



# Let's GO Cloud !

以簡馭繁，直上雲端

**IT Home 2015 DevOps 研討會**

**百人工研院團隊如何落實 CI**

雙子星雲端運算公司

符儒嘉 執行長

<http://www.geminiopencloud.com>

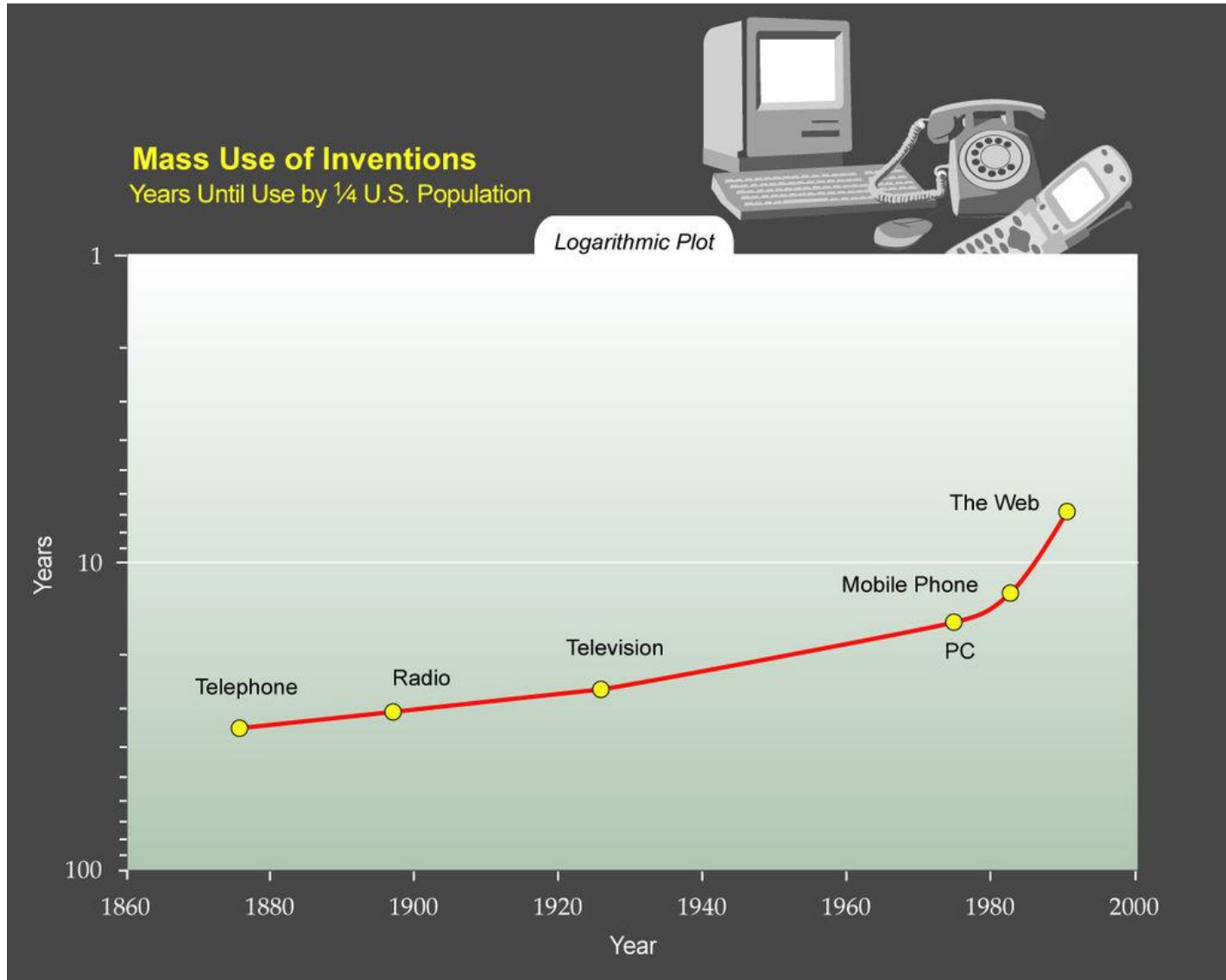


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# Agenda

- DevOps – What does it mean?
- From Agile to DevOps
- ITRI Cloud OS development process
- Tools
- Process
- People
- Summary

# New Invention Adoption



Courtesy of Ray Kurzweil and Kurzweil Technologies, Inc



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# Technology changes just as fast

## 1 The accelerating pace of change ...



## 2 ... and exponential growth in computing power ...

Computer technology, shown here climbing dramatically by powers of 10, is now progressing more each hour than it did in its entire first 90 years

### COMPUTER RANKINGS

By calculations per second per \$1,000

**Analytical engine**  
Never fully built, Charles Babbage's invention was designed to solve computational and logical problems



**Colossus**  
The electronic computer, with 1,500 vacuum tubes, helped the British crack German codes during WW II

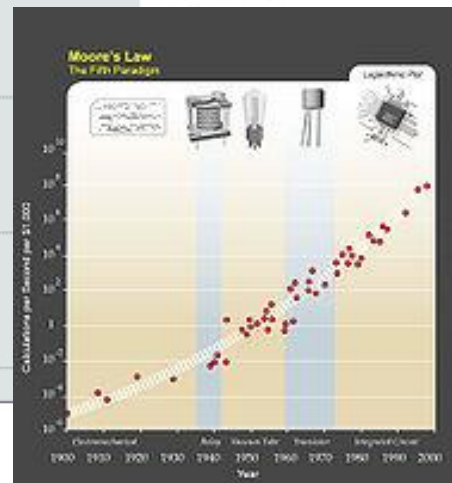
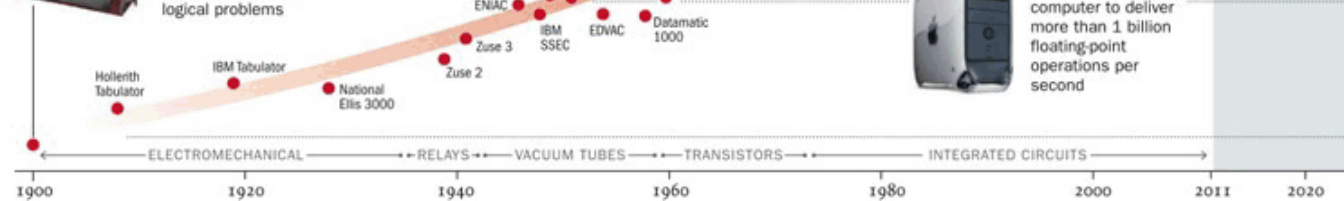
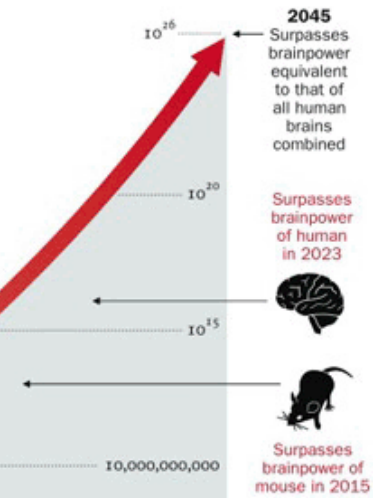


**UNIVAC I**  
The first commercially marketed computer, used to tabulate the U.S. Census, occupied 943 cu. ft.



**Apple II**  
At a price of \$1,298, the compact machine was one of the first massively popular personal computers

## 3 ... will lead to the Singularity



- Digitization, Internet, and Big Data leads to the wide adoption of Cloud Services and the era of globally-connected society

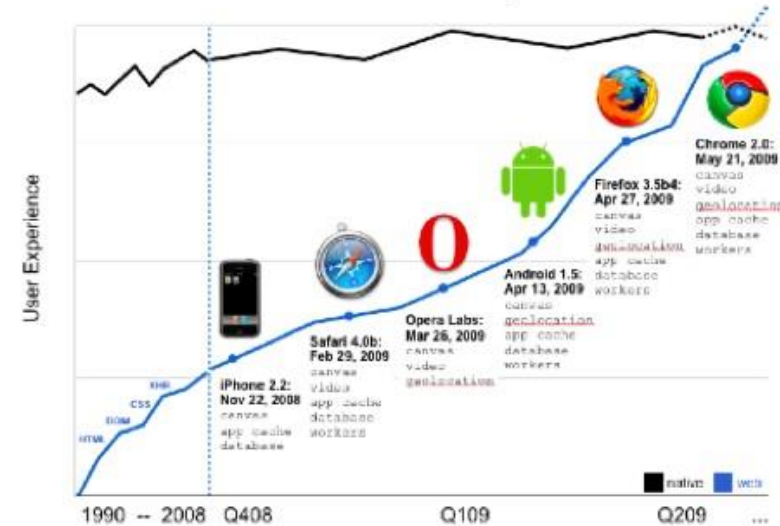


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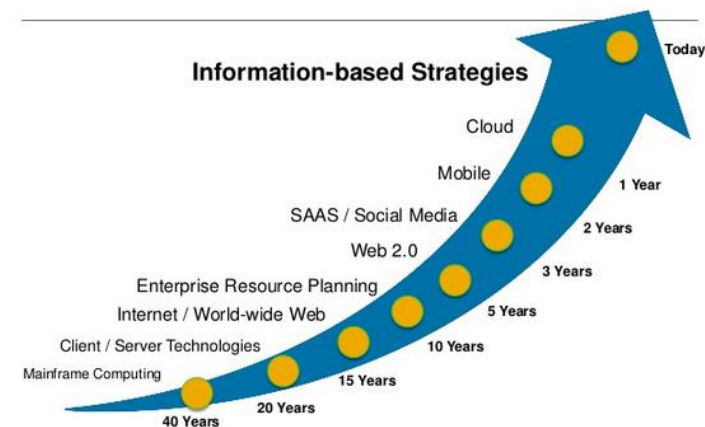
# DevOps – What does it mean?

- Business evolution is driving the rate of change of Web applications
- Waterfall model breaks down, Ken Schwaber brings in iterative, incremental development, aka Agile methodology
- Rapid and Frequent delivery by Development drives pressure into Operations team
- The same agile methodology for Development must now also apply to Operations
- DevOps is the iterative collaboration model between Development & Operations

The Web Platform is Accelerating



The Rate of Change is Accelerating





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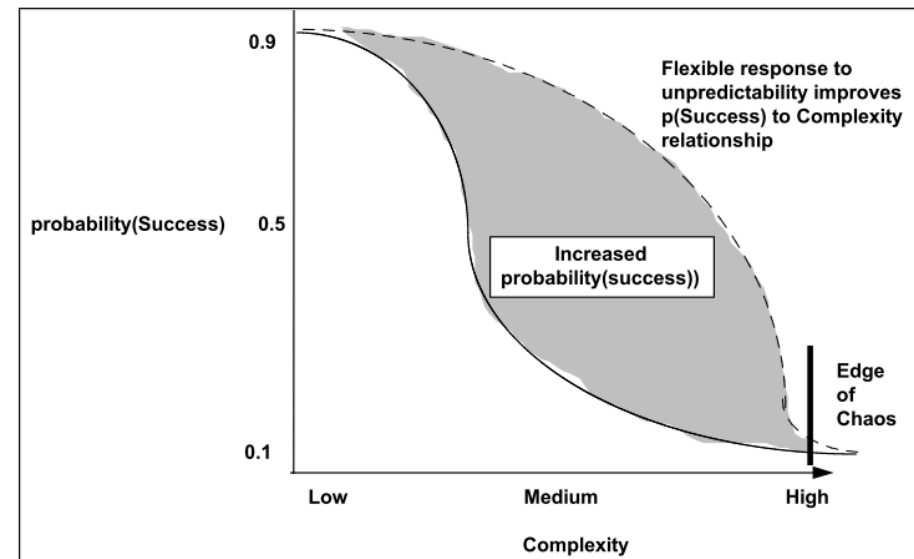
# Agile Development – It all starts here

- **Agile Practice**

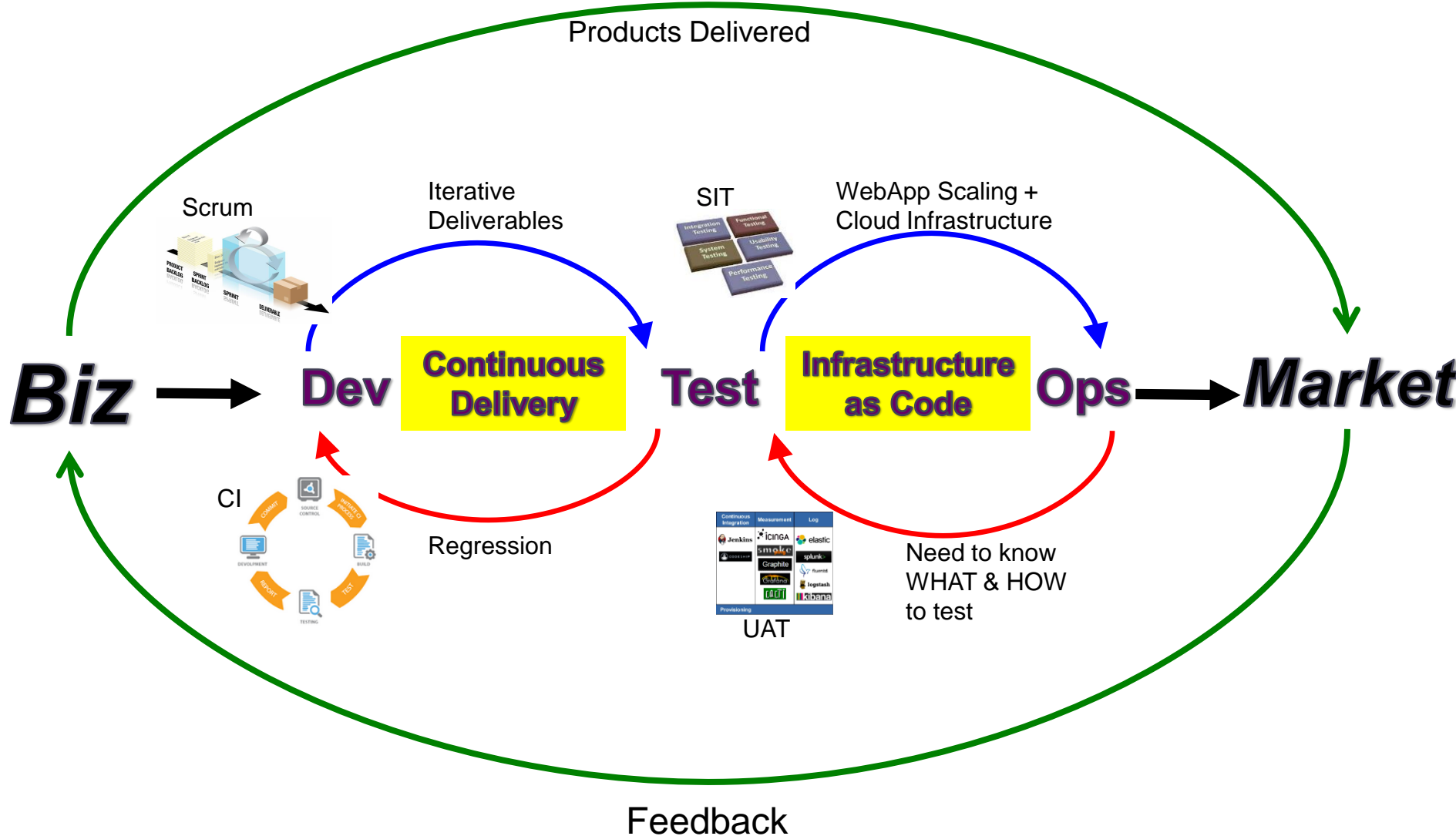
- Frequent delivery of releasable software
- Empowerment of individuals and teams
- Continuous communication, collaboration and improvement
- Responsiveness to change
- Velocity
- Prioritize to maximize value
- Attention to quality

- **Agile Values (manifesto)**

- Individuals & Interactions over process & tools
- Working software over comprehensive documentation
- Customer collaboration over contract negotiation
- Responding to change over following a plan



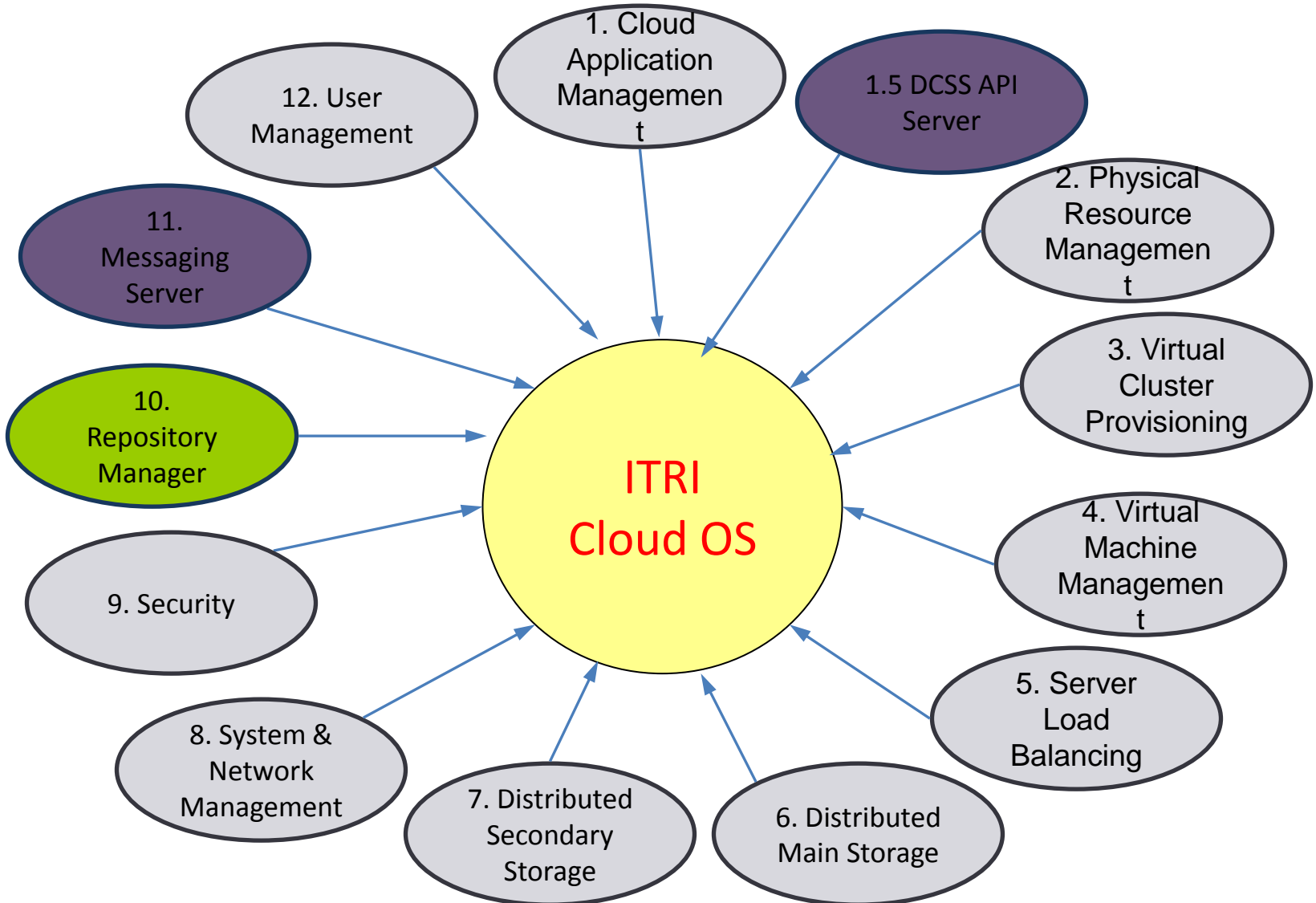
# From Agile to DevOps





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# ITRI Cloud OS – a complex system

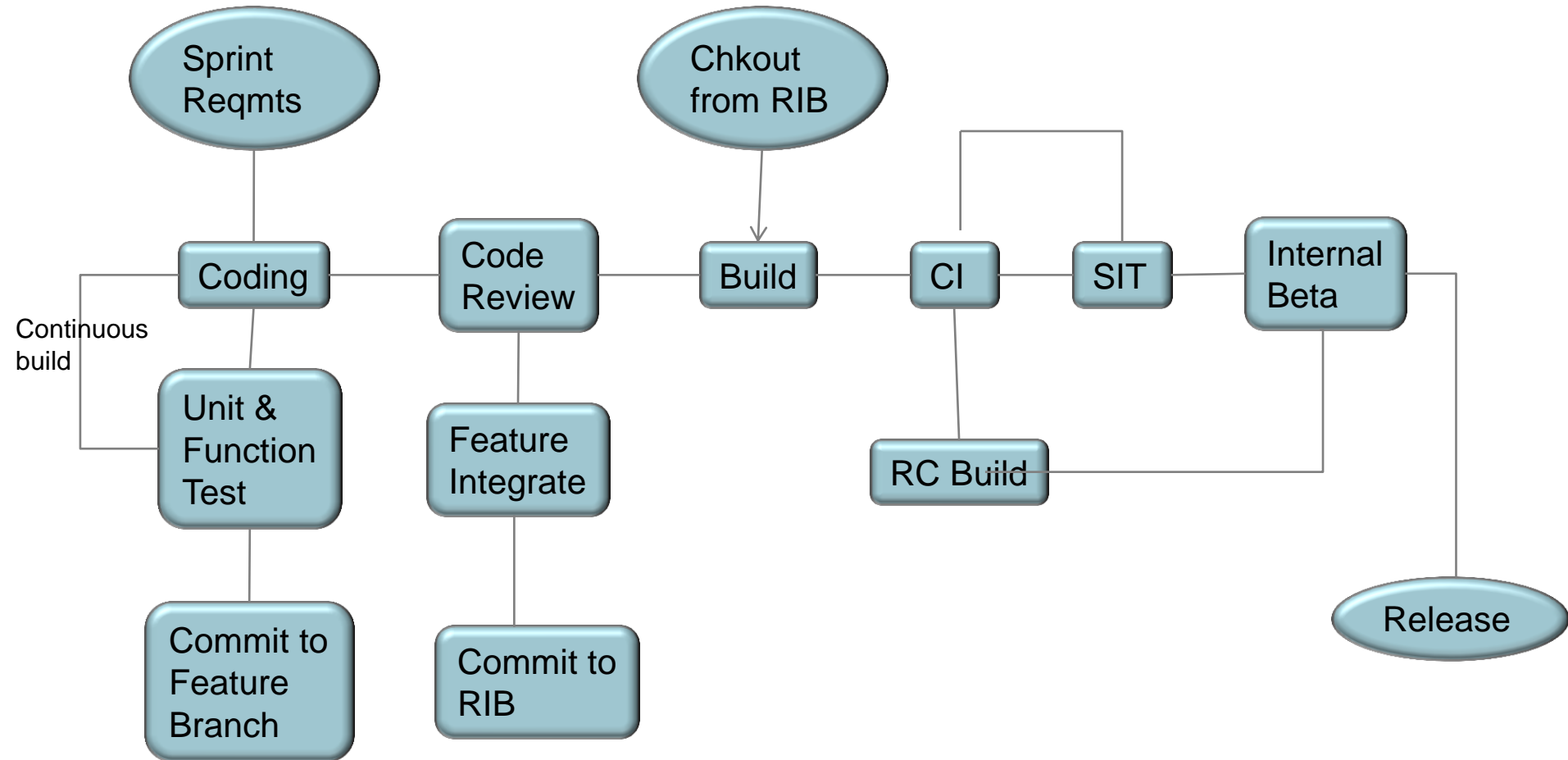






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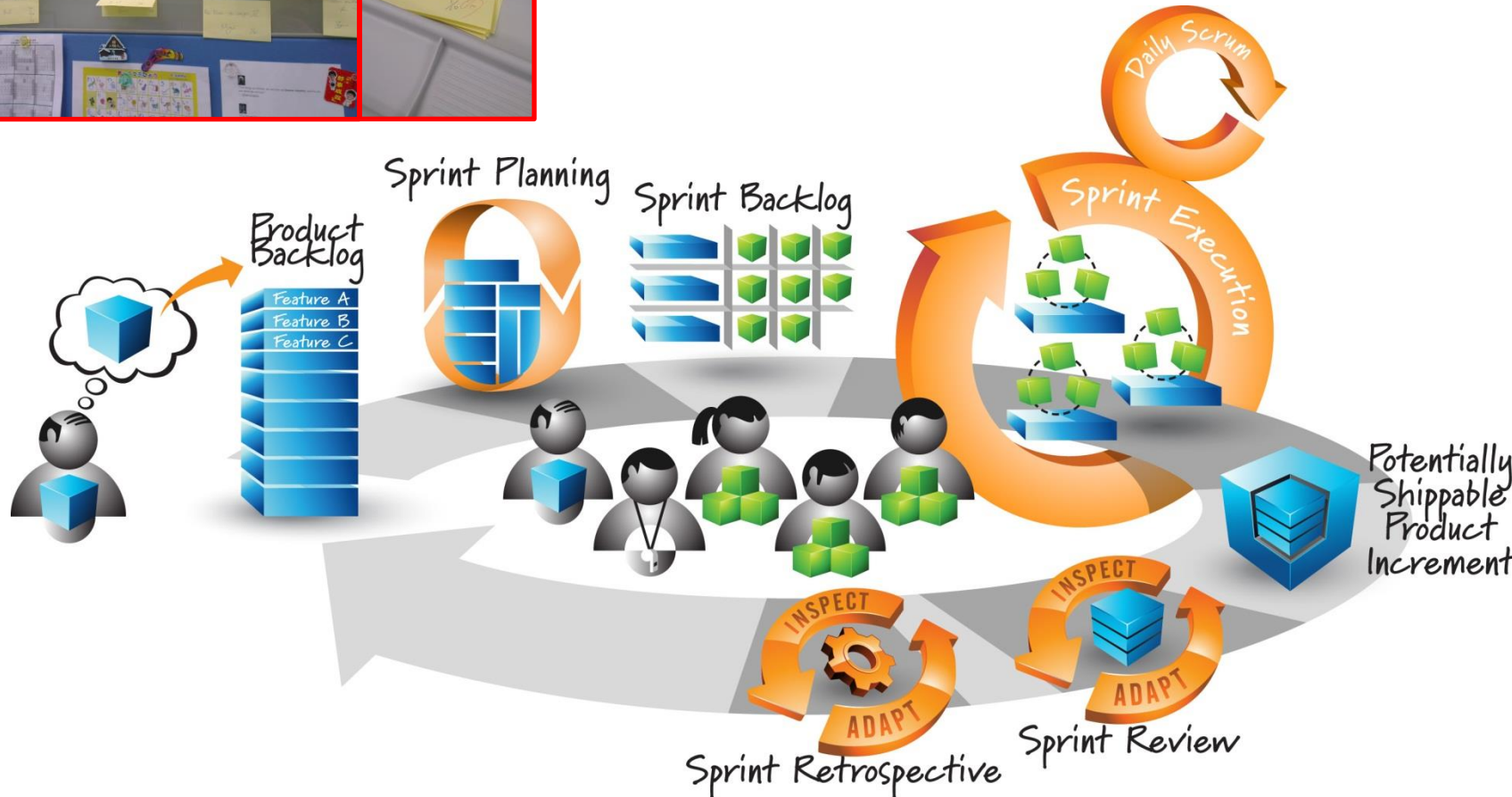
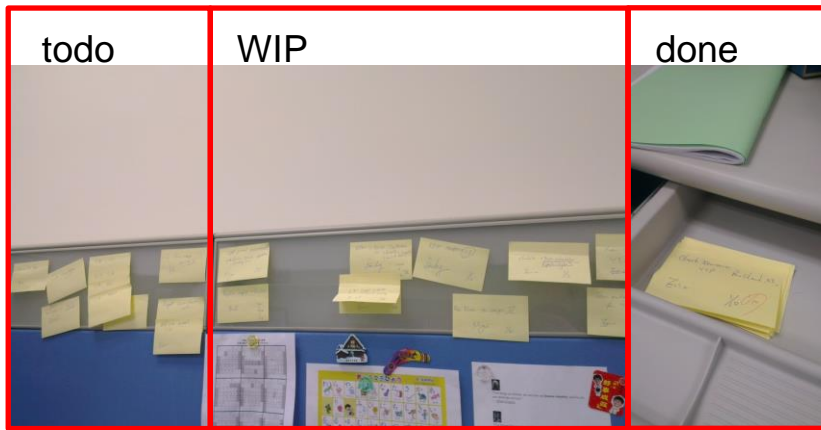
# ITRI Cloud OS SDLC





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# Scrum Development



# Review Board (by Google)

**All Incoming Review Requests**

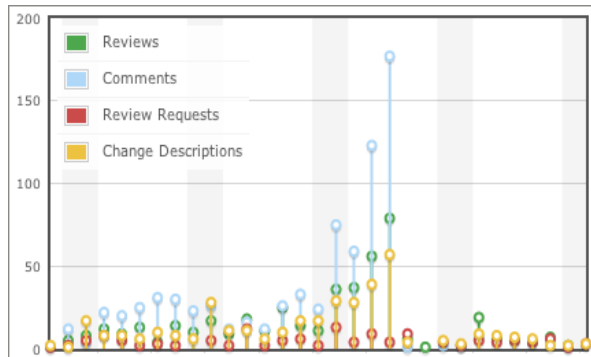
Summary

- generalize postreview.py
- [WIP] "Ship-It!" Ships Ascii Art Extension
  - Allow 'some.other.object.field' specification.
- Supporting dashboard impersonations
  - Users should be able to specify their default Dashboard vi

```

+ 9 lines
+ function buildColumnInfo() {
339   activeColumns[index] = activeColumns[beforeIndex];
340   activeColumns[beforeIndex] = tempName;
341
342   /* Swap the cells. This will include the headers
343      table = $grid.find("table:first")[0];
344
345      for (i = 0, rowsLen = table.rows.length; i < row
346          row = table.rows[i];
347          cell = row.cells[index];
348          beforeCell = row.cells[beforeIndex];
349
350
351
352   /* Switch the colspans. */
  
```

Moved to 396  
Moved to 397  
Moved to 398



```

1 17   var gridId = this.attr("id");
18   var
19   var
20   var
21   var
22
23   /*
24   var
25   var
26   var
27   var
28   var
29   var
30   var
  
```

**Your comment**

Consolidate this to one var statement

Open an issue

This comment has unsaved changes.

Save Cancel

Keep track of everything that needs fixing

Total: 12 Open: 1 Resolved: 9 Dropped: 2

Status:  From:

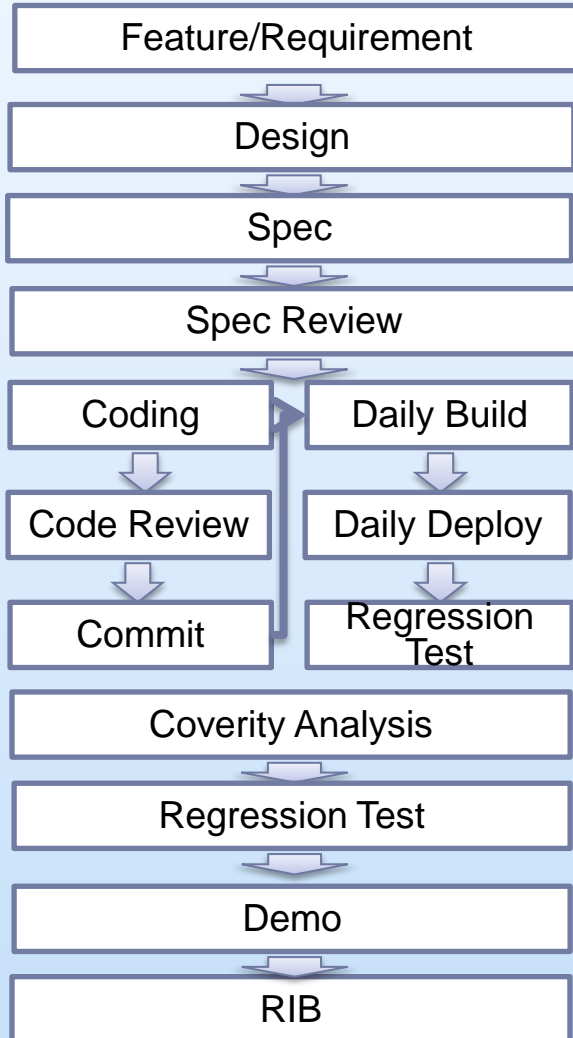
Issue ID	Description
Diff 7854	Should this subclass FileAttachmentCommentBlockModel instead
Diff 7887	This looks like it'll interfere with the diff viewer.
Diff 7888	Can you include a comment block describing this?
Diff 7889	The function you provide is the same signature as _addComm



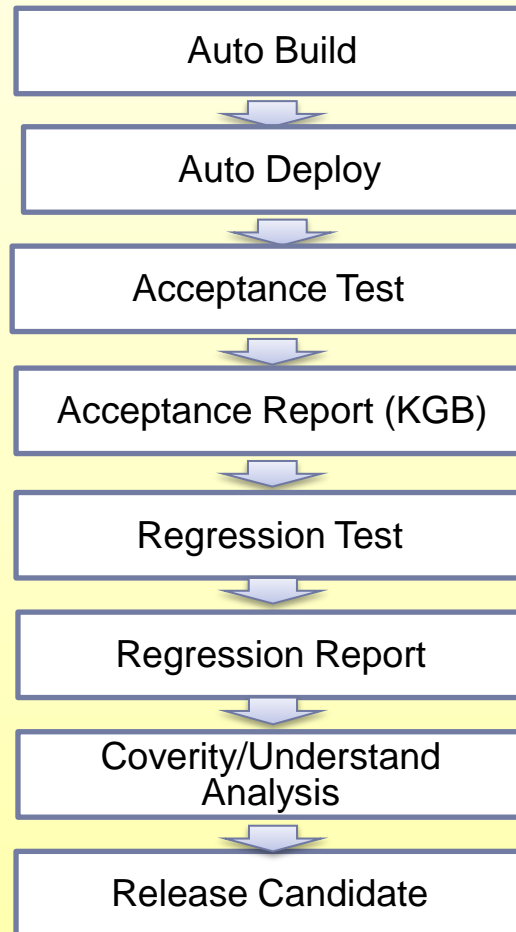
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# Branching Methodology

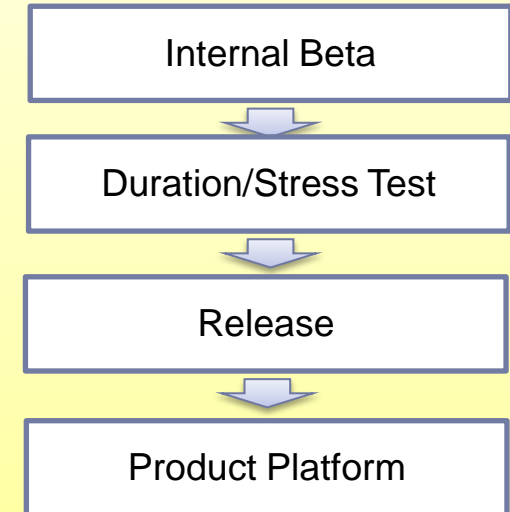
## Feature Branch



## Release Integration Branch



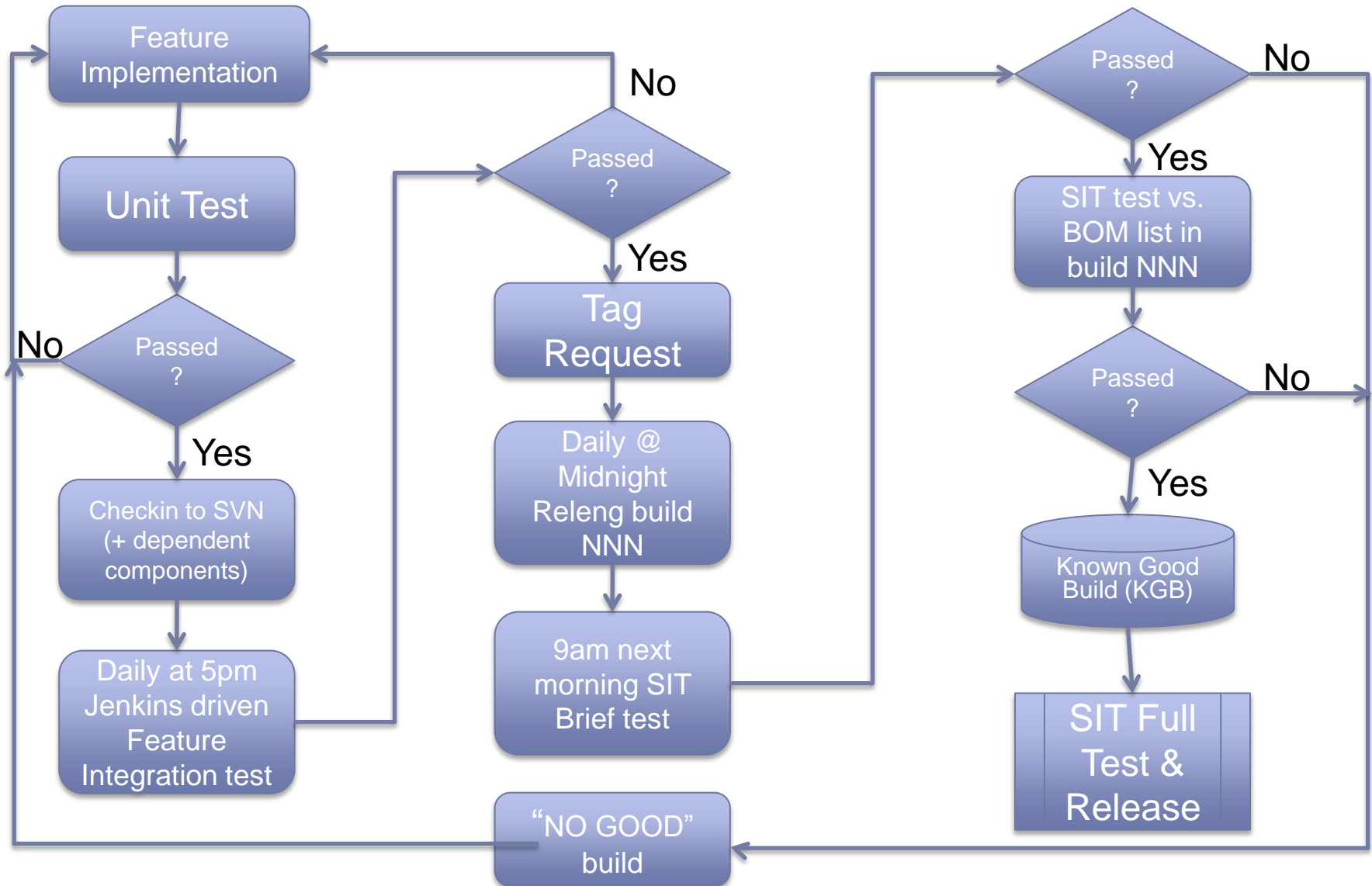
## Release Candidate Branch



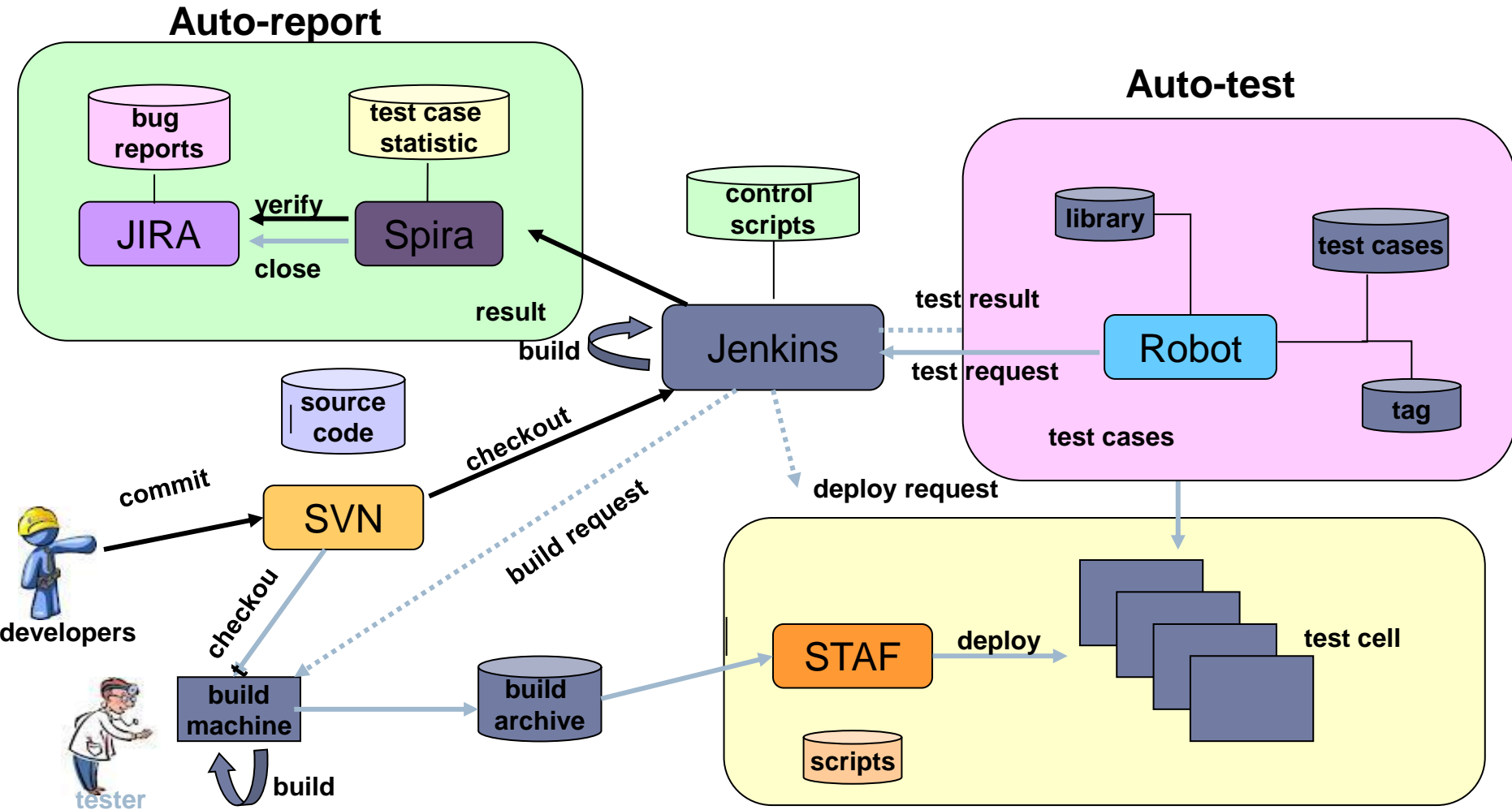


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# Continuous Integration



# System Integration Test





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# Test case Management



Welcome, Fred Bloggs | [My Profile](#) | [Administration](#) | [Log Out](#) | [Library Information System](#)

[Help?](#)

My Page | Project Home | Planning | **Testing** | Tracking | Reporting

Test Cases | [Test Sets](#) | [Test Runs](#) | [Automation Hosts](#) Role: Manager

[Insert](#) | [Delete](#) | [Indent](#) | [Outdent](#) | [Refresh](#) | [Edit](#) | [Tools](#) | [Filter](#)

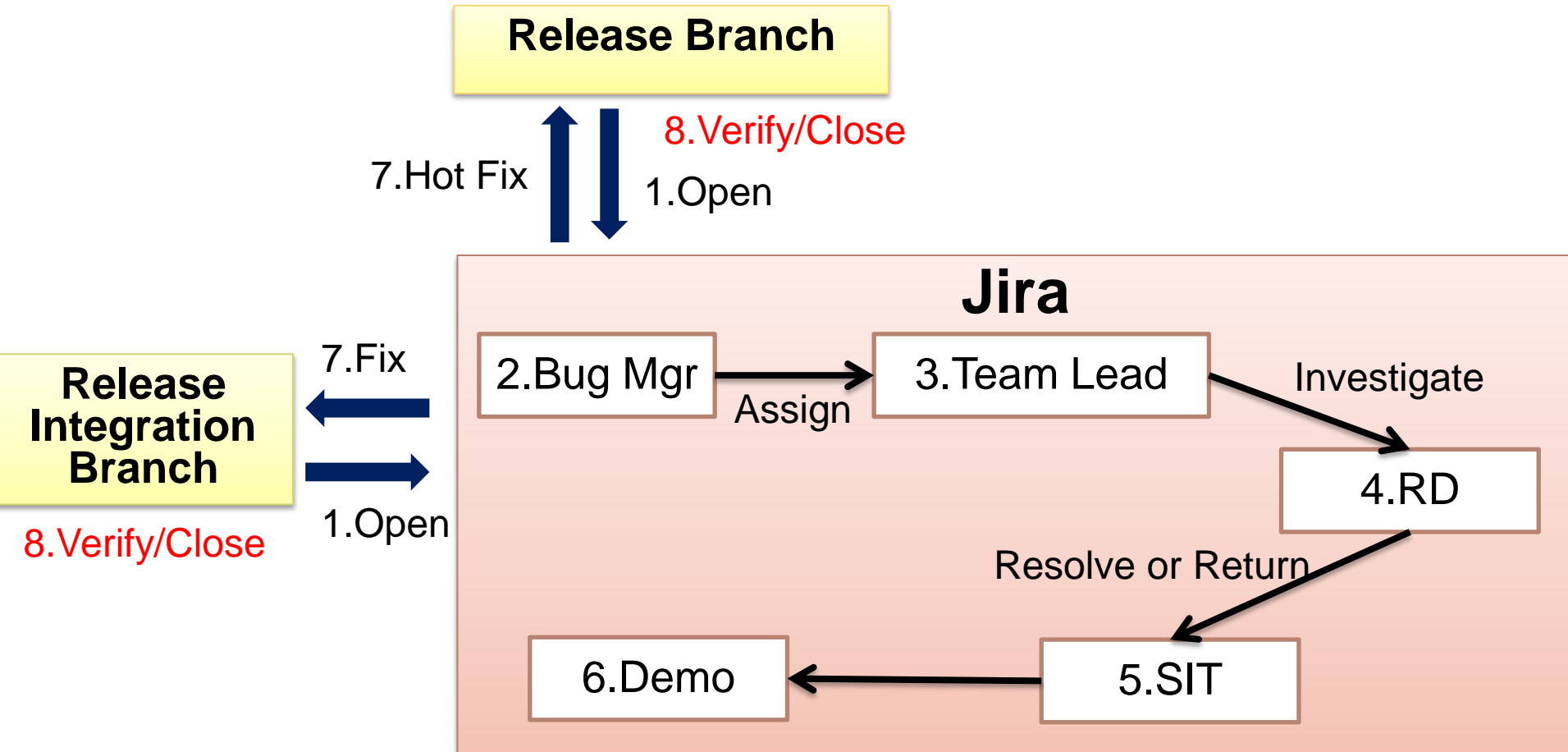
Displaying 9 out of 11 test case(s) for this release Display data for: [All Releases](#)

✓	⊞	Test Case Name	Execution Status	Owner	Last Executed	Author	Active	Test #	Edit
<input type="checkbox"/>			-- Any --	-- Any --		-- Any --	-- Any --	TC <input type="text"/>	<a href="#">Edit</a>
<input type="checkbox"/>	⊞	<b>Functional Tests (5)</b>	<div style="width: 100%; height: 10px; background: linear-gradient(to right, green, orange, red, yellow);"></div>	Fred Bloggs	1-Dec-2003	Fred Bloggs	Yes	TC000001	<a href="#">Edit</a>
<input type="checkbox"/>	⊞	<a href="#">Ability to create new book</a>	Failed	Fred Bloggs	10-Jun-2011	Fred Bloggs	Yes	TC000002	<a href="#">Edit</a>
<input type="checkbox"/>		<a href="#">Ability to edit existing book</a>	Caution	Fred Bloggs	1-Dec-2003	Fred Bloggs	Yes	TC000003	<a href="#">Edit</a>
<input type="checkbox"/>	⊞	<a href="#">Ability to create new author</a>	Failed	Joe P Smith	1-Dec-2003	Fred Bloggs	Yes	TC000004	<a href="#">Edit</a>
<input type="checkbox"/>		<a href="#">Ability to edit existing author</a>	Blocked	Joe P Smith	1-Dec-2003	Fred Bloggs	Yes	TC000005	<a href="#">Edit</a>
<input type="checkbox"/>		<a href="#">Ability to reassign book to different author</a>	Passed	Joe P Smith	1-Dec-2003	Fred Bloggs	Yes	TC000006	<a href="#">Edit</a>
<input type="checkbox"/>	⊞	<b>Regression Tests (2)</b>	<div style="width: 100%; height: 10px; background-color: green;"></div>		1-Dec-2003	Joe P Smith	Yes	TC000007	<a href="#">Edit</a>
<input type="checkbox"/>	⊞	<b>Scenario Tests (2)</b>	<div style="width: 100%; height: 10px; background-color: gray;"></div>	Joe P Smith		Joe P Smith	Yes	TC000010	<a href="#">Edit</a>
<input type="checkbox"/>	⊞	<b>Exception Scenario Tests (1)</b>	<div style="width: 100%; height: 10px; background-color: gray;"></div>	Joe P Smith		Joe P Smith	Yes	TC000011	<a href="#">Edit</a>
<input type="checkbox"/>		<a href="#">Person loses book and needs to report loss</a>	Not Run			Joe P Smith	Yes	TC000012	<a href="#">Edit</a>
<input type="checkbox"/>		<a href="#">Adding new book and author to library</a>	Not Run			Joe P Smith	Yes	TC000013	<a href="#">Edit</a>
<input type="checkbox"/>	⊞	<b>Common Tests (2)</b>	<div style="width: 100%; height: 10px; background-color: green;"></div>		1-Dec-2003	Fred Bloggs	Yes	TC000015	<a href="#">Edit</a>
<input type="checkbox"/>		<a href="#">Open Up Web Browser</a>	Passed		1-Dec-2003	Fred Bloggs	Yes	TC000016	<a href="#">Edit</a>
<input type="checkbox"/>		<a href="#">Login to Application</a>	Passed		1-Dec-2003	Fred Bloggs	Yes	TC000017	<a href="#">Edit</a>

Show  rows per page

Displaying page  of 1

# Jira Issue workflow







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# Internal Beta - EYODF

- **2 full racks in the container**
  - 90+ servers
  - 3 storage servers
  - >200TB
- **Workload**
  - Developer build/compile/test
  - Win 7 Office images
  - Test sandboxes
  - Simulates workloads

## 10 signs *of a* **BAD WORK ENVIRONMENT**



**YOU DON'T EAT YOUR OWN DOGFOOD**

No one in the building actually uses the stuff you sell.

### As a Developer...

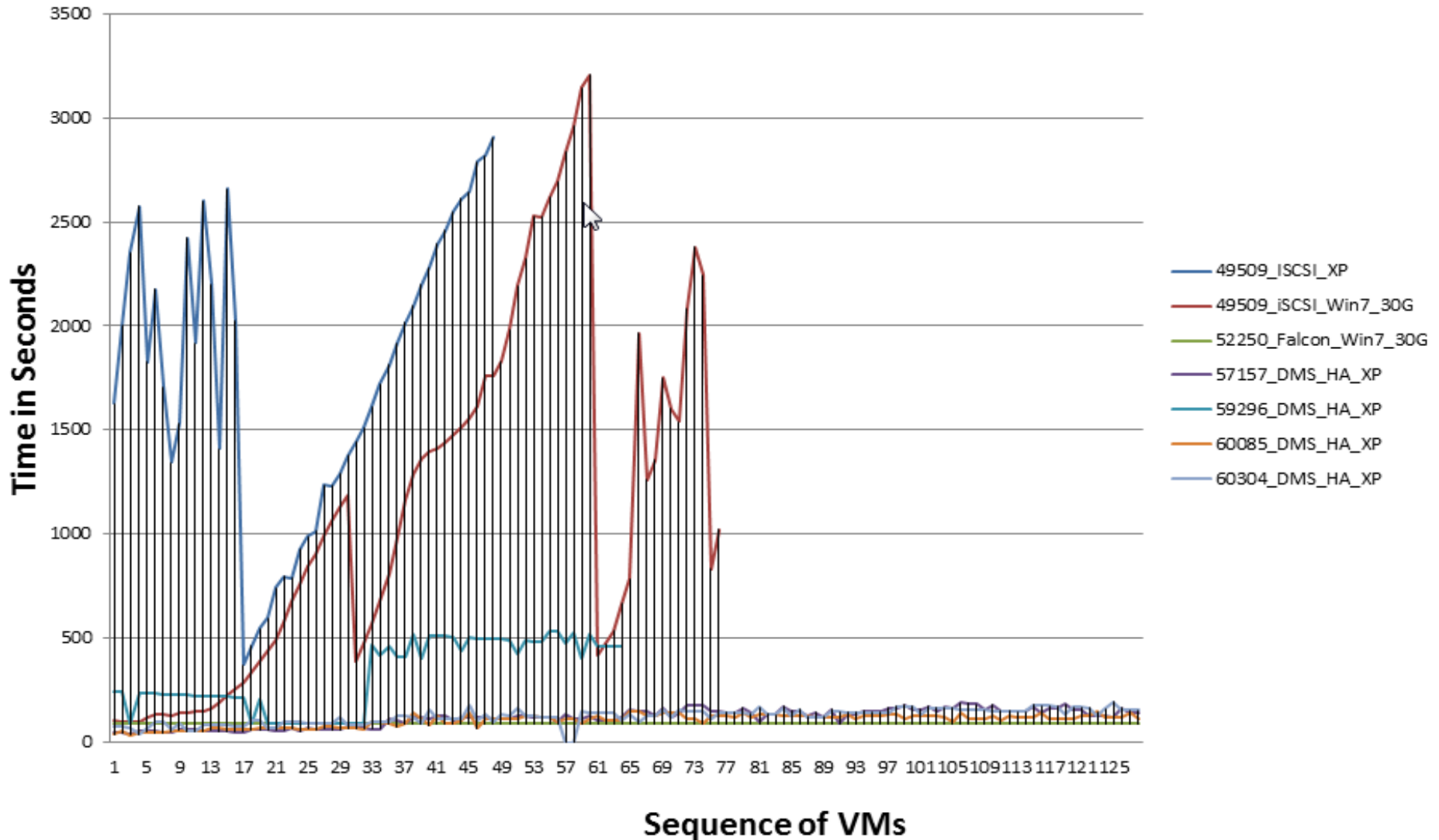
- “Eat your own dog food”
  - How does it deploy?
  - How does it perform under load?
  - What happens if it dies?
    - Chaos Monkey
- Understand the Live environment
- Own your system
  - In production, not dev
  - Fast feedback loops



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# Quantifiable result (1)

## Run VM Operation Timing

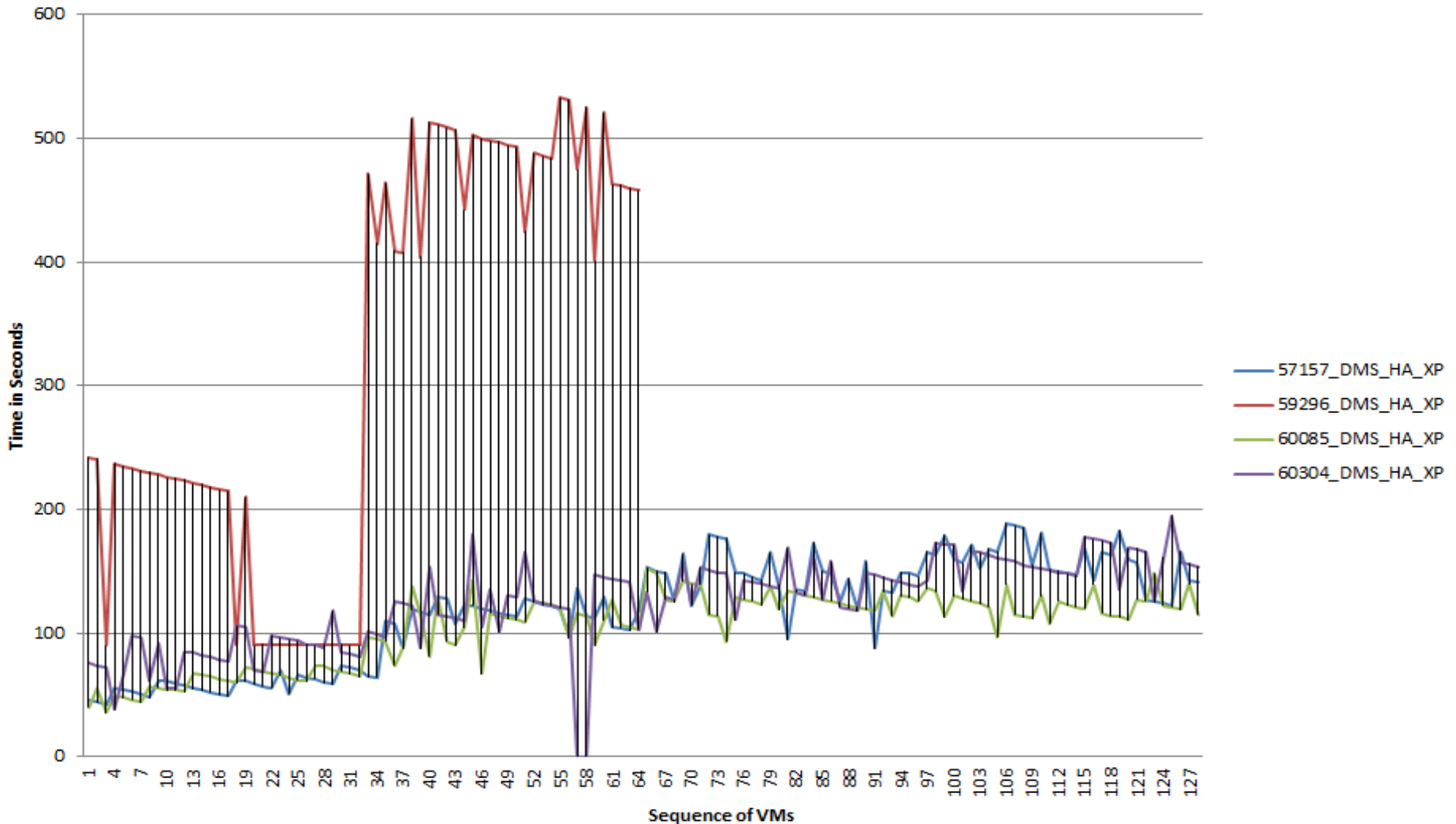




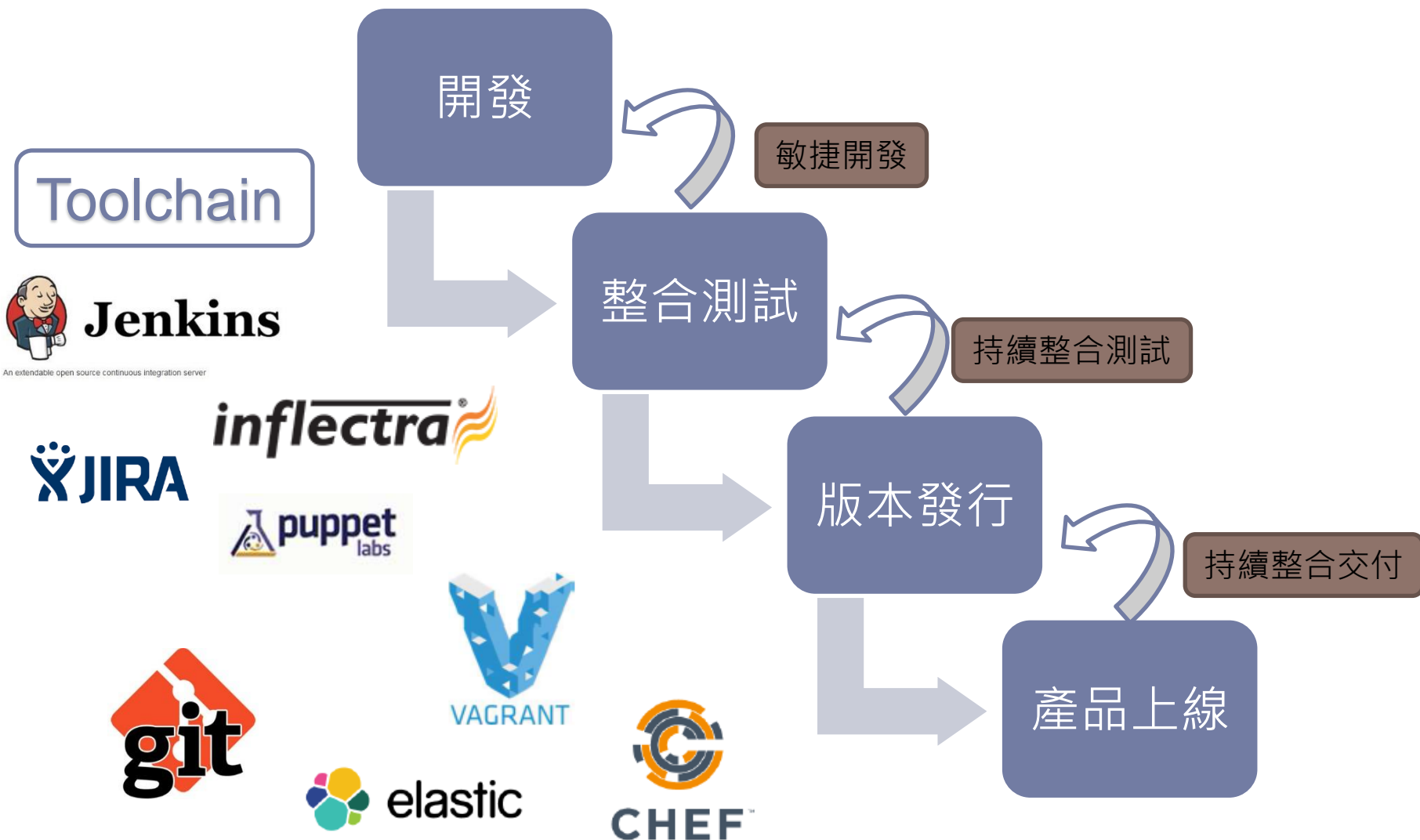
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# Quantifiable Results (2)

## Run VM Operation Timing for 128 XP\_5g VMs



# 軟體持續整合交付技術 (DevOps)













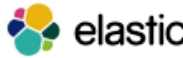










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# Infrastructure as Code (1)

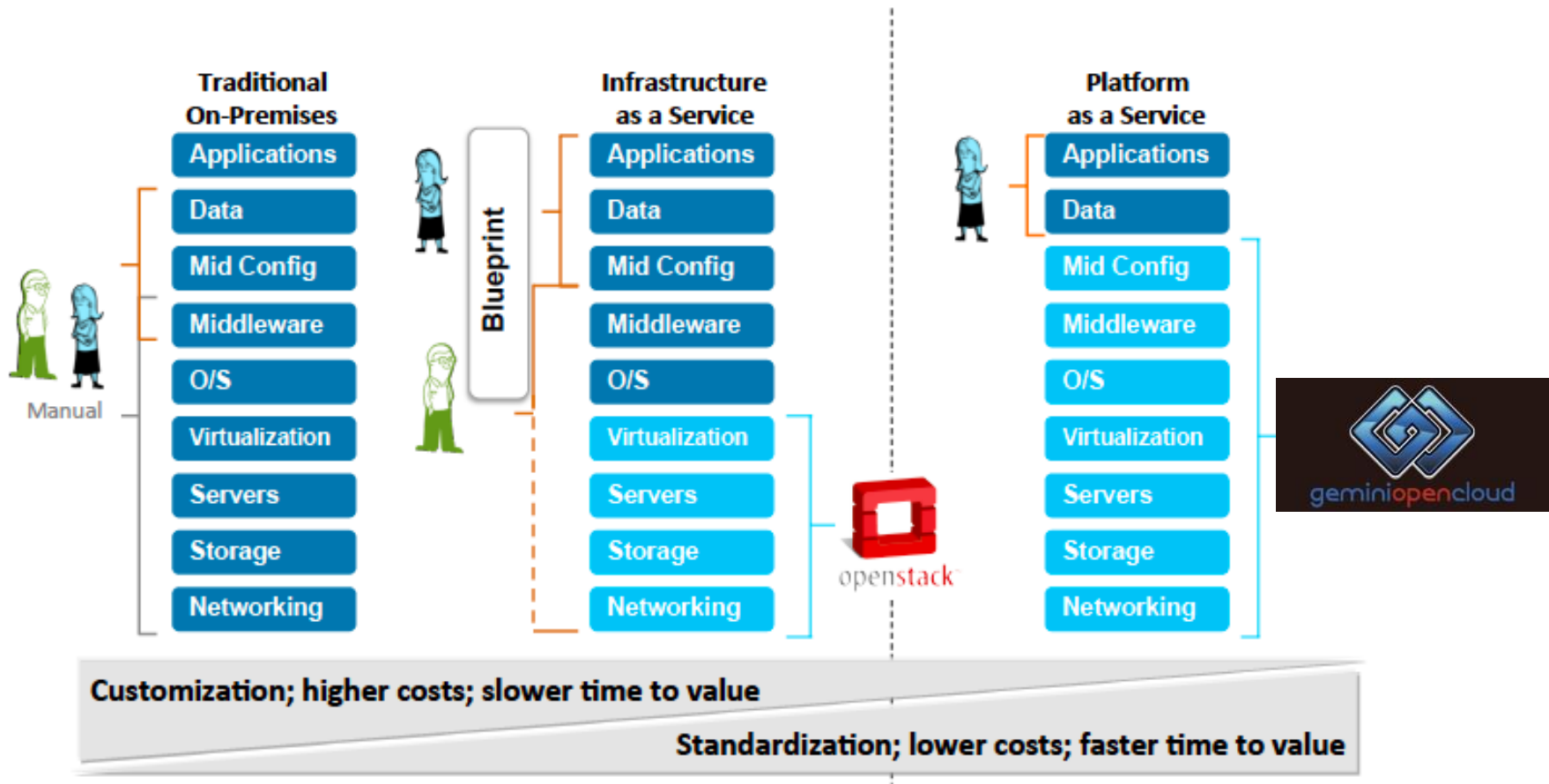
- Leverage Cloud to test Cloud
- Testing sandbox – Virtual containers (Google Kerbernets)
- Open source tools are abundant

Version Control	Configuration Management	Continuous Integration	Measurement	Log
 	  	 	    	    
<b>Provisioning</b>				
 				

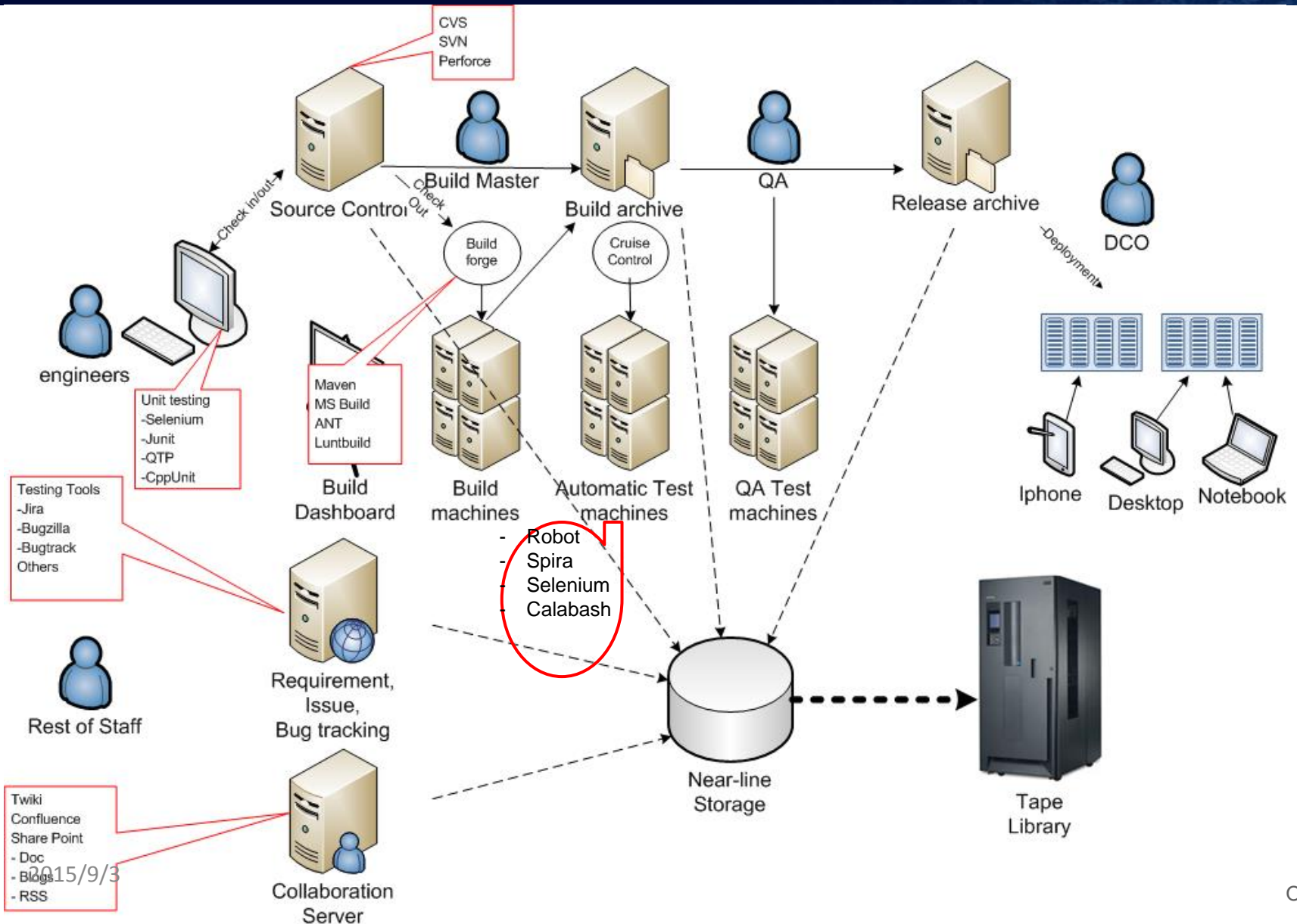
# Infrastructure as Code (2)

## DevOps and Cloud adoption

*Automating for faster delivery with DevOps and Cloud*



# Software Engineering Process Tools





- **Tools are abundant to enforce the following processes:**
  - Scrum Development
  - Code Reviews
  - Branching methodology
  - Continuous Integration testing
  - Test automation and test case management
  - Bugs/Problems management
  - SIT
  - Release methodology
  - UAT
- **But...**



## 敏捷軟體開發宣言

藉著親自並協助他人進行軟體開發，  
我們正致力於發掘更優良的軟體開發方法。  
透過這樣的努力，我們已建立以下價值觀：


個人與互動	重於	流程與工具
可用的軟體	重於	詳盡的文件
與客戶合作	重於	合約協商
回應變化	重於	遵循計劃

也就是說，雖然右側項目有其價值，  
但我們更重視左側項目。



# Summary

- **DevOps is an evolution from Agile; It comes from pressure on operations**
- **There are tons of tools in place**
- **Repeatable process improves accountability**
- **Faster feedback prevents further failures**
- **But it all depends on people taking ownership and work collaboratively to succeed**
- **Enable, Participate, Improve**

A photograph of the Space Shuttle Columbia on the Mobile Launcher Platform (MLP) being mated to the External Tank (ET) and Solid Rocket Boosters (SRBs) on the Orbiter External Tank (OET) tower at the Kennedy Space Center. The shuttle is white with black and red stripes, and the word "USA" is visible on the side. The scene is set against a dark sky with a sunset or sunrise glow on the horizon.

30年前，台積電董事長張忠謀擔任工研院院長，帶領一批團隊創辦了台積電，開啟了這將近30年的台灣電子與科技產業的榮景，為台灣創造了無比的產業競爭力。今天，雲端軟體產業在台灣仍是一片待填補的空白，雙子星也希望能如同當年台積電一般，以工研院孕育的技術成果為基礎，為台灣雲端軟體產業，貢獻一份心力。

感謝聆聽  
敬請指導