Lightweight LDAP development
With

Apache Directory

gn=Emmanuel, sn=L\C3\A9echarny, dc=apache, dc=org
Schedule

• ADS presentation
• How to use ADS during development
• ADS Advanced benefits
• Tools
ADS started in 2002
30 committers, 800 KSlocs
3 full-time committers
An active community
Certified by the OpenGroup
Used in production
2 sub-projects: Studio + TripleSec
ADS redux (2)

- Written in Java
- Embeddable server (used into Geronimo, and other projects)
- Offers features that no other DS has: Triggers, SP, full X500 ACIs...

Our aim: deliver the most open and extensible LDAP server
Using ADS during the development phase
LDAP, what for?

- LDAP is no longer for simple directories
  - core component of Windows (AD)
  - SSO
  - Security, AAA
  - Identity Management
  - RBAC & XACML
  - Radius, Diameter ...
  - Even storage for hierarchical data!
How to test it?

- LDAP & RDBMS tests:
  - start the database server
  - eventually initialize some data
  - for each test:
    - initialize some more data
    - run a test
    - rollback the data
  - stop the server and clean the base
Writing tests for LDAP using ADS

• ADS is embeddable: no need to have a LDAP environment set up
• ADS can be invoked using JNDI
• ADS is LDAP compliant
• Demo ...
ADS : Ready to test

- We deliver specific classes for tests
- Can be tested without network communication, or with network communication
- This is a unique feature only ADS offers!
(1) Initializing the data

• You can inject a new schema easily

• You can load some data using JNDI code or injecting LDIF files
(2) Launching the tests

• The server must be up and running
• Data must be present
• Test should succeed regardless of execution order
(3) Cleaning the data

• Problem: How do we guarantee that one test does not overlap with another one?
  – tests must be atomic
  – a standard approach implies that you manually rollback to the previous state.

• What if the test fails?
Rollbacking

• Solution: The server must implement a rollback mechanism
  - When starting a test, a tag is set
  - The test is run with its own data
  - Then we rollback to the initial state

• How?
  - ChangeLog interceptor!
  - Changes are stored and reverted
@RunWith(CiRunner.class)
@CleanupLevel(Level.CLASS)
@Factory(TestLDAPOperations.MyFactory.class)

public class TestLDAPOperations {
    public static DirectoryService service;

    public static class MyFactory implements DirectoryServiceFactory {
        ...
    }

    ...

    @Test public void testDelete() throws NamingException {
        ...
    }
}
Entry : ou=Test,dc=Apache,dc=Org

Change type is ADD

Attributes :
createTimestamp:
  20080410001440Z
ou:
  Test
objectClass:
  organizationalUnit
top
creatorsName:
  0.9.2342.19200300.100.1.1=admin,2.5.4.11=system
Reversed added entry:

Entry: ou=Test,dc=Apache,dc=Org

Change type is DELETE
Modified entry:

**Entry**: ou=Test, dc=Apache, dc=Org

Change type is **MODIFY**

Modifications:

- **Operation**: REPLACE
- **Attribute**: description
- **New Value**
Reversed modified entry:

Entry: ou=Test,dc=Apache,dc=Org
Change type is MODIFY
Modifications:
Operation: REPLACE
Attribute: description
Old Value
Advanced options

- You can define different scopes
  - Test
  - Class
  - Suite
  - System
Part 3

ADS Advanced benefits
Triggers and Stored-procs

- ADS support Triggers and Stored-Procedure
- Currently, must be Java code
- In the future, scripting languages will be supported
AFTER Delete

CALL "com.example.ldap.util.sp.BackupTools:backupDeletedEntry"
   ( $ldapContext "ou=backup,ou=system", $name, $deletedEntry );

Presentation available on our site:

**JNDI / ADS API**

**JNDI:**

```java
Attributes entry = new AttributesImpl( true );
Attribute objectClass = new AttributeImpl( "objectClass" );
objectClass.add( "top" );
objectClass.add( "organizationalUnit" );
entry.put( objectClass );
entry.put( "ou", "Test" );
```

**ADS API:**

```java
Entry entry = new DefaultClientEntry( new LdapDN( "ou=Test, dc=apache, dc=org" ) );
entry.add( "ObjectClass", "top", "organizationalUnit" );
entry.add( "ou", "Test" );
```
Part 4

Tooling
Installation

• Installers for a lot of platforms
  – Mac OS/X
  – Windows
  – Linux RPM, Debian, simple script
  – Solaris (soon)

• Graphic and silent installers

• Multi-instances

• A suite is available (Server + studio)
Studio

- A graphical UI
  - LDAP Browser
  - Schema manager
  - ADS configuration handling
  - More to come ...

- Standalone or Eclipse Plugin

- Written in Java: works everywhere eclipse works.
Why a Studio?

• Existing free Open Source GUI are poor
  – Jexplorer (Owned by CA)
  – LdapBrowser (no development since 1998)
  – Others are written in C

• Other are available, but they are free for browsing, not for modifications ...
Why Eclipse?

• Because it's the leading IDE
• The GUI can be delivered as plugins into the IDE or standalone
• A lot of existing plugins are available
Studio : LdapBrowser

DEMO...
Studio : Schema editor

Demo ...
Some numbers ...

• First release : February 2007
• First major version : September 2007
• 1.1.0 released this week :)
• More than 300 issues fixed
• Since 2007, more than 30 000 downloads !
Studio:

What are we working on?

- User's management
- Replication management
- Backend plugin
- Form templating
- ...

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Part 5

Conclusion
Production ready?

• Short answer: yes. But …
  – Documentation is lacking
  – 1.5 still in development (targeting 2.0 for 2008 Q3)
What's next?

• 2.0 is expected by the end of 2008
  – Better Documentation
  – New backend support
  – Better performances expected
  – Better Replication
  – Better ACI handling
  – Virtualization
What's next?

- Embedded HTTP server (DSML)
- Enhanced Kerberos support
- More interoperability (AD, etc)
- Enhanced Triplesec
- More tools
- More OpenLDAP/ADS interaction
• JNDI sucks™ ...
  – Too wide
  – Bad semantic

• A new LDAP API is needed
  – Will replace JNDI for LDAP specific operations
  – JNDI will still be available
  – Some JSR is currently brewed...
Q & A
Thanks

• Apache, of course!
  – And specifically to Alex who started the project 5 years ago
  – To all the committers, users...

• OpenLDAP and Symas peeps
  – Because they are great people!
  – Howard Chu, Kurt Zeilenga...

• The OpenGroup
Links

http://directory.apache.org
http://openldap.org
...

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