Whales, Cats and Kubernetes

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Software Defined Talk
Shifts in Modern Application Architecture

Demand an application-centric operations model

Infrastructure Centric Operations

UNIT OF VALUE is Server
UNIT OF WORK is Configuration

Cloud
Microservices
Containers

Application Centric Operations

UNIT OF VALUE is App
UNIT OF WORK is Deployment

EXISTING BUSINESS

CHEF
Infrastructure Automation

INSPEC
Compliance Automation

habitat
Application Automation

NEW BUSINESS
What is Habitat?

Application automation that enables modern application teams to build, deploy, and manage any application in any environment - from traditional to cloud native architectures.
The Container Learning Cliff

Security
Code Quality
Container Hosting
Peer Discovery
Config Changes
Supervision
Monitoring
Rolling Deployment
Networking
Internal Registry
Workload Placement

Production

Development
Replying to @dysinger @calebhailey

Hopefully you agree that all the source and dependencies should be built, packaged, and tested together, then frozen.

10:03 PM - 20 Oct 2017

2 Retweets 18 Likes
Modern Application Workflow

Packaging Applications

RUNNER → PLAN → ARTIFACT → DEPOT

Running Applications

DEPOT → ARTIFACT → CONTAINERS → BARE METAL, VM, AMI

SUPERVISOR → SERVICE
hab plan init

**Standardized build and packaging templates**

- Go
- Java
- Node.js
- Ruby
- ...and more
pkg_name=redis
pkg_origin=core
pkg_version=3.2.4
pkg_description="Persistent key-value database, with built-in net interface"
pkg_upstream_url=http://redis.io/
pkg_license=('BSD-3-Clause')
pkg_maintainer="The Habitat Maintainers <humans@habitat.sh>"
pkg_source=http://download.redis.io/releases/${pkg_name}-${pkg_version}.tar.gz
pkg_shasum=2ad042c5a6c508223adeb9c91c6b1ae091394b4026f73997281e28914c9369f1
pkg_bin_dirs=(bin)
pkg_build_deps=(core/make core/gcc)
pkg_deps=(core/glibc)
pkg_svc_run="redis-server $pkg_svc_config_path/redis.config"
pkg_exports=[[port]=port]
pkg_exposes=(port)
do_build() {
    make
}
hab studio enter

**Builds an immutable artifact**

- Disposable, reproducible build environment
- Produces a signed, timestamped `.hart` file with runtime dependencies and manifest
- Push to package depo
hab pkg export docker <origin>/<package>
hab pkg export

Same immutable packages deployed everywhere

- ACI
- Cloud Foundry
- Docker
- Helm
- Kubernetes
- Mesos
- Tar
Configuration

Configuration from the Environment

- default.toml
- docker run -e HAB_REDIS='tcp-backlog=128' mattray/redis
- echo “port=6380” | hab config apply redis.prod 3
Managing Applications

Automated Application Supervision

- Start, Stop, Reconfigure, etc.
- RESTful API
- Artifact updates
- Encrypted discovery service
Managing Services

Running Applications

Topologies

Update Strategies

LEADER

STAND ALONE

LEADER ELECTION

ALL AT ONCE

ROLLING
Kubernetes

#kubernetes

- `hab pkg export kubernetes`
- `hab pkg export helm`
- Habitat Kubernetes Operator
- OpenShift
- GKE, PKS, and more!
Demo Time!
Habitat Builder
https://bldr.habitat.sh

**SaaS-based build service**

- GitHub integration
- Automated builds and dependency rebuilds
- Public and private origins
- Release channels for Continuous Delivery
- Container publishing to Docker Hub
- > 500 packages for common applications and libraries

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**Habitat Builder**

**My Origins**

**Search Packages**

**QUICK LINKS**

- Download Habitat
- Docs
- Tutorials
- Blog
- Website
- GitHub

**SERVICE STATUS**

- All Systems Operational

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**mattray / inspec-profile-parks-demo**

**package**

**LATEST**

- Version: 0.1.0
- Release: 20171217133113
- Checksum: 1caab8b2e739d290734bb47237c69f07a69f6617b7b080f9496d30963b9e0a

**Maintainer:**

- Version: 0.1.0
- Release: 20171217133113
- Architecture: x86_64
- System: linux
- Target: x86_64–linux
- Upstream URL: not defined
- License: Apache-2.0
- Source: not provided or required
- SHA256 checksum: not provided or required
- Path: `/hab/pkgs/mattray/inpec-profile-parks-demo/0.1.0/20171217133113`

**Build Dependencies:**

- No build dependencies or undefined

**Interpreters:**

- No interpreters or undefined

**Plan**

**Build Flags**

- `-L /hab/pkgs/core/cxx/2.4.2/20171014214323/include`
- `-L /hab/pkgs/core/cxx/2.4.2/20171014214323/include`
- `-L /hab/pkgs/core/ruby/2.4.2/20171014214323/include`
- `-L /hab/pkgs/core/ruby/2.4.2/20171014214323/include`
- `LDFLAGS +L /hab/pkgs/core/ruby/2.4.2/20171014214323/lib`

**Plan Source**

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**Supported Platforms**

None. View available versions.
Windows Support

Build, deploy and manage Habitat packages on Windows

- plan.ps1
- Native Windows Supervisor
- IIS, SQL Server, MySQL, and more
- ASP.NET Core, .NET Core, Node, and more
12 Factor/Cloud Native

https://12factor.net

Implements 12 Factor application patterns

- Decouples the app from operating system dependencies
- Separates concerns of ‘build’ from ‘deploy’
- Provides declarative deployment capabilities
- Configuration from the environment
- Immutable artifacts
For Developers

**Works on my machine**
- Any language
- Automatic builds on commit
- Explicit dependency declarations
- Stable & unstable release channels
For Operators

Works the same everywhere

- Automated container builds
- Immutable build artifacts
- Release channels for CD workflow
- Consistent management of any application on any platform
Open Source Community
https://habitat.sh

Apache Licensed!

- https://github.com/habitat-sh
- 2017:
  - 5,976 Commits - 2,411 Pull Requests - **142 Authors**
  - 12 core developers employed by Chef, **7 external maintainers**
  - 543 Core Packages
  - **1,479 people** in https://slack.habitat.sh