

# UNICORE

## Server bundle: installation and configuration

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# Outline

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- Installation
- Configuration overview
- Individual components
  - Gateway
  - Unicore/X
  - TSIs
  - XUADB
  - Registry
- Security

# Prerequisites

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- Java 5 JRE or SDK (or later)
  - >java -version
  - <http://java.sun.com>
- Perl 5 for classic UNICORE TSIs

```
$>java -version
java version "1.5.0_07"
Java(TM) 2 Runtime Environment, Standard Edition (build
1.5.0_07-b03)
Java HotSpot(TM) Server VM (build 1.5.0_07-b03, mixed mode)
```

# Installation

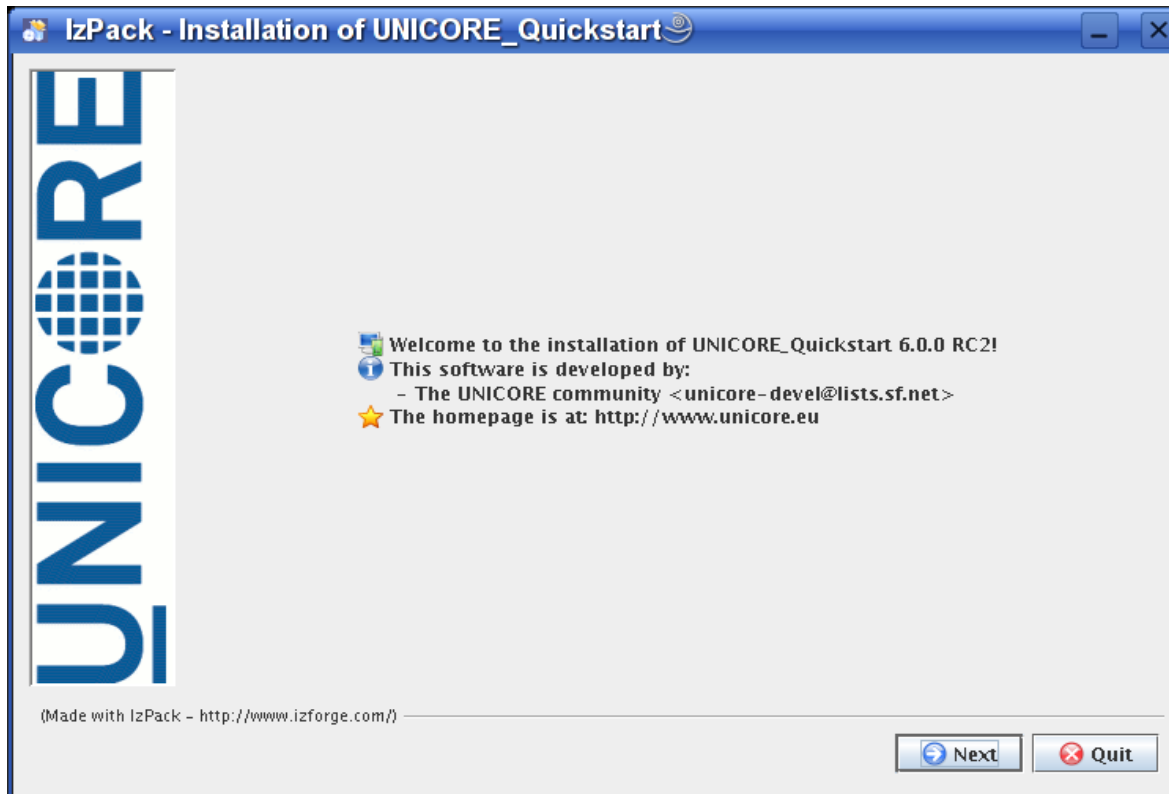
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- Currently best starting point: quickstart bundle
  - Server bundle (tar.gz)
  - Server bundle (jar)
  - GPE Client bundle
  - UCC client (tar.gz)
- Individual components (Gateway, etc) not available as packages
- Installation from source (not recommended)

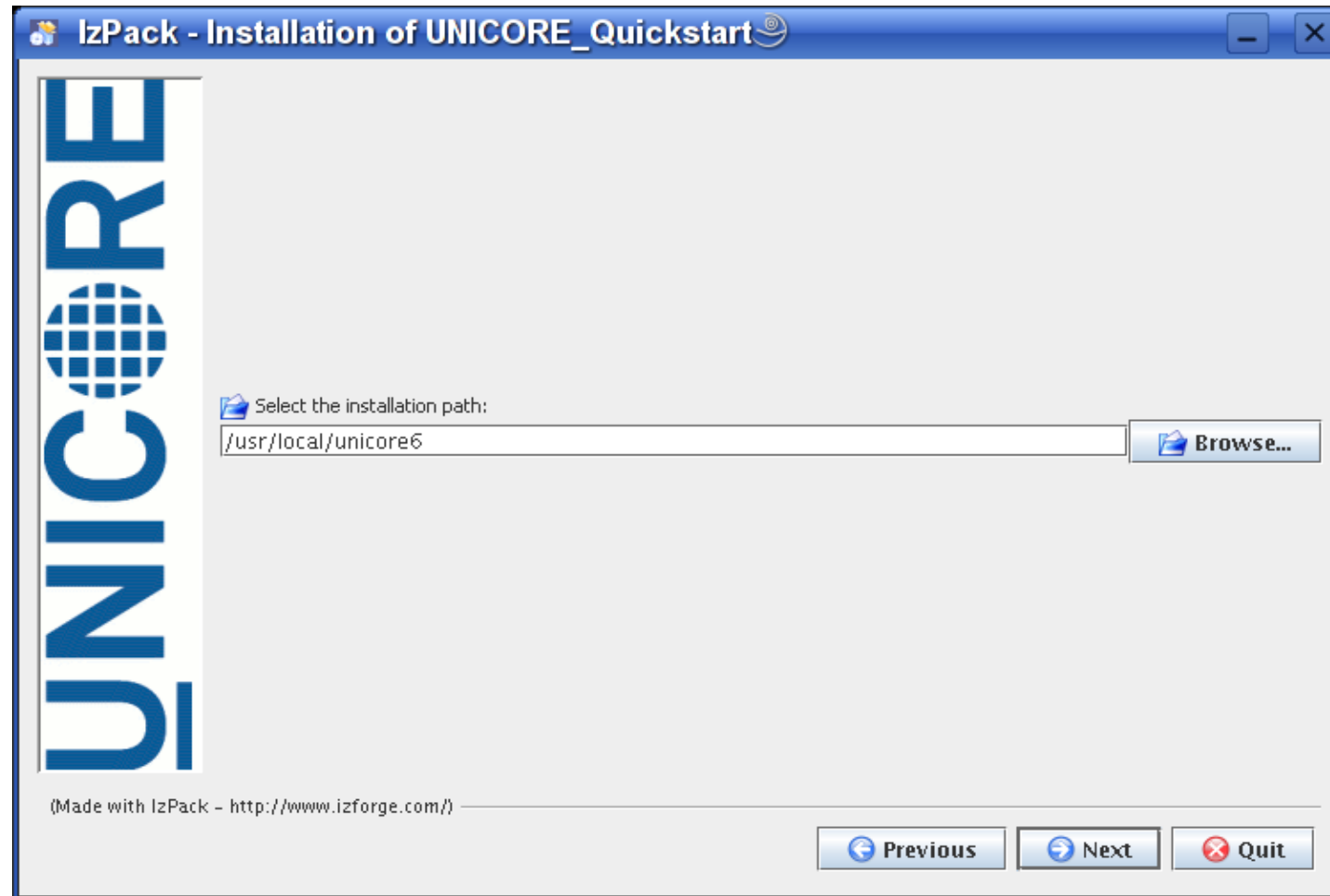
# Server bundle: graphical installer

- Unix, MacOS, Windows

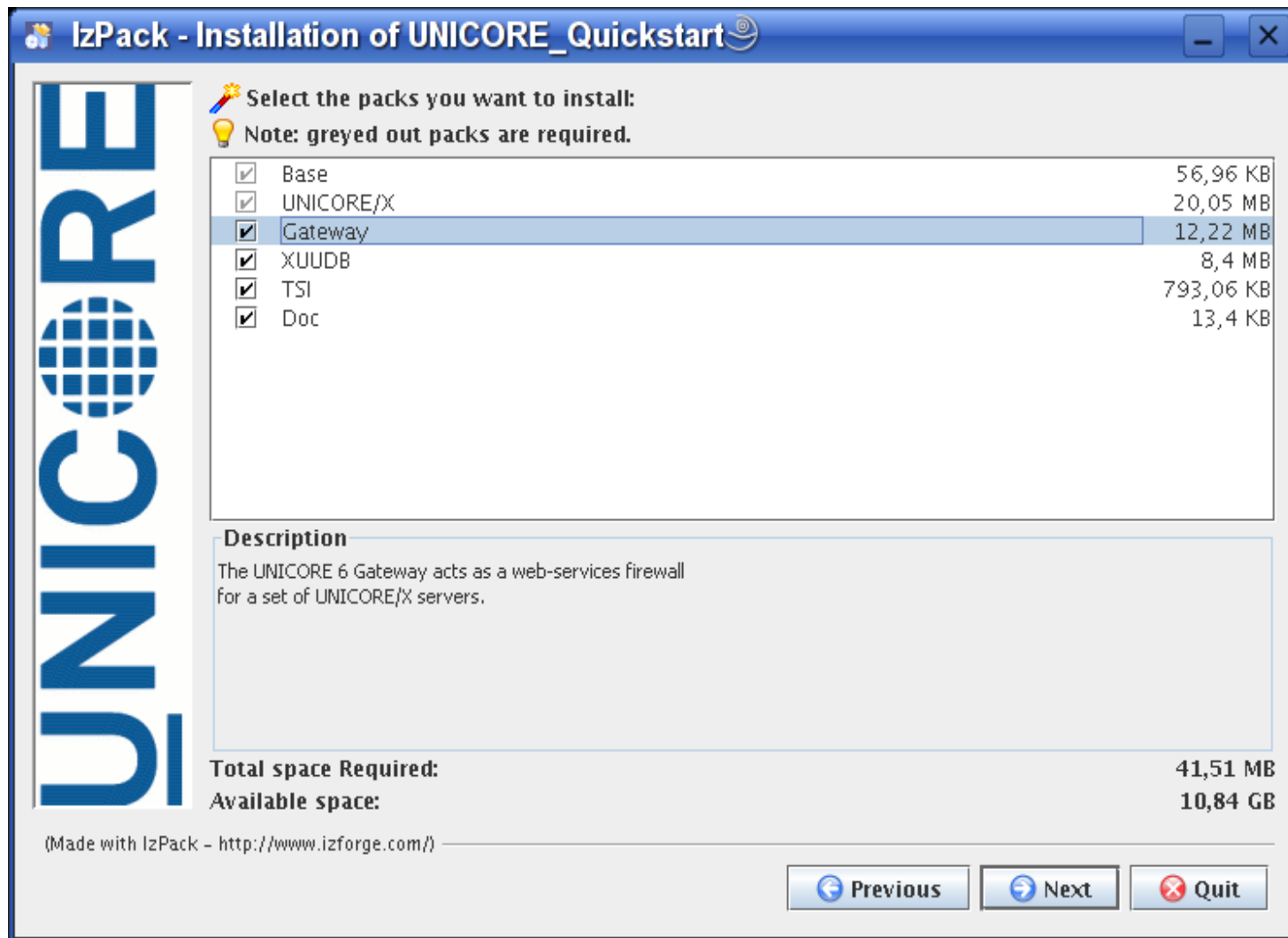
```
$>java -jar unicore-quickstart-6.0.0-rc2.jar
```



# Directory selection



# Component selection



# Installation: configuration dialog I

IzPack - Installation of UNICORE\_Quickstart

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

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Please enter the host and port where the gateway will be running. This port is the only one that needs to be accessible from the 'outside'.

**Gateway Host:**

**Gateway Port:**

---

Please enter information about the UNICORE/X server.

**Server Host:**

**Server Port:**

**Vsite Name:**

**JMX Port:**

---

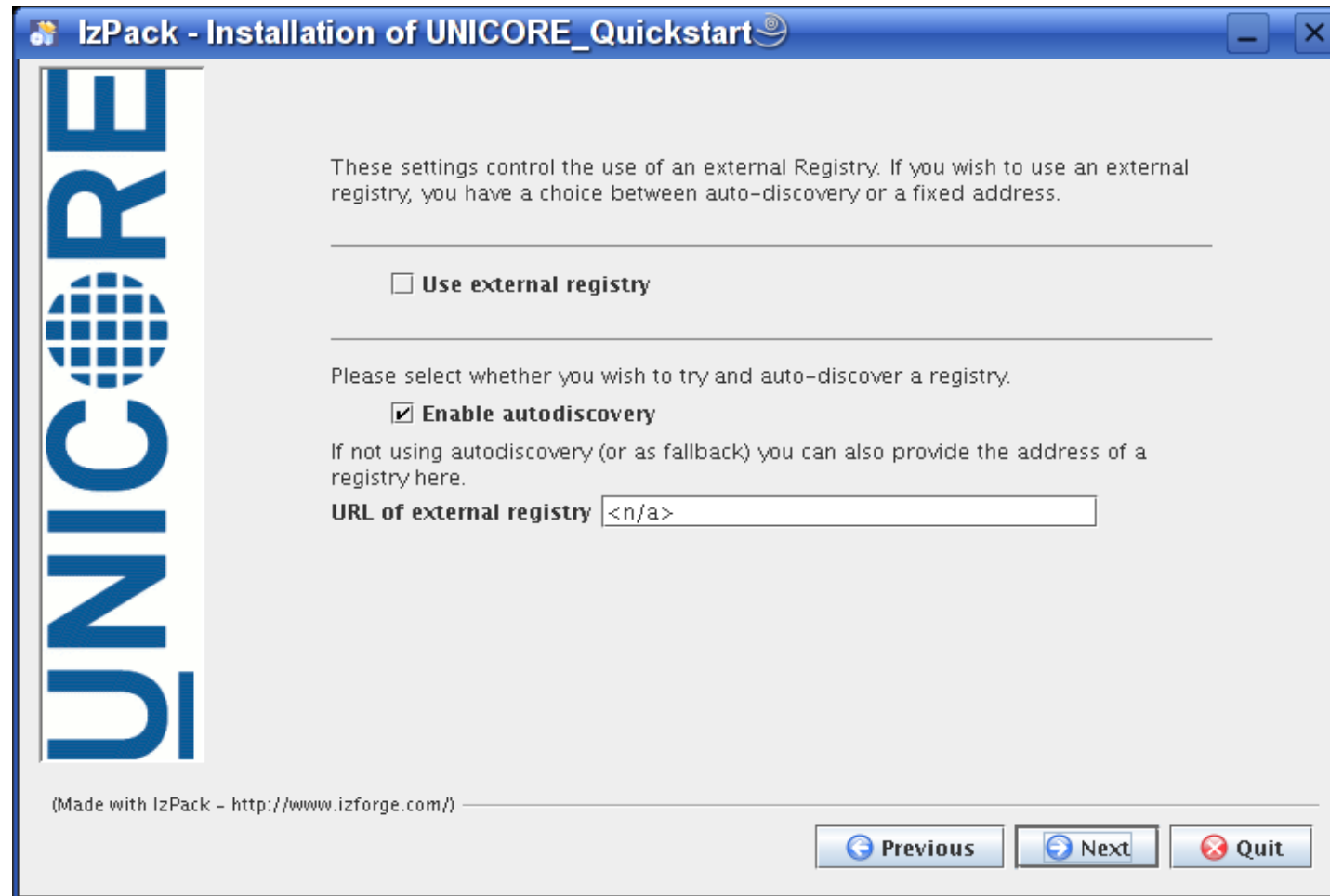
Please enter the host and port of the XUADB server that will be used.

**XUADB Host:**

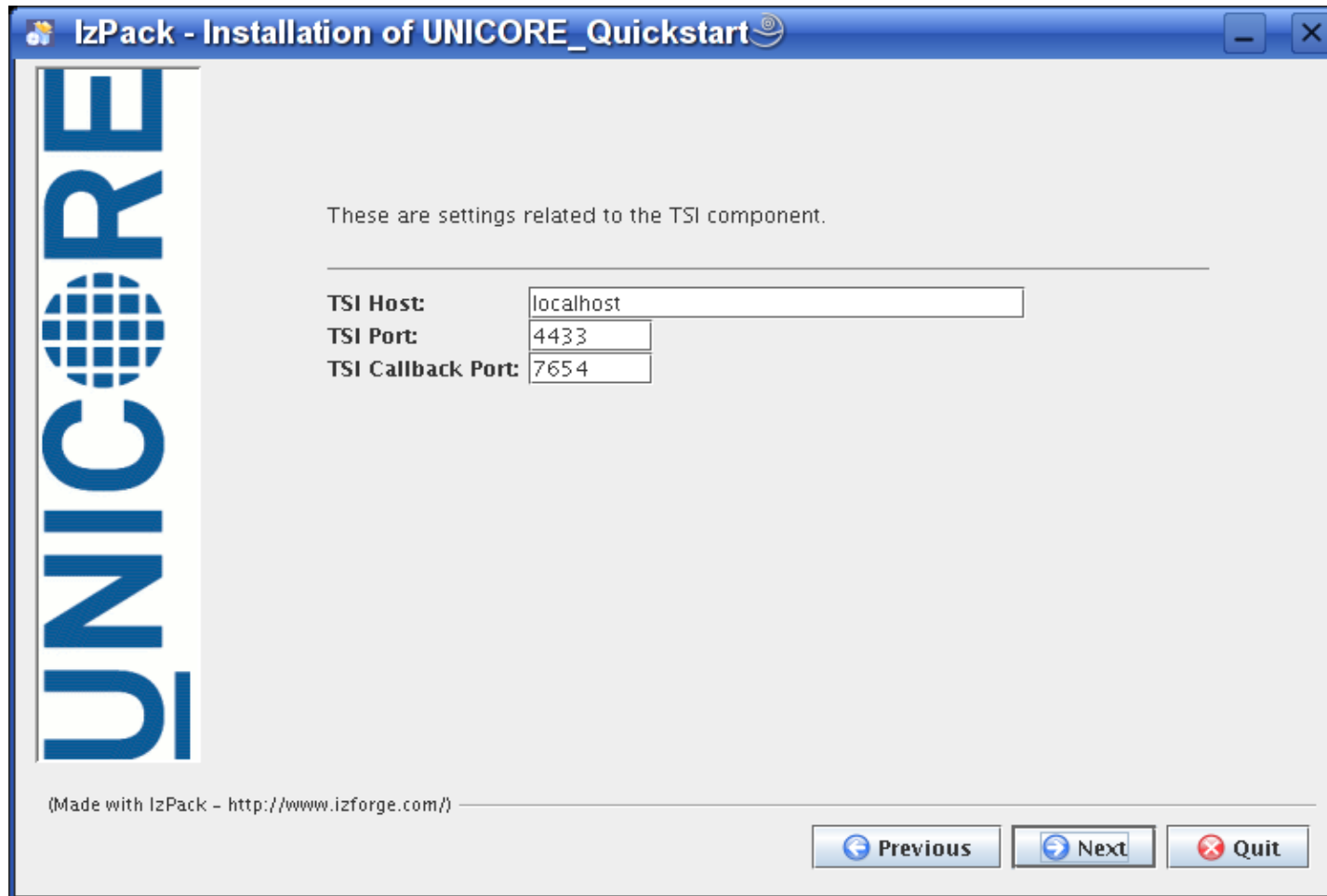
**XUADB Port:**

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

# Installation: configuration dialog II



# Installation: configuration dialog III



# Non-GUI installation

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- Download tar.gz bundle
- Python script „inst.py“
- Contains same settings as GUI installer

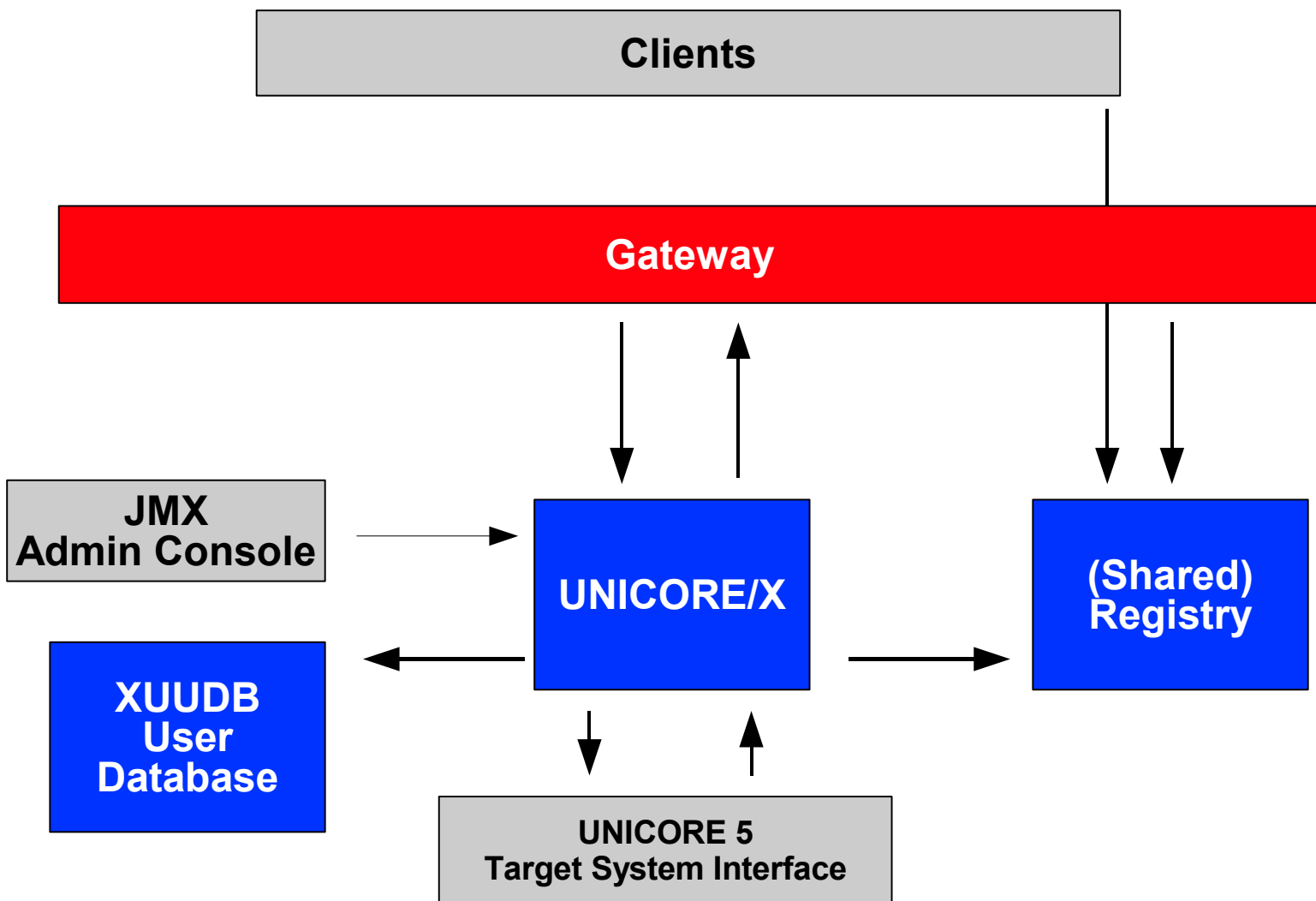
```
$>tar xzf unicore-quickstart-6.0.0-rc2.tgz  
$>cd unicore-quickstart-6.0.0-rc2.tgz  
$>./inst.py username hostname
```

# Quickstart bundle contents

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- Gateway, Unicore/X, XUADB
  - conf : configuration files
  - bin : individual start/stop scripts
  - lib : component libraries
- Unicore 5 TSI
- Scripts for starting/stopping all components
- Helper script „adduser“ that adds a demo user cert to XUADB on first startup
- Demo certificates in „certs“ directory
- Some readme files in docs/

# Inter-component communication



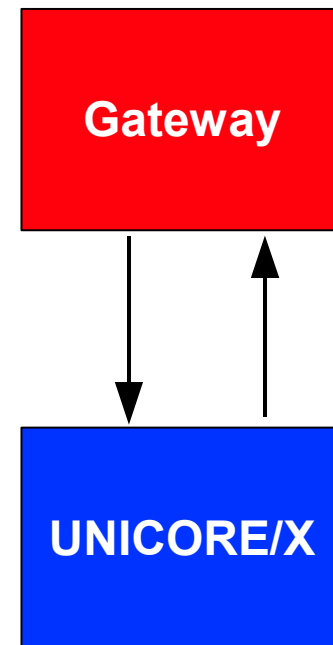
# Gateway --- UNICORE/X

- Mapping of Vsite names to addresses  
`gateway/conf/connections.properties`

```
DEMO-SITE = https://unicorexhost:7777
```

- Vsite logical and physical address  
`unicorex/conf/wsrflite.xml`

```
<property name="unicore.wsrflite.baseurl"  
    value="https://gatewayhost:8080/DEMO-SITE/services"/>  
<property name="unicore.wsrflite.host" value="localhost"/>  
<property name="unicore.wsrflite.port" value="7777"/>  
<property name="unicore.wsrflite.ssl" value="true"/>  
<property name="unicore.wsrflite.ssl.clientauth" value="true"/>
```



# UNICORE/X --- TSI

- Switch on use of „classic“ UNICORE 5 TSI

```
unicorex/conf/uas.config
```

```
uas.targetsystemfactory.xnjs.configfile=conf/xnjs_legacy.xml
```

- Configure XNJS

```
unicorex/conf/xnjs_legacy.xml
```

```
<Property name="CLASSICTSI.machine" value="tsihost"/>
```

```
<Property name="CLASSICTSI.port" value="4433"/>
```

```
<Property name="CLASSICTSI.replyport" value="7654"/>
```

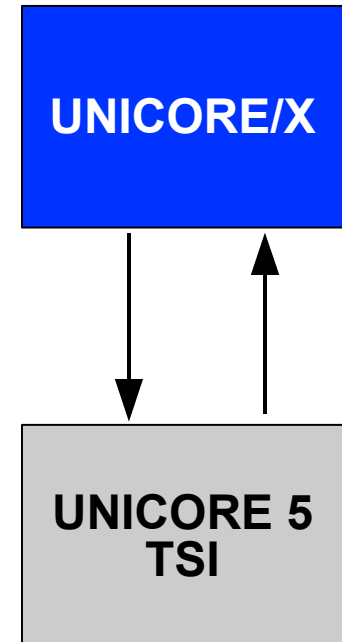
- Configure TSI

```
tsi/conf/tsi.properties
```

```
tsi.my_port=4433
```

```
tsi.njs_machine=unicorexhost
```

```
tsi.njs_port=7654
```



# UNICORE/X --- XUADB

- XUADB usage

```
unicorex/conf/uas.config
```

```
uas.security.authoriser
```

```
  =de.fzj.unicore.uas.security.XUADBAuthoriser
```

```
xuadb_http_port=34463
```

```
xuadb_http_host=https://xuadbhost
```

```
xuadb_gcid=DEMO-SITE_7777
```

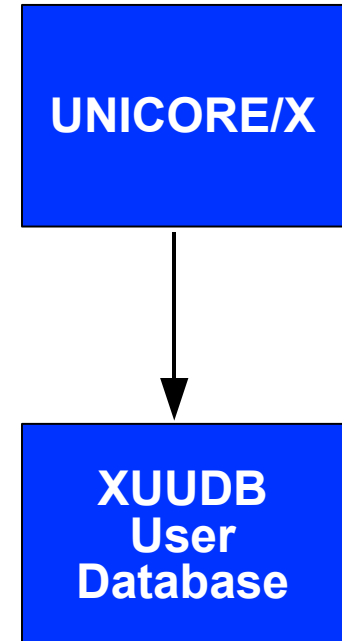
- XUADB server configuration

```
xuadb/conf/xuadb_server.conf
```

```
xuadb_use_ssl=true
```

```
xuadb_http_port=34463
```

```
xuadb_http_host=https://xuadbhost
```



# XUADB

- Shared between multiple Vsites
- Use „Grid component ID“ (GCID) to distinguish and/or group Vsites
- Queries and admin commands always include GCID

XUADB  
User  
Database

```
$>bin/admin.sh list
```

```
The database query result contains 1 entries:
```

Nr	GcID	Xlogin	Role	Projects
1	DEMO-SITE_7777	schuller	user	

# XUADB administration

---

- admin.sh script

```
$>bin/admin.sh
```

```
UNICORE AUTHORISATION SERVICE 1.0
```

```
Usage: java -jar lib/xuadb-admin-client.jar <command> [parameters]
```

```
Commands are:
```

```
add          gcID pemfile xlogin role [project1,project2,...]
remove       ALL|gcID=x|pemfile=file|role=x|xlogin=x|project=x
list         gcID=x|pemfile=file|role=x|xlogin=x|project=x
update       gcID pemfile gcID=x|pemfile=file|role=x|xlogin=x|project=x
export       csv-file
import       csv-file
--init       creates a new admin client configuration in ./conf if not exist
--help       examples TODO
```

```
$>bin/admin.sh add DEMO-SITE_7777 ~/certs/pubkey.pem xlogin user
```

# Roles and authorisation

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- Role parameter is used to make authorisation decisions
- Standard installation uses three roles
  - „anonymous“: certificate/DN is not in XUADB
  - „user“: certificate/DN found in XUADB, restricted access
  - „admin“: certificate/DN found in XUADB, full access
- Actual authorisation rules are in XACML policy file `unicorex/conf/security_policy.xml`

# UNICORE/X --- Registry

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- Enable use of a shared registry

```
unicorex/conf/uas.config
```

```
uas.externalregistry.use=true
```

```
uas.externalregistry.autodiscover=true
```

```
uas.externalregistry.url=https://gateway:8080/REGISTRY/services/Registry?res=default_registry
```

- Option: autodiscovery via UDP multicast
- Registry setup
  - „normal“ Vsite (running only registry service)
  - Needs to be configured the same way as any other VSite

# Shared registry configuration

---

- Currently not automated
- Gateway and local address needs to be configured the usual way
- Usually, Registry VSite does not offer any other services, and has some special settings

```
unicorex/conf/uas.config
```

```
uas.registry.global=true
```

```
uas.registry.global.advertise=true
```

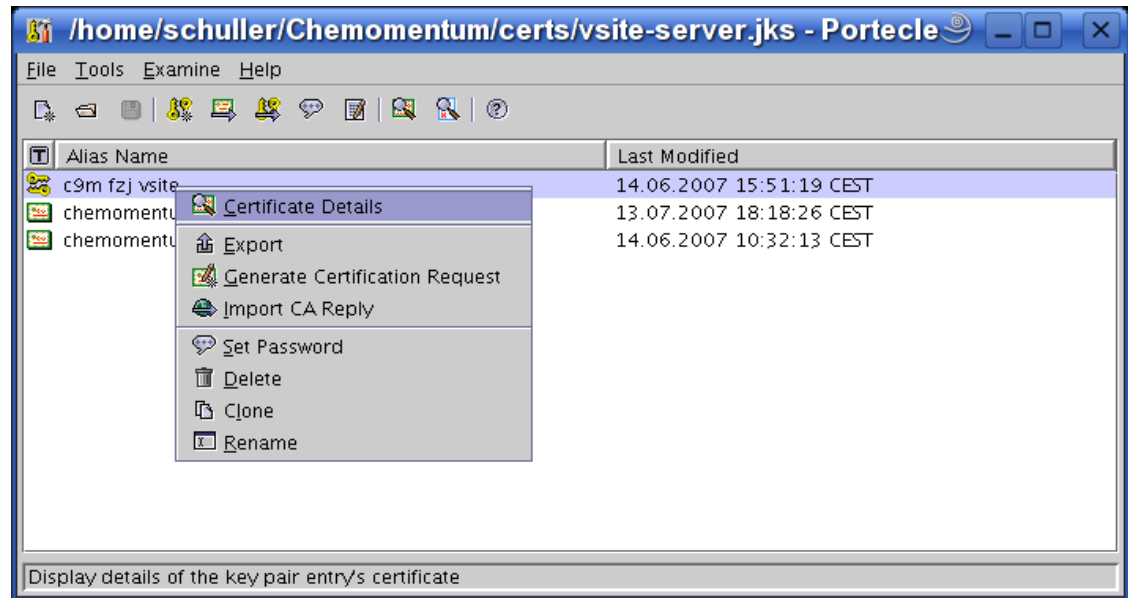
```
uas.onstartup=de.fzj.unicore.uas.util.RegistryStartup
```

```
unicorex/conf/wsrflite.xml
```

```
(remove service definitions and add registry service)
```

# Security

- Components communicate using client-authenticated SSL
- Keystore and truststore needed (can be one file)
  - key entry (signed by a CA)
  - trusted certificates
- PKCS12 or JKS formats supported
- OpenSSL (no JKS),
- keytool (Java SDK)
- Portecle



# Security: relevant config files

---

- Gateway
  - Keystore, etc.: `gateway/conf/security.properties`
- UNICORE/X
  - Keystore, etc.: `unicorex/conf/wsrflite.xml`
  - Access Policy: `unicorex/conf/security_policy.xml`
  - General settings: `unicorex/conf/uas.config`
  - JMX passwords: `unicorex/conf/jmxremote.passwd`
- XUADB
  - Server: `xuadb/conf/xuadb_server.conf`
  - Admin client: `xuadb/conf/xuadb_client.conf`

# Monitoring and managing a VSite

- JMX console „jconsole“ (Java SDK)

The image displays two overlapping windows of the J2SE 5.0 Monitoring & Management Console (jconsole) running on localhost:5558.

**Left Window (Summary Tab):**

- 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

**Right Window (MBeans Tab):**

- MBeans Tree:**

  - JMImplementation
  - WSRFlite
    - Kernel
      - Service<FileTransferBFT>
      - Service<FileTransferRBYTEIO>
      - Service<FileTransferSBYTEIO>
      - Service<JobManagement>
      - Service<Registry>
      - Service<ServiceGroupEntry>
      - Service<StorageManagement>
      - Service<TargetSystemFactoryService>
      - Service<TargetSystemService>
  - XNJS
    - de.fzj.unicore.xnjs.simple.jmx.BasicM
  - java.lang
  - java.util.logging

- Attributes Table:**

Name	Value
InstanceCount	9
ServerTime	Mittwoch, 18. April 2007 19:35 U...
- Refresh** button

# JMX configuration

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- Activated using system properties in start script

```
unicorex/bin/start.sh
```

```
#enable JMX (use jconsole to connect)
```

```
OPTS=$OPTS" -Dcom.sun.management.jmxremote"
```

```
#enable JMX remote access protected by username/password
```

```
OPTS=$OPTS" -Dcom.sun.management.jmxremote.port=9128 -Dcom  
.sun.management.jmxremote.authenticate=true"
```

```
OPTS=$OPTS" -Dcom.sun.management.jmxremote.ssl=false"
```

```
OPTS=$OPTS" -Dcom.sun.management.jmxremote.password.file=conf/jmxremote.password"
```

- Remote access is password protected
- SSL protection is also possible (check JMX docs)

# Backend configuration: Persistence

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- **WSRF container persistence**

`unicorex/conf/wsrflite.xml`

```
<property  
name="unicore.wsrflite.persistence.storagedirectory"  
value="data"/>
```

- **XNJS persistence (local!)**

`unicorex/conf/xnjs.xml` (or `xnjs_legacy.xml`)

```
<property name="XNJS.statedir" value="data/NJSSTATE"/>
```

- **XNJS filespace root (on target system!)**

`unicorex/conf/xnjs.xml` (or `xnjs_legacy.xml`)

```
<property name="XNJS.filespace" value="/var/data/FILESPLACE"/>
```

# Backend configuration: IDB

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- XNJS IDB file („incarnation database“)  
unicorex/conf/xnjs.xml (or xnjs\_legacy.xml)  
  
<property name="XNJS.idbfile" value="conf/simpleidb"/>
- IDB contains
  - Application mappings („incarnation“)
  - Site resources (CPUs, memory, etc)
  - Textual information (key-value)
- IDB is dynamic, i.e. restart is not needed after changing the IDB
- New format (NOT Unicore 5 IDB)

# More information

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- [www.unicore.eu/documentation/manuals/unicore6](http://www.unicore.eu/documentation/manuals/unicore6)
- UNICORE/X
  - <http://www.unicore.eu/documentation/manuals/unicore6/unicorex>
    - Detailed guide for configuring UNICORE 5 TSI
    - Detailed IDB guide
    - Configuration option reference