

基于AWS的DevOps实践指南

代 闻

AWS解决方案架构师

wendai@amazon.com

什么是DevOps?



WIKIPEDIA
The Free Encyclopedia

“

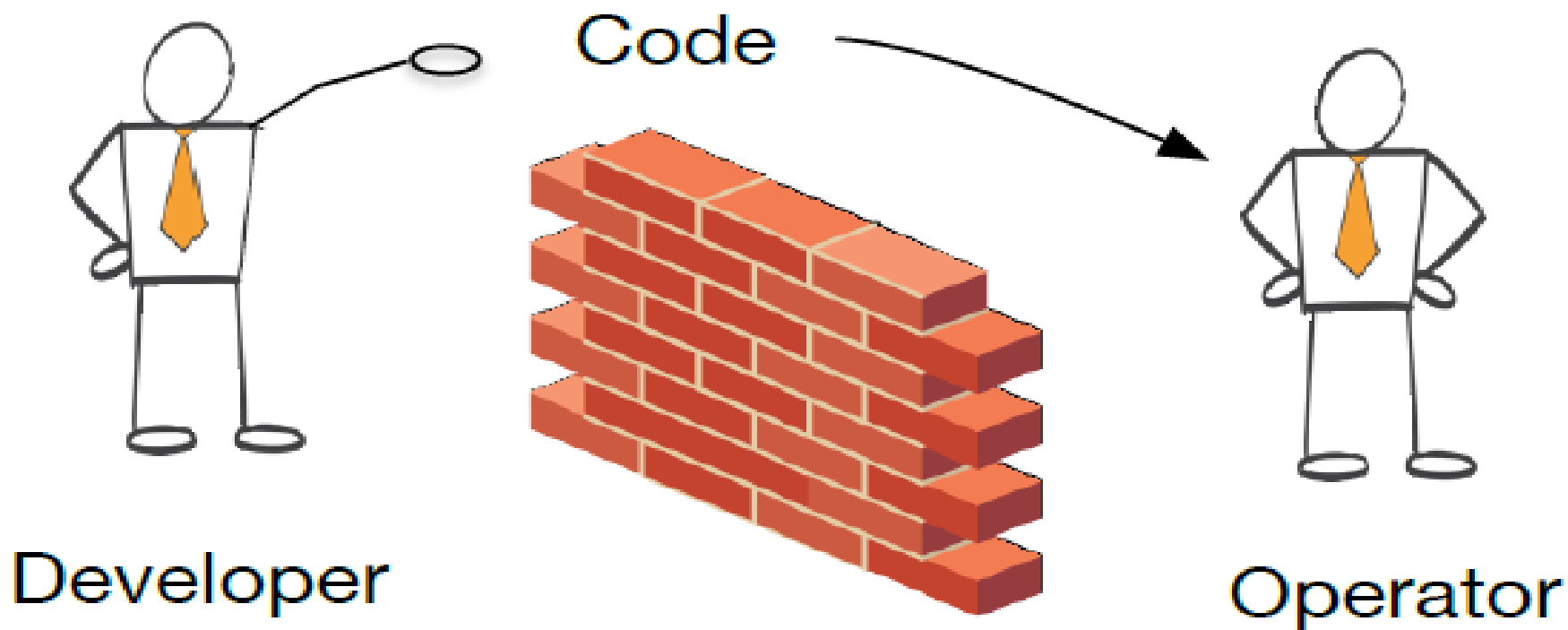
*DevOps is a **software development method** that stresses communication, collaboration, integration, automation, and measurement of cooperation between **software developers and other IT professionals** to **improve operations performance**.*

”

Source: <http://en.wikipedia.org/wiki/DevOps>

为什么需要DevOps?

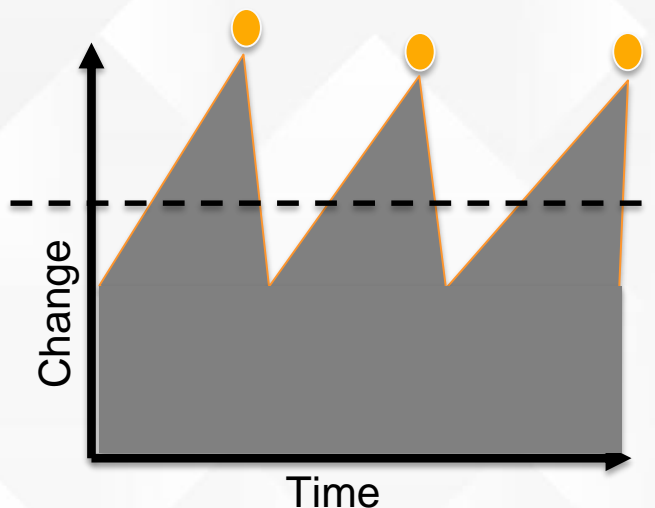
因为我们不希望事情是这样的...



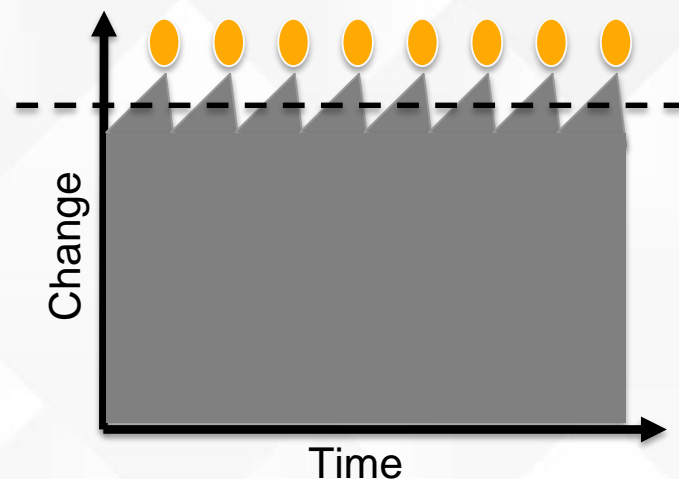
为什么需要DevOps?

我们希望...

瀑布式开发，版本发布少



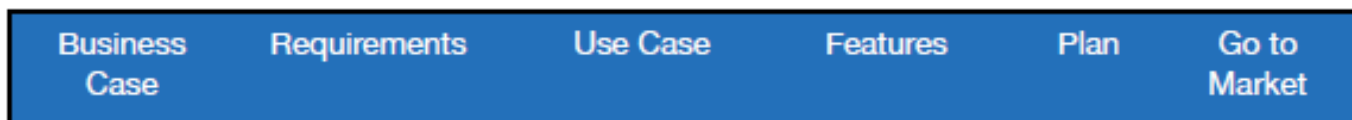
快速迭代，敏捷开发



为什么需要DevOps?



Business



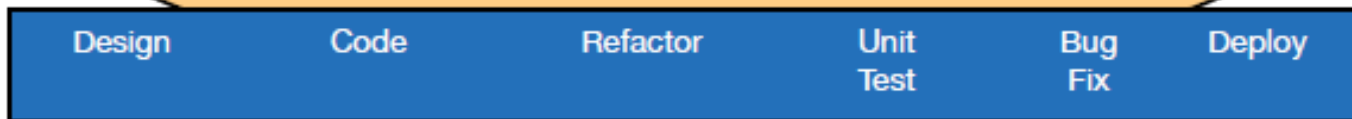
Agile Software Development

- Iterative development
- Sprints, Stories, Feedback
- Velocity

Business Agility



Developers
(application)



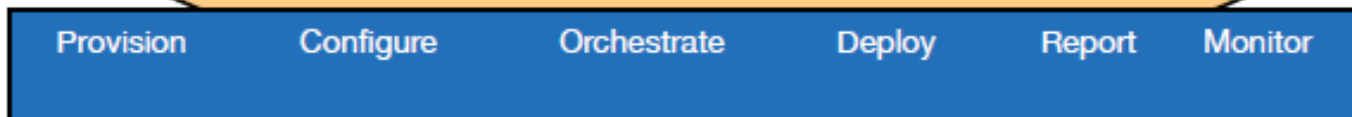
DevOps

- IT Automation
- Continuous Integration
- Continuous Deployment

IT Agility

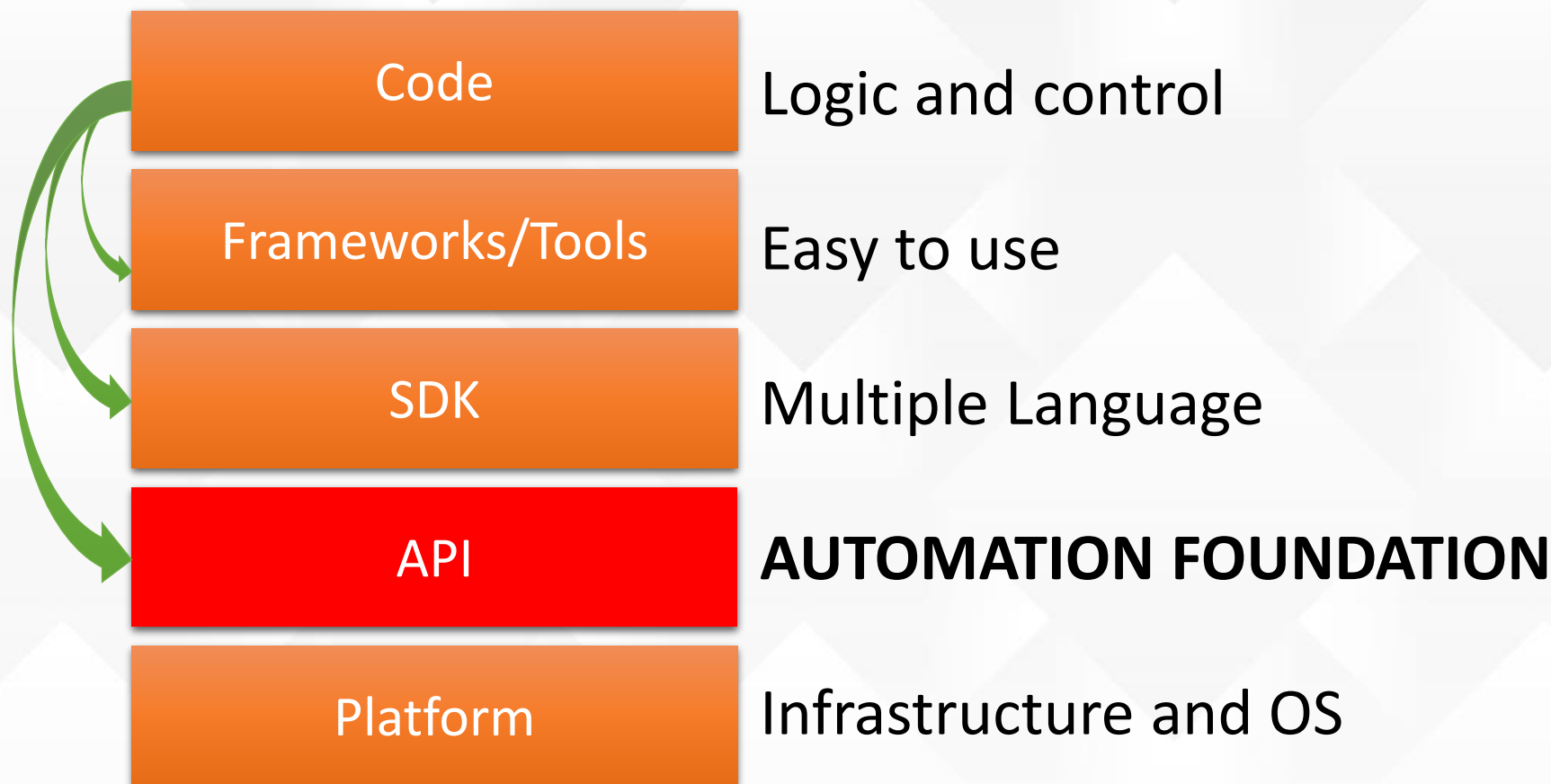


IT Operations
(infrastructure)

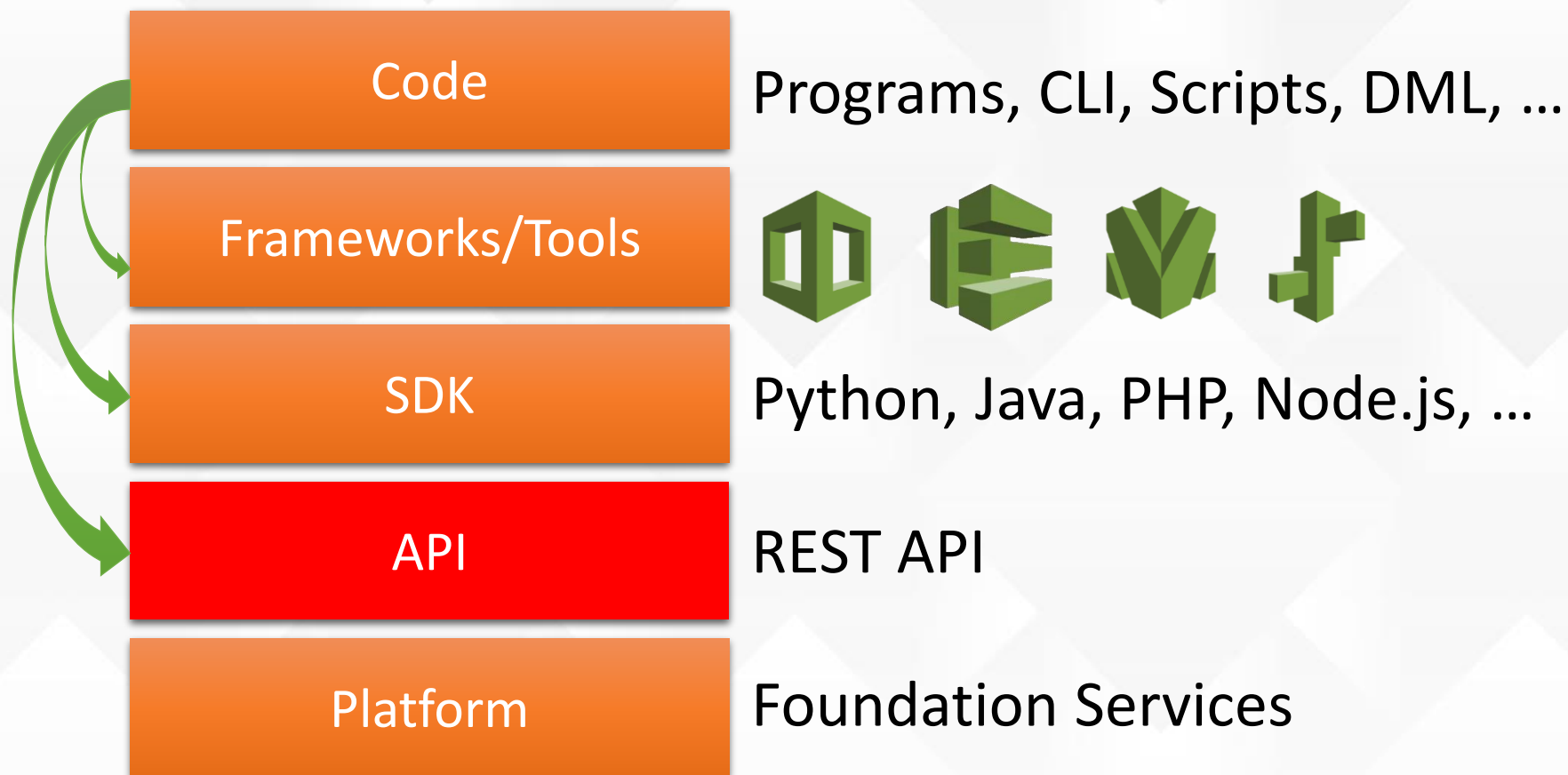


怎么实现DevOps?

从软件开发的角度看DevOps



AWS对DevOps的全面支持



基于AWS的DevOps实践要素

代码和命令行

CloudFormation

CodeDeploy

OpsWorks

ElasticBeanstalk

第三方服务



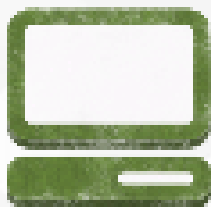
API & SDK

AWS Services

代码和命令行



操作AWS服务的三种方式



Management Console



APIs and SDKs



Command Line Interface

DevOps基础

AWS Tools (SDK, CLI, IDE, etc.): <http://aws.amazon.com/tools/>

DEMO

Python Code

– Start two EC2 instances

```
runec2.py x
1  import boto.ec2
2
3  conn = boto.ec2.connect_to_region("cn-north-1")
4  conn.run_instances(
5      'ami-981d8fa1',
6      min_count=2,
7      max_count=2,
8      key_name='wendai-cn',
9      instance_type='t2.micro',
10     security_groups=['wslinux'],
11 )
12
```

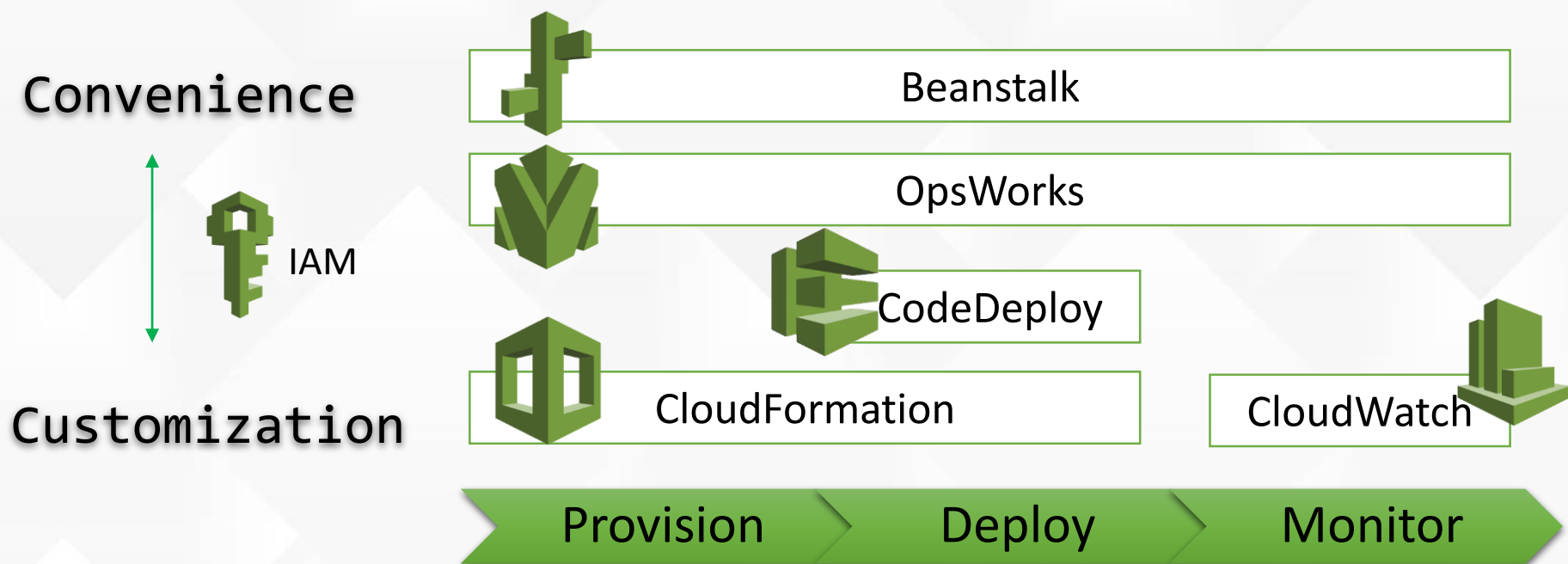
CLI

- Add Tag to EC2 instances

```
aws ec2 create-tags  
--resources i-fffb064c7 i-8eb561b6  
--tags Key=Name,Value=QConEC2
```

大规模基础架构的DevOps 需要框架和工具

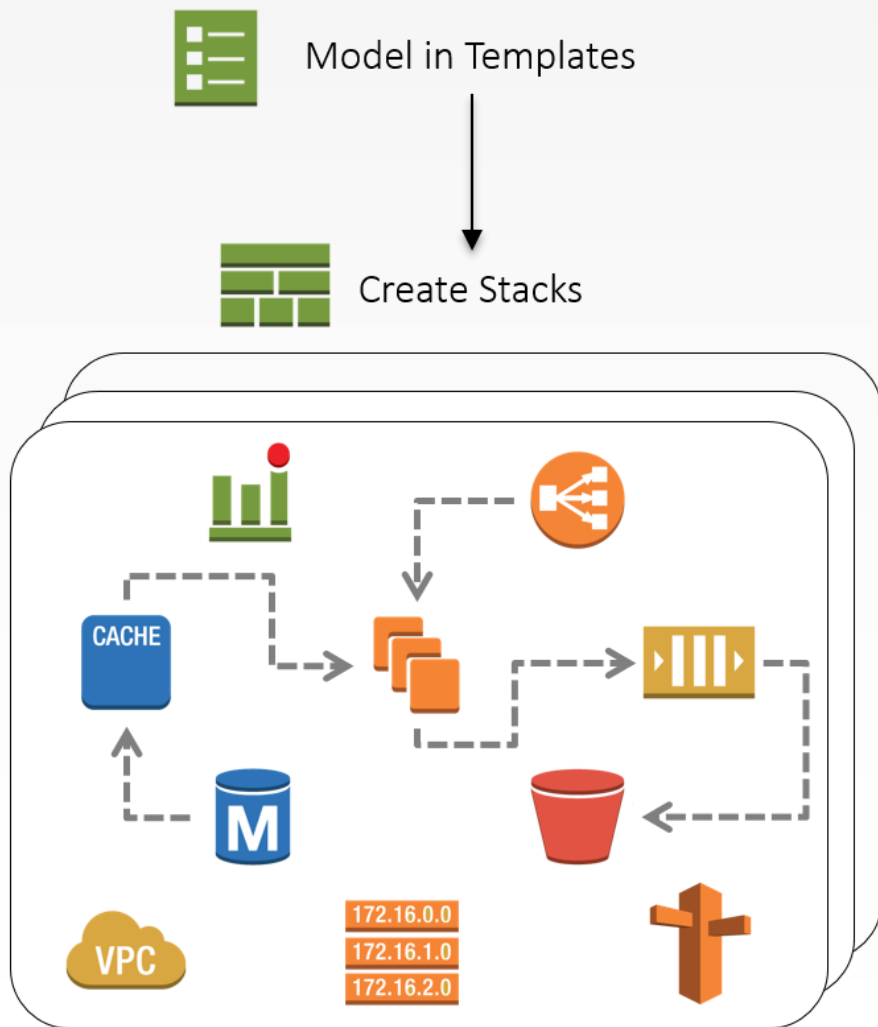
AWS DevOps服务适用场景



CloudFormation



基础平台模板化



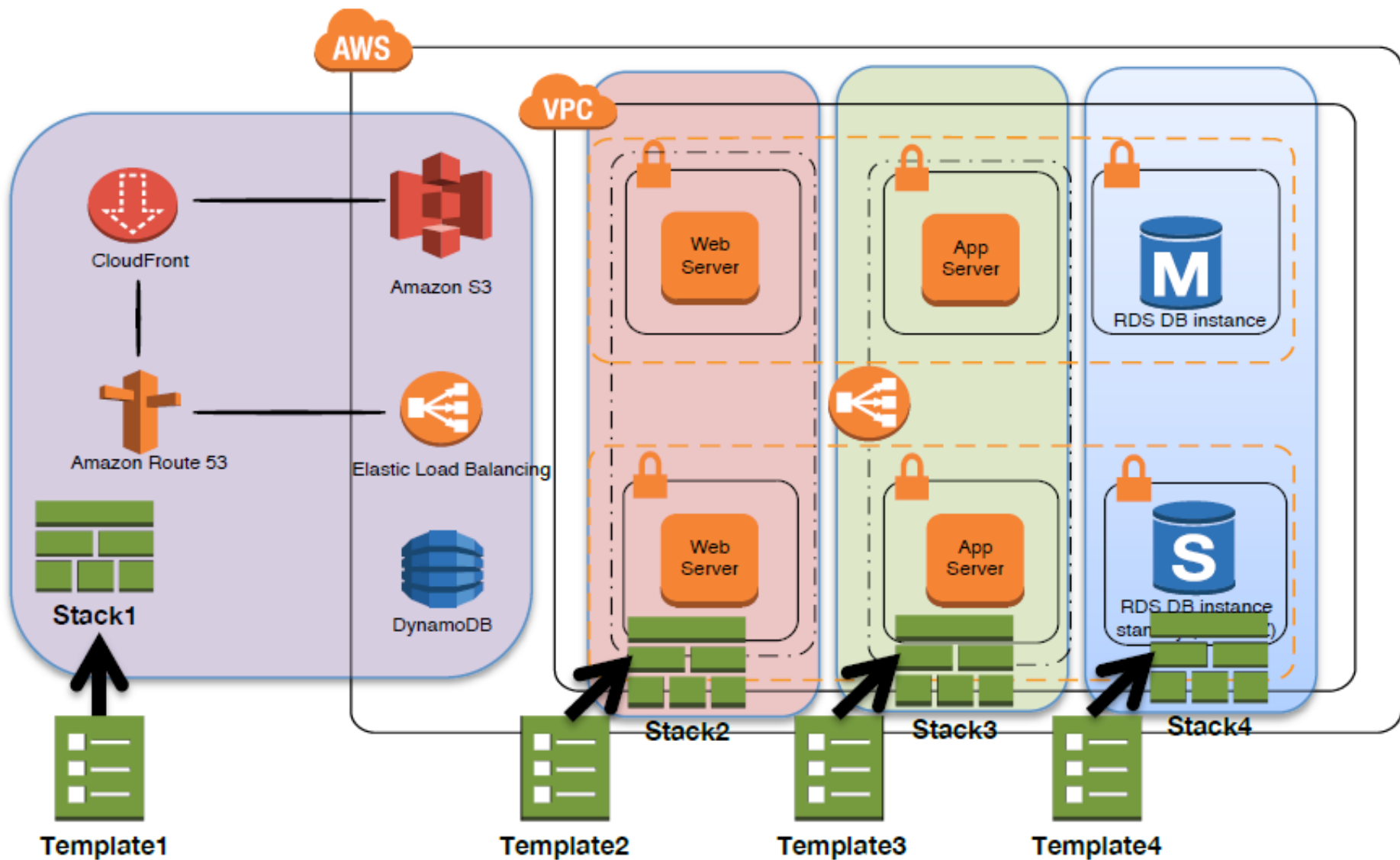
- 简化AWS服务的部署，快速部署一个Stack
- 模板化基础平台
- CloudFormation自动解决资源部署的先后和依赖关系
- 版本控制
- 第三方管理工具可以通过API集成CloudFormation

Infrastructure as Code

```
{
  "Description": "Create an EC2 instance running the Amazon Linux 32 bit AMI.",
  "Parameters": {
    "KeyPair": {
      "Description": "The EC2 Key Pair to allow SSH access to the instance",
      "Type": "String"
    }
  },
  "Resources": {
    "Ec2Instance": {
      "Type": "AWS::EC2::Instance",
      "Properties": {
        "KeyName": { "Ref": "KeyPair" },
        "ImageId": "ami-75g0061f",
        "InstanceType": "m1.medium"
      }
    }
  },
  "Outputs": {
    "InstanceId": {
      "Description": "The InstanceId of the newly created EC2 instance",
      "Value": { "Ref": "Ec2Instance" }
    }
  }
}
```

Samples: <http://docs.aws.amazon.com/AWSCloudFormation/latest/UserGuide/sample-templates-services-us-west-2.html>

基于模板的快速部署



CodeDeploy



自动化应用部署



Amazon S3



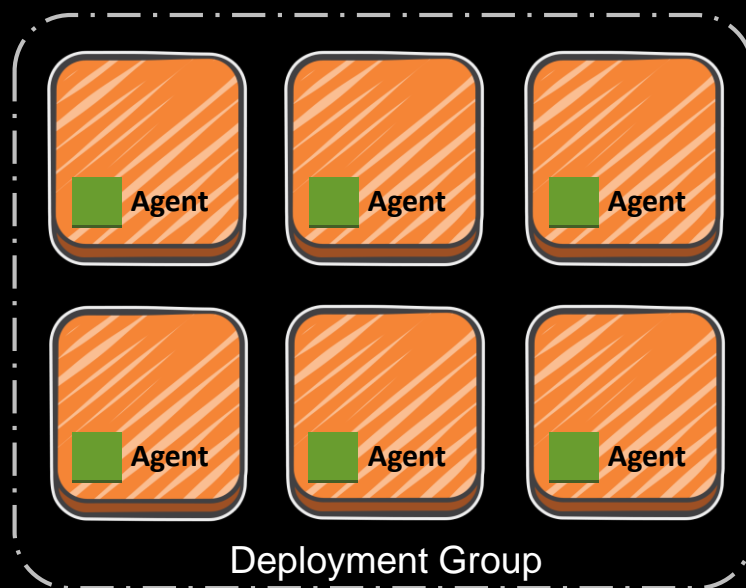
GitHub



Application
Bundle

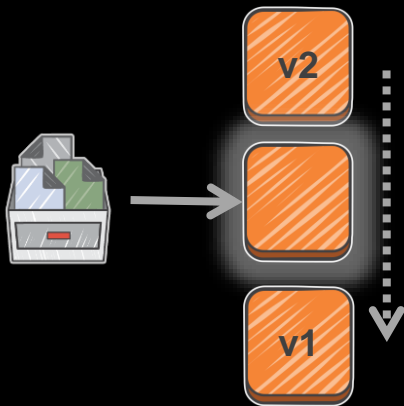


Deployment

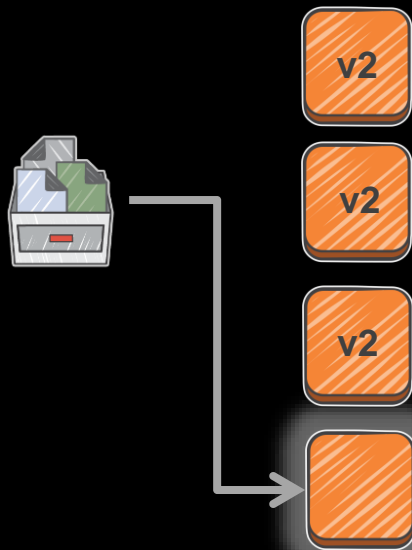


Deployment Configuration

Rolling updates



Auto Scaling support



Customized Install

files:

- source: /web_files/
destination: /var/www/html/

hooks:

BeforeInstall:

- location: setup/install_dep.sh

ApplicationStart:

- location: setup/start_server.sh
- location: setup/start_logger.sh

ApplicationStop:

- location: setup/stop_server.sh
- location: setup/flush_logs.sh

Application Specification File

version: 0.0

os: linux

files:

- source: /
destination: /var/www/html/WordPress

hooks:

BeforeInstall:

- location: scripts/install_dependencies.sh
timeout: 300
runas: root

AfterInstall:

- location: scripts/change_permissions.sh
timeout: 300
runas: root

ApplicationStart:

- location: scripts/start_server.sh
timeout: 300
runas: root

ApplicationStop:

- location: scripts/stop_server.sh
timeout: 300
runas: root

Demo Snapshot

DemoApplication

Manage your application's deployment groups and revisions.

Deployment Groups

Create New Deployment Group

Filter: Status

Search by Deployment Group

✓ DemoFleet

Succeeded 3 instance(s)

DeploymentGroup2

Delete Application

Deleting DemoApplication will delete all the associated deployment groups and revisions. This can't be undone. Are you sure you want to delete this application?

Revisions

Manage your application revisions. Select a deployment group on the left to view a list of revisions to deploy.

Revisions per page 10

< Viewing 1 to 1 Revision(s) >

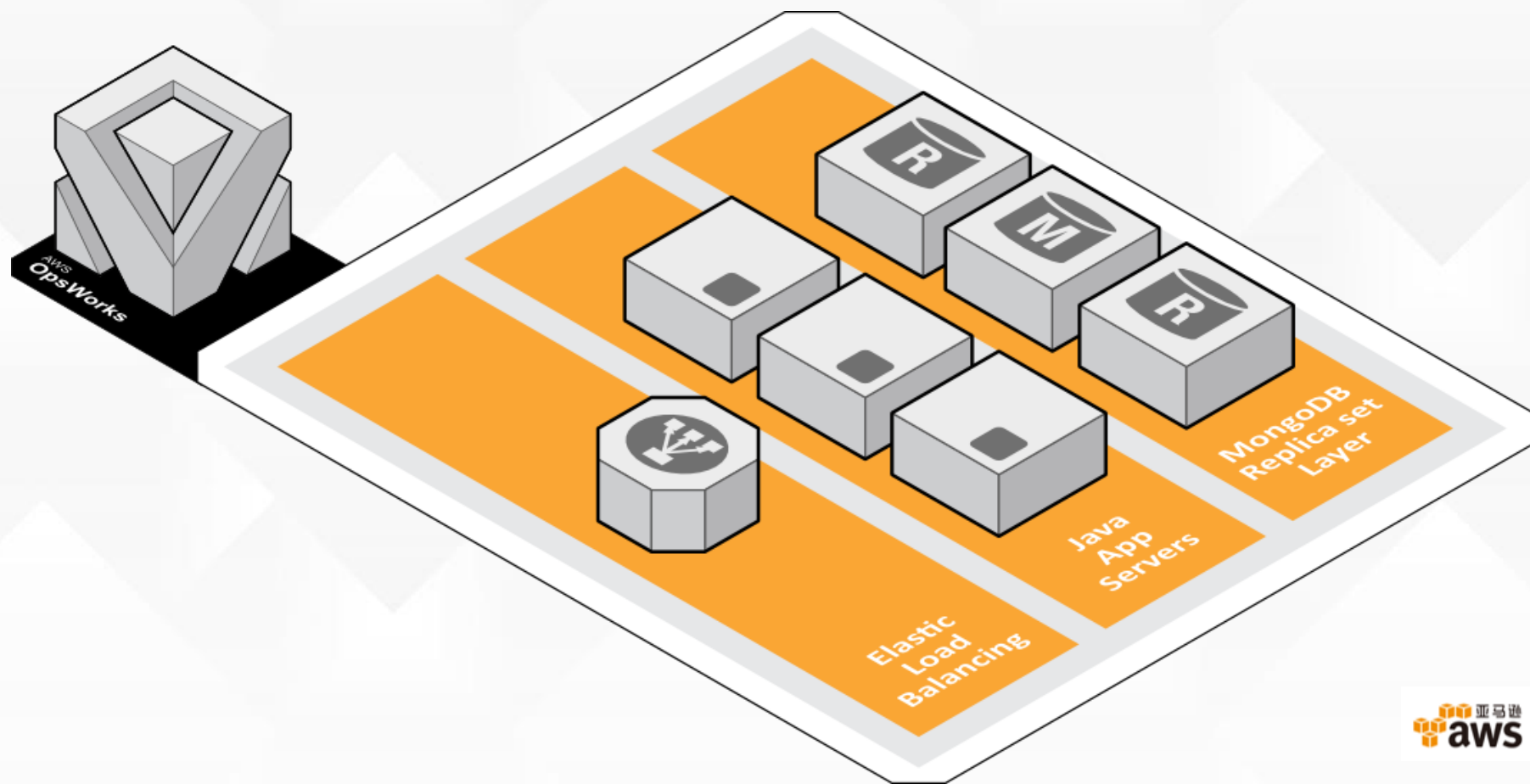
Revision Location	Created	Last Deployed
s3://aws-codedeploy-us-west-2/sa...	7 hours ago	7 hours ago

OpsWorks

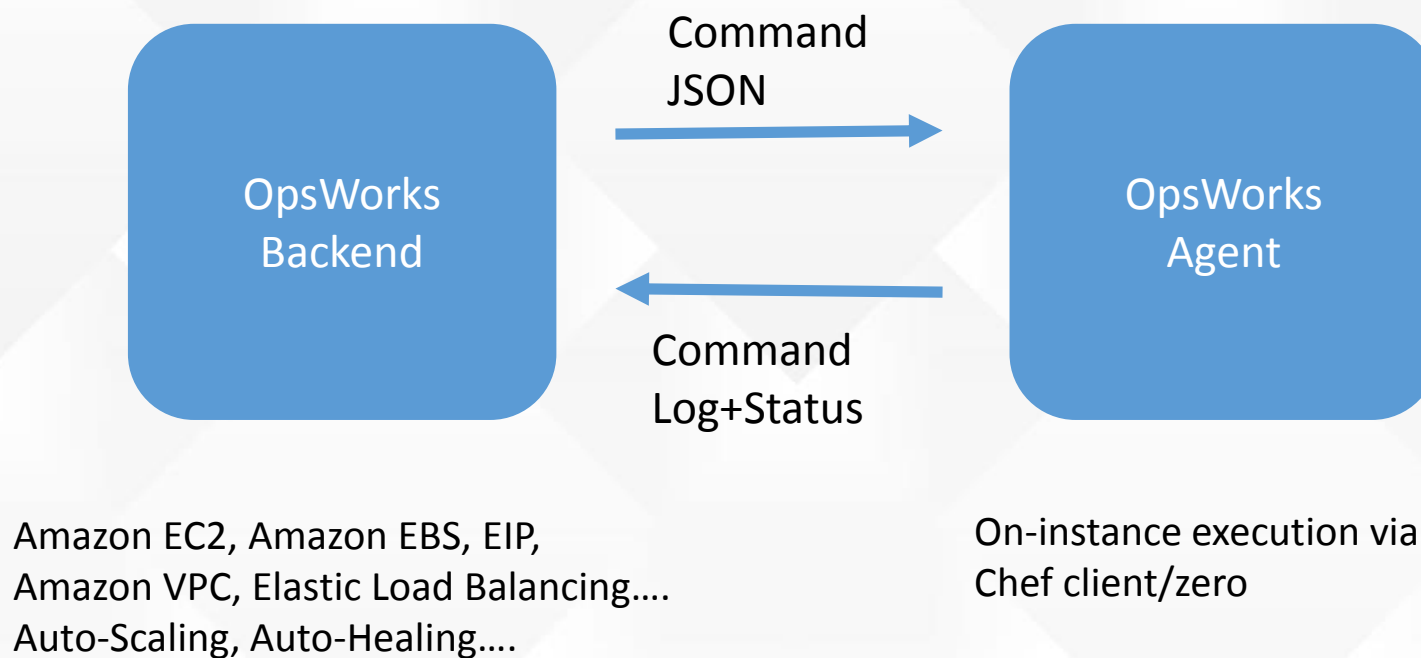


OpsWorks

AWS OpsWorks is a flexible application management solution with automation tools that enable you to model and control your applications and their supporting infrastructure.



OpsWorks工作原理



大大简化了Chef环境的搭建

Lifecycle events

setup



configure



deploy



undeploy



shutdown



Built-in and Custom Chef Recipes

QConStack ▾

Dashboard

Stack

Layers

Instances

Time-based

Load-based

Apps

Deployments

Monitoring

Resources

Permissions

Layer Static Web Server

General Settings

Recipes

Network

EBS Volumes

Security

Built-in Chef Recipes ⓘ

We have defined 17 built-in Chef recipes for your layer.

8	Setup	opsworks_initial_setup	ssh_host_keys	ssh_users	mysql::client	dependencies	ebs	opsworks_ganglia::client
		nginx						
4	Configure	opsworks_ganglia::configure-client	ssh_users	mysql::client	agent_version			
2	Deploy	deploy::default	deploy::web					
1	Undeploy	deploy::web-undeploy						
2	Shutdown	opsworks_shutdown::default	nginx::stop					

Custom Chef Recipes ⓘ

Repository URL

https://s3-ap-southeast-1.amazonaws.com/wendaifiles/opsworks_cookbooks_1.1.zip (change)

0	Setup	<input type="text" value="mycookbook::myrecipe, mycookbo"/>	+
0	Configure	<input type="text" value="mycookbook::myrecipe, mycookbo"/>	+
0	Deploy	<input type="text" value="mycookbook::myrecipe, mycookbo"/>	+
0	Undeploy	<input type="text" value="mycookbook::myrecipe, mycookbo"/>	+
0	Shutdown	<input type="text" value="mycookbook::myrecipe, mycookbo"/>	+

Custome Recipe Demo

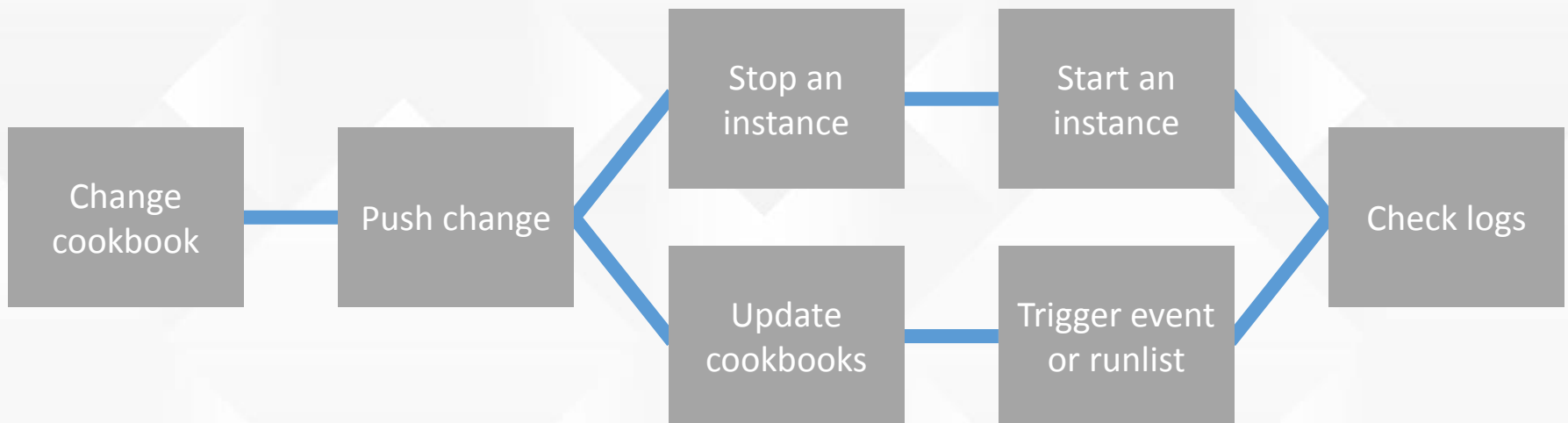
– 创建目录

```
Chef::Log.info("*****Creating a data directory.*****")

data_dir = value_for_platform(
  "centos" => { "default" => "/srv/www/shared" },
  "ubuntu" => { "default" => "/srv/www/data" },
  "default" => "/srv/www/config"
)

directory data_dir do
  mode 0755
  owner 'root'
  group 'root'
  recursive true
  action :create
end
~
~
```

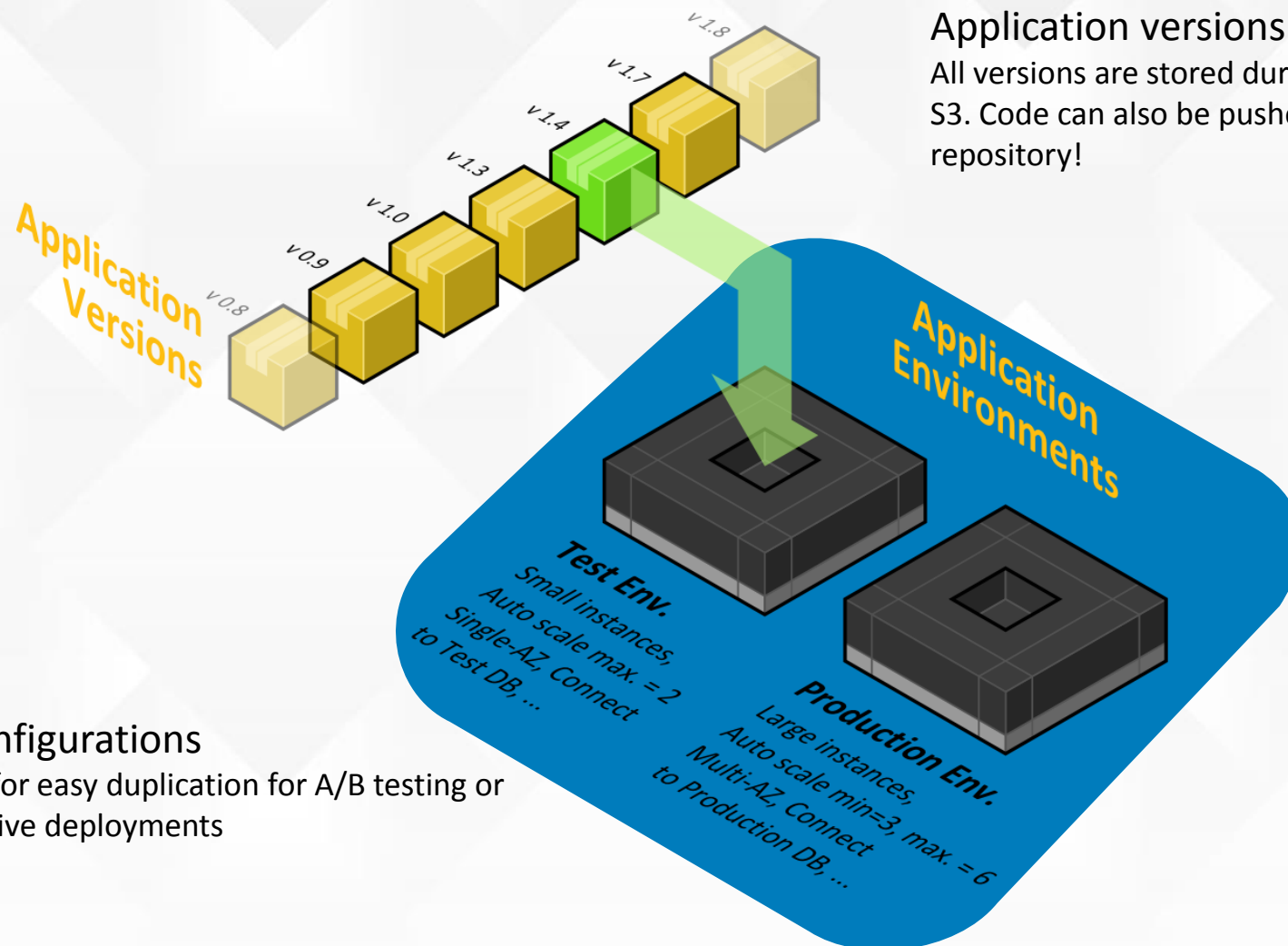
Cookbook development workflow



ElasticBeanstalk



Elastic Beanstalk 工作原理



Application versions

All versions are stored durably in Amazon S3. Code can also be pushed from a Git repository!

Saved configurations

Save these for easy duplication for A/B testing or non-disruptive deployments

Application

My First Elastic Beanstalk Application

Actions ▾

Environments

Delete

Deploy

Upload

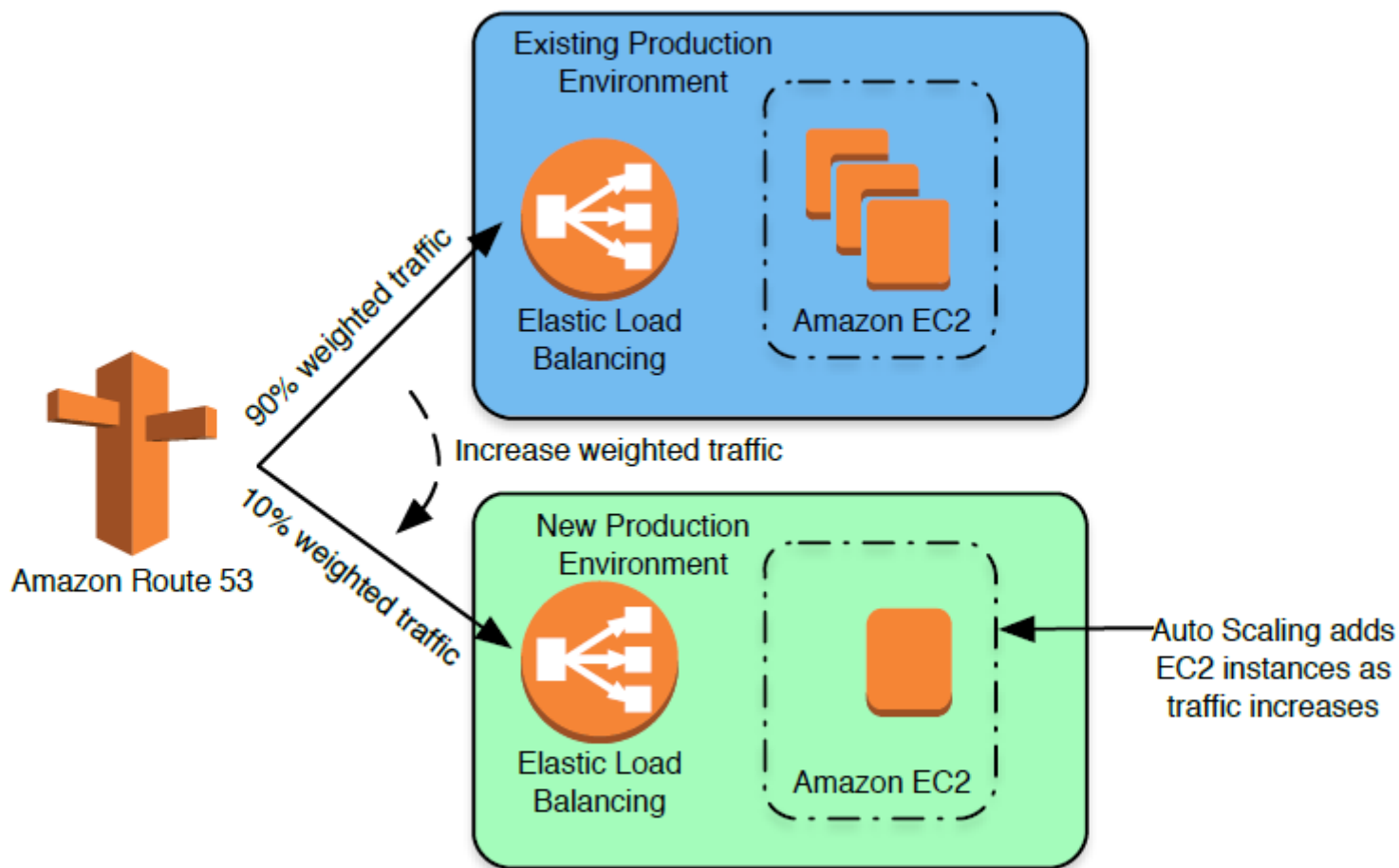
Refresh

Application Versions

Saved Configurations

<input type="checkbox"/>	Version Label	Description	Date Created	Source	Deployed To
<input type="checkbox"/>	Sample Application		2015-04-23 16:33:35 UTC+0800	Sample Application	Default-Environment

蓝绿部署



Demo: CLI workflow

Initial app deployment:

01 Initialize your Git repository
`$ git init .`

02 Create your Elastic Beanstalk app
`$ eb init`

03 *Follow the prompts to configure the environment*

04 Add your code
`$ git add .`

05 Commit
`$ git commit -m "v1.0"`

06 Create the resources and launch the application
`$ eb create`

Demo: CLI workflow

Update your app:

01 Update your code

02 Push the new code

```
$ git add .  
$ git commit -m "v2.0"  
$ eb deploy
```

03 Monitor the deployment progress

```
$ eb status
```

贯彻始终的安全与监控

**Amazon
CloudWatch**



Monitor resources

**AWS IAM (Identity
& Access Mgmt)**



Manage **users,**
groups &
permissions

Convenience



IAM

Customization



Beanstalk



OpsWorks



CodeDeploy



CloudFormation

CloudWatch



Provision

Deploy

Monitor

感谢您宝贵的时间！