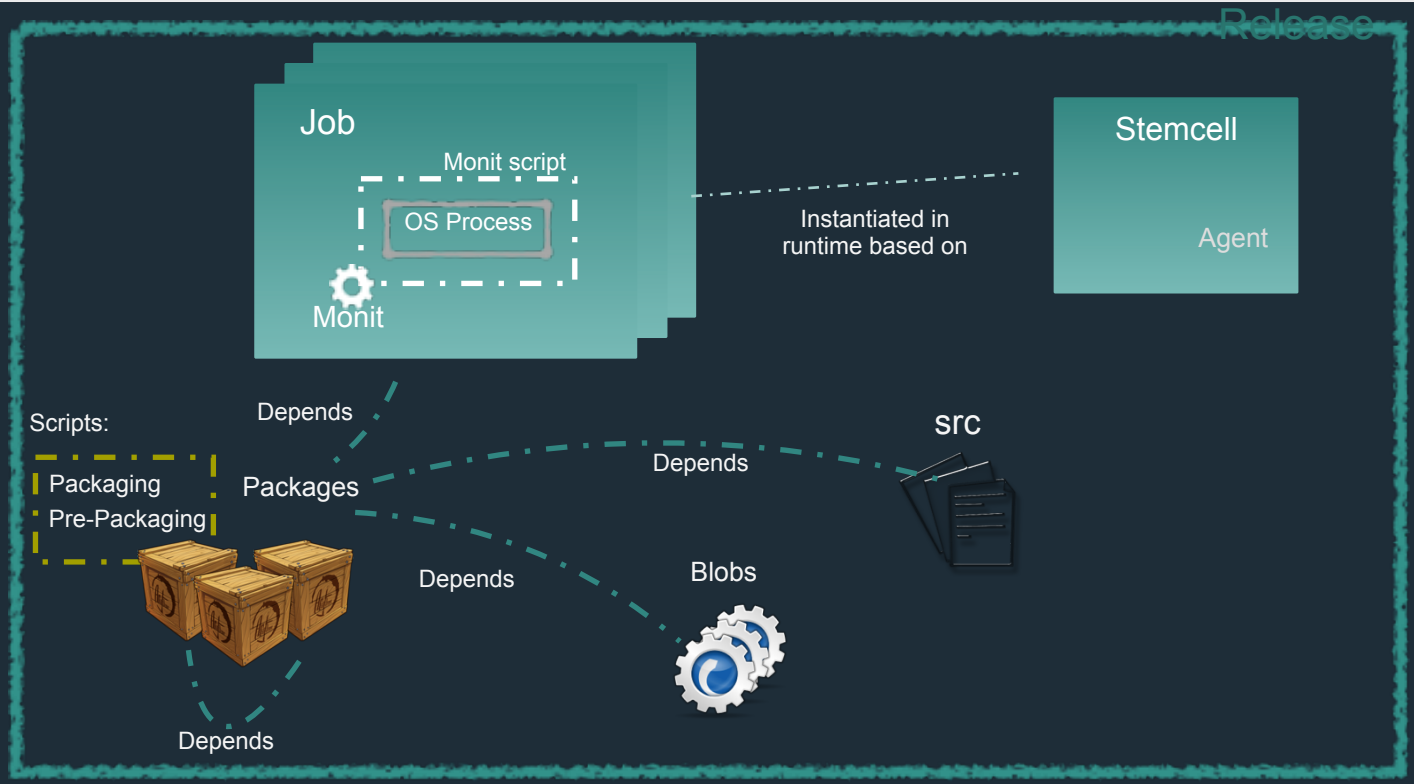
Pivotal

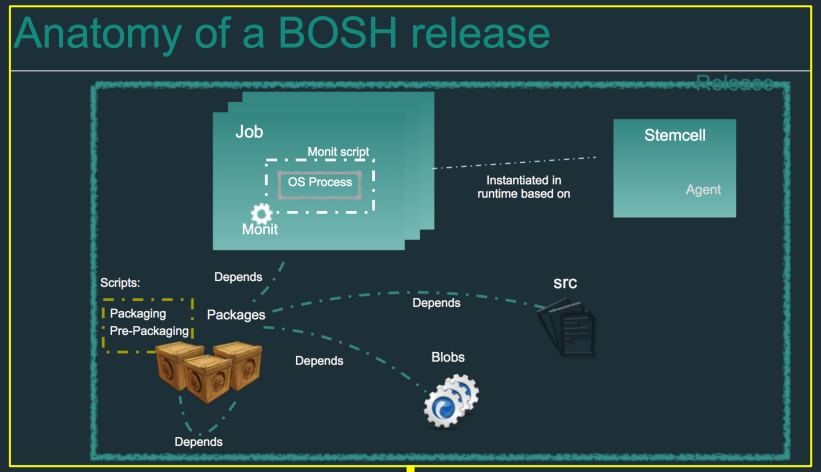
Lab 3: Creating a Bosh Release "from scratch"

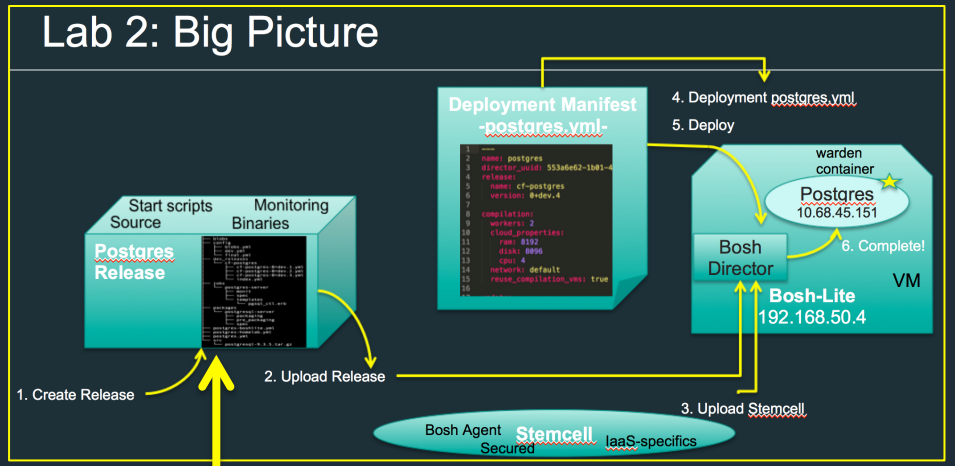
Anatomy of a BOSH release



Pivotal

Lab 3: Big Picture





Create Jobs, Packages, Scripts and Assemble them into a new Release

Pivotal

Pivotal

Anatomy of a BOSH release

What is a release?

- A versioned collection of source code, binary artifacts, configuration templates, and anything else required to build and deploy software in a reproducible way
- Ultimatelly, a release is the layer placed on top of a stemcell

Pivotal

Elements of a release

- Jobs: describes pieces of the service or application you are releasing
- Packages: provides software to jobs
- Source: provides packages the non-binary files they need
- Blobs: provide packages the binaries they need, other than binaries that are checked into a source code repository

Pivotal

What is a package?

- A Package provides executables, source code and dependencies to jobs
- It should not be tied to a particular stemcell and should not depend on internet access
- Never depend on the presence of libraries or other software on stemcells
- It is composed of a source code and/or a blob and instructions on how to build it

```
➜  packages git:(master) ✗ tree redis-server
redis-server
├── packaging
└── spec
```

Pivotal

Package's spec file

```
---
name: redis-server
dependencies: []
files:
  - redis/redis-2.8.3.tar.gz
```

Package name

Package's dependencies (at compile time)

The location where BOSH can find the binaries and other files that the package needs at compile time.

BOSH interprets the locations you record in the files section as being relative either in the "src" directory or in the "blobs" directory

Pivotal

Package's packaging script

```
set -e # exit immediately if a simple command exits with a non-zero status
set -u # report the usage of uninitialized variables

# Available variables
# $BOSH_COMPILE_TARGET - where this package & spec'd source files are available
# $BOSH_INSTALL_TARGET - where you copy/install files to be included in package
export HOME=/var/vcap

tar xfv $BOSH_COMPILE_TARGET/redis/redis-2.8.3.tar.gz
cd redis-2.8.3
make PREFIX=${BOSH_INSTALL_TARGET} install
```

Ensure that any copying, installing or compiling delivers resulting code to the install target directory

Pivotal

Package's dependency graph

Be aware that BOSH ensures that dependencies cited in the dependencies block of package spec files are available to the deployed binary, but only at compile time

```
---
name: ruby_1.9.3

dependencies:
- libyaml_0.1.4
```

```
set -e -x

tar xzf ruby_1.9.3/ruby-1.9.3-p484.tar.gz
pushd ruby-1.9.3-p484
  ./configure \
    --prefix=${BOSH_INSTALL_TARGET} \
    --disable-install-doc \
    --with-opt-dir=/var/vcap/packages/libyaml_0.1.4

  make
  make install
popd
```

Pivotal

Sources

- Provides packages with the non-binary files they need
- We store them at the “src” directory
- Use the globbing pattern *<package_name>/**/** to deep-traverse the directory in src where the source code should reside

```
files:
  - myappsrc/**/*
```

Pivotal

Blobs

- Packages often use tar files or other binaries, also known as blobs
- Checking blobs into a repository is problematic if your repository is unsuited to dealing with large binaries (as is true of Git, for example)
- We store them at the “blobs” directory

Pivotal

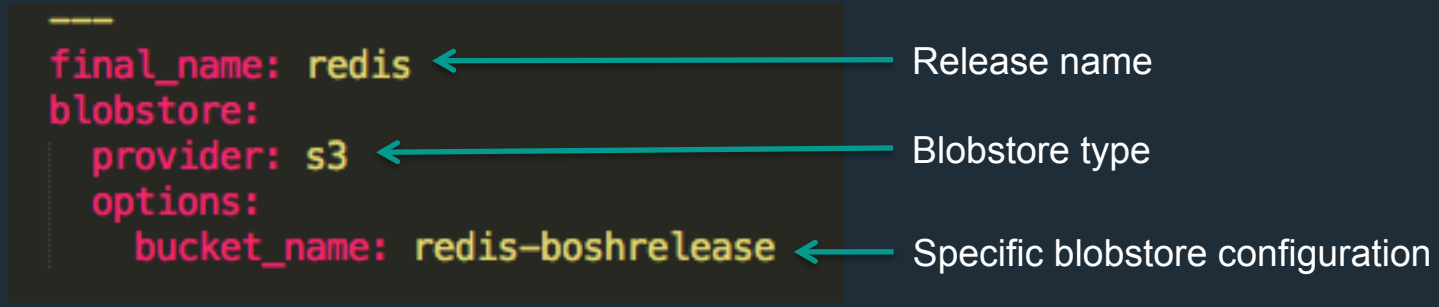
Configuring a blobstore

In the config directory, you record the information BOSH needs about the blobstore:

- The final.yml file names the blobstore and declares its type, which is either local or one of several other types that specify blobstore providers.
- The private.yml file specifies the blobstore path, along with a secret. It contains keys for accessing the blobstore and should not be checked into a repository.

Pivotal

final.yml example for AWS S3 blobstore



Pivotal

private.yml example for AWS S3 blobstore

```
---
blobstore:
  s3:
    access_key_id: <AWS ACCESS KEY ID>
    secret_access_key: <AWS SECRET ACCESS KEY>
```

Specific blobstore configuration

Never check this file into a repository!!!

Pivotal

What is a job?

A job describe pieces of the service or application you are releasing:

- What packages depends on
- How to start/stop it
- How to monitor it
- What properties can be configured

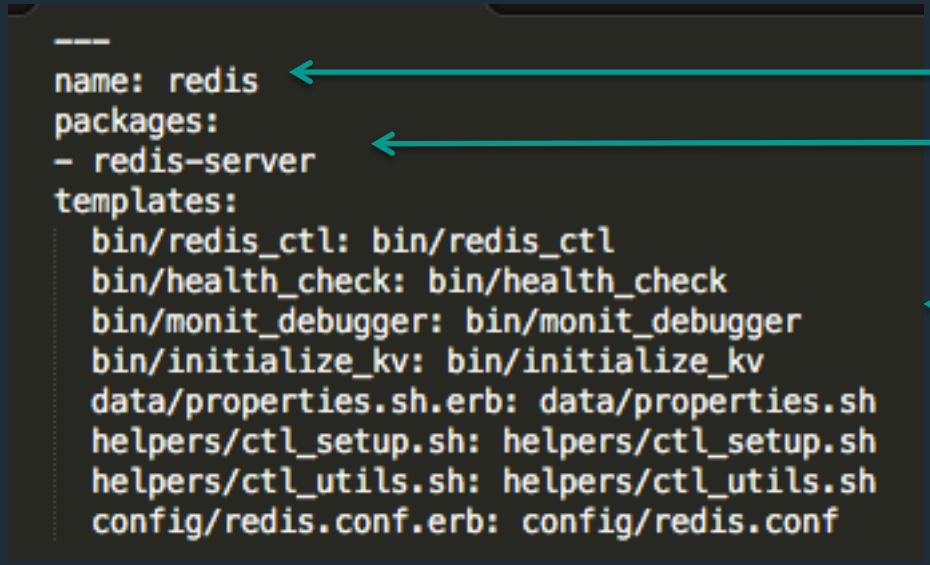
Pivotal

Elements of a Job

- Spec: describes the job specification (package's dependencies, templates and properties)
- Monit: describes how to run the job's processes
- Templates: control scripts, configuration files, …

Pivotal

Spec file



Pivotal

Spec file

```
properties:
  redis.port:
    description: Port to listen for requests to redis server
    default: 6379
  redis.password:
    description: Password to access redis server
    default: "r3d!s"
  redis.master:
    description: IP address or hostname of the Redis master node
```

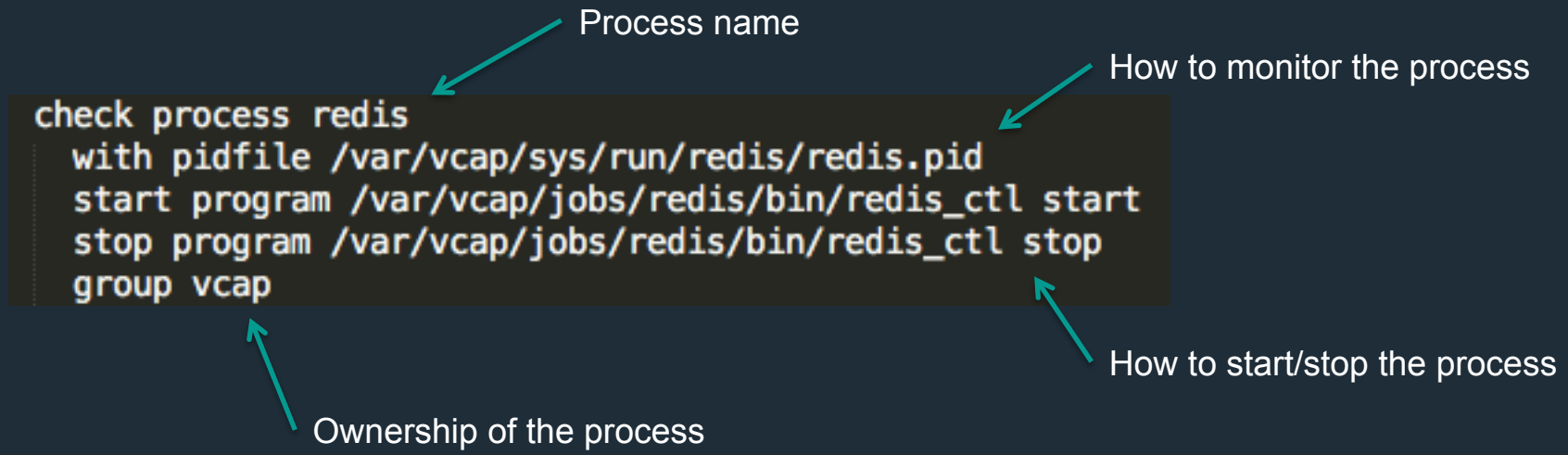
Property name

Property description

Property default value

Pivotal

Monit file



Pivotal

Templates

```
#!/bin/bash

set -e # exit immediately if a simple command exits with a non-zero status
set -u # report the usage of uninitialized variables

# Setup env vars and folders for the webapp_ctl script
source /var/vcap/jobs/redis/helpers/ctl_setup.sh 'redis'

export LANG=en_US.UTF-8

echo redis redis $PIDFILE $(cat $PIDFILE)

case $1 in

  start)
    pid_guard $PIDFILE $JOB_NAME

    exec redis-server /var/vcap/jobs/redis/config/redis.conf
    ;;

  stop)
    redis-cli shutdown
    kill_and_wait $PIDFILE

    ;;

  reload)
    echo redis reloading...
    $JOB_DIR/bin/redis_ctl stop
    $JOB_DIR/bin/redis_ctl start

    ;;

  *)
    echo "Usage: redis_ctl {start|stop}"

    ;;

esac
exit 0
```

Pivotal

Special scripts

- bin/pre-start: will run before the job is started. This script allows the job to prepare machine and/or persistent data before starting its operation.
- bin/drain: will run when the job is restarted or stopped. This script allows the job to clean up and get into a state where it can be safely stopped
- bin/run: will run a job's errand

Pivotal