UNICORE/X security basics

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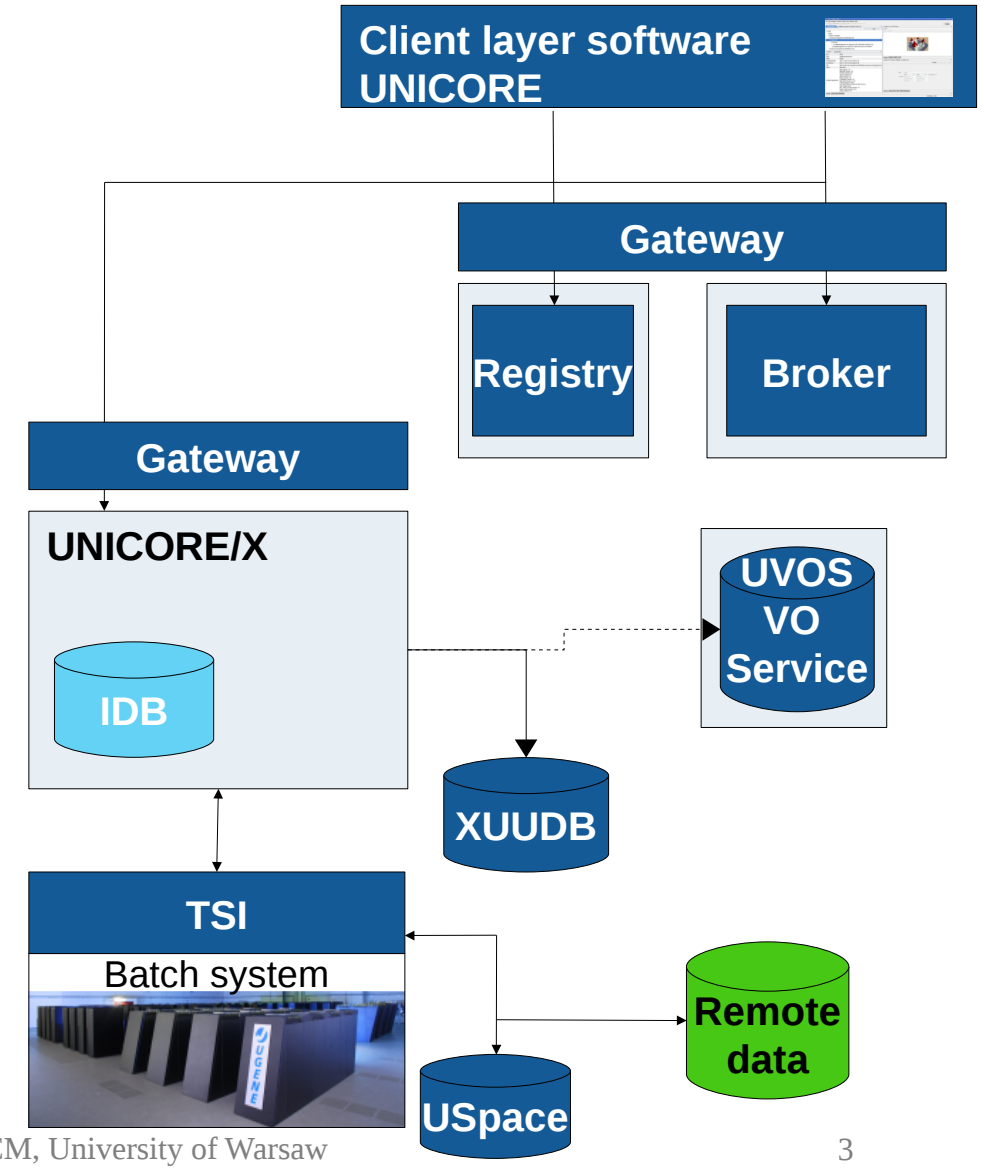
UNICORE Security PT

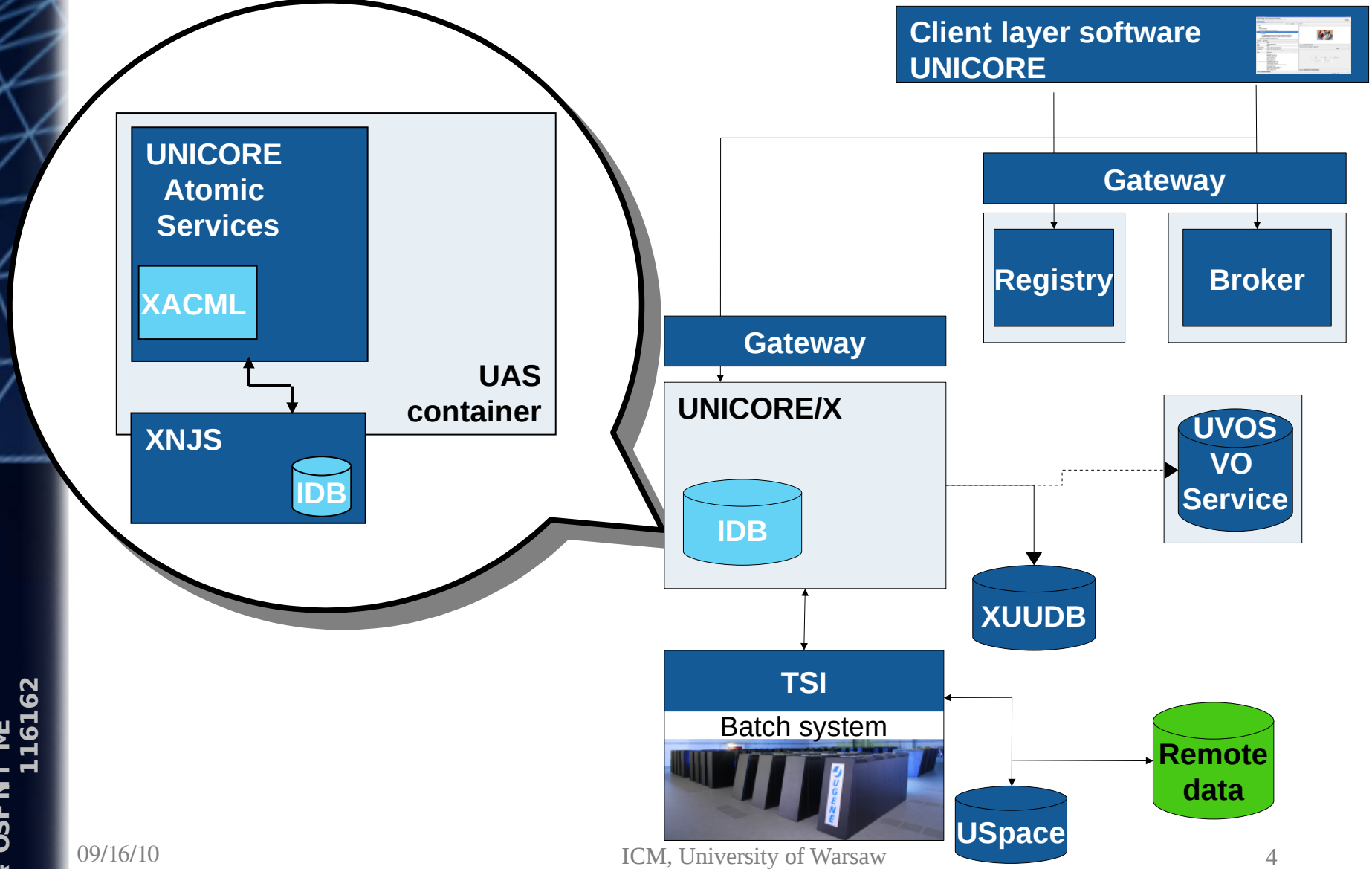
Short outline

- Short UNICORE architecture tour
- UNICORE environment
- **Configuration**
- **Logging**
- **Authorization**
- What was not covered, where to search for help?

UNICORE Architecture



UNICORE Architecture



UAS container

- Most of the UNICORE servers (UNICORE/X, Registry, Workflow Service, Service Orchestrator, ...) use the same **UAS** container.
  - UNICORE Gateway and TSI are exceptions.
- Security is therefore configured in the same way for all UAS services.
- UNICORE Gateway is special but its configuration is simple.
- TSI is rarely reconfigured/maintained.

Network environment

- Only one port must (and should) be opened on a site's firewall: the Gateway's external port.
- Only the Gateway's machine address must be public.
- It is strongly suggested to block access to other ports used by UNICORE services.
- There must be network communication possibility between Gateway and all other services except TSI.
  - And between UNICORE/X and TSI.

Basic operations

- Starting & stopping:
  - $INSTALLDIR/**start.sh** $INSTALLDIR/**stop.sh**
    - All services that were installed.
    - From the script contents you can judge dependencies.
  - $INSTALLDIR/COMPONENT/**bin/{start|stop}.sh**
    - For the specified component only.
    - For TSI it is bit different: $INSTALLDIR/tsi/bin/{start|kill}_tsi
  - There are RedHat-ish init scripts available in extras/redhat-init.d and SUSE template.

Security related configuration files

- Gateway (in conf/):
  - **gateway.properties**
    - main config (public address; tuning; advanced options)
  - **connections.properties**
    - list of accessible services behind gateway
  - **security.properties**
    - keystore and truststore setting
  - **crlcheck.properties**
    - CRL sources

Security related configuration files (2)

- UAS-based servers (in conf/):
  - **wsrflite.xml**
    - Basic network&WS configuration: keystore and truststore, available web services.
  - **uas.config**
    - General UNICORE configuration: authorization (and much more)
  - **security_policy.xml**
    - XACML policy. Usually not touched.
  - (only in UNICORE/X) **xnjs_legacy.xml**
    - Configuration of job processing engine + TSI connection.

Log files

- UAS servers and Gateway log through log4j.
  - TSI logs are nearly useless (you can check whether TSI has been started correctly).
- Log files are in the service log/ subdirectory.
- By default rolled everyday.
  - Old log files are not automatically removed.
- Configuration in component's conf/logging.properties file.

Logging

- To debug security problems (e.g. user can't access the grid for unknown reason) set `log4j.logger.unicore.security` to:
  - DEBUG - the most useful, lot of diagnostics is printed.
  - TRACE - as DEBUG and much more - mostly useful when reporting bugs to developers.

Logging (2)

- To set what is actually written modify:

```
log4j.appender.A1.layout.ConversionPattern=\
%d [%t] %-5p %c %x - %m%n
```

  - %c will print the whole context for which you can set level.
- You can set level of log4j.logger.CONTEXT to get messages only from the one module. This is hierarchical. E.g.:

```
log4j.logger.unicore.services=INFO
log4j.logger.unicore.services.RegistryEntryUpdater=DEBUG
```

- Always check your log files for messages with ERROR or FATAL level. WARN is also suspected.

Authorization

This information is valid for upcoming 6.3.2 and mostly valid for 6.3.1.

- Attribute based - in UNICORE authZ policy is usually unchanged, but user attributes are modified.
- Attributes provide information used for:
  - authorization (whether access is granted)
  - incarnation, i.e. mapping a user to the local system
- Available attribute sources:
  - XUUDB - default. A very simple standalone server.
  - UVOS - advanced, flexible with groups support, SAML service.
  - File - simple per-host attributes list read from a file.

Authorization (2)

- Multiple attribute sources can be used together with a configurable combing policy:
  - MERGE_LAST_OVERRIDES - all sources are evaluated, subsequent sources override.
  - FIRST_APPLICABLE - attributes from the first source that has any attributes for the user are used.
  - FIRST_ACCESSIBLE - attributes from the first source that is accessible are used.
  - MERGE - union of attributes is returned.
- You can use meta-attribute source to form subchains (with different policy).

Example

```
# The main chain configuration:
uas.security.attributes.order=UVOS_CLUSTER FILE
uas.security.attributes.combiningPolicy=MERGE_LAST_OVERRIDES

# The FILE source cfg:
uas.security.attributes.FILE.class=\
eu.unicore.uas.security.file.FileAttributeSource
uas.security.attributes.FILE.file=conf/localAttribtues.xml

# The UVOS_CLUSTER is a sub chain:
uas.security.attributes.UVOS_CLUSTER.class=\
de.fzj.unicore.uas.security.util.AttributeSourcesChain
uas.security.attributes.UVOS_CLUSTER.order=UVOS1 UVOS2
uas.security.attributes.UVOS_CLUSTER.combiningPolicy=FIRST_ACCESSIBLE

# And configuration of the two real sources used in the sub chain:
uas.security.attributes.UVOS1.class=\
eu.unicore.uas.security.vo.SAMLPullAuthoriser
uas.security.attributes.UVOS1.configurationFile=conf/vo.config1
uas.security.attributes.UVOS2.class=\
eu.unicore.uas.security.vo.SAMLPullAuthoriser
uas.security.attributes.UVOS2.configurationFile=conf/vo.config2
```

Banning users

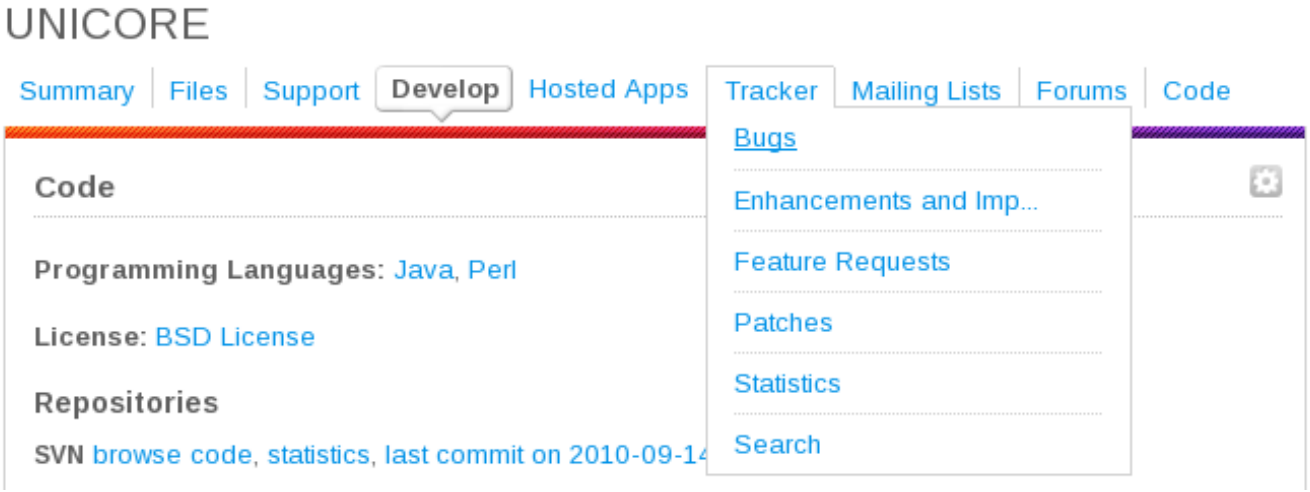
- With default authZ policy a user must posses the attribute role with user value to gain access.
- Remove the attribute (or set to 'banned') to ban the user.
  - You can do this in your XUUDB, file or UVOS.
  - If you don't have access to the global users DB (usually UVOS) then override the role in your local DB (usually XUUDB).
  - When using UVOS you can assign attributes for groups too.

Advanced topics

- UNICORE without gateway.
  - To improve file transfer speed.
  - Supported, but bit risky.
- Securing UNICORE/X<->TSI connection.
  - Requires extra work (you need special Perl modules for TSI); suggested when not trusted users have access to UNICORE/X machine.
- Restricting Registry access.
  - Suggested.
- Changing the XACML policy.
  - For advanced access tuning, though XACML is hard.

Reporting problems

- http://sourceforge.net/projects/unicore/develop
  - Bugs and Feature Request
  - Please log in to SF first
  - Check open bugs if your problem isn't already reported.
- Soon it will be possible to use GGUS.



Documentation links

- Main entry point for official documentation:
  - http://www.unicore.eu/documentation/manuals/unicore6/
- Wiki (slowly growing)
  - http://sourceforge.net/apps/mediawiki/unicore/index.php?title=Main_Page
- Distribution docs/ directory.
- Config files are well commented.
- If there is no information there ask at **unicore-support [at] lists.sourceforge.net**

Thank you!

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