Container Driven Continuous Delivery

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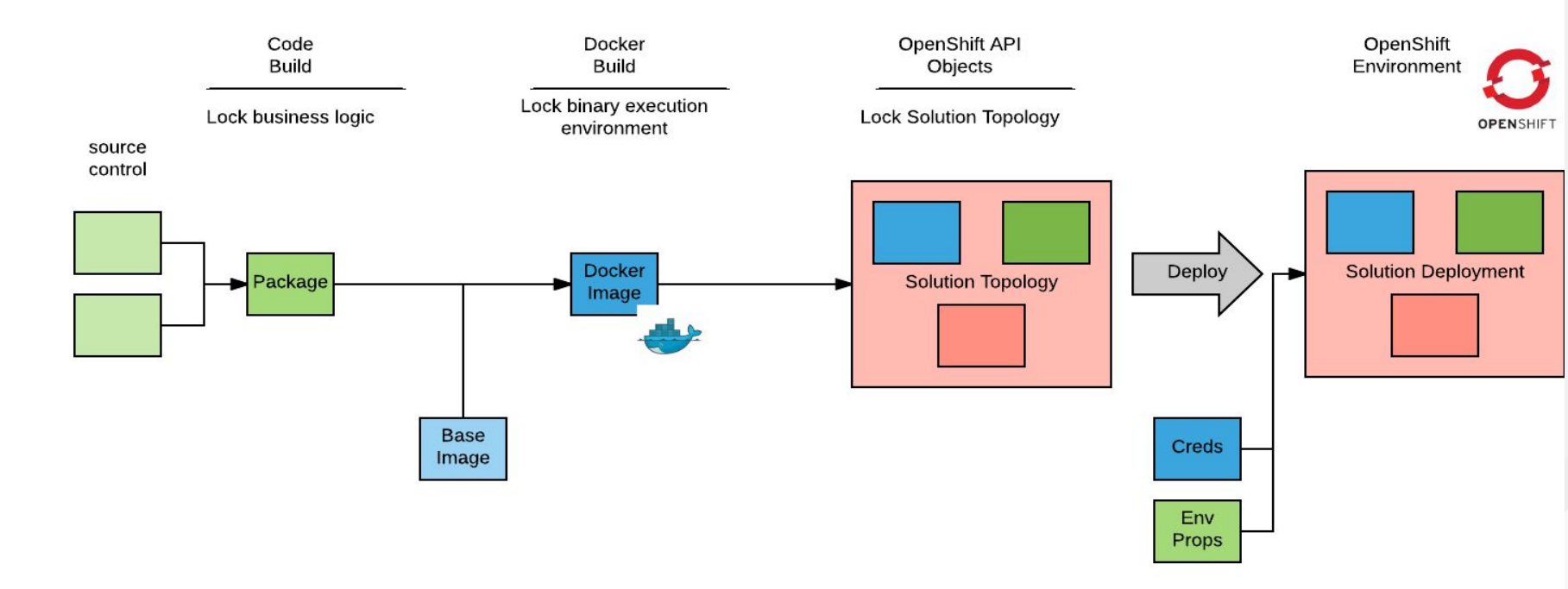
Agenda

- Immutable infrastructure
- MVP CD in openshift
- CD best practices

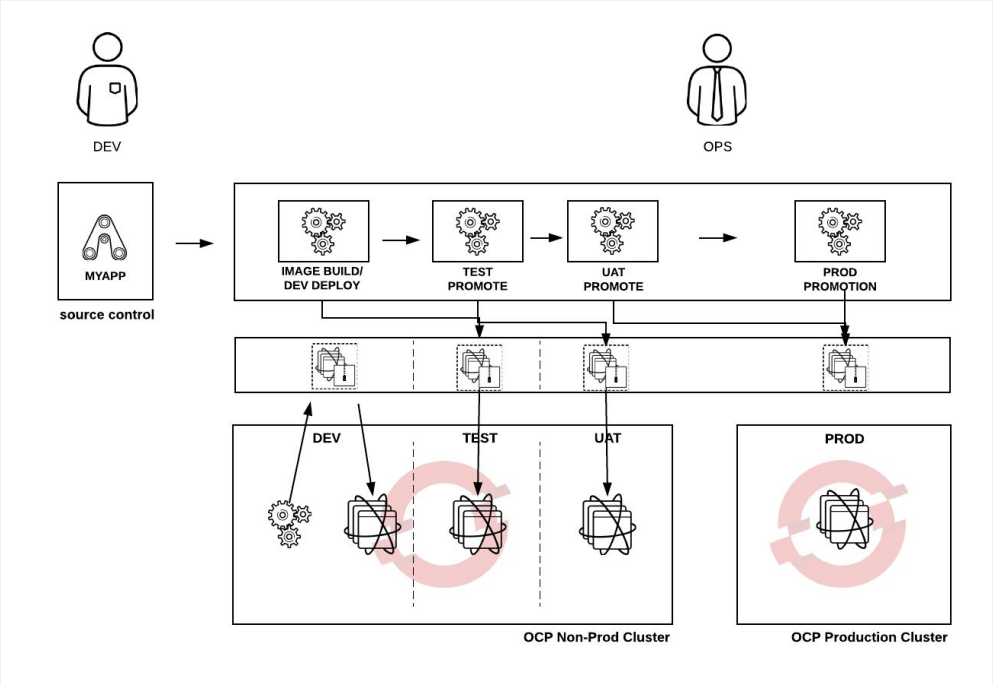
Immutable infrastructure

A contract between the application and the infrastructure necessary to run it



High-level MVP deployment process

Moving through the SLDC environments



CI/CD considerations

Questions to answer before we start

Organizational:

1. Who owns the pipeline process
2. Point&Click deploy vs true pipeline

Technical:

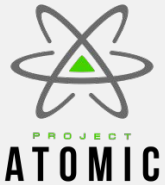
1. How do we promote images
2. How do we promote API objects
3. How to we manage environment dependent properties
4. How do we manage secrets
5. How to we execute the release

Image Promotion Tooling

Tools to Facilitate Image Promotion

Docker Engine

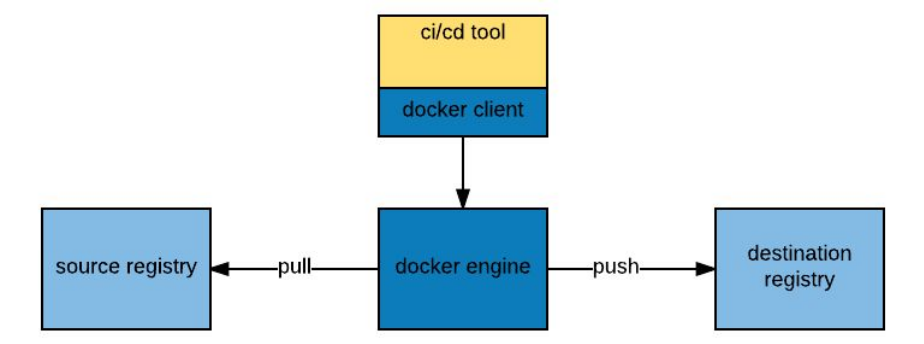
- Utilizes Docker Client
- Command line interface

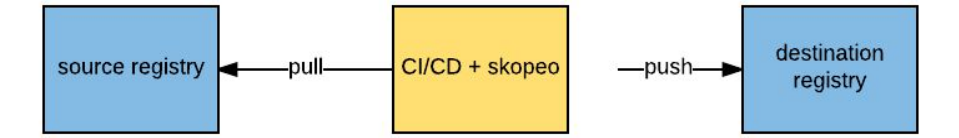


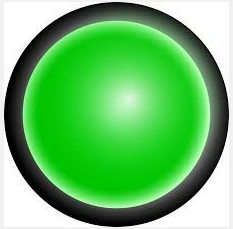
Skopeo

- Project Atomic tool
- Command line interface to perform Docker operations
- Communicates with Docker REST API

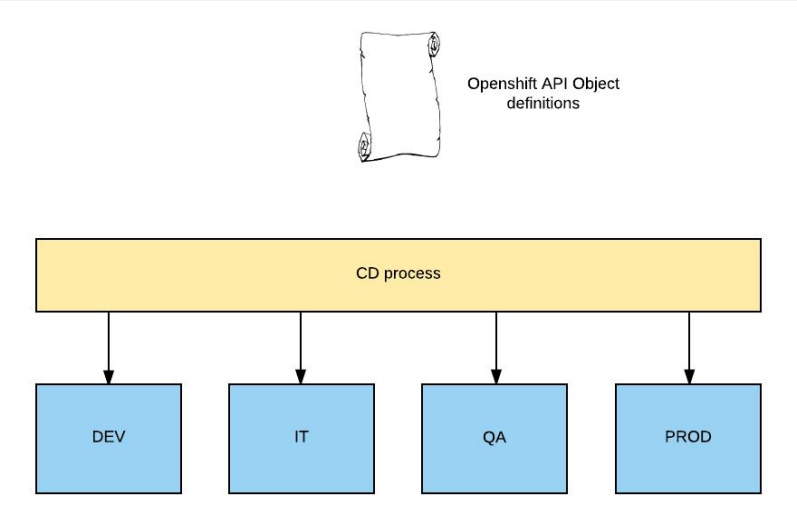
Image promotion recommended approach







Openshift API object promotion recommended approach




```
oc process <template> -v … | oc apply -f -
```

Environment Dependant Configuration Approaches

Environment Variables

Environment dependent properties are passed as environment variables to the container process

Does not scale with the number of variables

Configuration Profiles

All properties for all environments are stored in the image. Container process picks the right one based on an environment variable.

Does not work well with ephemeral environments

ConfigMap

OpenShift ConfigMaps are used to store environment dependent properties.

Additional API object to manage

Config Store

Properties are retrieved from a Config Store service at application boot.

Container may not be able to start if store service is down.

Credential management approaches

OpenShift Secrets

OpenShift secrets is the recommended approach.

Openshift secrets have some limitations with regard to security, if this is a concern, consider a user space solution.

Secret Store

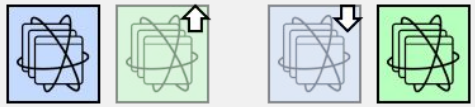
Build an integration with a secret store

- Hashicorp Vault
- CyberArk
- ...

Rollout options

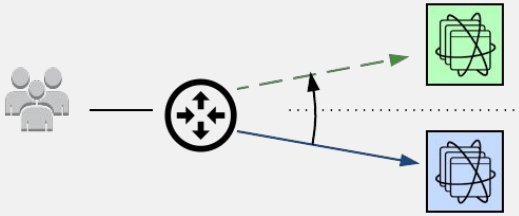
DeploymentConfig-based options:

1. Recreate
2. Rolling deployment
3. Custom deployment



Routing policy-based options:

1. Blue-Green deployments
2. A/B deployments



References

Cross cluster image promotion techniques.

Environment dependent configuration management strategies.

Rollout reference architecture.

OpenShift-Vault Integration.

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CI/CD 1/2

	Why / objective	How	The effect
CI	To make the quality of software observable at any point in time	Static analysis, unit tests, Integration tests And A DASHBOARD	Quality will tend to go up to the point where software is always in a releasable state.
CD	To reduce the cost of a release	By automating all the steps	Confidence in the release process goes up. Releases can be done any time code is ready to be released.

CI/CD 2/2

- Code is always releasable.
- Releasing is relatively inexpensive.
- It is possible to release more frequently therefore reducing the risk.
- Releasing becomes a non-event for IT, done during normal business hours.
- Releasing becomes a business decision, not an IT decision.

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