Delivering SaaS to the Enterprise with illumos

or: Herding Cats for Fun and Profit

illumos day 2014
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Automator of Things
- Continuous integration/delivery
- Packaging
- Deployments
What's Circonus?

- API-driven, scalable monitoring and telemetry analysis
- Distributed, service-oriented architecture
- Available as both public and private (on-prem) SaaS
- Runs on OmniOS and RHEL/CentOS
- ...but this talk isn't really about Circonus
Challenges

- Started as public SaaS (one true copy)
- Lots of moving parts, many disparate configs
- Must now be delivered on-premise too, configured correctly for the local environment
- Updates happen frequently
- Periodically define a known-good set of versions
Goals

- Bring up over 20 async components across N systems
- Deliver a consistent set of software, regardless of when users update
Right tool for the job
Minimalist server-focused illumos distribution
OmniOS Key Enablers

- IPS
- Zones
- Crossbow
- of course: ZFS, SMF, DTrace, etc.
Initial Install

1. Install chef-solo environment package
2. Provide site config (data bag)
3. Run management script
Updates

Run management script again!
Herding Cats

>200 custom packages

Need a way to move from one set of package versions to another

flickr.com/photos/ceardach/
Image Packaging System

- aka IPS, pkg(5)
- developed @ Sun for OpenSolaris
- network-centric
- delta-only updates
- integrates with ZFS, SMF
- rich dependency support
IPS Package

FMRI (Fault Managed Resource Identifier)

pkg://circonus/field/ck@0.4.2,5.11-0.151006:20140611T155727Z

pkg:// scheme

0.4.2 component version

circonus publisher

5.11 build version

field/ck name

0.151006 branch version

20140611T155727Z

timestamp (ISO 8601)
set name=pkg.fmri
  value=pkg://circonus/field/ck@0.4.2,5.11-0.151006:20140611T155727Z
set name=pkg.summary value="Concurrency Kit"
...
dir group=bin mode=0755 owner=root path=opt/circonus/lib/amd64
file c217fea9c27c7f48f3a1679883ac510e6ea476dd
  chash=7c62a0b79e561090a024d61d40fe647a037adff0 elfarch=i386
  elfbits=64 elfhash=bdf288d24210adfc1cc1aa16d60a613ec5ed6d36
  group=bin mode=0744 owner=root
  path=opt/circonus/lib/amd64/libck.so.0.4.2
  pkg.csize=22125 pkg.size=48192
...
depend fmri=pkg:/system/library@0.5.11-0.151006 type=要求
Dependency Types

- **require**
  - # any version of foo
  - library/foo

- **optional**
  - # foo >= 2
  - library/foo@2

- **exclude**
  - # foo >= 2.1
  - library/foo@2.1
Dependency Types

incorporate

# 2.x, not 1.x or 3.x
library/foo@2

# 2.1.x, not 2.0 or 2.2
library/foo@2.1

# 2.1.2 only
library/foo@2.1.2
Cat Status: Herded

set name=pkg.fmri value=pkg://circonus/field/circonus-incorporation@0.2.1411487427,5.11-0.151006:20140923T155035Z
set name=pkg.human-version value="8e53fc6:Tue Sep 23 15:50:27 2014 UTC"
...
depend
  fmri=pkg://circonus/field/ck@0.4.2,5.11-0.151006
type=incorporate
depend
  fmri=pkg://circonus/field/jdk@1.7.0.67,5.11-0.151006
type=incorporate
depend
  fmri=pkg://circonus/platform/ca@0.1.1410355765,5.11-0.151006
type=incorporate
...

Cat Status: Herded

- Updating circonus-incorporation pulls any other installed packages into compliance
- A newly-installed package will be constrained to the version allowed by the installed incorporation
- All version decisions concentrated in a single package
Other illumos Benefits

- **Zones**: OS partitions that isolate app environments
- **SMF**: true framework for service control
- **ZFS**: because we care about our data
  - Filesystem trees can be delegated to zones
- **Advanced virtual networking (Crossbow)**
Which led to...

New product idea!

Deliver on-premise SaaS that runs on a single host

- Trade redundancy, scalability for simplicity
- Lower cost
- Easier to operate
- Fills a niche between public SaaS and full-scale private version
SaaS in a Box

VNIC
virtual network i/f

etherstub
virtual switch

GZ forwards to NGZs and does outbound NAT (IPFilter)

Entire system operates from one visible IP address
Thanks!

http://wiki.illumos.org/
http://omnios.omniti.com/
http://circonus.com