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Open Source IAM using Fortress and OpenLDAP

LDAPCon
October 11, 2011

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Agenda

- Product vision
- Project status
- Functional gaps covered
- Features and technologies
- Installation and usage demo
- Where to get more information
- Roadmap
- Questions

Vision

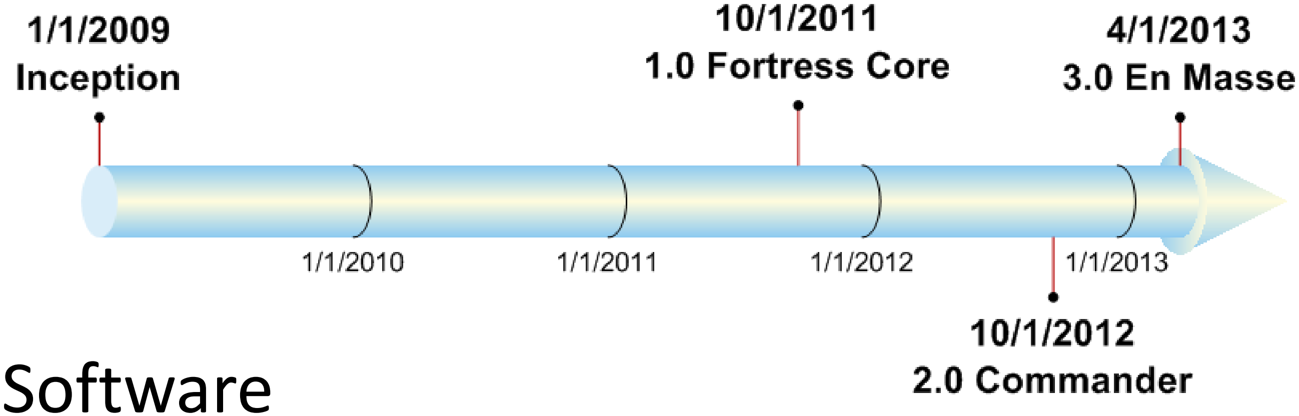
Java is a trademark of Sun Microsystems, Inc.

Securing Web and SOA with Apache Axis, WSS4J, Spring, and OpenLDAP

Shawn McKinney
Mike Scheuter
Fidelity National Information Services
Marty Heyman
SYMAS

- OpenLDAP matured
  - the 'ilities'
  - flexible data storage
  - auditing with access log
  - password policies
- Specifications formalized
  - RBAC, SAML, etc…
- Gaps persisted
  - between those that employ secure technology and who don't
- Needs remain for
  - all networked applications to utilize adequate safeguards
  - a common and robust API that works across all platforms
  - the ubiquitous IAM infrastructure that is easy to use, cost effective and long term viable
- Opportunity exists
  - to harvest a large and previously untapped market share

Project Status



- Start date
  - Jan 2009
- Sponsor
  - JoshuaTree Software
- Partner
  - Symas
- Release Schedule
  - Oct 2011 – 1.0 – Fortress Core & Realm Client SDKs
  - Oct 2012 – 2.0 – Commander Admin UI Server
  - Apr 2013 – 3.0 – En Masse Policy Server

This engine is Powered by OpenLDAP®

- Capable, robust server infrastructure for LDAP v3 network protocols
- Reliable, scalable, fault tolerant, highly-available with 99.99% uptime
- Comprehensive authentication support
- Flexible application data storage and retrieval
- Reliable audit event storage and retrieval
- Server-side password policy support
- Portability across system platforms

But

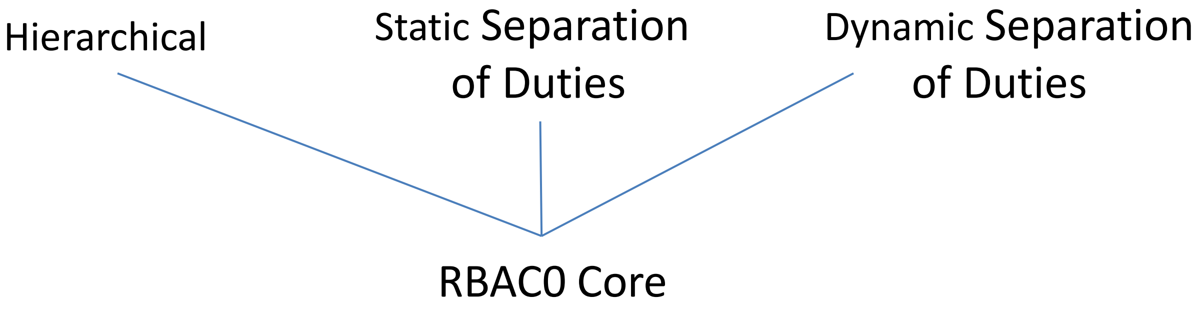
Functional Gaps

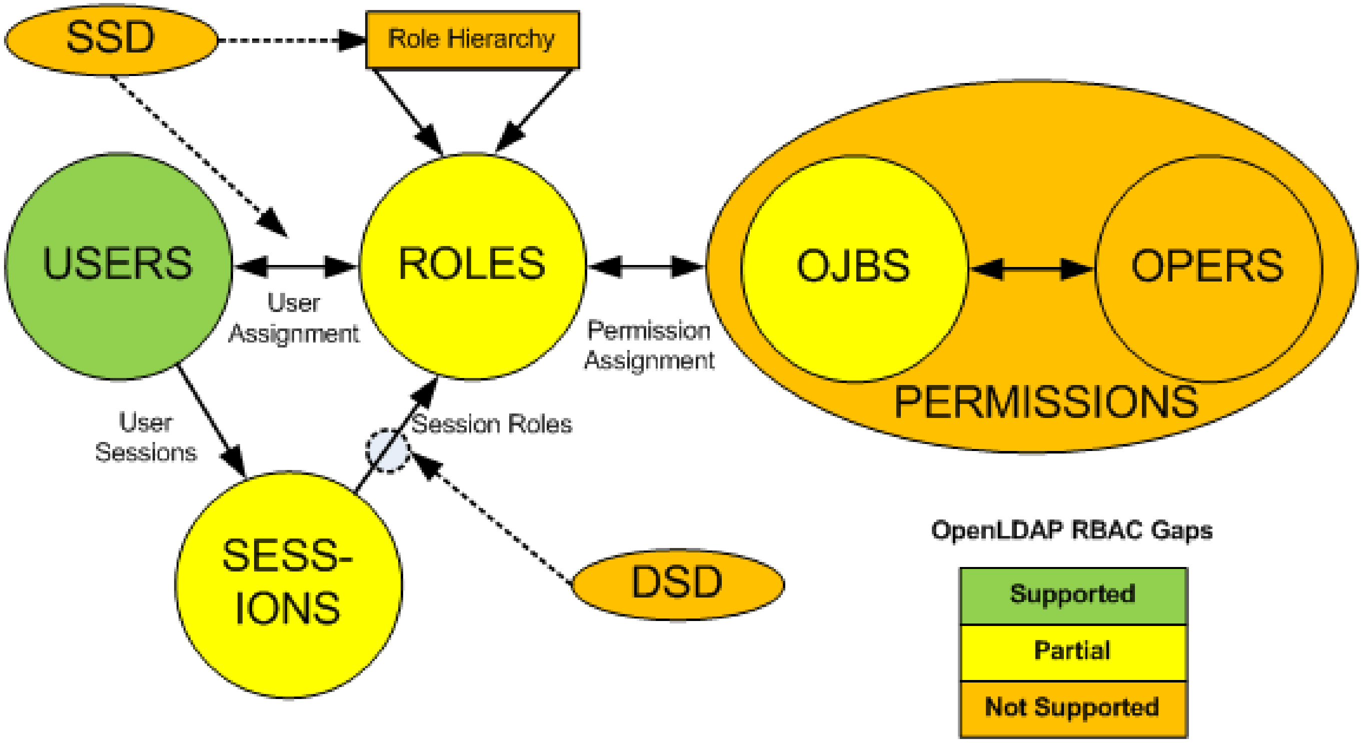
OpenLDAP doesn’t provide

- RBAC API/object model
- Delegated administration model for enterprises
- Comprehensive authorization and audit support
- Security enforcement with Java EE containers
- Password policy client-side APIs
- Tools to install/configure IAM infrastructure and maintain user and policy data

ANSI/NIST RBAC Compliance

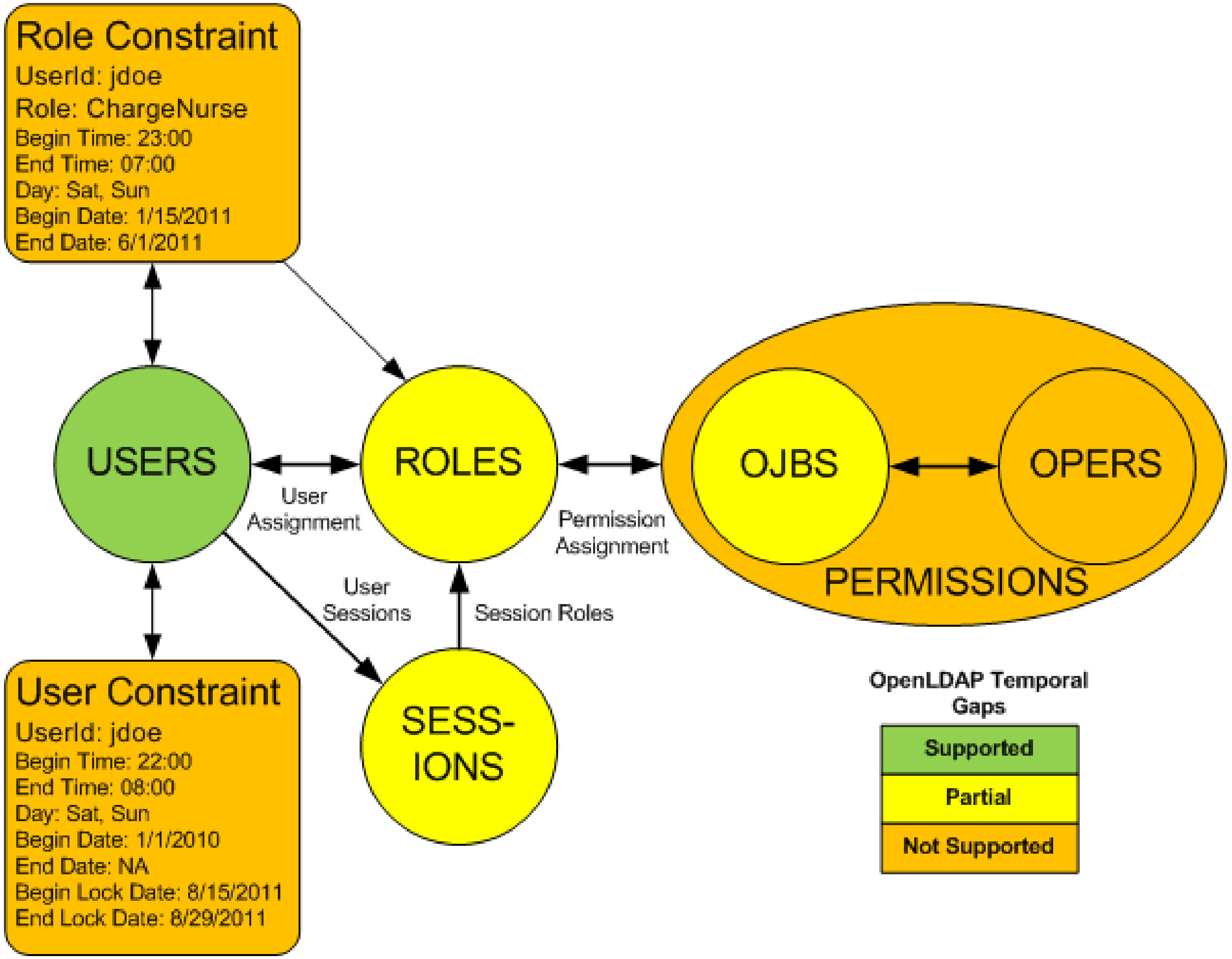
- **RBAC0**: users, roles, perms, sessions
- **RBAC1**: hierarchical roles
- **RBAC2**: static separation of duties
- **RBAC3**: dynamic separation of duties





User and Role Temporal Constraints

- begin/end date
- begin/end time
- day of week
- temporary lockout periods
- timeout



Role Constraint
UserId: jdoe
Role: ChargeNurse
Begin Time: 23:00
End Time: 07:00
Day: Sat, Sun
Begin Date: 1/15/2011
End Date: 6/1/2011

USERS

User Assignment

ROLES

Permission Assignment

OJBS

OPERS

PERMISSIONS

User Sessions

Session Roles

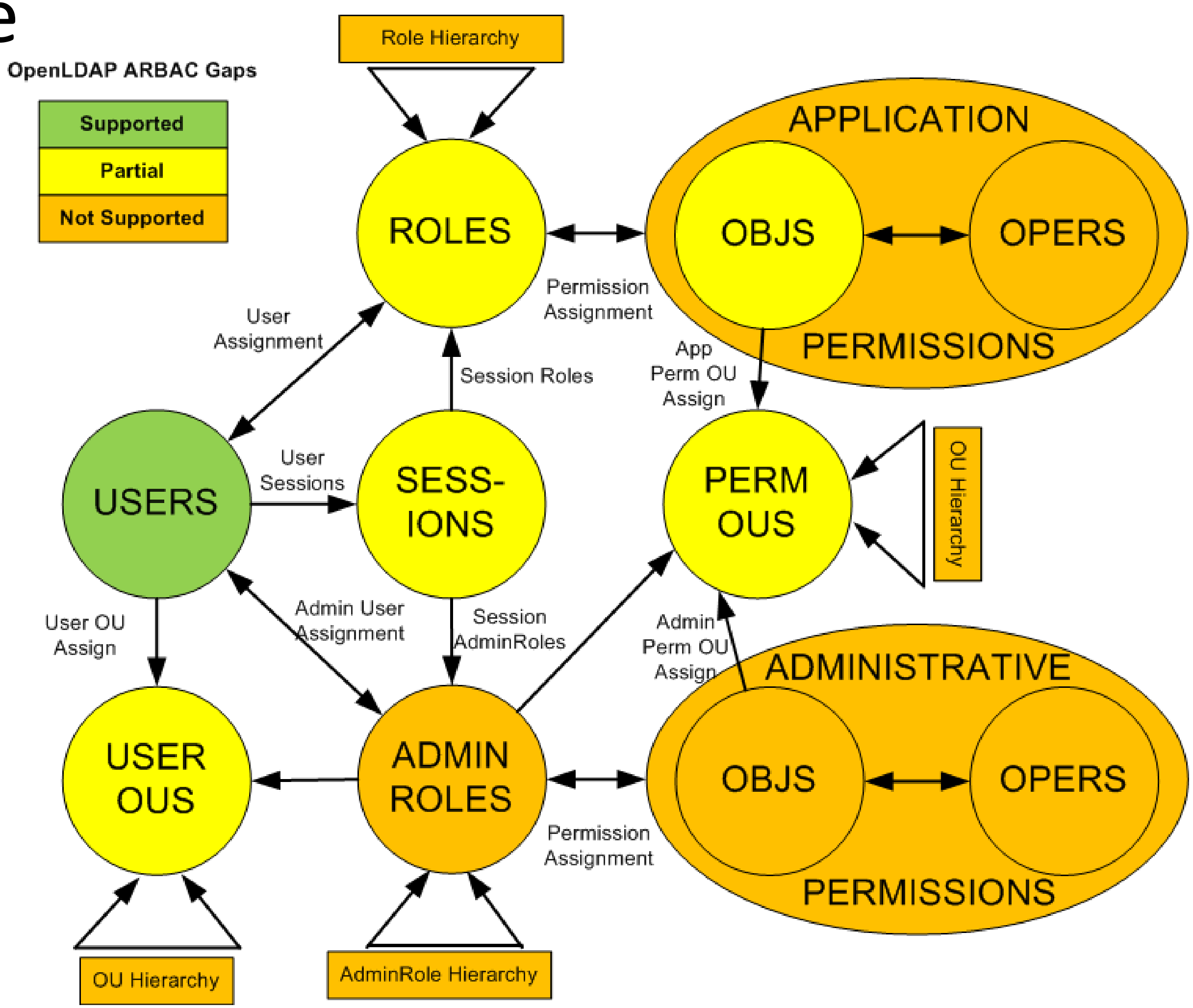
SESS-IONS

User Constraint
UserId: jdoe
Begin Time: 22:00
End Time: 08:00
Day: Sat, Sun
Begin Date: 1/1/2010
End Date: NA
Begin Lock Date: 8/15/2011
End Lock Date: 8/29/2011

OpenLDAP Temporal Gaps
🟩 Supported
🟨 Partial
🟧 Not Supported

Administrative Role Based Access Control (ARBAC02)

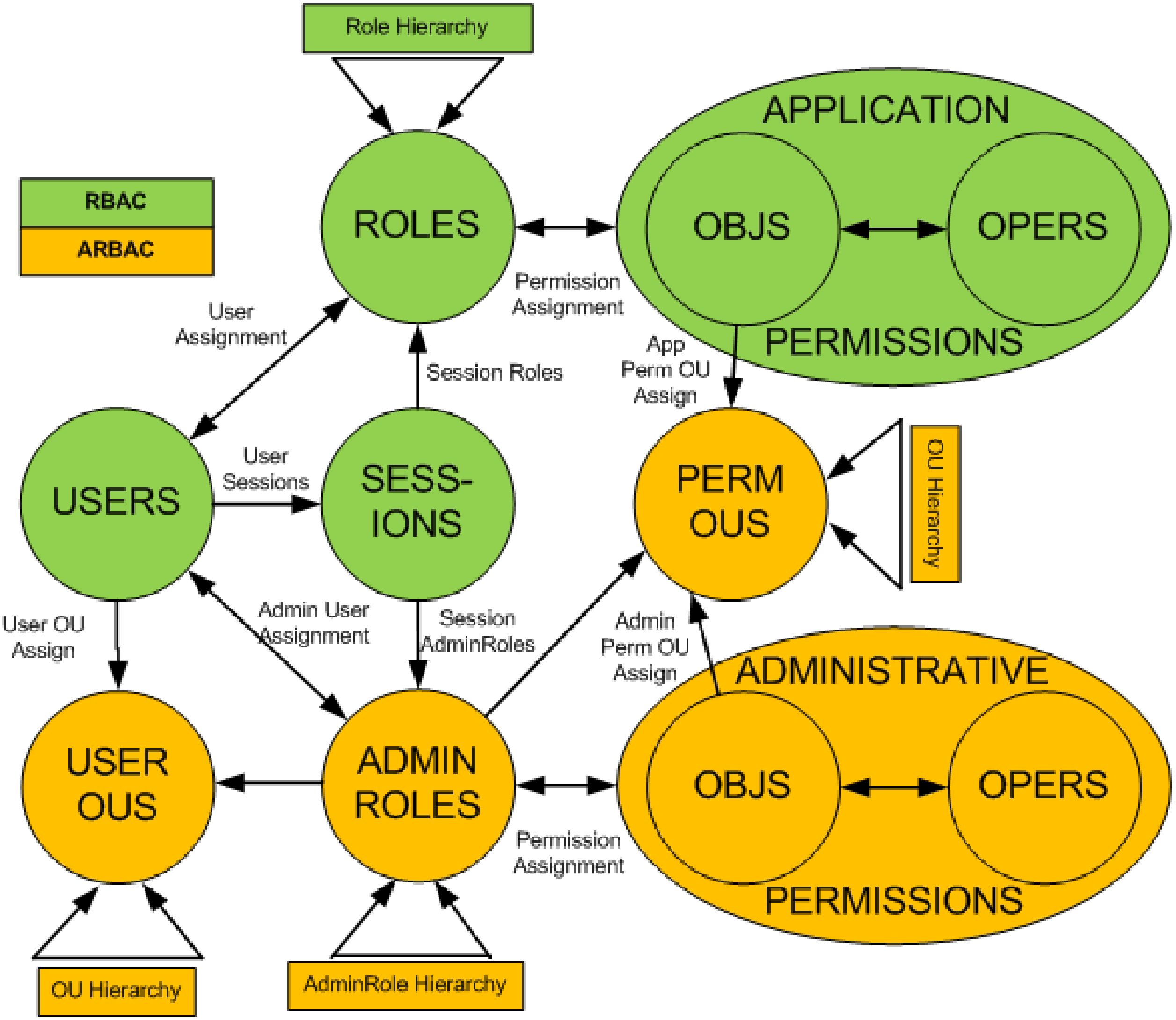
- administrative user access control
- user OUs
- perm OUs
- administrative roles (hierarchical)
- administrative permissions



Rationale

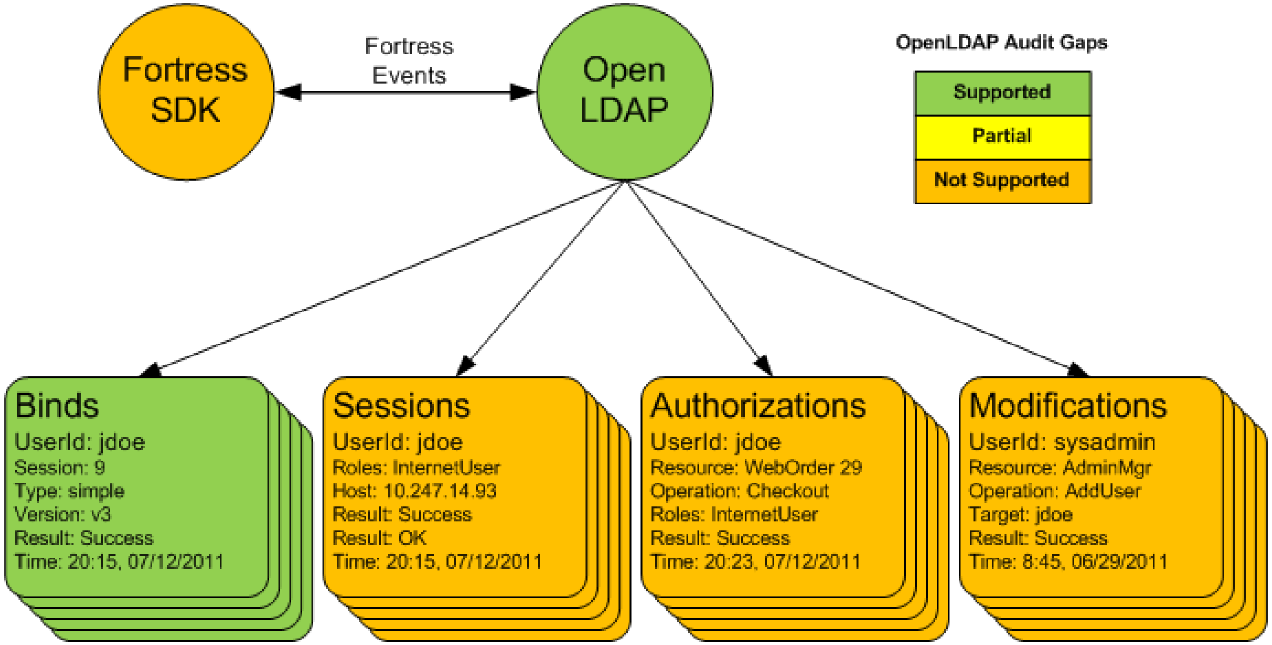
RBAC /ARBAC

- enterprise admin model
- reduce costs
- centralized policy control
- regulatory compliance
- code resuse
- separation of duty control



Audit and Monitoring

- Audit storage and retrieval
  - Session Creation Events
  - Authorization Events
  - Administrative Events/History
  - API for Monitoring and Reporting



Fortress SDK

Fortress Events

Open LDAP

OpenLDAP Audit Gaps

Supported

Partial

Not Supported

Binds
UserId: jdoe
Session: 9
Type: simple
Version: v3
Result: Success
Time: 20:15, 07/12/2011

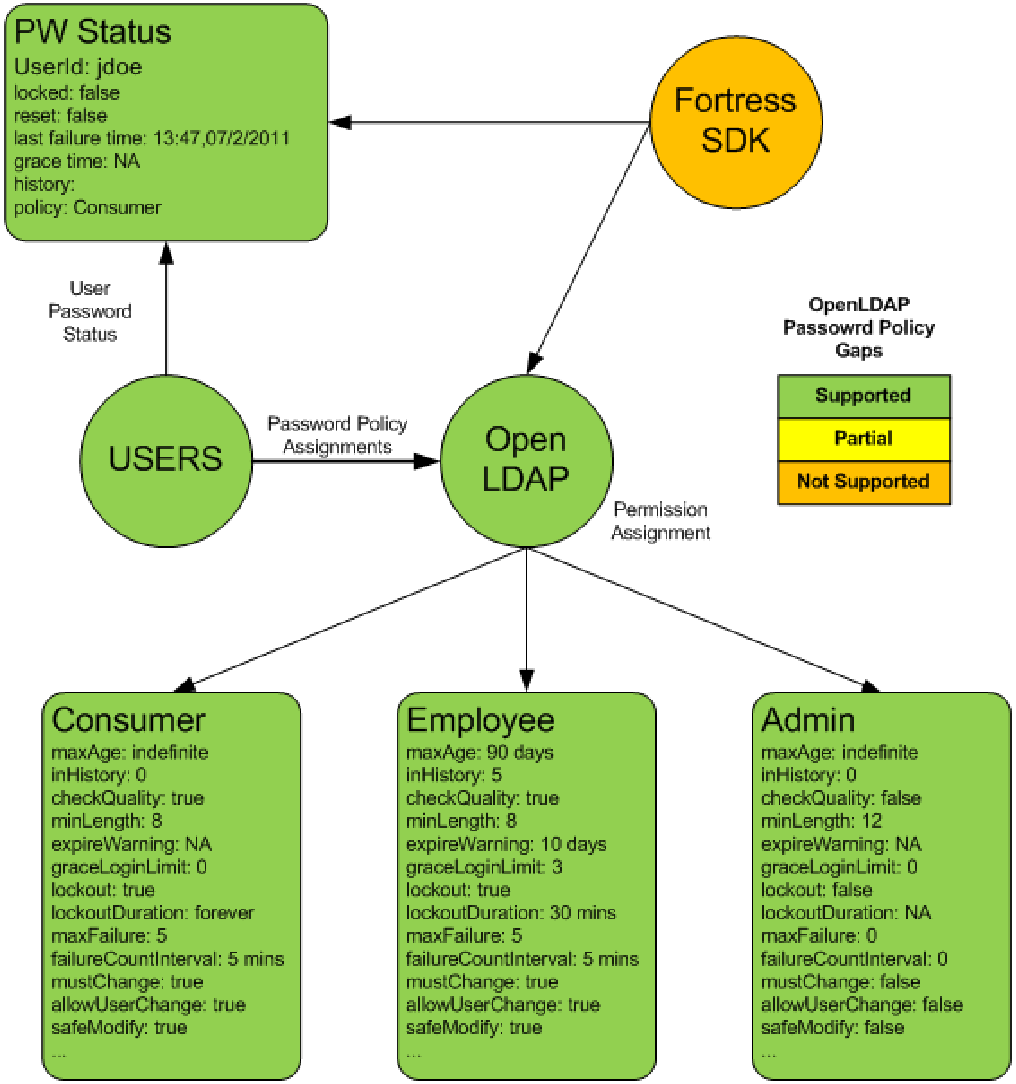
Sessions
UserId: jdoe
Roles: InternetUser
Host: 10.247.14.93
Result: Success
Result: OK
Time: 20:15, 07/12/2011

Authorizations
UserId: jdoe
Resource: WebOrder 29
Operation: Checkout
Roles: InternetUser
Result: Success
Time: 20:23, 07/12/2011

Modifications
UserId: sysadmin
Resource: AdminMgr
Operation: AddUser
Target: jdoe
Result: Success
Time: 8:45, 06/29/2011

Functional Gaps

Password Policy Compliance in Apps



PW Status
UserId: jdoe
locked: false
reset: false
last failure time: 13:47,07/2/2011
grace time: NA
history:
policy: Consumer

Fortress SDK

User Password Status

USERS

Password Policy Assignments

Open LDAP

Permission Assignment

OpenLDAP Passowrd Policy Gaps

- 🟩 Supported
- 🟨 Partial
- 🟧 Not Supported

Consumer
maxAge: indefinite
inHistory: 0
checkQuality: true
minLength: 8
expireWarning: NA
graceLoginLimit: 0
lockout: true
lockoutDuration: forever
maxFailure: 5
failureCountInterval: 5 mins
mustChange: true
allowUserChange: true
safeModify: true
...

Employee
maxAge: 90 days
inHistory: 5
checkQuality: true
minLength: 8
expireWarning: 10 days
graceLoginLimit: 3
lockout: true
lockoutDuration: 30 mins
maxFailure: 5
failureCountInterval: 5 mins
mustChange: true
allowUserChange: true
safeModify: true
...

Admin
maxAge: indefinite
inHistory: 0
checkQuality: false
minLength: 12
expireWarning: NA
graceLoginLimit: 0
lockout: false
lockoutDuration: NA
maxFailure: 0
failureCountInterval: 0
mustChange: false
allowUserChange: false
safeModify: false
...

Product Features

Fortress 1.0 Packages

1. **Embeddable Core SDK**
   – APIs for Java applications
2. **Pluggable Realm**
   – SPIs for Java EE Containers
3. **Builder Tools**
   – Server Installations
   – Platform specific
   – OpenLDAP binaries
   – Fortress binaries

Fortress Core SDK

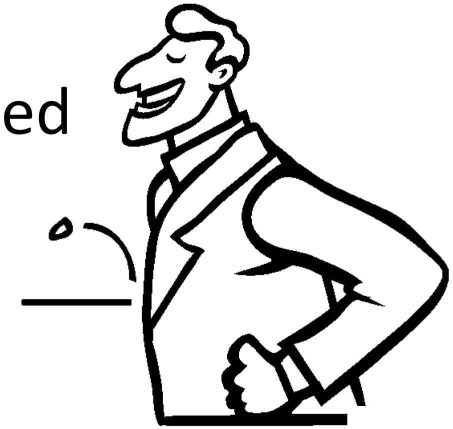
Nine Managers, 100+ APIs

1. **AccessMgr** – enforcement for RBAC in Java apps
2. **AdminMgr** – provision RBAC objects and policies
3. **ReviewMgr** – interrogation of RBAC objects and policies
4. **PswdPolicyMgr** – provision and interrogate OpenLDAP password policies
5. **DelegatedAccessMgr** – enforcement for ARBAC in Java apps
6. **DelegatedAdminMgr** – provision ARBAC objects, policies
7. **DelegatedReviewMgr** – interrogate ARBAC objects and policies
8. **AuditMgr** – monitor audit data
9. **ConfigMgr** – provision properties for application usage of Fortress

Fortress Realm SPI

Policy Enforcement for Java EE Containers

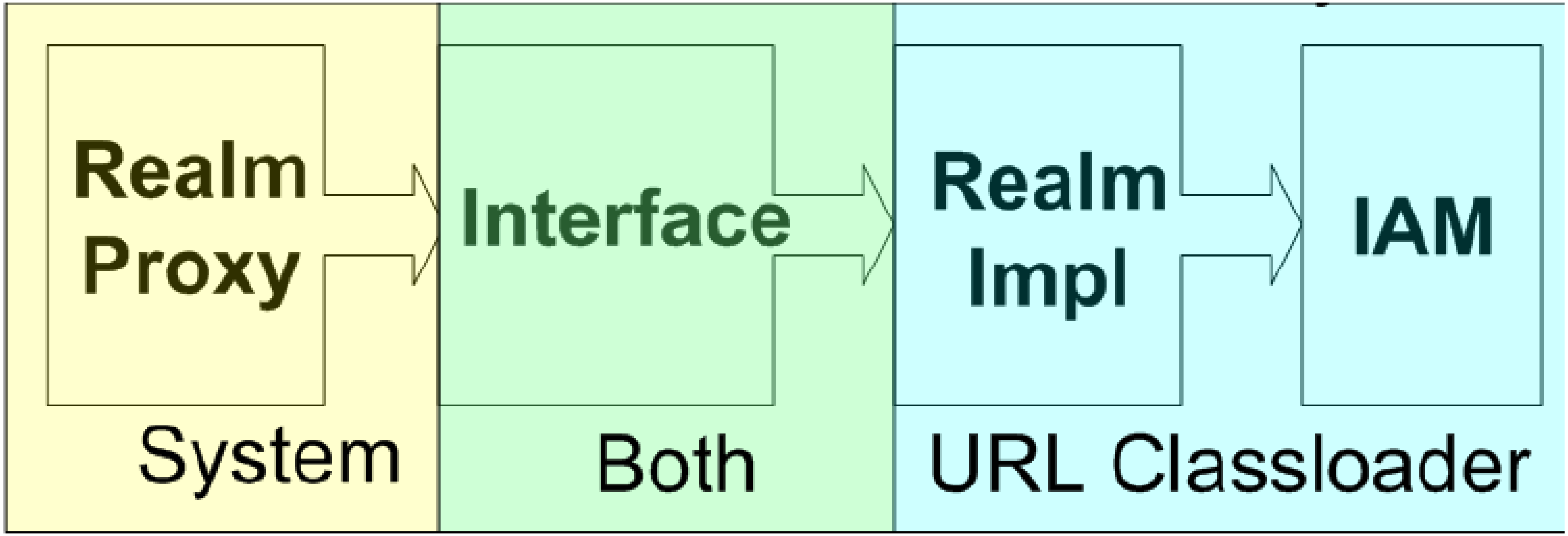
- **RealmMgr** – runtime security policy enforcement for applications running within JEE containers
  - Websphere, JBoss, Tomcat available today
  - Glassfish & Weblogic available future
- **Declarative Enforcement**
  - Coarse-grained policy enforcement
  - Sessions, simple authentications, role-based authorizations, session management
  - Safe, secure and bullet-proof
- **Monitoring**
  - Security audit trail stored in OpenLDAP



Fortress Realm SPI

Classloader Isolation Technique

- keep runtime libraries off the app server's execution classpath
- simple, predictable and repeatable installation outcome

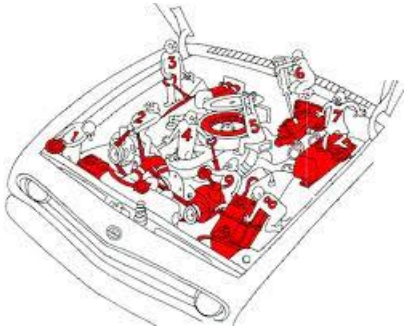


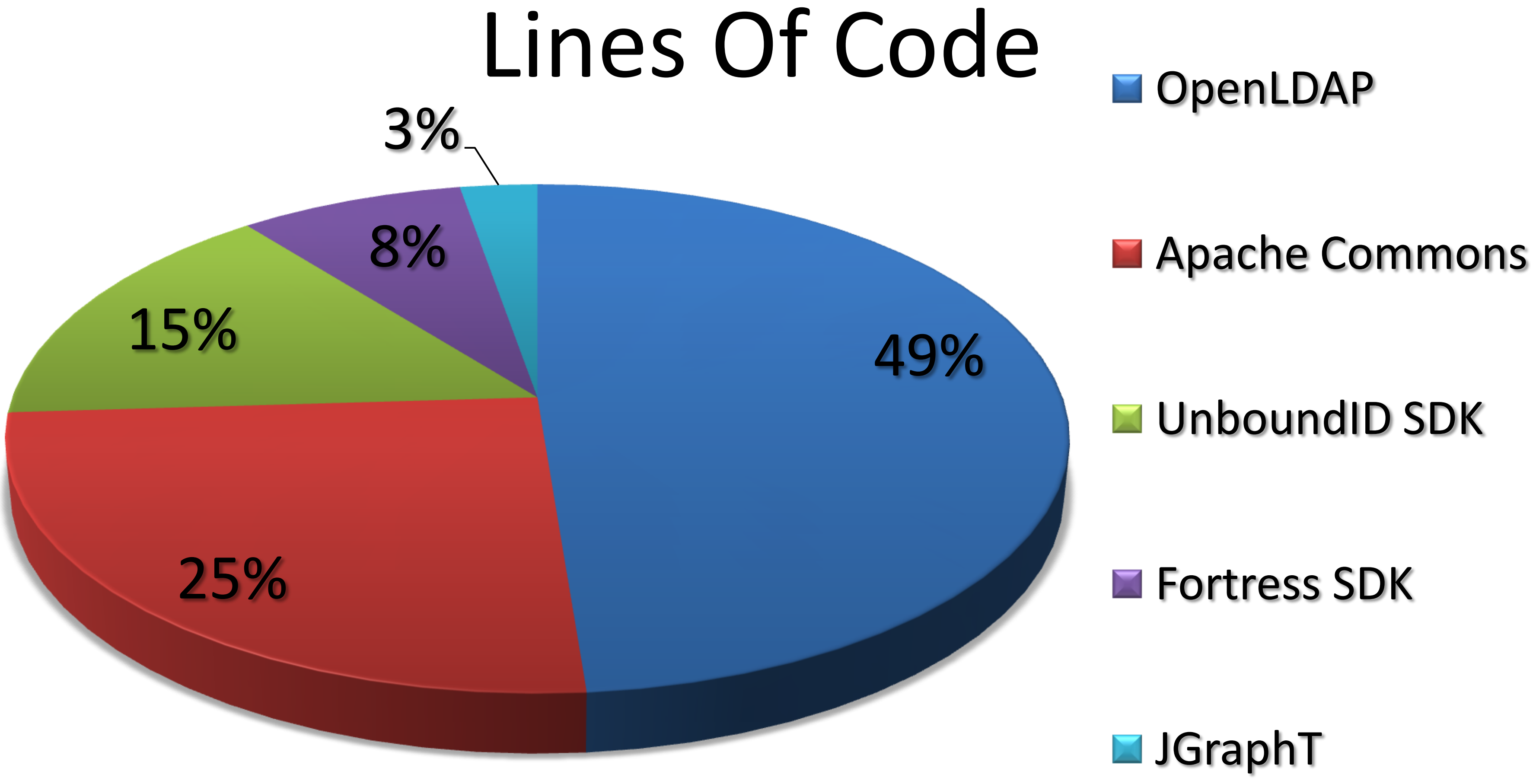
Fortress Builder Package

Install, Configure, Administer

- Install and configure OpenLDAP servers
- Tailor OpenLDAP servers for Fortress usage
- Property persistence for Fortress apps
- Build and run load scripts (drive admin APIs)
- CRUD console for administration and review APIs
- Full regression testing of installations (all APIs)
- Encryption and decryption of application properties
- Samples to learn the programming APIs

Technologies in Use





Fortress Builder & Calendar Sample

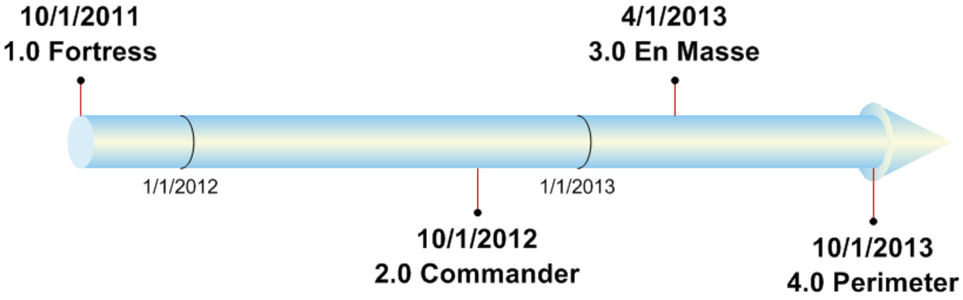
demo

Where to get more

1. Collaboration and Source ---> OpenLDAP.org
   - GIT source repo: http://www.openldap.org/devel/gitweb.cgi
   - list server: http://www.openldap.org/lists/mm/listinfo/openldap-fortress
   - issue tracking: http://www.openldap.org/its/index.cgi
2. Silver Release and Doc -> JoshuaTreeSoftware.us
   - doc: https://joshuatreesoftware.us/jtspages/docs.php
   - release: https://joshuatreesoftware.us/jtspages/download.php
3. Gold Release and Commercial Support ---> Symas.com
   - subscription: http://www.symas.com/index.php/support/
   - release: http://www.symas.com/index.php/downloads/

Roadmap

- **2.0 Commander Web UI Server**
  - currently in development
  - Fortress & OpenLDAP administration
  - Java EE platform uses Apache Wicket UI framework
  - October 2012
- **3.0 En Masse Policy Server**
  - RESTful API wrapper for Fortress APIs
  - Java EE platform uses Apache CXF & Camel frameworks
  - April 2013
- **4.0 Perimeter Server**
  - B2C SSO
    - SSO Reverse Proxy Server
    - SAML 2.0
  - B2B SSO
    - WS-Trust Security Token Server
  - October 2013



Questions

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Thank You!

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