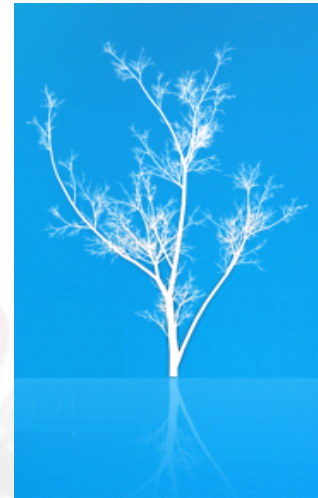


Is the
***Apache Directory
Server*** the new
challenger to ***FedoraDS***
and ***OpenLDAP*** ?

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Planning



- 1- Introduction
- 2- Features comparison
- 3- Compared performances
- 4- Future evolutions
- 5- Conclusion...
- 6- Q&A

1-Introduction



2-1 Functionalities



Generalities



	ApacheDS	FedoraDS	OpenLDAP
LdapV3	✓	✓	✓
Code	Java	C/C++	C/C++
Documentation	Well, err...	Extensive	Spare
Books	None	None	2
Licence	ASL 2.0	GPL	OPL
Backed by organization	Apache	RedHat	Many
Origin	Genuine	Michigan university	

Technical elements



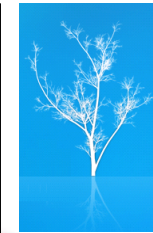
	ApacheDS	FedoraDS	OpenLDAP
Installation	Installer	Installer	Package/build
Backend	JDBM	RDBMS allowed	BDB, GDB...
Transaction	✗	RDBMS	Extension
Multi-backend	✗	Yes	✗
Replication	Mitosis M/M	4 ways M-M	M-S
Schema	Compilation	Dynamic/GUI	Static/files
Referrals	✓	✓	✓
Attribute Encryption	✗	✓	✓
Subtrees specification	✓	✗	✗

Security

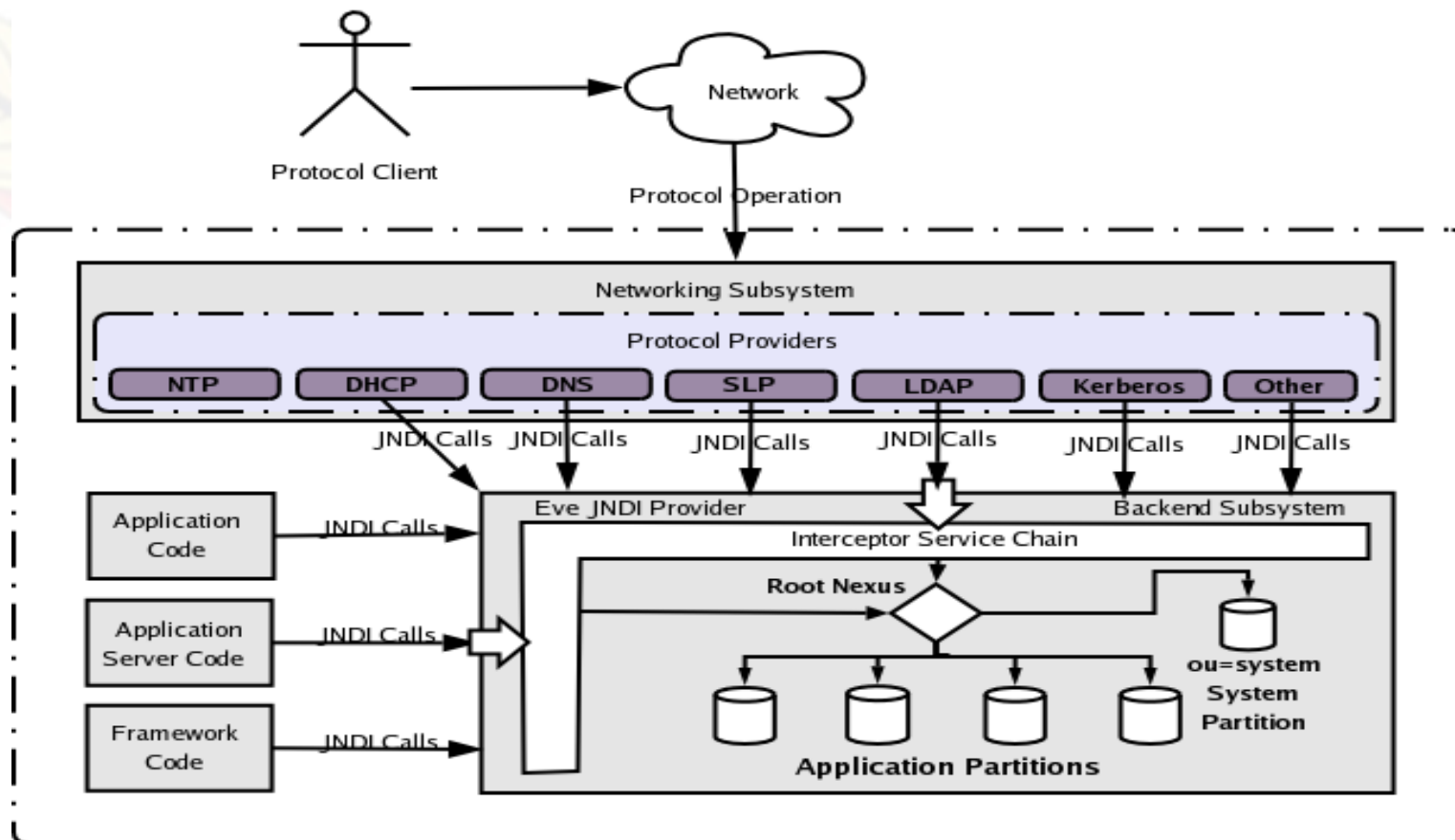


	ApacheDS	FedoraDS	OpenLDAP
SSL V3	✓	✓	✓
TLS	Soon...	✓	✓
SASL	Soon...	✓	✓
ACIs	✓	✓	Partial ?
Attribute Encryption	✗	✓	✗

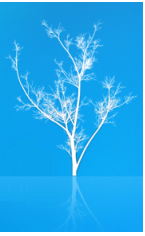
2-2 Apache DS



Apache DS structure



Apache Directory Server



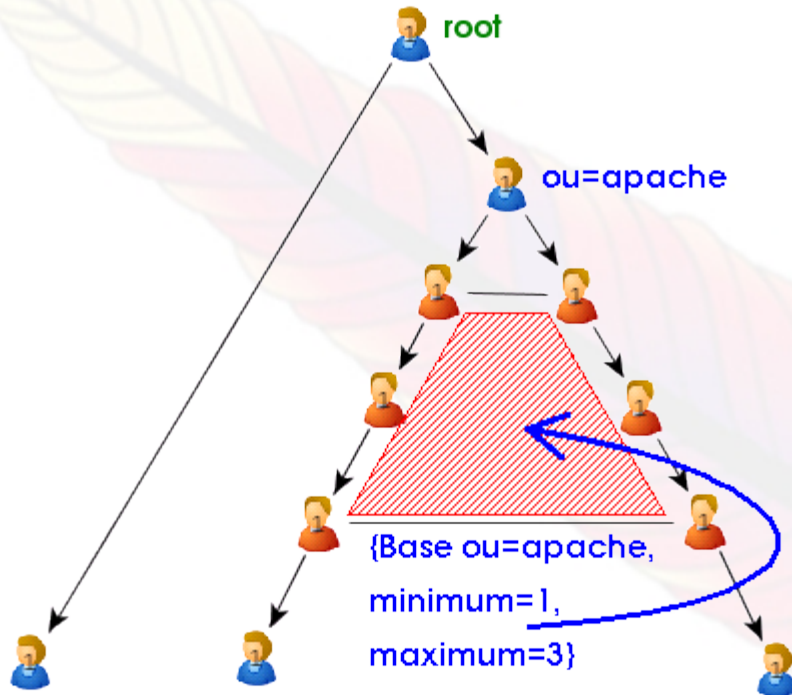
- Full RFCs compliance
- Embeddable
- Layered architecture
- Extensible (Kerberos, DNS, DHCP...)
- Implements X500 Administrative model
- Written in Java => multi-platform

Apache DS X500 extensions



- X.500 Directory Administrative Model
- Basic Access Control Scheme
- Collective Attributes
- Subentries

Subentries



- Selections
- Exclusions
- Levels
- Filtering
- ...

ADS drawbacks



- It's young !
- Lot of bugs to be fixed (memory leaks)
- Replication is to be delivered by october
- Large object remains in memory
- Backend : JDBM only at the moment
- Documentation is lacking
- It's a large piece of software, and we are few working on it...

3- Performance

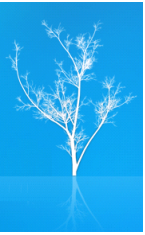


Tests



- 3 tests :
 - Added 10K users
 - Random search through the base
 - Delete all the 10K users
- “Out of the box” installation
- **We just wanted to know if we are really bad ;)**

Users



- Use of MakeLdif to create users :

```
dn: uid=user.3776,ou=People,dc=cs,dc=hacettepe,dc=edu,dc=tr
objectClass: top
objectClass: person
objectClass: organizationalPerson
objectClass: inetOrgPerson
givenName: Janeczka
sn: Favreau
cn: Janeczka Favreau
initials: JF
uid: user.3776
mail: user.3776@cs.hacettepe.edu.tr
userPassword: password
telephoneNumber: 510-586-6567
homePhone: 143-449-3159
pager: 012-704-9314
mobile: 105-287-9092
employeeNumber: 3776
street: 55438 Ash Street
l: Steubenville
st: MT
postalCode: 77097
postalAddress: Janeczka Favreau$55438 Ash Street$Steubenville, MT 77097
description: This is the description for Janeczka Favreau.
```


Typical search request



- Search for a single user, randomly picked
- Perform 10K searches
 - The cache is not likely to be used at run 1
- 10 runs
- The fastest and slowest are removed

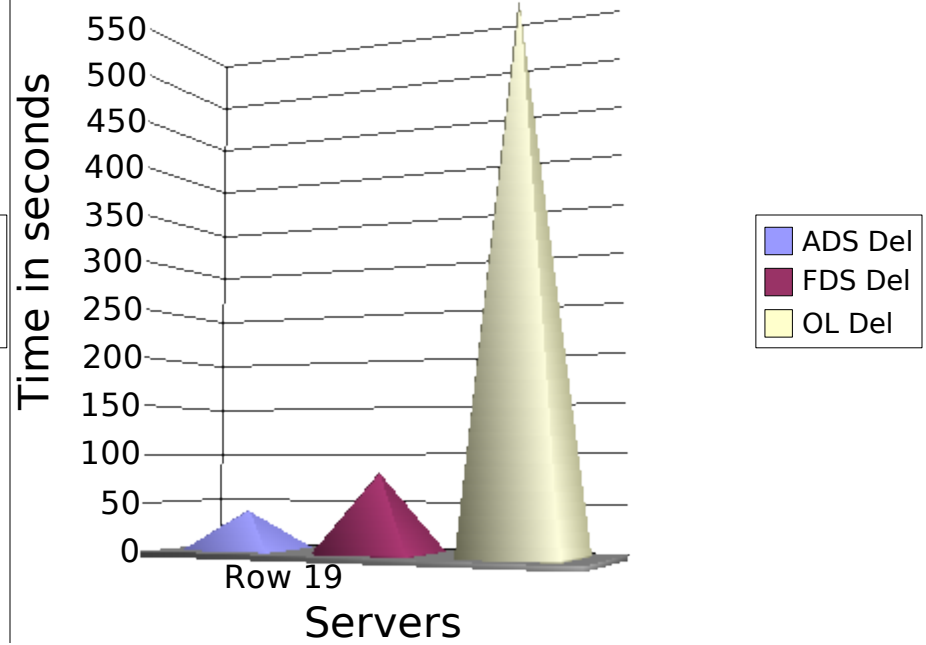
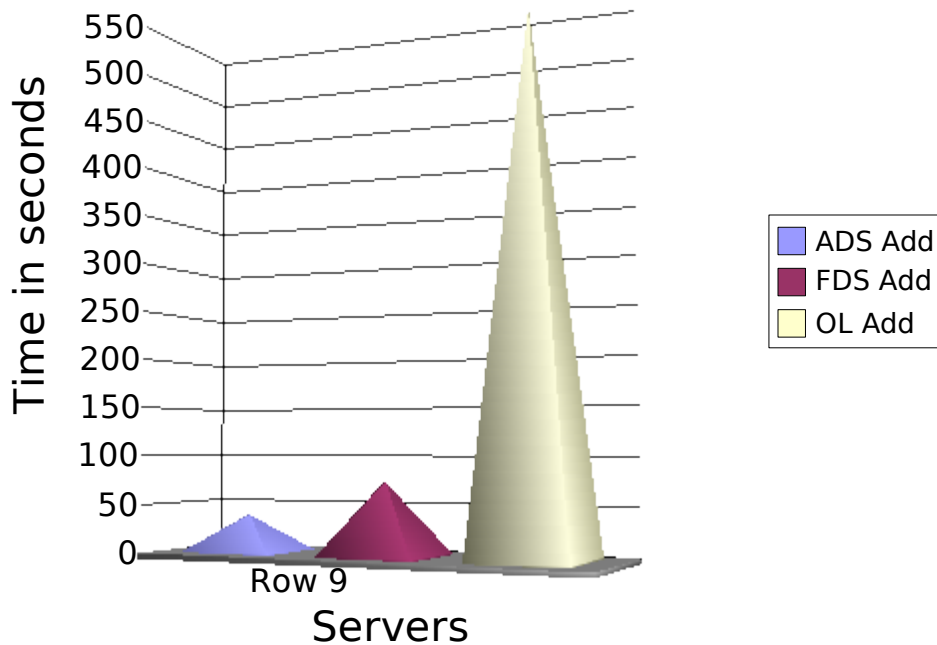
`uid=user. @,ou=People,dc=cs,dc=hacettepe,dc=edu,dc=tr`

Insertion/deletion



Add 10K users

Delete 10K users

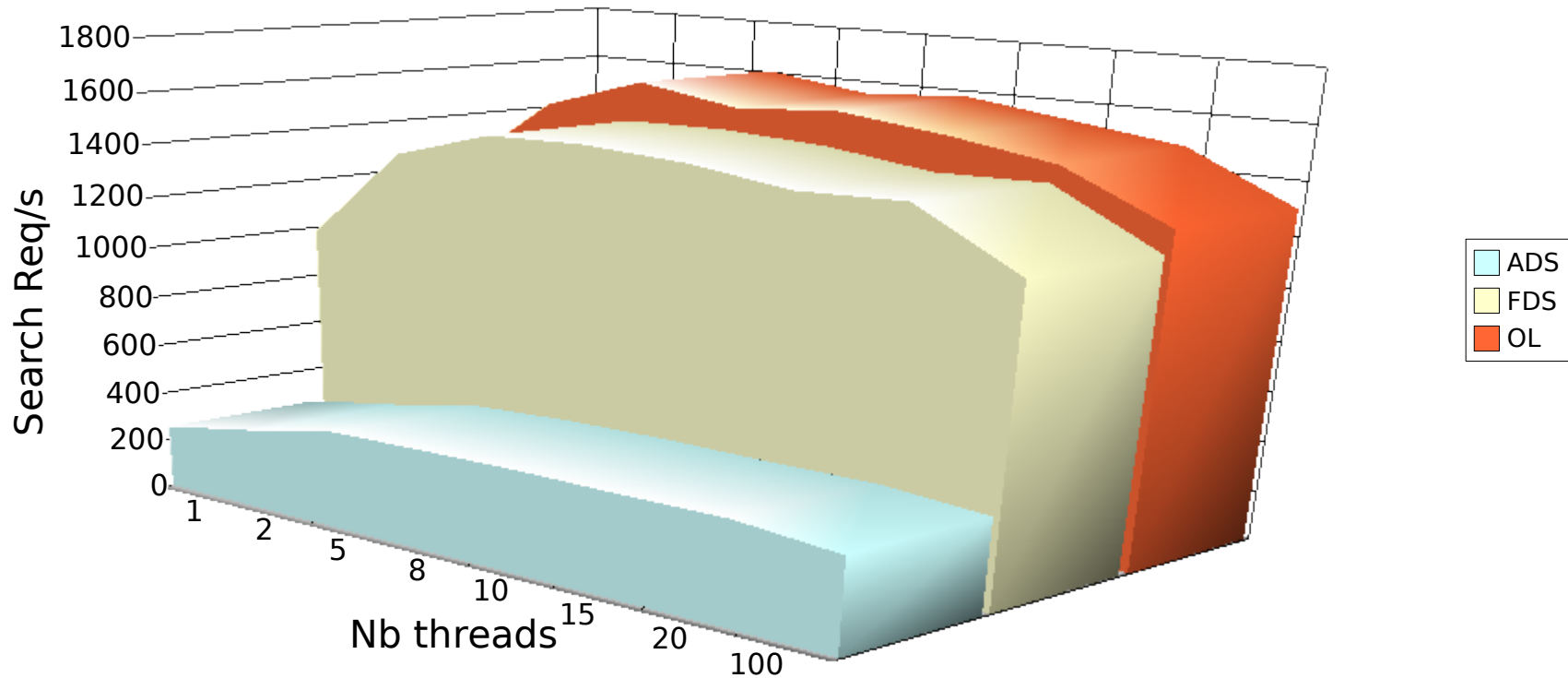


(Smaller pyramids is better)

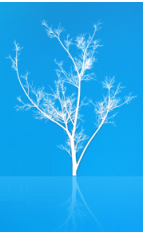
Search run



Ldap servers performance test : random search



Performance issues



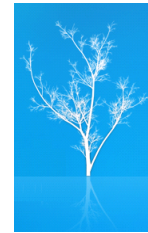
- Better cache mechanism needed
- ASN.1 codec can be improved (15% total)
- Needless Attribute checking (12% total)
- DN processing optimization (10% total)
- Serialization improvement
- Some operations are done many times
- Backend is not optimal
- Memory allocation => GC

What has already been done

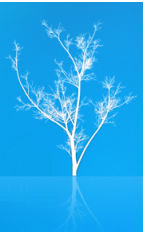


- DN comparison improved : ADS 4x times faster !!! (with a single line modified :)
 - One day to work this out
 - Thanks to **yourKit** profiler!
- ASN.1 codec is much faster (10x)
 - 6 months of work, 40 000 SLOCs
- LdapDN is 2.7x faster than LdapName
 - 2 months of work, difficult to merge in ADS :(

4- Evolution



Backend



- JDBM is the actual backend
- Berkely DB JE[©] is a possible target
- RDBMS soon...
- Needs :
 - Fast backend
 - Reliable backend
 - Transactions support



Tooling (RCP- Eclipse plugin)

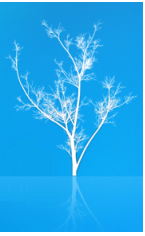
- Start/Stop
- Import/export
 - LDIF
 - DSML 1.0/2.0
- UI Schema Manager
- Ldap Browser
- Ldap Proxy

Replication



- Replication is a must-have
 - Master-Slave replication (OpenLDAP) **OR**
 - Multi-Master replication (FDS)
- RFC 3384 => Multi Master replication
- Draft by Zeilenga says : 'LDAP Multi-master Replication Considered Harmful'
- What about ADS ?

SP and Triggers



- SP : stored procedure
 - Support Java language, but scripting languages as Janino or Jython may be added later
 - Ease some management operations
- Triggers with pre/post operations
 - Fine grained replication
 - E-Provisioning

Standards

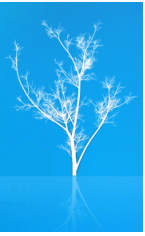


- New RFCs : RFCs 4510 -> 4519
 - Better X500 compliance
 - Internationalization explained
 - Clarification on previous RFCs
 - Imply some modification, but not so much.
- Collectives attributes support (RFC 3671)
- Subentries support (RFC 3672)

5-Conclusion



Links



- Apache Directory Server site and documentation :
 - <http://directory.apache.org/>
 - <http://directory.apache.org/subprojects/apacheds/features.html>
 - <http://directory.apache.org/subprojects/apacheds/index.html>
 - <http://directory.apache.org/subprojects/mina/index.html>
- Articles
 - <http://www-128.ibm.com/developerworks/opensource/edu/os-dw-os-ag-ld>
 - <http://www-128.ibm.com/developerworks/java/library/j-apacheds1/>
 - <http://www-128.ibm.com/developerworks/java/library/j-apacheds2/>
 - <http://www.screaming-penguin.com/main.php?storyid=4972>

Thanks !



- *Alex Karasulu*, “the brain” !
- *Trustin Lee*, Mina's father
- *Ersin Er*, Sp and Triggers
- *Stefan Zoerner*, tests and docos
- *Brett Porter*, Maven and now MVN :)
- And *Peter Royal*, *Cyrille Leclerc*, *Stéphane Bailliez*, *Pierre-Arnaud Marcelot* for their help and support !

Special thanks to **Zinedine Zidane** !

6-Q&A

