OpenDS and Other Sun-Sponsored Open Source Projects

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Directory Services Engineering

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Who Am I?

- Architect for the OpenDS project, which is a Java-based open source LDAP directory server
  - > Employed as a directory services engineer at Sun Microsystems for the last 5.5 years
  - > Prior to joining Sun, I was involved with directories in various ways at Netscape/iPlanet, TidePoint Corporation, and Caterpillar, Inc.

- Other open source projects I'm involved with include the SLAMD Distributed Load Generation Engine and Java LDAP Client API

- Avid user of Solaris and Linux

Open Source at Sun

http://www.sun.com/software/opensource/index.jsp

Sun's Open Source Initiatives

- Sun has contributed more (measured in lines of code) to open source than any other organization
  - > 2006 European Commission: Sun's contributions account for over 25% of the code in Debian Linux distribution -- over 3x more than any other organization
  - > Estimated value for all Sun contributions is over $2 billion

- Sun participates in many external open source projects, including Linux, GNOME, Mozilla, x.org, Derby, PostgreSQL, Roller.

- Sun has contributed hardware to many projects, and sponsors java.net providing key infrastructure components for open source development.

Sun Offers a Full Open Source Stack

- http://www.sun.com/software/opensource/learnmore.jsp

- Hardware: OpenSPARC

- Operating System: OpenSolaris, Linux

- Clustering: Grid Engine, Open MPI

- Development: OpenJDK, Fortress, Netbeans

- Middleware: OpenDS, OpenSSO, Glassfish, OpenPortal, OpenInstaller, OpenCDS, OpenESB

- Desktop: x.org, GNOME, OpenOffice.org, Mozilla, Looking Glass

How Can Open Source Make Money?

- Give away the software, but charge for related items
  - > Support Contracts
  - > Professional Services
  - > OEM and Reseller Licenses
  - > Sponsored Development
  - > Training and Certification
  - > Managed and Hosted Services
- Sell the hardware that runs the software
  - > Servers, workstations, thin clients
  - > Storage, network and security equipment

OpenSolaris

- Available at http://www.opensolaris.org/
- Virtually all of Solaris is now open source (CDDL)
  - > Some components are currently still binary-only due to legal issues, although an Emancipation Project is trying to address that
  - > Some components are being phased out (e.g., CDE, OpenWindows) and aren't planned to be included
- Many ongoing projects and communities
  - > DTrace, ZFS, Zones, Trusted Extensions, BrandZ, Xen, NFS, Networking, Resource Management, etc.
  - > Active mailing lists provide direct access to developers and help shape the future of Solaris / OpenSolaris

OpenSolaris Distributions

- http://www.opensolaris.org/os/downloads/
- Nevada -- Sun's OpenSolaris Distribution
  - > Available through Solaris Express
  - > Will eventually become the next version of Solaris
- NexentaOS -- GNU/OpenSolaris
  - > Kind of like Ubuntu with a Solaris kernel
- BeleniX -- OpenSolaris Live CD
- marTux -- First external SPARC-based distribution
- Schillix -- One of the first distributions, but hasn't been kept current

The CDDL License

- An OSI-approved open source license

- A file-based license, very similar to the MPL

- Very flexible for integrating with other licenses, including closed-source licenses
  - > Ensures that any code released under CDDL will stay open under CDDL. Any new files that you want to create or integrate in can be under almost any license you want.

- Includes patent grant and patent protection clauses

- Not compatible with GPLv2, mainly due to GPL
  - > Many other common licenses aren't GPL compatible
  - > Other licenses only compatible after retroactive changes

OpenSPARC

- Available at http://www.opensparc.net/

- Includes information about OpenSPARC-T1 (the open source version of the UltraSPARC-T1)
  - > 8 CPU cores, 4 hardware threads per core
  - > Verilog RTL, hypervisor API, diagnostic tests, misc. scripts and tools available under GPLv2

- Makes it easy for other OSes to support this CPU
  - > Ubuntu and Gentoo Linux
  - > FreeBSD
  - > OpenVZ Virtualization

- Simply RISC has built a single-core version

OpenJDK

- Available at http://openjdk.java.net/
- Open sourced over the last year
  - > Officially announced at JavaOne last year (May, 2006)
  - > Fully buildable by JavaOne this year (May, 2007)
- Virtually all available under GPLv2
  - > As of the release announcement, the available code is at Java 1.6.0_01-b06, which is the same as the latest downloadable binary version
  - > Still a couple of binary-only components licensed from external vendors

The OpenDS Project

http://www.opends.org/
https://opends.dev.java.net/

What Is OpenDS?

- An open source high-performance Java-based LDAPv3 directory server

- Requires Java 5.0 or higher (Java 6 is better)

- All content available under CDDL

- Available at https://opends.dev.java.net/
  - > Subversion code repository, mailing lists, issue tracking system, weekly builds

- Other content available at http://www.opends.org/
  - > QuickSetup installer, documentation wiki, daily builds, source browser

A Quick Overview of LDAP

- Lightweight Directory Access Protocol
  - > Latest specs defined in RFC 4510 and related standards
  - > A standard wire protocol unlike RDBMS solutions, so no custom drivers required.
  - > Very extensible through features like controls, extended operations, schema management.
  - > Advertises its capabilities so that clients can discover how they can interact with the server.

- Directory servers have lots of security features, including access control, password policies, SASL authentication, connection-level security.

Common Uses for Directory Servers

- Traditional Uses
  - > Operating system naming and authentication
  - > Application authentication and authorization / SSO
  - > Application configuration / profile storage
  - > User information / identity management
  - > Corporate "white pages" directory
  - > E-mail address book
  - > General data storage

- More Recent Uses
  - > Atom / APP services
  - > OpenID services

Why Open Source OpenDS?

- Helps make it easier for users to interact with developers to express what features they want and where they're having trouble

- Helps make it easier for administrators to identify problems if something goes wrong

- Helps drive interest in the product, and can lead to users contributing code, documentation, HOWTOs, etc.

- Makes it much more attractive to developers/OEMs looking to embed a directory server in their product

Why Not Open the Existing Server?

- It's a great product with a long and distinguished heritage, but it's showing its age and a fresh start allows us to better meet the needs of the future

- It includes many components licensed from other third parties that would make it difficult to truly open source in a usable form

- The Red Hat Fedora Directory shares a common ancestry (split shortly before iPlanet Directory Server 5.1) but it has gotten very little attention or traction even after having been opened

Why Not Join an Existing Project?

- The open source project should certainly not be seen as Sun giving up on its directory -- we're more committed to it than ever.

- None of the existing projects were seen to provide the combination of features, performance, and stability that we need.

- Starting from scratch allowed us to ensure that we have the underlying architecture needed to meet customer demands.

- We are working with other open source directory projects where appropriate.

Java and Performance

- Well-written Java code isn't slow and hasn't been for quite a while, and it's getting faster over time.

- Java is not interpreted -- the HotSpot JIT compiles to native machine code and executes that.
  - > Gets faster over time because it's able to identify and apply optimizations based on real-world use.

- Garbage collection costs can be virtually eliminated when properly designed, and can even provide performance benefits in some cases.

- Java is extremely observable, so we can easily identify bottlenecks and focus tuning efforts there.

The Current State of OpenDS

- OpenDS 0.8.0 released last week (May 8, 2007).
  - > OpenDS 0.9.0 expected around the beginning of July
  - > OpenDS 1.0.0 expected by the end of the year
- Available features:
  - > Protocols: Full LDAPv3, limited LDAPv2, DSML gateway
  - > Database: Berkeley DB JE, indexing, import/export, etc.
  - > Security: access control, privileges, password policy / account lockout, storage schemes, SSL / TLS, SASL
  - > Logging: access / error / audit / debug / alerting
  - > Other: replication, static / dynamic groups, virtual attributes, schema management, extensibility, & more

What Still Needs to Be Done

- Management interfaces (CLI, GUI)
- Identity synchronization for Windows
- Proxy / distribution / virtual capabilities
- More flexible logging and alerting mechanisms
- Many replication / data synchronization features
- Better application compatibility
- Migration tools and documentation
- Performance and scalability improvements
- Lots of improvements, bugfixes, and cleanup

How to Get OpenDS

- Install via Java Web Start with our QuickSetup tool
  - > Direct URL: http://builds.opends.org/install/QuickSetup.jnlp
  - > More Information:
    https://www.opends.org/wiki/page/OverviewOfTheQuickSetupTool
- Download a build (daily, weekly, and milestone builds are available so far)
  - > Unzip and run "./setup" (or "setup.bat" on Windows)
- Check out and build the source for yourself
  - > https://www.opends.org/wiki/page/OpenDSSourceGuide

How to Contribute to OpenDS

- Join the community by requesting the "User" role
- Subscribe to mail lists and participate in discussions
- Try out the builds and tell us what you think
  - > What's good, what needs work, what should be added
  - > If you want, file issues in our Issue Tracker
- Create an account for yourself on our wiki and help out with documentation, example usages, etc.
- Sign the SCA and become a code contributor
  - > Look for issues with the "bite_size" or "self_contained" keywords if you want an easier starting point.

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http://blogs.sun.com/DirectoryManager/