

A Smart Rolling Update Methodology adopt Intelligent DevOps workflow – Take Cloud Project as Use Case

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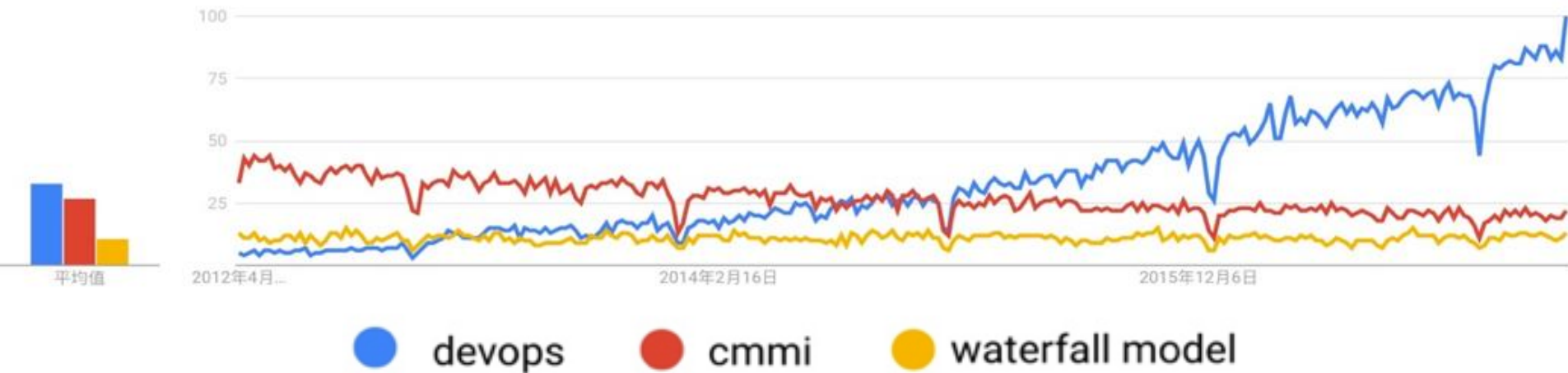
27 Sept 2017



Refresh your life

Introduction(1/4)

- ❖ In past five years, the DevOps workflow had been more and more popular compared with CMMI and waterfall model.



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❖ Advantages of DevOps

- Catch up the newest trend in the market
- Bridge the gap between Develops and Operators
- Delivery software and service rapidly and reliability
- Regression, Continuous feedback
- Productive team work



Introduction(3/4)

❖ Problems of DevOps

- Too many DevOps tools and methodologies
- Although DevOps had been mature, it lacks central version management
- Lack Automatic Tag mechanism in DevOps workflow

PERIODIC TABLE OF DEVOPS TOOLS (V2)																		EMBED		DOWNLOAD		ADD													
1	Fm																	2	Fm																
Gh	GitHUb																	Aws	Amazon Web Services																
3	Os	4	En															5	En	6	En	7	Os	8	Os	9	Os	10	Pd						
Gt	Git	Dm	DBmaestro															Ch	Pu	Puppet	An	Ansible	Sl	Salt	Dk	Docker	Az	Azure							
11	Fm	12	Os															13	Os	14	En	15	Os	16	Fr	17	Os	18	En						
Bb	Bitbucket	Lb	Liquibase															Ot	Bl	Bladelogic	Va	Vagrant	Tf	Terraform	Rk	Rkt	Gc	Google Cloud							
19	Os	20	En	21	Os	22	Os	23	Os	24	Os	25	Fr	26	Os	27	Fr	28	Os	29	Pd	30	Os	31	Pd	32	Os	33	Os	34	Os	35	Os	36	En
Gl	GitLab	Rg	Redgate	Mv	Maven	Gr	Gradle	At	ANT	Fn	FitNesse	Se	Selenium	Ga	Gatling	Dh	Docker	Jn	Jenkins	Ba	Bamboo	Tr	Travis CI	Gd	Deployment Manager	Sf	SmartFrog	Cn	Consul	Bc	Bcf2	Mo	Mesos	Rs	Rackspace
37	Os	38	En	39	Os	40	Os	41	Os	42	Fr	43	Os	44	Os	45	Os	46	Fm	47	Pd	48	Fm	49	Fr	50	Fr	51	Os	52	Os	53	Fr	54	Os
Sv	Subversion	Dt	Datical	Gn	Gulp	Gp	Broccoli	Br	Cucumber	Cu	Cucumber	Cj	JUnit	Qu	Quint	Npm	npm	Cs	CodeShip	Vs	Visual	Cr	CircleCI	Cp	Capistrano	Ju	Julia	Rd	Rundeck	Cf	CFEngine	Ds	Docker Swarm	Op	OpenStack
55	Os	56	En	57	Fr	58	Os	59	Os	60	Fr	61	Fr	62	Fr	63	Os	64	Fm	65	Fm	66	Os	67	En	68	Fm	69	En	70	En	71	Os	72	Fr
Hg	Mercurial	Dp	Dephix	Sb	sbt	Mk	Make	Ck	CMake	Jt	JUnit	Jm	JMeter	Tn	TestNG	Ay	Artifactory	Tc	TeamCity	Sh	Shippable	Cc	CruiseCon	Ry	RapidDepl	Cy	CodeDepl	Oc	Octopus Deploy	No	CA Nallo	Kb	Kubernetes	Hr	Heroku
73	En	74	En	75	Os	76	Os	77	Fr	78	Os	79	Fr	80	Os	81	Os	82	Os	83	Fm	84	Pd	85	En	86	En	87	Fm	88	En	89	Os	90	En
Cw	ISPW	Id	Idera	Msb	MSBuild	Rk	Rake	Pk	Packer	Mc	Mocha	Km	Karma	Jm	Jasmine	Nx	Nexus	Co	Continuum	Ct	Continua	So	Solano CI	Xld	XL Deploy	EB	ElasticBox	Dp	Deploybot	Ud	UrbanCode	Nm	Nomad	Os	OpenShift

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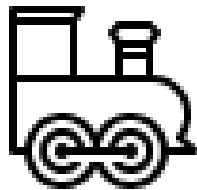
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91 En Xlr XL	92 En Ur UrbanCode Release	93 En Bm BMC Release	94 En Ca CA Release	95 En Au Automic	96 En Pl Plutora Release	97 En Sr Serena Release	98 En Tfs Team Foundation	99 Fm Ti Trello	100 Pd Jr Jira	101 Pd Rf HipChat	102 Fm Sl Slack	103 Fm Fd Flowdock	104 Pd Pv Pivotal Tracker	105 En Sn ServiceNow
106 Os Ki Kibana	107 Fm Nr New Relic	108 En Dt Dynatrace	109 Os Ni Nagios	110 Os Zb Zabbix	111 En Dd Datadog	112 En EI Elasticsearch	113 Fm Ad AppDynamics	114 En Sp Splunk	115 Fm Le Logentries	116 Fm Sl Sumo	117 Os Ls Logstash	118 Os Sn Short	119 Os Tw Tripwire	120 En Ff Fortify

Reference: <https://goo.gl/S9J5BP>

❖ How Chunghwa Telecom solve problems

- Choose suitable DevOps tools and methodologies and then used them into our large cloud project
- Purposed Smart Tag Engine Application Manager (STEAM) to strengthen rolling update which is part of DevOps Workflow



STEAM

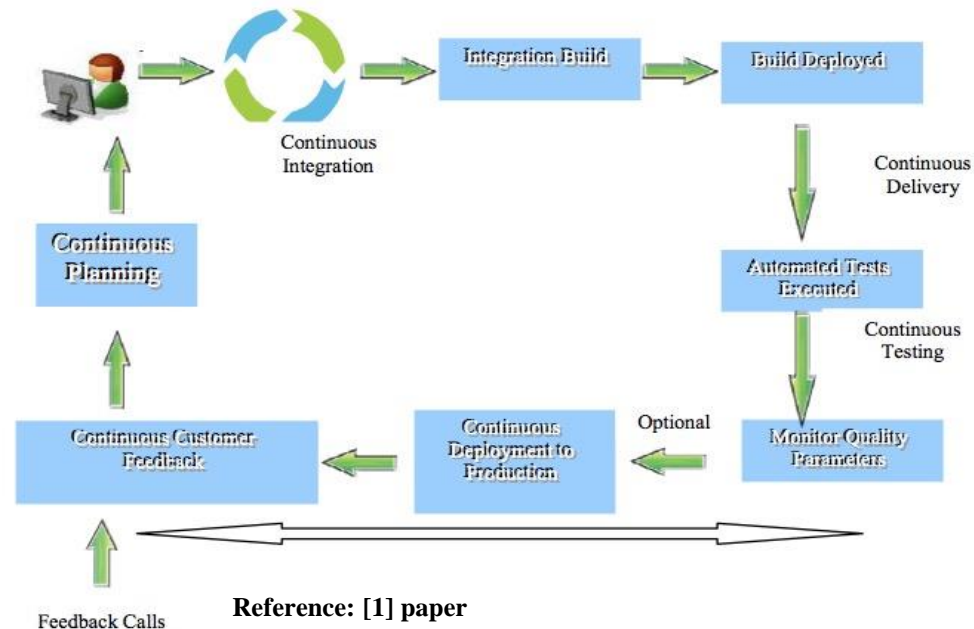
- Provide real-time release version searching
- Rolling update system Easily
- Management Friendly
- System's Loopholes indexing



Related Work

❖ IBM's DevOps Workflow

- Continuous Planning
- Continuous Integration
- Continuous Deployment
- Continuous Testing
- Continuous Monitoring



Reference: [1] paper

Why we need Smart Tag Engine Application Manager (STEAM)

What feature does this release version included?

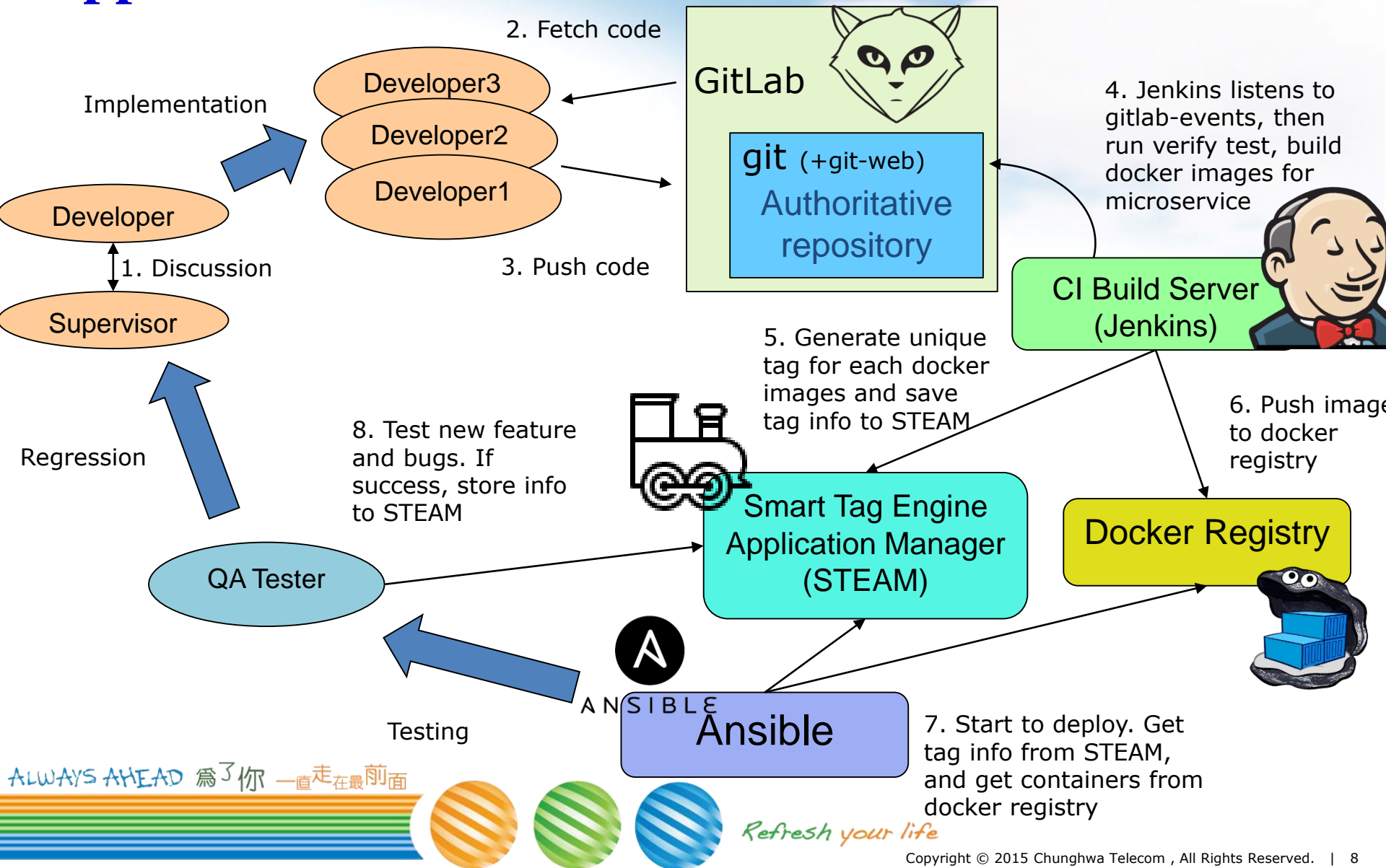
3rd party announce security issue, does our system use this version?

I need rolling update system without offline Service

Could I just update one microservice?



STEAM in CHT DevOps Workflow Approach



STEAM Implementation(1/2)



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Smart Tag Engine
Application Manager
(STEAM)

❖ Front-End

- Use Swagger UI Framework to show STEAM Service
 - a specification for defining the interface of a REST web service

swagger

default (/v2/api-docs) api_key

Spring REST Sample with Swagger

Spring REST Sample with Swagger

Created by kkw@cht.com.tw

[Apache License Version 2.0](#)

REST API

basic-error-controller : Basic Error Controller

Show/Hide

greeting-controller : Greeting Controller

Show/Hide

microservice-controller : Microservice Controller

Show/Hide

production-tag-controller : Production Tag Controller

Show/Hide

release-tag-controller : Release Tag Controller

Show/Hide

sample-controller : Sample Controller

Show/Hide

[BASE URL: /]

Curl

```
curl -X GET --header "Accept: */*" "http://10.144.190.61:8090/releaseTagName/v2.0.16-develop"
```

Request URL

Request URL

http://10.144.190.61:8090/releaseTagName/v2.0.16-develop

Response Body

```
{
  "releaseTagName": "v2.0.16-develop",
  "microservicesMap": {
    "ecc-testing-sample": "0.0.1-SNAPSHOT.develop.20170123.66",
    "ecc-automated-testing": "2.0.develop.20170406.69",
    "odl": "2.0.develop.20170424.20",
    "ecc-order": "2.0.develop.20170420.56",
    "ecc-cht": "2.0.develop.20170420.3",
    "ecc-eureka": "2.0.develop.20170420.28",
    "ecc-up": "2.0.develop.20170425.97",
    "ecc-redis": "latest",
    "ecc-api-gateway": "2.0.develop.20161209.18",
    "ecc-common-configs": "0.0.1-SNAPSHOT.develop.20170427.16",
    "ecc-im-querybuilder": "2.0.develop.20170217.1",
    "ecc-storage": "2.0.develop.20170427.10",
    "ecc-ra": "2.0.develop.20170425.31",
    "ecc-proxyserver-outband": "2.0.develop.20170425.25",
    "ecc-image": "2.0.develop.20170427.21",
    "ecc-inventory": "2.0.develop.20170425.157",
  }
}
```

Release Version

Each microservices' version

Response Code

200

Response Headers

```
{
  "date": "Tue, 23 May 2017 12:24:14 GMT",
  "content-disposition": "inline;filename=f.txt",
  "transfer-encoding": "chunked",
  "content-type": "application/json;charset=UTF-8"
}
```

STEAM Implementation(2/2)

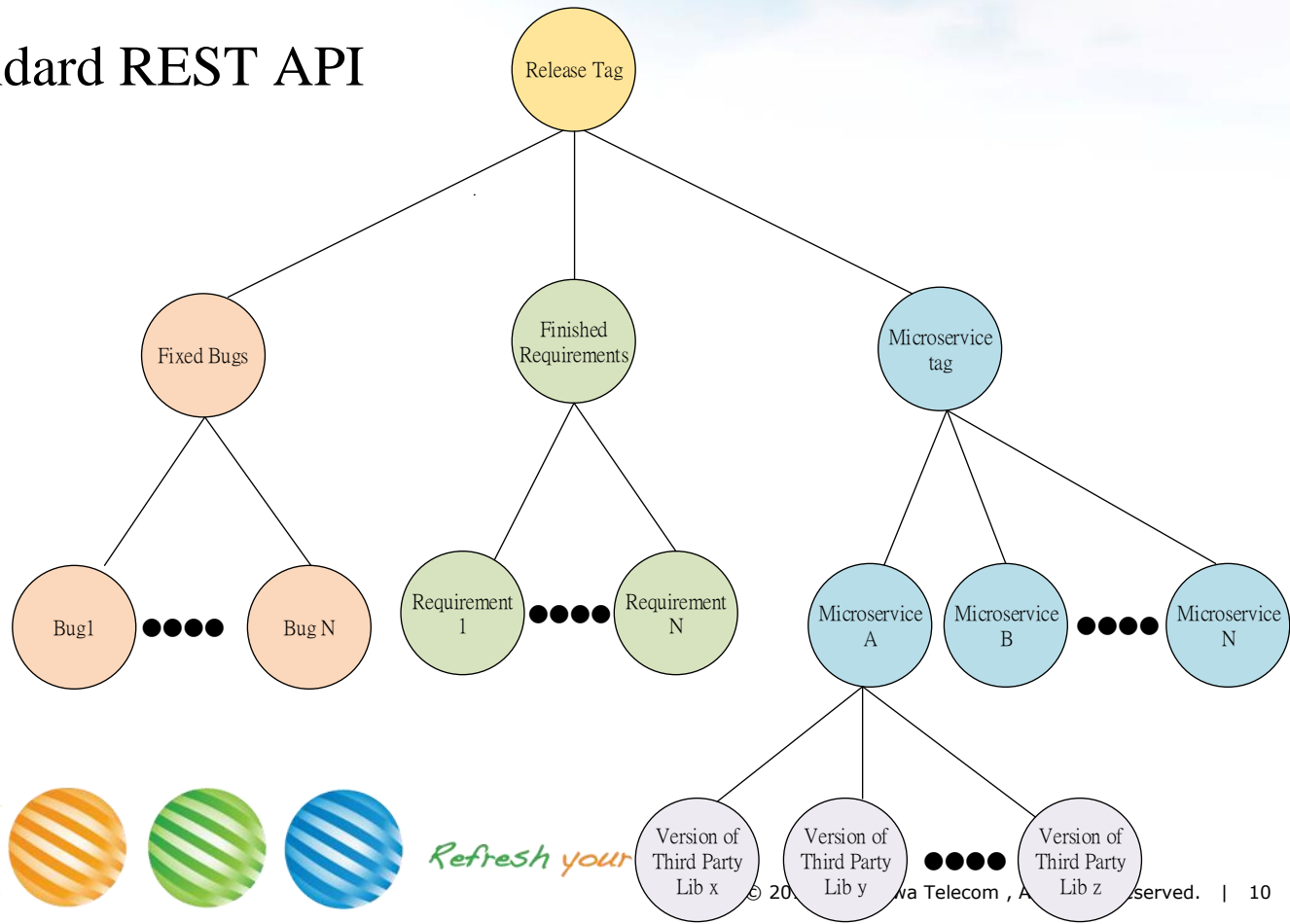


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Smart Tag Engine
Application Manager
(STEAM)

❖ Back-End

- Use Tree Structure
- Searchable
- Provide Standard REST API



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STEAM Content

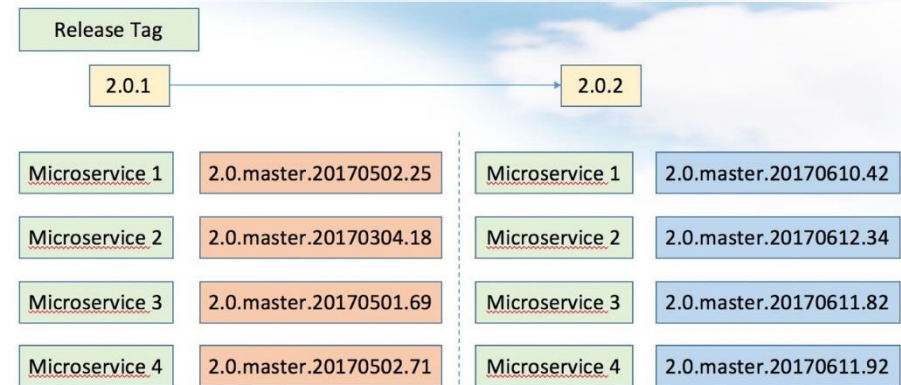


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Smart Tag Engine
Application Manager
(STEAM)

❖ Each release tag contains

- Finished requirements
- Fixed Bugs
- Microservice's version
- 3rd Party Libs



Microservice tag: major tag + minor tag + branch name + tag Date + Jenkins build number

Major tag: this tag only increase when make incompatible API or finished huge milestone

Minor tag: increase when add functionality in backwards-compatible manner

Tag date: when this container be made

Jenkins Number: every time Jenkins started to build, it will give a unique ID to make sure the build is unique

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Advantages of STEAM

❖ Advantages of STEAM

- Provide real-time release version searching
- Rolling update system Easily
- Management Friendly
- System's Loopholes indexing
 - Can search the 3rd party libs' version if 3rd party for announce security issue

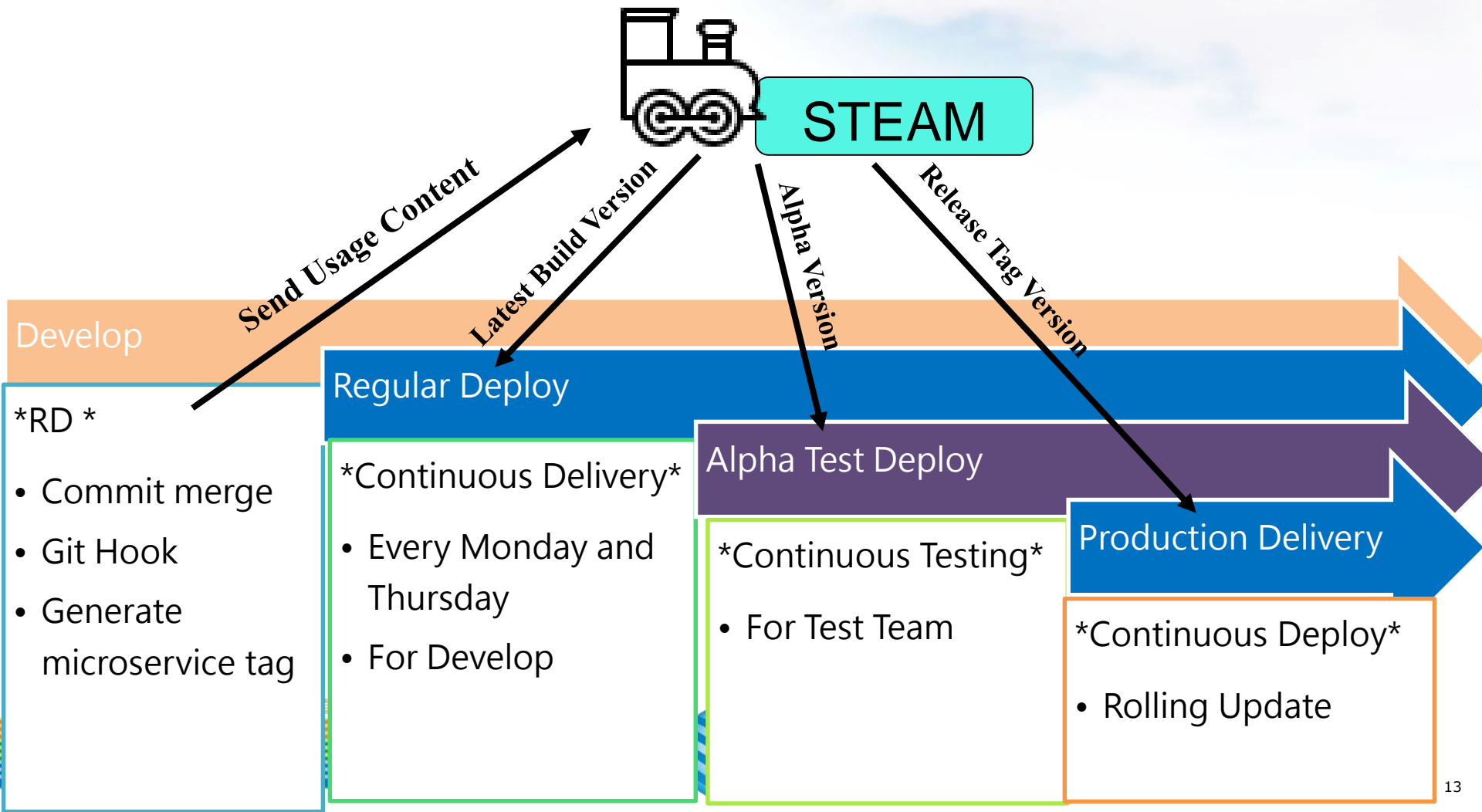


Use Case – STEAM in deploy strategy



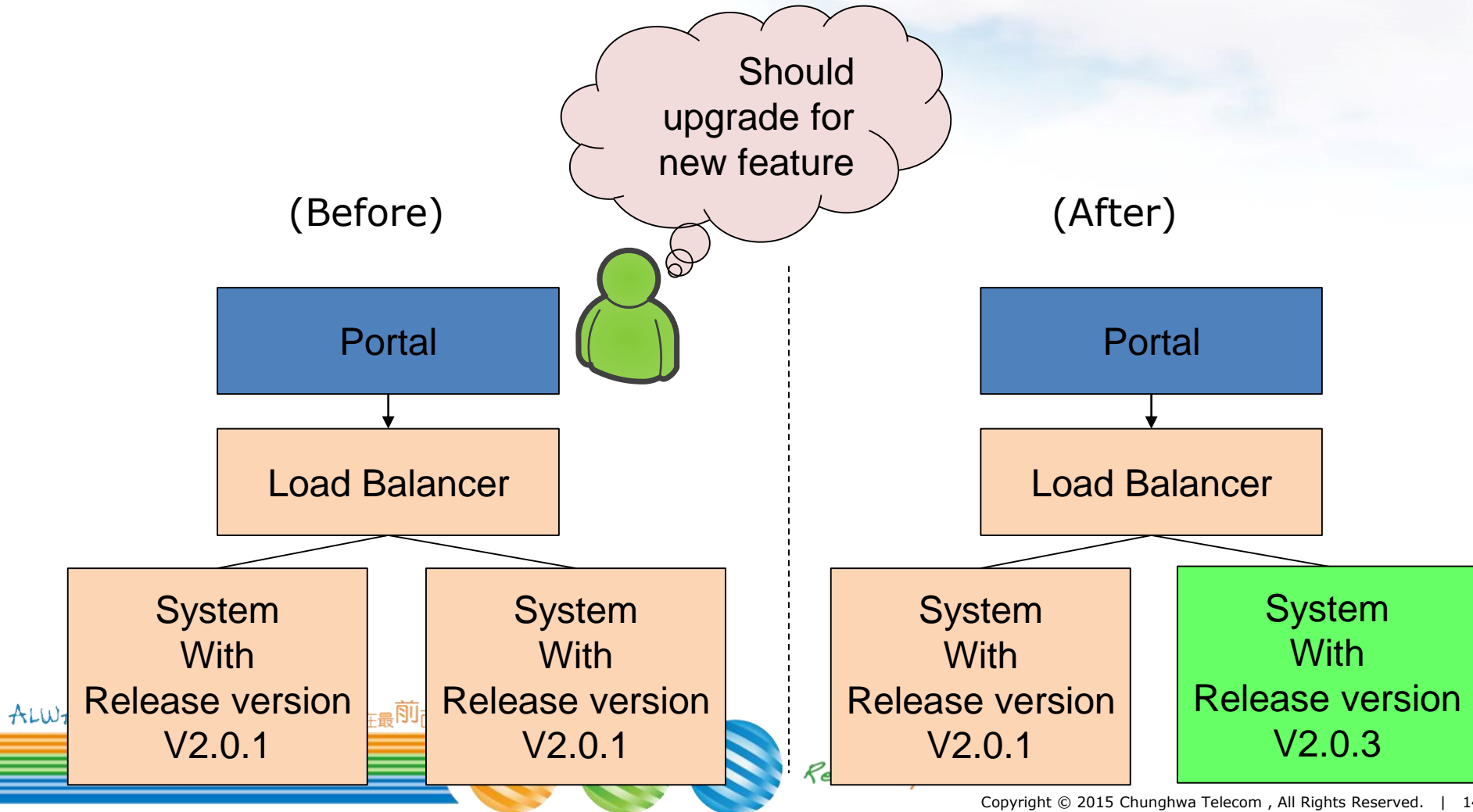
❖ Build and Deploy Strategy

CI Build Server
(Jenkins)



Use Case – STEAM in rolling update

❖ Achieve Smart Rolling Update



Use Case – STEAM in Security

- ❖ Patch severity security issue announced by 3rd party/organization
- ❖ Avoid putting production system in danger

Message view

From	Mark Thomas <ma...@apache.org>
Subject	[SECURITY] CVE-2017-5650 Apache Tomcat
Date	Mon, 10 Apr 2017 20:53:13 GMT

CVE-2017-5650 Apache Tomcat Denial of Service

Severity: Important

Vendor: The Apache Software Foundation

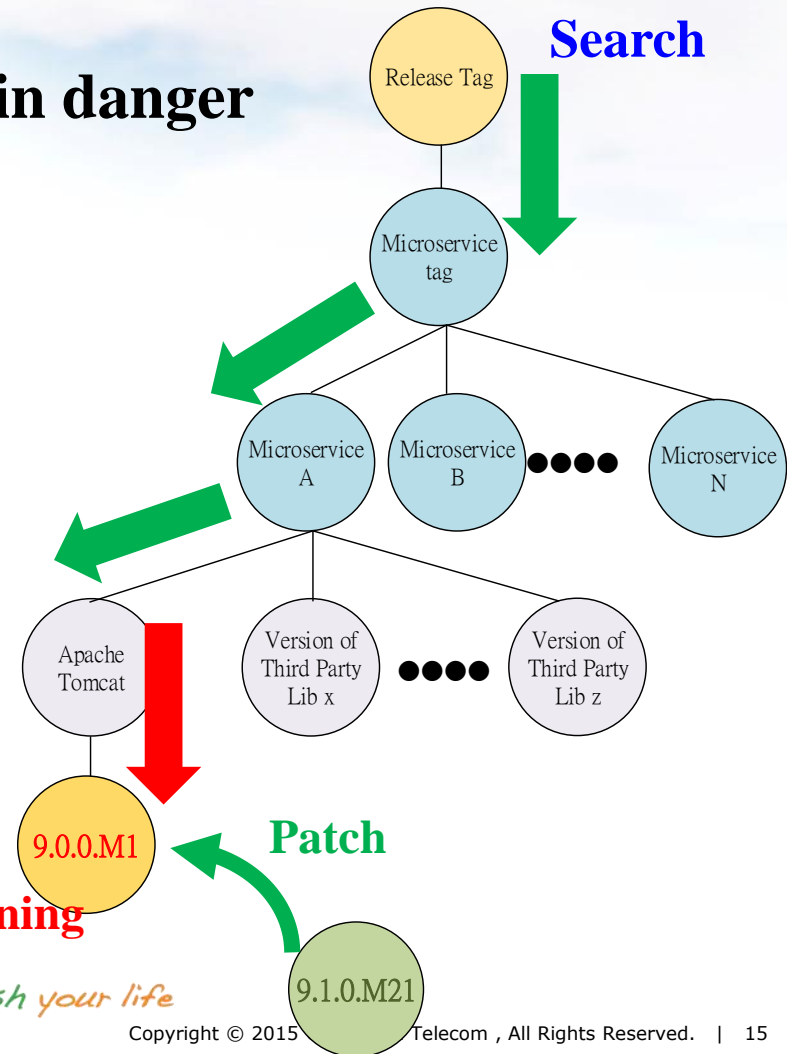
Versions Affected:

Apache Tomcat 9.0.0.M1 to 9.0.0.M18
Apache Tomcat 8.5.0 to 8.5.12
Apache Tomcat 8.0.x and earlier are not affected

Description

The handling of an HTTP/2 GOAWAY frame for a connection did not close streams associated with that connection that were currently waiting for

Reference: <https://goo.gl/OcWqxc>



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Conclusions

- ❖ DevOps can bridge the gap between develops and operators
- ❖ Operator can choose correct version
- ❖ Make rolling update more stability



Thanks for your listening

Q & A

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