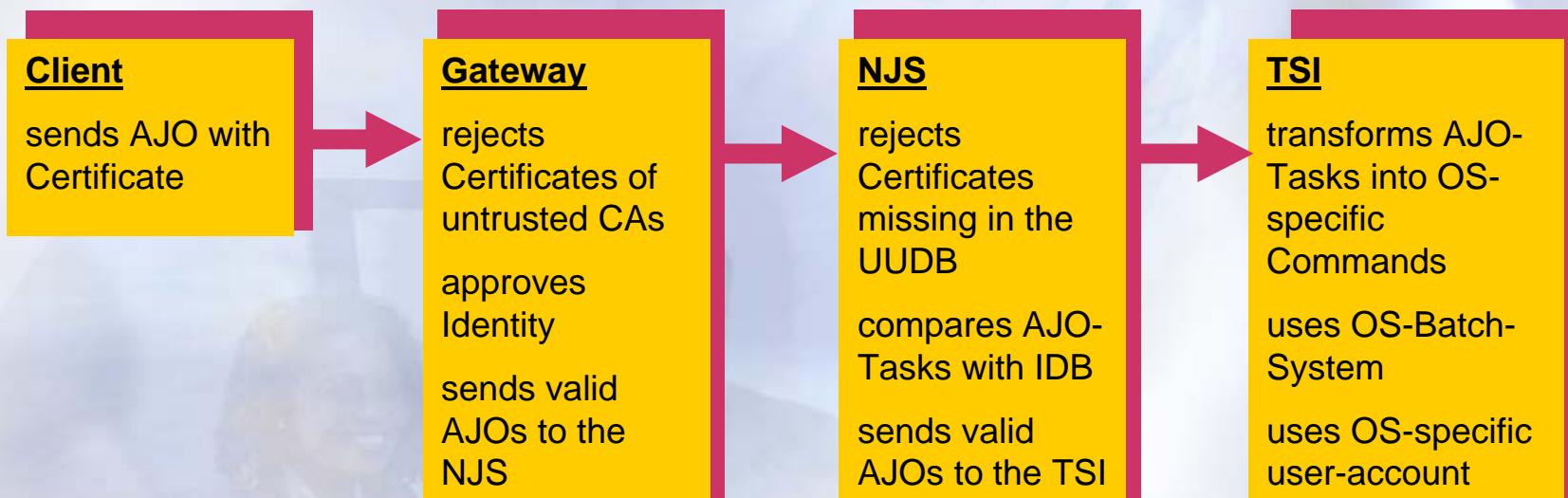
Easy to understand : security



# UNICORE in Production

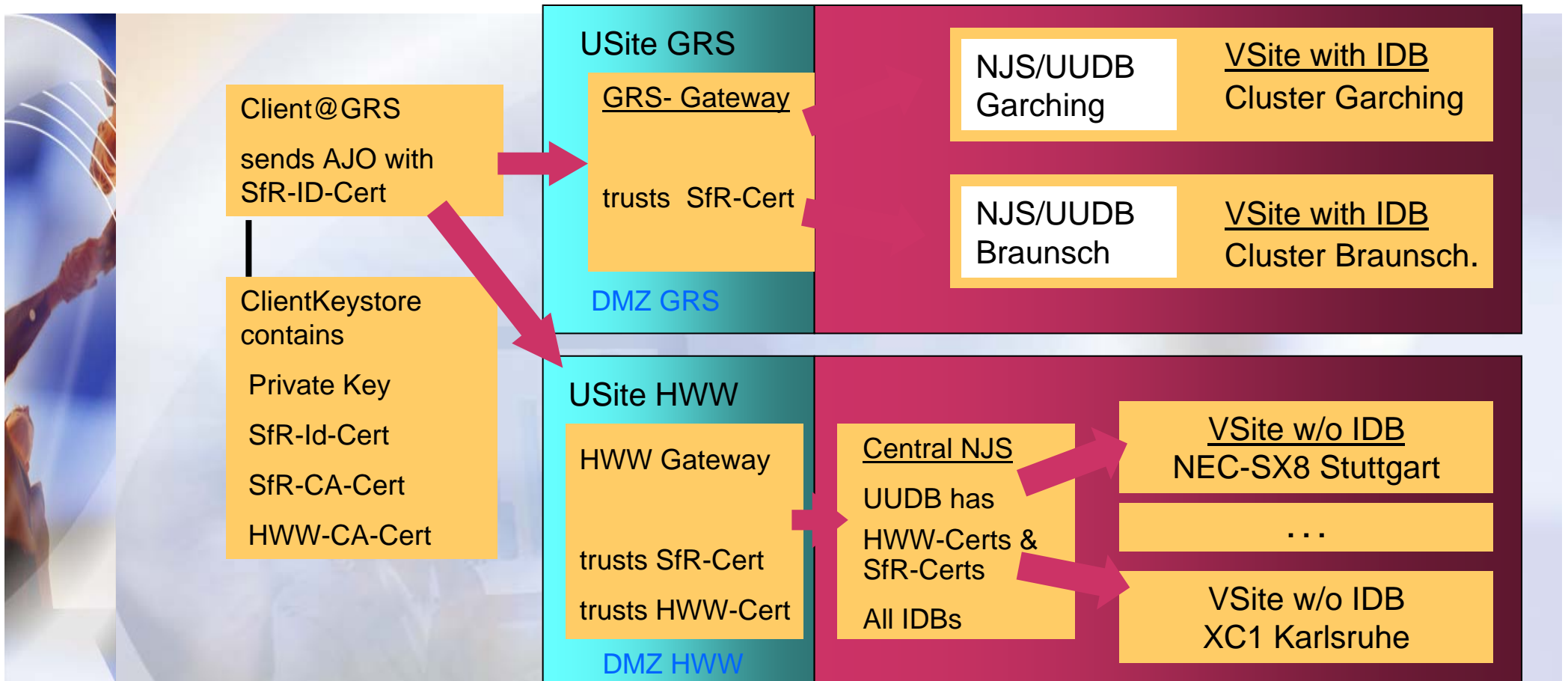
Easy to understand : security

## Complete UNICORE-Workflow for a simple Abstract Job Object (AJO)



# UNICORE in Production

## Easy to understand: example GRS and HWW





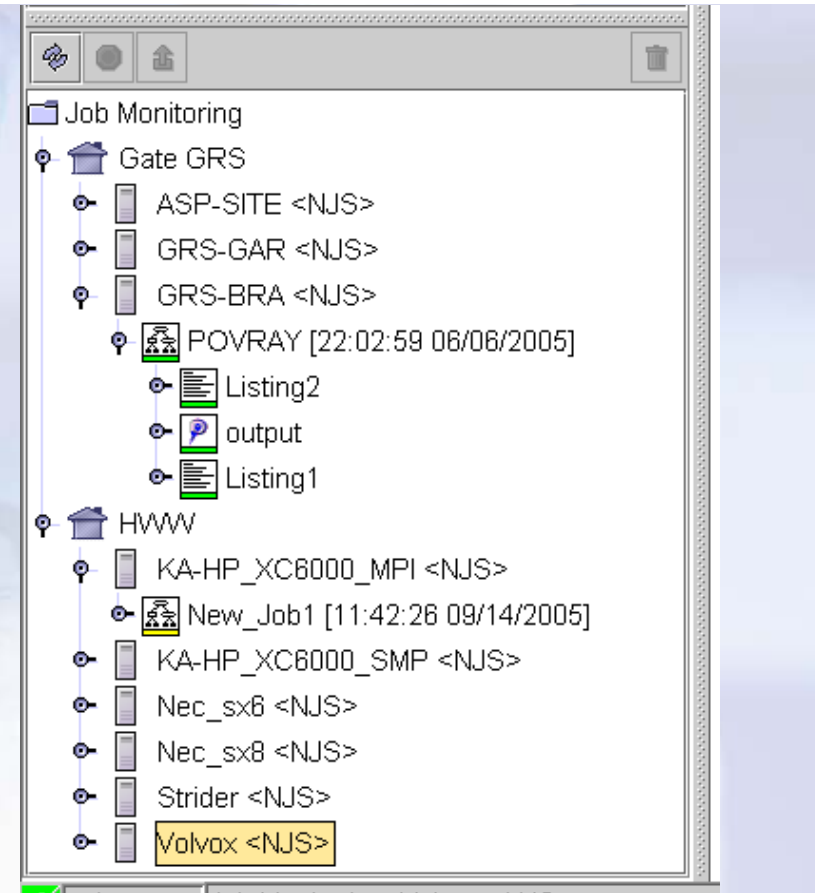
# UNICORE in Production

## Easy to understand: example GRS and HWW

The UNICORE-Client

shows all

USites/VSites reachable  
for customers, that are  
working for GRS



# UNICORE in Production

## Easy to do: What next?

- UNICORE is easy to use
- UNICORE is easy to understand
- **UNICORE is easy to install**
- UNICORE is easy to maintain

# UNICORE in Production

## Easy to install

- plan your site
- download the needed components
- install the components
- configure the components
- check the installation

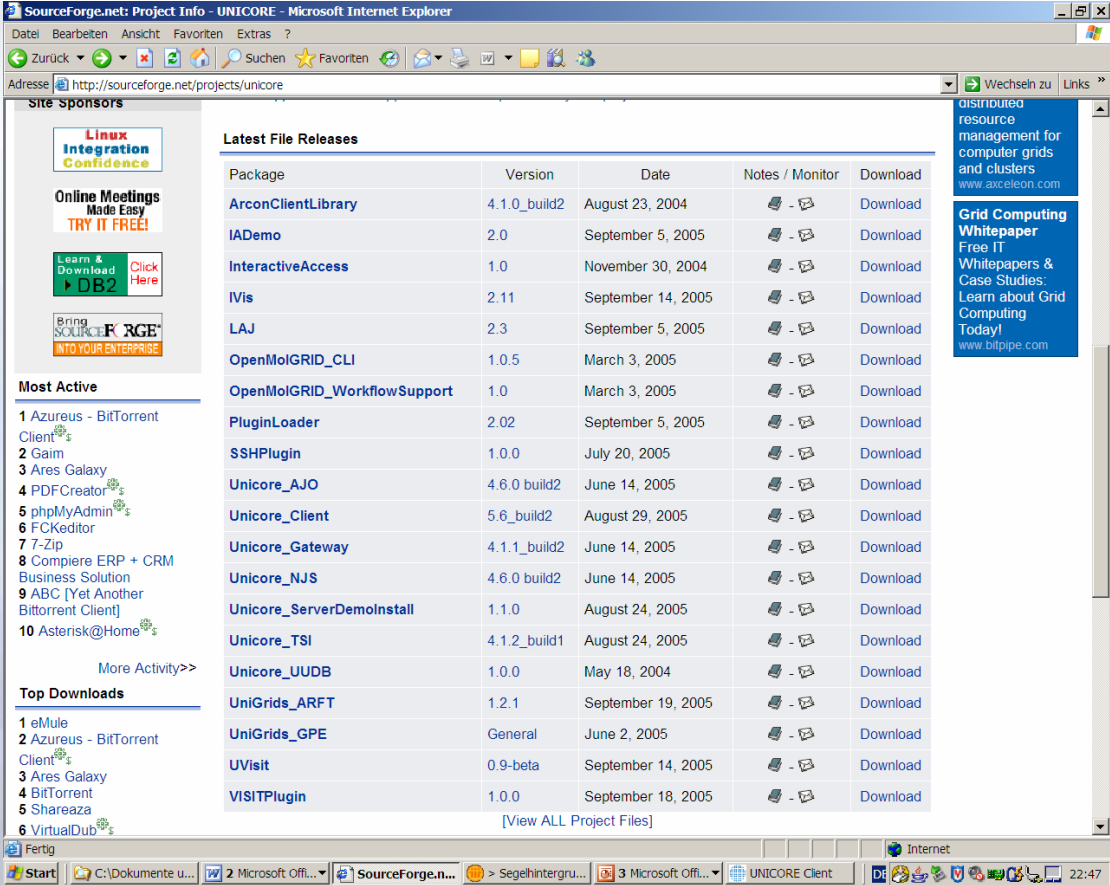
# UNICORE in Production

## Easy to install: Plan your Site

- which computer will act as what in UNICORE ?
- IP-ports, the components shall communicate on?
  - Client – Gateway
  - Gateway - NJS

# UNICORE in Production

## Easy to install: Download the Software



SourceForge.net: Project Info - UNICORE - Microsoft Internet Explorer

Adresse: <http://sourceforge.net/projects/unicore>

**Site Sponsors**

- Linux Integration Conference
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**Most Active**

- 1 Azureus - BitTorrent Client
- 2 Gaim
- 3 Ares Galaxy
- 4 PDFCreator
- 5 phpMyAdmin
- 6 FCKeditor
- 7 7-Zip
- 8 Compiere ERP + CRM Business Solution
- 9 ABC [Yet Another BitTorrent Client]
- 10 Asterisk@Home

More Activity>>

**Top Downloads**

- 1 eMule
- 2 Azureus - BitTorrent Client
- 3 Ares Galaxy
- 4 BitTorrent
- 5 Shareaza
- 6 VirtualDub

**Latest File Releases**

Package	Version	Date	Notes / Monitor	Download
ArconClientLibrary	4.1.0_build2	August 23, 2004		Download
IADemo	2.0	September 5, 2005		Download
InteractiveAccess	1.0	November 30, 2004		Download
IVis	2.11	September 14, 2005		Download
LAJ	2.3	September 5, 2005		Download
OpenMolGRID_CLI	1.0.5	March 3, 2005		Download
OpenMolGRID_WorkflowSupport	1.0	March 3, 2005		Download
PluginLoader	2.02	September 5, 2005		Download
SSHPlugin	1.0.0	July 20, 2005		Download
Unicore_AJO	4.6.0_build2	June 14, 2005		Download
Unicore_Client	5.6_build2	August 29, 2005		Download
Unicore_Gateway	4.1.1_build2	June 14, 2005		Download
Unicore_NJS	4.6.0_build2	June 14, 2005		Download
Unicore_ServerDemoinstall	1.1.0	August 24, 2005		Download
Unicore_TSI	4.1.2_build1	August 24, 2005		Download
Unicore_UUDB	1.0.0	May 18, 2004		Download
UniGrids_ARFT	1.2.1	September 19, 2005		Download
UniGrids_GPE	General	June 2, 2005		Download
UVisit	0.9-beta	September 14, 2005		Download
VISITPlugin	1.0.0	September 18, 2005		Download

[View ALL Project Files]

**Grid Computing Whitepaper**  
Free IT Whitepapers & Case Studies: Learn about Grid Computing Today!  
[www.bitpipe.com](http://www.bitpipe.com)

Download the software from Sourceforge:

- Client
- Plugins
- NJS
- TSI
- UUDB
- Gateway

# UNICORE in Production

## Easy to install: Install the Components

- **Client**: downloaded file is self installing software

Simply activate the downloaded file

- **Server Parts**: downloaded files are archive-files

Extract them

```
$ tar -xzf <filename>.tar.gz
```

# UNICORE in Production

## Easy to install: Configure the Server Parts



- Change to directory named **./conf**

- Adopt entries in **\*.properties** file

Simply follow the comments to use the right

- hostnames and ports
- certificate files
- etc

# UNICORE in Production

## Easy to install: Check the Installation

- Change to directory `./conf/logs`
- Watch the logfiles  
use a higher level of debug-verbosity at the start



# UNICORE in Production

## Easy to do: What next?

- UNICORE is easy to use
- UNICORE is easy to understand
- UNICORE is easy to install
- **UNICORE is easy to maintain**

# UNICORE in Production

## Easy to maintain

- Monitoring the System
- Updating the System

# UNICORE in Production

## Easy to maintain: Monitoring

- Monitoring the System

Use external tools

- Big Brother (DWD, GRS)

- Nagios (GRS and HWW; with reporting)

our experience:

**OS-specific tools break much more often, than UNICORE does**

# UNICORE in Production

## Easy to maintain: Monitoring with Big Brother

green : Big Brother - Status @ Sat Oct 8 22:49:42 CEST 2005 - Microsoft Internet Explorer

Adresse <http://dv-lxbs.grs.de/bb/>

big brother last update  
Sat Oct 8 22:49:42 CEST 2005

	conn	pbs	mom	pbs	sched	pbs	server	unicore -gw	unicore -njs	unicore -tsi
front2	🔄	-	-	-	-	-	-	-	-	-
cs-gar01.grs.de	■	-	-	■	■	-	-	-	■	■
cs01-lxbs.grs.de	■	-	-	■	■	-	-	-	■	■
ca-sfr.grs.de	■	-	-	-	-	-	-	■	-	-
cs-gar01-icnode1	■	■	-	-	-	-	-	-	-	-
cs-gar01-icnode2	■	■	-	-	-	-	-	-	-	-
cs-gar01-icnode3	■	■	-	-	-	-	-	-	-	-
cs-gar01-icnode4	■	■	-	-	-	-	-	-	-	-
cs-gar01-icnode5	■	■	-	-	-	-	-	-	-	-
cs-gar01-icnode6	■	■	-	-	-	-	-	-	-	-
cs-gar01-icnode7	■	■	-	-	-	-	-	-	-	-
cs-gar01-icnode8	■	■	-	-	-	-	-	-	-	-
cs01-lxbs-node1	■	■	-	-	-	-	-	-	-	-
cs01-lxbs-node2	■	■	-	-	-	-	-	-	-	-
cs01-lxbs-node3	■	■	-	-	-	-	-	-	-	-
cs01-lxbs-node4	■	■	-	-	-	-	-	-	-	-
cs01-lxbs-node5	■	■	-	-	-	-	-	-	-	-
cs01-lxbs-node6	■	■	-	-	-	-	-	-	-	-
cs01-lxbs-node7	■	■	-	-	-	-	-	-	-	-
cs01-lxbs-node8	■	■	-	-	-	-	-	-	-	-

# UNICORE in Production

## Easy to maintain: Update

➤ Update the System

Watch, if something has changed on SourceForge,  
Download and reinstall.  
Keep the configuration files.

**OR ...**

# UNICORE in Production

## Easy to maintain: Quality Managed Update

- Update the System T-Systems Style

Take advantage of QM-based Release-Management

But this leads to another story! ....

# UNICORE in Production

Is Easy to do



THANKS FOR LISTENING

# Release Management for UNICORE

## 1. Customer Aspects

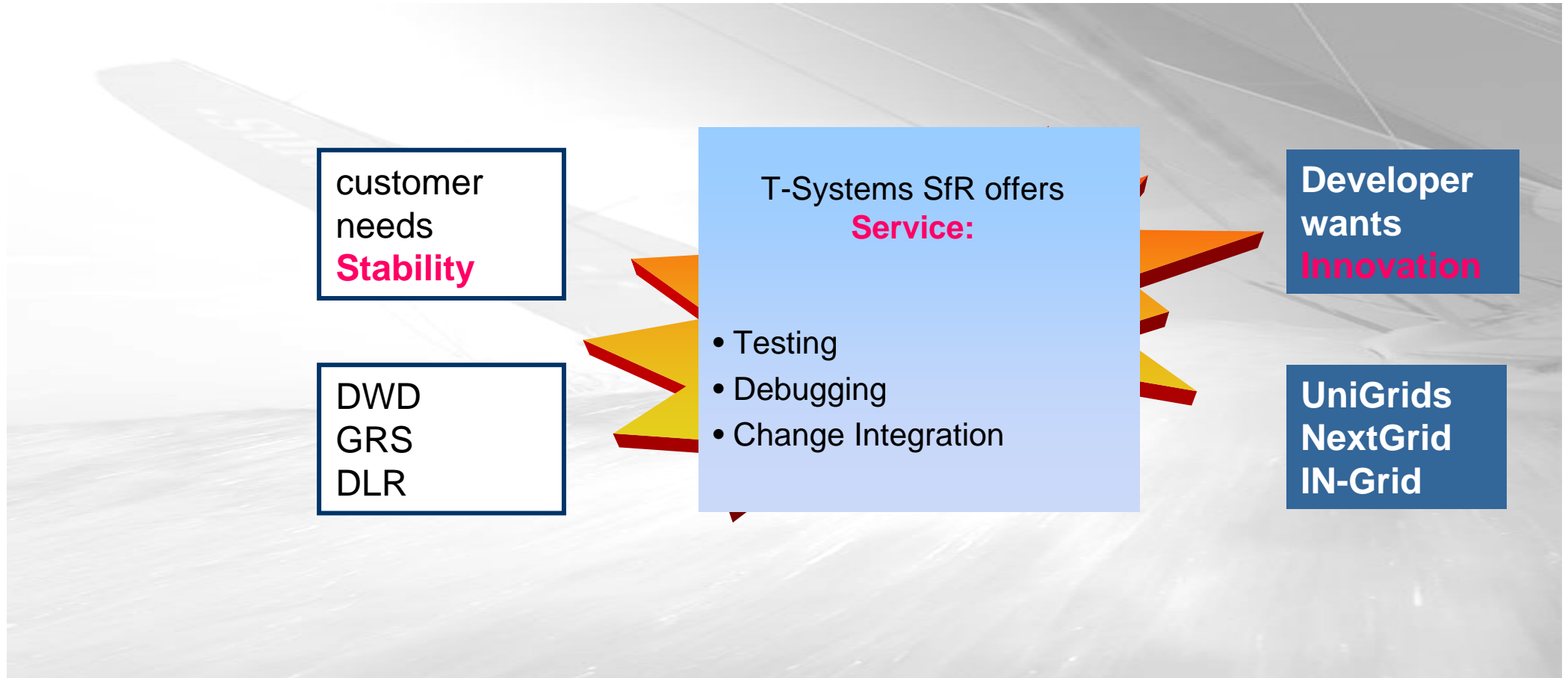
- Deliver **innovative *and* stable GRID-Software** to the customer (just an update)

## 2. Developer Aspects

- Synoptical check of UniGrids with prerequisite packages
- Formalize dependencies and versioning
- Early warning system of malfunctions
- Continous Integration Tool: Apache Gump



# Release Management: Customer Aspects (just an update)



# Release Management: Developer Aspects

Unigrids

uses projects, which are still under definition and development themselves

AXIS

LOG4J

commons-  
discovery

commons-  
httpClient

SAXON8

XERCES

WS-  
addressing

commons-  
logging

# Release Management: Developer Aspects

Unigrids

Unigrids breaks if another project fails  
or changes definitions

Jar-Hell threatens:

<http://www.krysalis.org/version/jar-hell.html>

**Approved Solution: Continuous  
Integration Tool**

AXIS

commons-  
discovery

SAXON8

WS-  
addressing

LOG4J

commons-  
httpClient

XERCES

commons-  
logging

# Release Management Solution: Continuous Integration Tools

There are many Continuous Integration Tools

- CruiseControl
- DamageControl
- Tinderbox
- BuildBot
- Anthill
- BeetleJuice
- LuntBuild
- **Gump (Apache)** <= Unigrids depends on Apache-Projects mostly
- Draco.NET
- Continuum
- Sin
- Parabuild

# Release Management: How Gump works

Unigrids

uses projects,  
which are still  
under definition  
and development  
themselves

AXIS

LOG4J

commons-  
discovery

commons-  
httpClient

SAXON8

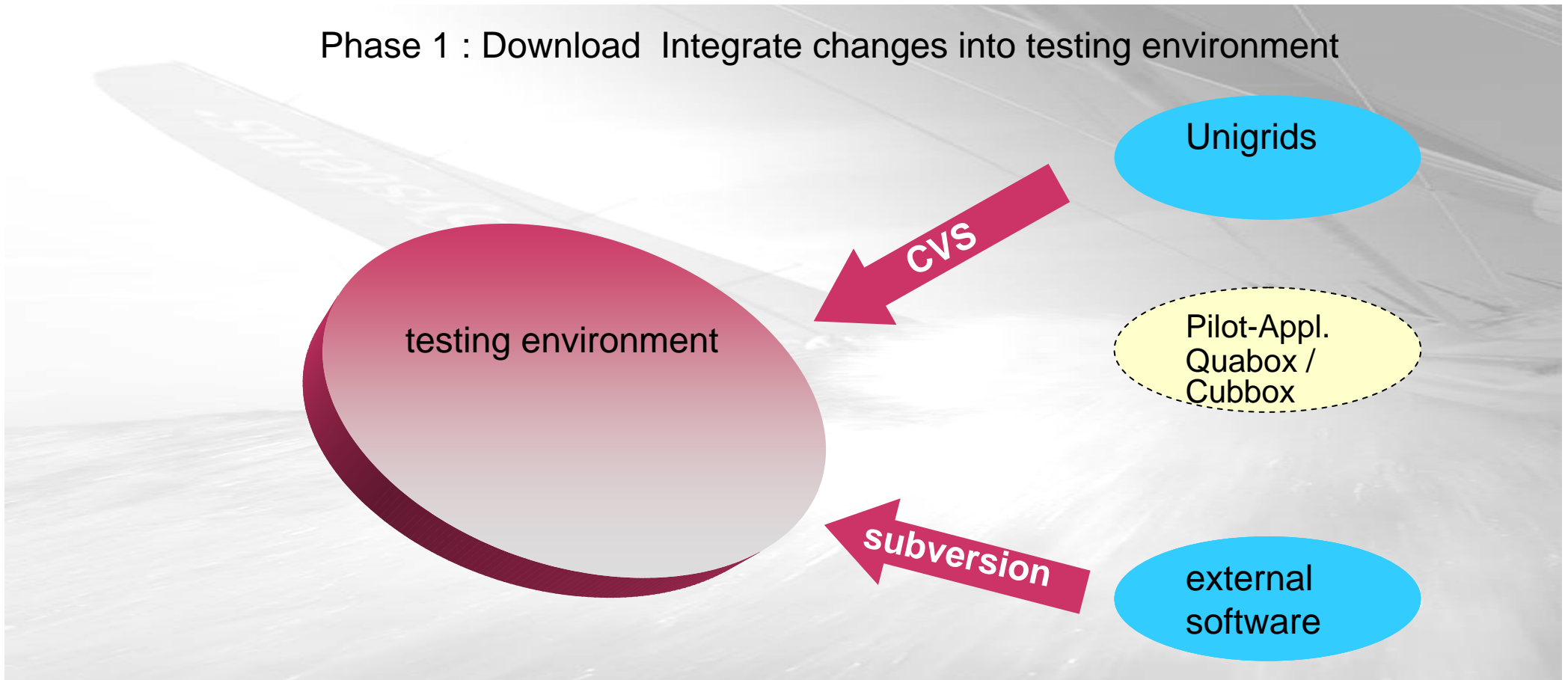
XERCES

ws-  
addressing

external  
software

# Release Management: How Gump works

Phase 1 : Download Integrate changes into testing environment



# Release Management: How Gump works



testing environment

# Release Management: How Gump works

Phase 2 : Build- and functionality

Testing

building tools

- ant
- maven
- make

testing tools

- junit
- user defined





# Release Management: How Gump works

## Phase 3 : Results, Presentation and Notification

Fileserver

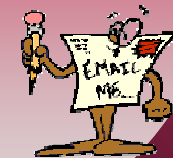
Pool of  
tested  
software

Webserver

Webpages

testing environment

Email to  
developer if  
new error  
occurred



- for developer: logfiles
- for customer: observable metric (ex. error-count)

# Release Management: Work already done with Gump

## For Phase 1: Download

- Description of Repositories

## For Phase 2: Building and Testing

- Description of Unicore/UniGrids Package Dependencies

## For Phase 3: Results, Presentation and Notification

- Web-Server

<http://tdb.grs.de/gump> (URL will change)

- File-Server with central Download-Pool for the Customers is in Preparation



# Thank You

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Customer Center GRS

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