Lightweight LDAP development With

Apache Directory

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Schedule

- ADS presentation
- How to use ADS during development
- ADS Advanced benefits
- Tools

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Part 1

Apache Directory Server Presentation

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ADS redux (1)

- 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

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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

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Part 2

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 !

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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 ...

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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

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(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

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```java
@RunWith ( CiRunner.class )

@CleanupLevel ( Level.CLASS )

@Factory ( TestLDAPOperations.MyFactory.class )


public class TestLDAPOperations

{

    public static DirectoryService service;


    public static class MyFactory implements DirectoryServiceFactory

    {

    ... (initialize the server)

    }

...

    @Test public void testDelete() throws NamingException

    {

    ...

    }

}
```
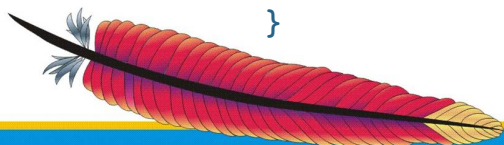
Added entry :

```
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

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Backup deleted entries

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

Presentation available on our site :

http://directory.apache.org/community%26resources/lda
   p-stored-procedures-and-triggers-in-apacheds.html

JNDI / ADS API

- JNDI :

```
Attributes entry = new AttributesImpl( true );

Attribute objectClass = new AttributeImpl( "objectClass" );

objectClass.add( "top" );

objectClassr.add( "organizationalUnit" );

entry.put( objectClass );

entry.put( "ou", "Test" );
```

- ADS API :

```
Entry entry = new DefaultClientEntry(

    new LdapDN( "ou=Test,  dc=apache, dc=org ) );

entry.add( "ObjectClass", "top", "organizationalUnit" );

entry.add( "ou", "Test" );
```
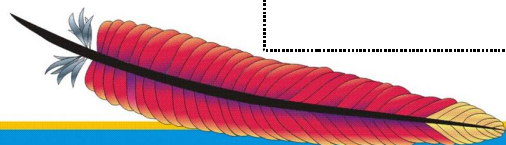
Part 4

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)

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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.

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Studio

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 ...

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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

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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)

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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

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What's next ?

– Embedded HTTP server (DSML)
– Enhanced Kerberos support
– More interoperability (AD, etc)
– Enhanced Triplesec
– More tools
– More OpenLDAP/ADS interraction

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JNDI V2

- 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...

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Q & A

Thanks

- Apache, of course !
  - And specifically to Alex whio 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

...