Sun microsystems

Packaging Java Applications for Ubuntu

ubuntu
linux for human beings

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Who am I ?

- Member of Project GlassFish team
- GlassFish Evangelist
- With Sun for over 8 years
- Specifications, Engineering, Standards, Interoperability, ...
- http://blogs.sun.com/arungupta

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Packaging Java Applications for Ubuntu

Tap into the fastest-growing Linux users community

Learn how to package your Java Applications to deliver into Ubuntu

Packaging Java Applications for Ubuntu

- Introduction to Ubuntu
- Introduction to Ubuntu Packages
- Releasing a Java Application into Ubuntu
  - > Use Case: Releasing GlassFish
- Lessons Learned

Packaging Java Applications for Ubuntu

- **Introduction to Ubuntu**
- Introduction to Ubuntu Packages
- Releasing a Java Application as a Package
  - > Use Case: Releasing GlassFish
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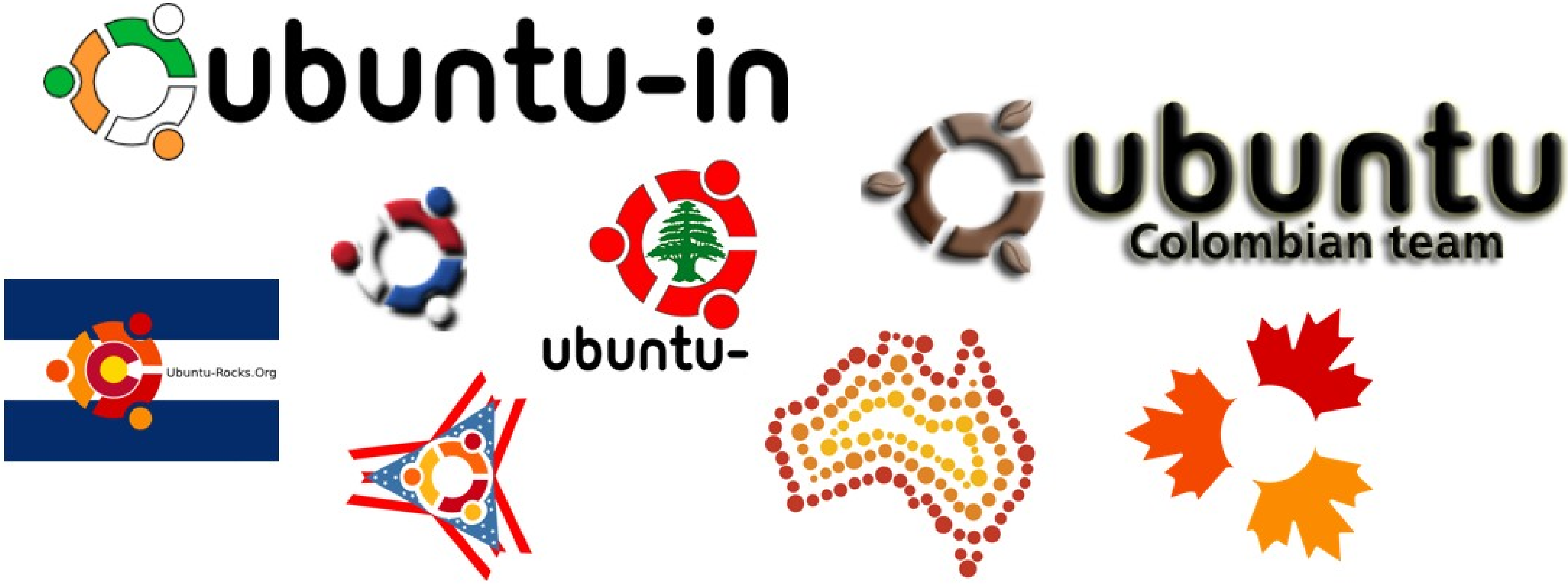
What is Ubuntu ?

- Favorite Linux distribution since 2005 according to http://distrowatch.com/
- Based on Debian GNU/Linux
- Strong desktop and notebook offering focusing on
  - Usability
  - Localization
  - Accessibility
- Solid server platform (including port to SPARC)
- Commercially supported by Canonical and others

An incredibly active community

- Over 13,000 active members of local community teams
- Over 2 million forum posts by 200,000 forum members
- 2006 - Over 4 million users in just over 2 years



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How is software distributed ?

- Software in the Ubuntu archive organized into four sections (aka “repositories”)

	Free	Non-Free
Supported	main	restricted
Non-Supported	universe	multiverse

🟨	Core
🟦	MOTU

How is software distributed ?

Licensing

- Software in the Main or Universe component must be Free/Open Source
  - Example F/OSS licenses : GPL, BSD, CDDL
- Software that is not Free/Open Source, but still fully redistributable, can go into Multiverse
- Package with build or runtime dependencies in Multiverse can only go in Multiverse
- Exception possible for documentation, media file and firmware (decided on a case-by-case basis)

Debian packages explained

What a developer needs to know about Ubuntu packages

- Based on the Debian .deb package format
- Essentially :
  - > Files (binaries, libraries, doc, etc.)
  - > Metadata (Dependencies, Description, etc)
  - > “Maintainer” scripts

The purpose : providing Free/Open Source software (usually distributed as source) to the user in an easy to install and maintain fashion

Debian packages explained

Requirements and Policies

- Ubuntu packaging policy largely based on Debian: http://www.debian.org/doc/debian-policy/

In a nutshell :

- Software can be built from source (with some exceptions)
- Runtime and build dependencies must be specified (and have to be fulfilled within a section)
- Respect of the FHS is non-negotiable
  - http://www.pathname.com/fhs/

Debian packages explained
Source package

Components :

- .dsc : source package meta-data
- .orig.tar.gz : pristine source of the software
- .diff.gz : local packaging modifications in “patch” format (including the debian/ directory)

Debian packages explained

Content of a minimal debian/ directory

- debian/control: package meta-data
- debian/copyright: copyright, license and attributions
- debian/changelog: packaging history
- debian/rules: package build Makefile

Debian packages explained
Maintainer scripts

- Action to be taken on package installation, upgrade and removal – scripted.
  - preinst / postinst : prior and after installation
  - prerm / postrm : prior and after removal
- No user interaction (except through debconf)

Debian packages explained

Packaging tools

- debhelper : automating common task in the rules file
  - Examples : dh_installdocs, dh_fixperms
  - Start your Debianization with dh_make
- CDBS : An abstraction layer above debhelper
  - Make **very** short debian/rules file
  - Automatically do the right thing for the common case
- devscripts package has nice-to-have tools

Packaging Java Applications for Ubuntu

- Introduction to Ubuntu
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- **Releasing a Java Application as a Package**
  - > **Use Case: Releasing GlassFish**
- Lessons Learned

What is Project GlassFish?

Use Case: Project GlassFish

- 100% Open Source Java EE 5 Application Server
- Source donated by Sun Microsystems and Oracle Corporation (TopLink Essentials)
- GlassFish v2 current stable release.
    - CDDL/GPL v2 with Classpath Exception
- High Availability, Clustering, .NET interoperability, ...
- Community at http://glassfish.java.net
    - Wikis, Bugs, Architecture Docs, Roadmap, ...

GlassFish Highlights

- Metro: Web services stack
  - Java API for XML Web Services (JAX-WS)
  - Interoperability with .NET 3.0
- Web Tier: Grizzly, Java Server Pages, Servlets
- Java Persistence: TopLink Essentials
- Rich Clients: Ajax and Java Web Starts
  - Jmaki, JavaFX
- Enterprise Quality Management and Clustering
- NetBeans and Eclipse integration

GlassFish v3

- Small (<100 KB)
- Fast (starts up < 1 sec)
- Modular (load the required container)
- Ideal for Web 2.0 applications
- Will be Java EE 6 compatible
- Scheduled in 2009
  - Technology Preview available

Packaging Java Applications

Identifying pre-requisites

- Decide number of packages on following criteria
  - > Platform specific binaries
  - > Licensing requirements of sub-components
- Choose your License
  - > License has an impact on the choice of repository
- Identify repository to deliver to
- Identify your dependencies
  - > Build time dependencies
  - > Run time dependencies

Packaging GlassFish

Identifying pre-requisites for GlassFish

- Decide number of packages
  - > glassfish, glassfish-bin, sunwderby, imq
- Choose your License
  - > GlassFish v2 – CDDL
- Identify repository to deliver to
  - > Multiverse (Non-free but redistributable)
  - > Based on dependency on sun-java5-jre and license
- List your dependencies
  - > Build Dependencies: devscripts, dh_make,sun-java5-jdk, sun-java5-jre
  - > Run-time Dependencies: sun-java5-jre

Packaging Java Applications

Tools to package Java Applications.

- Use dh_make to debianize a regular source archive
  - > Creates default debian files like control, rules, changelog
- Use debuild (from devhelper package)
  - > Modify rules file to write build rules.
  - > Modify control to define runtime dependencies for your package.
  - > Modify prerm, preinst to add preinstallation scripts.
  - > Modify postrm, postinst to add postinstallation scripts.

Packaging GlassFish: Build Files

```
#Control File
Source: glassfish
Section: devel
Priority: optional
Maintainer: Harpreet Singh <harpreet.singh@sun.com>
Build-Depends: debhelper (>= 5.0.0)
Standards-Version: 3.7.2

Package: glassfish
Architecture: all
Depends: sunwderby (>= ${Source-Version}), imq (>=
${Source-Version}), sun-java5-jre, glassfish-bin (>=
${Source-Version})

Description: Sun's open source Java EE 5 Application
Server.
```

Packaging GlassFish: Build Files

```
#Rules File
# Build architecture-independent files here.
binary-indep: build install
build:
        # Add here commands to compile the package.
        $(MAKE)
install:
        # Install the package into debian/glassfish.
        $(MAKE) install DESTDIR=$(CURDIR)/debian/glassfish
```

Installing and Testing Packages

Tools to install packages

- dpkg -i *.deb
- Setup your own trivial repository
  - > Create meta-data that describes source, packages
    - – dpkg-scanpackages, dkpg-scansources
  - > Add your repository under /etc/apt/sources.list
  - > Refresh your repository list: sudo apt-get update
- Fetch packages with apt-get
  - > sudo apt-get glassfish

Post Build: Uploading to Ubuntu

Tools to upload packages

- Sign your packages
  - Generate your gpg key
  - Upload key to Ubuntu keyservers
  - Sign your package: debsign -k key_id
- Upload to Ubuntu servers
  - Revu (http://revu.tauware.de)
  - Use dput to upload to Ubuntu servers
- Receive feedback, make changes and upload.

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Lessons learned

Tips and caveats about packaging for Ubuntu

- Break the software into discrete components
  - > Unbundle useful libraries, think re-usability!
- Have the software licensing figured out
  - > Be careful when incorporating third-party project into yours, and give credit where it's due
- Introducing a new package requires all build dependencies to be packaged
- Don't sidestep the system tools
  - > Software with their own built-in update mechanism are discouraged

Lessons Learned

Tips and caveats about packaging for Ubuntu

- Don't rely on graphical setup tools for installation
  - But it is ok for runtime configuration
- Don't include .jar and .class in source package
  - Does the package build from source?
- Building package for software using Ant is easier, thanks to CDBS

Lessons Learned

Deciding where to distribute your Ubuntu package

The Ubuntu archive

- Universe/Multiverse
  - Maintained by community teams
  - Become a member of the MOTUs!
    - https://wiki.ubuntu.com/MOTU/Hopeful/Recruitment
  - Have the benefits of team work and use of Launchpad
- Commercial
  - Reserved for Canonical ISV partners
  - Complete control over your packages

Slightly problematic: hosting .deb packages outside of the archive (on your own host)

Lessons Learned

Final Thoughts

- Packaging for Ubuntu is non-trivial, but worth it
  - Do the right thing for your users
  - Widen the audience for your software dramatically
- Contributors welcome
  - Ubuntu - a community where you can make a difference
  - GlassFish – a community where you can build open source Java EE Application Server.

Summary

- Figure out licensing requirements
- Choose a repository to upload packages
- Use system provided tools to debianize your sources
- Test and Upload
- Join the communities
  - http://www.ubuntu.com
  - https://glassfish.java.net

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