

# From Application To Appliance

Building Software Appliances with rPath's rBuilder

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# An Introduction to rPath

- Founded in 2005 by Billy Marshall and Erik Troan
- Venture Capital-backed
- Headquarters: Raleigh, North Carolina, USA

# What is a software appliance?

- “A software appliance is an application combined with Just Enough Operating System (JeOS) that readily installs on industry standard hardware or inside a virtual machine.”
- Ideal for virtualization
  - Creation made easy.
  - Lifecycle maintenance included.
  - Smaller size, lighter memory requirements out of the box.

## Some rPath Collaborations

- STAR Project
  - STAR packaged in rBuilder format, deployed appliances to Xen hypervisor and Amazon EC2 hosts as a proof of concept.
  - An appliance was created that could be deployed by the Globus system.
  - Automated deployment demonstrated at Super Computing 2006, Tampa, Florida.

# rPath's Tools

- Developer Tools:
  - rBuilder
  - rMake
  - Conary
- Deployment Tools:
  - rPath Appliance Platform Agent
  - Update Service
  - Entitlement Service

# rPath Linux

- rPath Linux is a reference implementation of a Linux distribution geared towards software appliances.
- How is it different from RHEL, CentOS, etc?
  - Minimal patching: we stick to upstream.
  - Geared towards appliances
  - Componentized: :devel, :runtime, :lib
- Underlying rPath tools not tied to rPath Linux
  - RPM Import
  - Ports to other platforms

# How do you build a software appliance?

- Application Package (package recipe)
- Appliance Manifest (group recipe)
- Choose output format: Installable CD, VMware, Xen, EC2, etc.

# Sample Application Recipe

```
class OracleSettings(PackageRecipe):
    name = 'oracle-settings'
    version = '1.0'

    buildRequires = [ 'chkconfig:runtime' ]

    def setup(r):
        r.addArchive('dataframe_ora.zip', dir = '/opt/bea/')
        r.addSource('oracle-settings.init',
            dest = '%(initdir)s/oracle-settings', mode = 0755)
        r.addSource('oracle-settings.script', dest = '/opt/bea/')

        r.MakeDirs("/opt/oradata")
        r.Ownership('oracle', 'dba', "/opt/oradata")

        r.Requires('zip:runtime', '%(initdir)s/oracle-settings')
        r.Requires('unzip:runtime', '%(initdir)s/oracle-settings')
```



# Sample Group Recipe

```
loadSuperClass('group-appliance=conary.rpath.com@rpl:1')
class GroupDist(ApplianceGroupRecipe):
    name = 'group-dist'
    version = '0.1'

    def addPackages(r):
        r.add('wlserver', flavor = 'is: x86')
        r.add('sun-jre')

        r.add('oracle-xe')
        r.add('oracle-xe-java')

        r.add('openssh-client')
        r.add('openssh-server')
```

# Deploy!

## Build Types

- Installable CD/DVD
- Raw Filesystem Image
- Compressed Tar File
- Demo CD/DVD (Live CD/DVD)
- Raw Hard Disk Image
- VMware (R) Virtual Appliance
- VMware (R) ESX Server Virtual Appliance

## Build Contents

Please choose a version:

← Back

- 3.4.2-4-0.1
- 3.4-0.1-2
- 3.4-0.1-1
- 3.3.4-0.1-2
- 3.3.4-0.1-1
- 3.3.1-0.1-3

## Digging deeper...

- Canary
  - Networked software repositories
  - Detailed dependency inspection
  - Simplified “recipe” format
  - Build policy to catch common errors
  - Automatic package componentization
- rMake
  - Isolated and repeatable “sandbox” builds
  - Automate builds of an entire appliance

# One size doesn't fit all!

- Monolithic operating systems:
  - One size fits all
  - All components integrated and shipped
  - Customizable after-the-fact
  - Dependency hell
- Purpose-built distributions:
  - Ground-up design
  - Per-application customizable
  - Ideal for virtualization
  - “Tree” of configurations



# Summary

- rPath, Inc.
  - Strong open-source history
- Tools
  - Development: rBuilder, Conary, rMake
  - Deployment: Appliance Agent, Update Service, etc.
  - rPath Linux

## For more information...

- rPath Corporate Site:
  - <http://www.rpath.com/>
    - Appliance tours
    - White papers
    - Supported hardware
- rBuilder Online:
  - <http://www.rpath.com/rbuilder/>
- rPath Wiki:
  - <http://wiki.rpath.com/>

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# Questions?

