

Chaos to DevOps

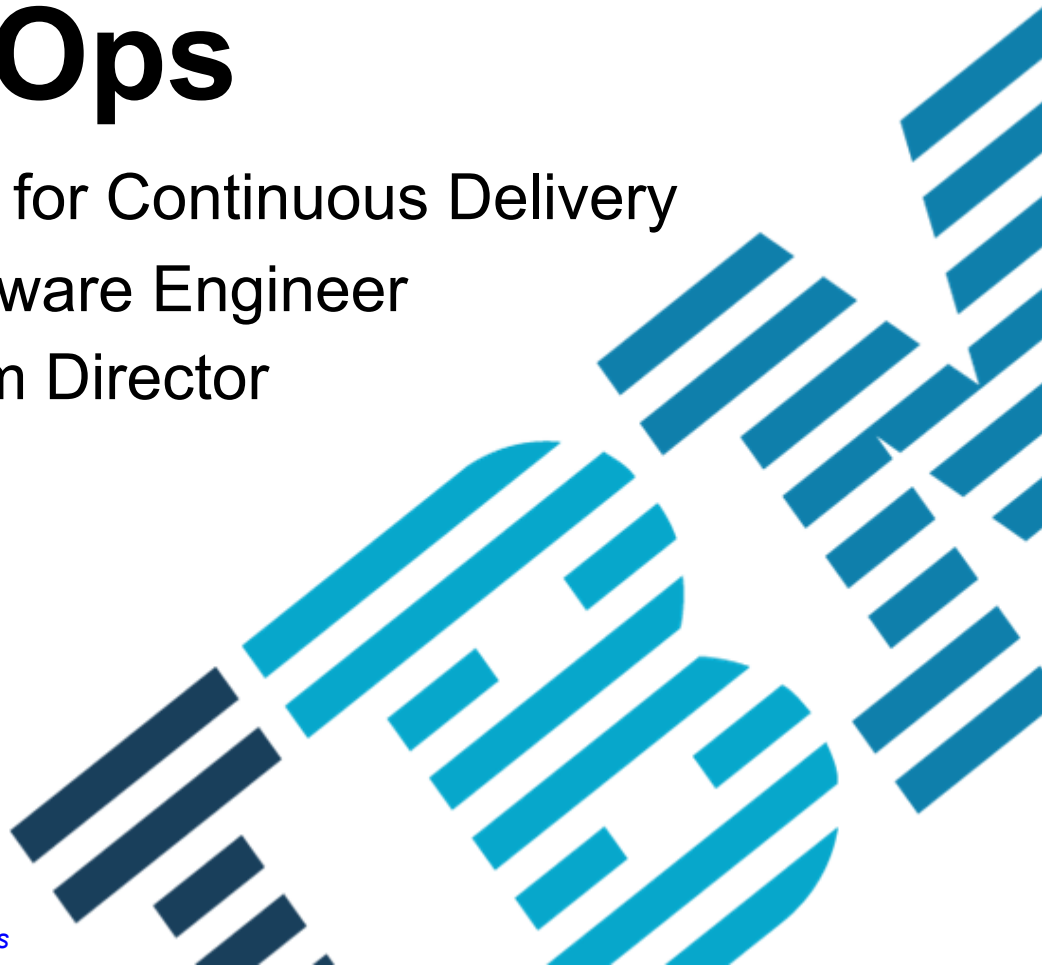
Re-architecting Maintenance for Continuous Delivery

Bianca Jiang, Senior Software Engineer

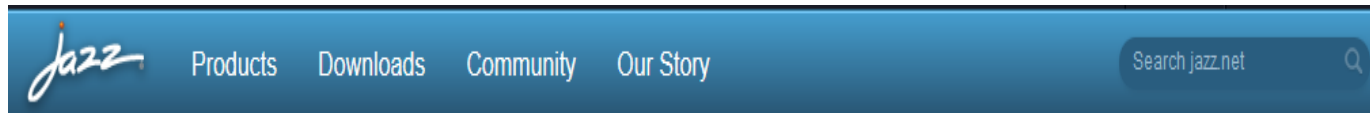
Ginny C Ghezzeo, Program Director

March 18, 2015

O'Reilly Software Architecture Conference



What we do - Collaborative Lifecycle Management



Our tools help you plan, design, develop, and deliver better software and systems.

Agile Development




- ✓ Task tracking
- ✓ Source control
- ✓ Agile planning

 Rational Team Concert



Lifecycle management for the whole team

Our products combine seamlessly to improve collaboration across the lifecycle and can integrate with a wide range of industry tools through the Jazz Platform.

-  Rational Collaborative Lifecycle Management
-  Rational Systems and Software Engineering
-  DevOps

[Check out all the Jazz products >](#)

Requirements

- ✓ Capture business needs
- ✓ Manage and reuse requirements

 Rational DOORS Next Generation


Quality Testing

- ✓ Get products ship-ready
- ✓ Plan, execute, and report on testing

 Rational Quality Manager

Design

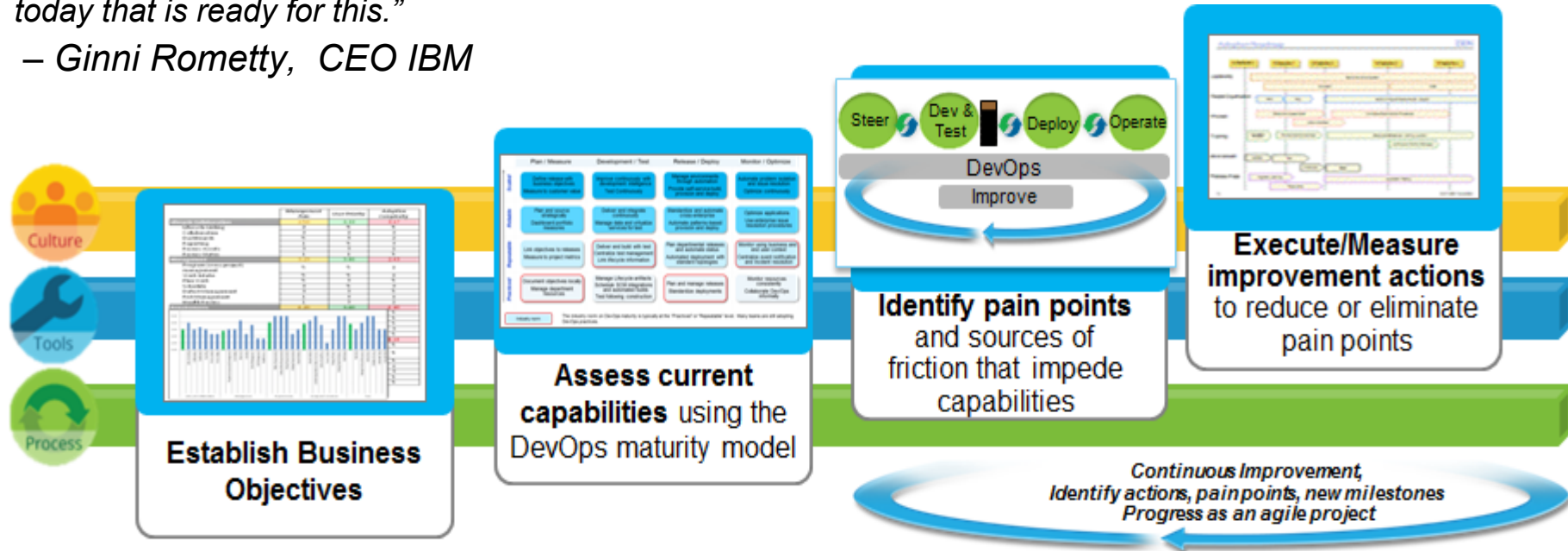
- ✓ Collaborate on architecture and design
- ✓ Manage design change

 Rational Software Architect
 Rational Rhapsody

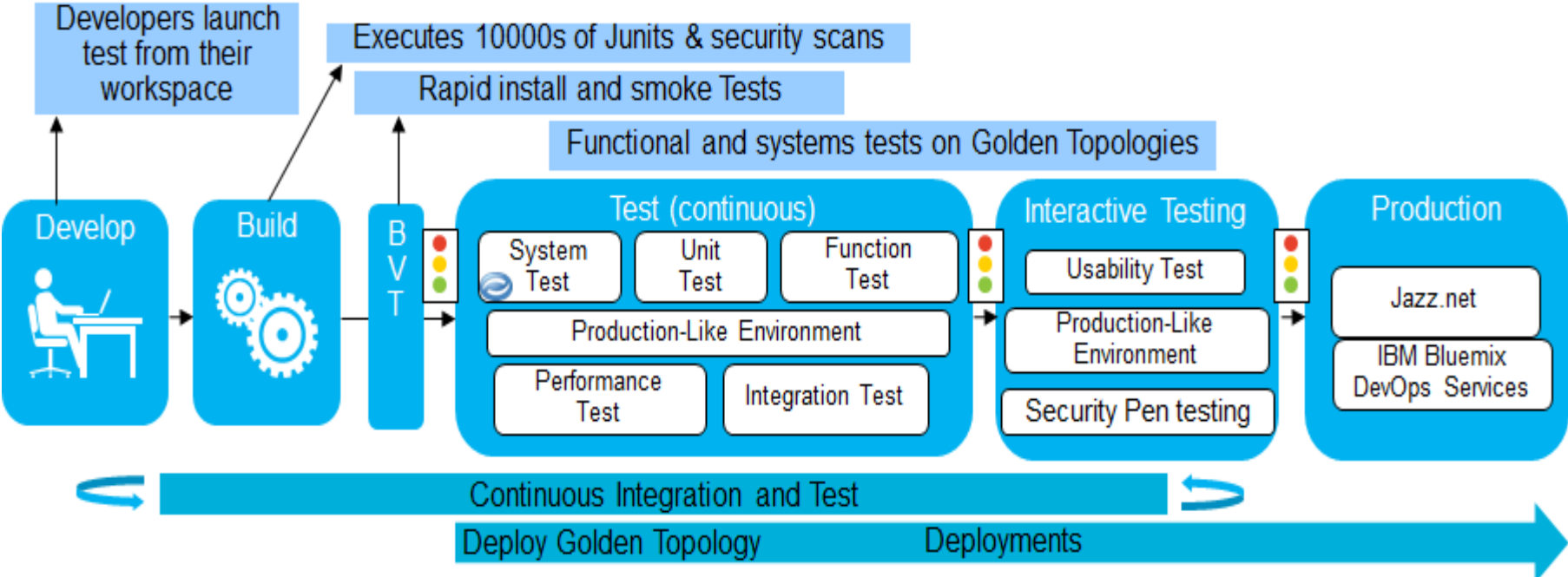
What is DevOps

“The agile, “devops” culture will move from the software development lab to the front office. That will be required of sales and marketing, customer service, HR, product development... they (customers) will expect you to behave differently. Rapid response, iterative, fast with quality. It is a rare front office today that is ready for this.”

– Ginni Rometty, CEO IBM



Strength in the Delivery Pipeline



CLM Improvements through DevOps

| Lifecycle Measurements | 2008 | 2010 | 2012 – 2014 | Total Improvement |
|-----------------------------|-----------|-----------|-----------------------|-------------------|
| Project Initiation | 30 days | 10 days | 2 days | 28 days |
| Groomed Backlog | 90 days | 45 days | On-going | 89 days |
| Overall Time To Development | 120 days | 55 days | 3 days | 117 days |
| Composite Build Time | 36 hours | 12 hours | 5 hours | 700 % |
| BVT Availability | N / A | 18 hours | < 1hour | 17 hours |
| Sprint Test Time | 5 days | 2 days | 14 hours | 4 days |
| Total Deployment Time | 2 days | 8 hours | 4 hours -> 20 minutes | 2 days |
| Overall Time To Production | 9 days | 3 days | 2 days | 7 days |
| Time Between Releases | 12 Months | 12 Months | 3 Months | 9 Months |
| Innovation / Maintenance | 58% / 42% | 64% / 36% | 78% / 22% | +20% / -20% |

Continuous Delivery exposed some challenges in our implementation of the IBM Software Support LifeCycle Policy

Maintenance Solution in a DevOps Journey

Challenge: How do we deliver high quality, timely resolution to defects that meets IBM's Support Lifecycle agreement

- 1.Limited content through governance
- 2.Detailed description of content
- 3.Consistent for all Customers and Cumulative
- 4.Clarity on Upgrade Path
- 5.In-place installation
- 7.Easy Rollback
- 8.Right-sized

Challenges exposed by CD

Jazz Team Server 4.0.7 Rational Doors Next Generation 5.0.2 Rational Team Concert 4.0 Rational Requirements Manager 3.0.1.6

Rational Quality Manager 5.0.2 Rational Team Concert 4.0.2 Rational Quality Manager 5.0.1

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100+ product releases in Support Lifecycle in 2014

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100+ product releases in Support Lifecycle in 2014

Half a million downloads from jazz.net

Rational Team Concert 4.0.5 Jazz Team Server 3.0.1.6 Rational Team Concert 5.0

Traditional Approaches: Hot Fix & Full Release

com.ibm.team.rtc.common.scripengine_3.1.600.v20140219_0230.jar
com.ibm.team.rtc.common.service_3.0.700.v20140409_0058.jar
Hot Fix A
com.ibm.team.rtc.common_3.1.900.v20140401_0200.jar
com.ibm.team.rtc.foundation.api.common_3.1.500.v20140322_0239.jar
com.ibm.team.rtc.foundation.api.ui_3.1.700.v20140114_0844.jar
com.ibm.team.rtc.foundation.jdojo.stubs_3.2.700.v20140322_0239.jar
com.ibm.team.rtc.foundation.web.ui_3.1.900.v20140411_0059.jar
Hot Fix B
com.ibm.team.rtc.foundation.web_3.1.500.v20140322_0239.jar
com.ibm.team.rtc.relm_1.0.200.v20131203_0218.jar
com.ibm.team.rtc.web_3.0.900.v20140509_1836.jar
com.ibm.team.scm.admin.common_3.2.0.v20130830_0148.jar
com.ibm.team.scm.admin.service_3.2.100.v20140311_1413.jar
com.ibm.team.scm.common_3.2.200.v20140414_0046.jar
com.ibm.team.scm.repotools_1.0.0.v20140423_0712.jar
Hot Fix B
com.ibm.team.scm.service_3.2.200.v20140426_0043.jar
com.ibm.team.scm.svn.common_3.1.300.v20130614_0105.jar
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com.ibm.team.scm.web_3.1.900.v20140424_0707.jar

Rational Team Concert
Task tracking · Source control · Agile planning

Overview Agile Downloads What's happening

Latest Versions **Rational Team Concert 3.0.1.6 interim fix 5**
Product Release Trial | March 4, 2015

Archive

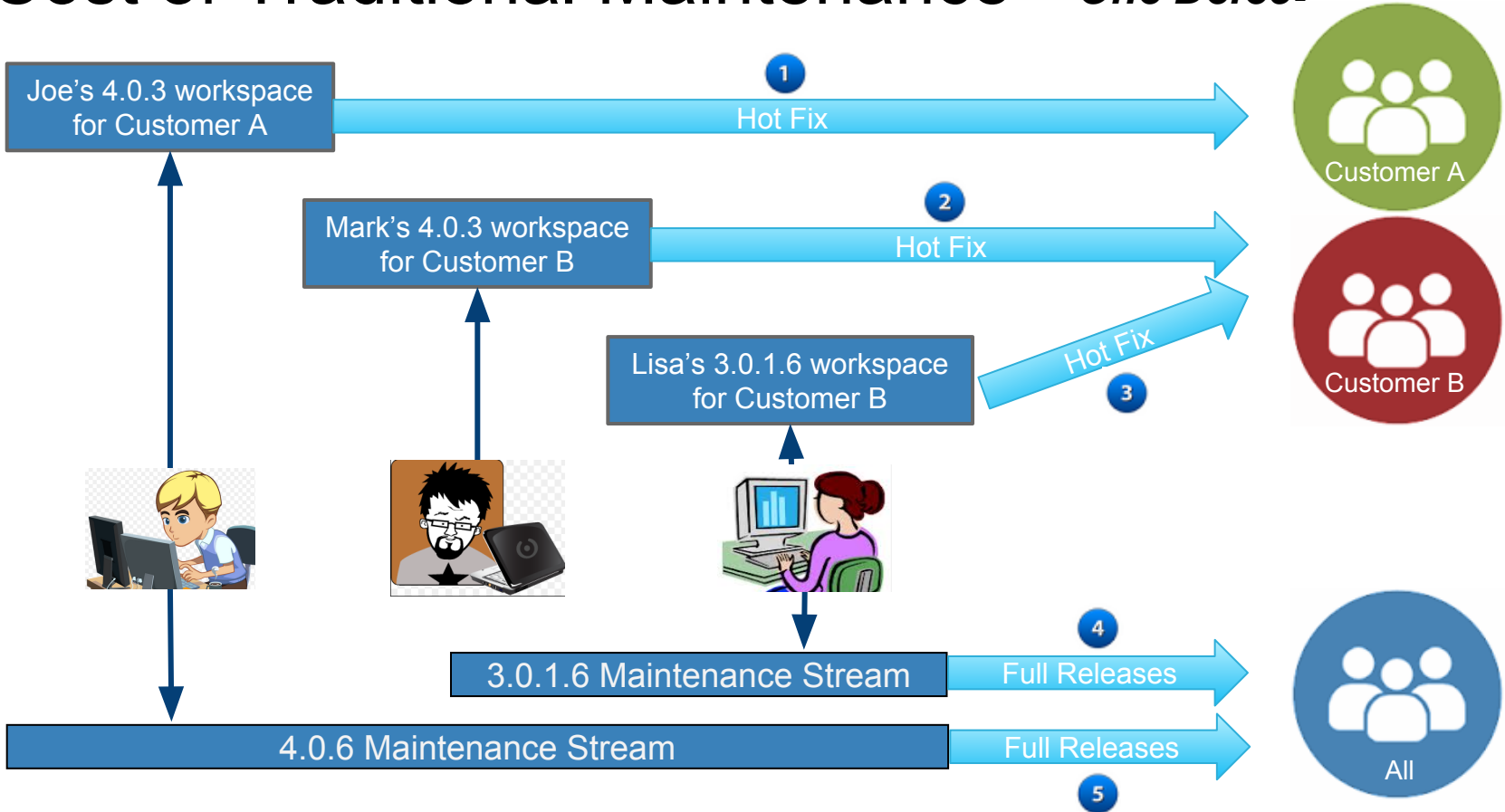
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Product Release Trial | May 10, 2013
















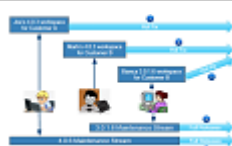



Archive

Full Upgrade

Cost of Traditional Maintenance - *One Defect*



“The Matrix of Chaos”

| | APAR 1 | APAR 2 | APAR 3 | |
|---|--|---|--|--|
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
| |  |  |  |  |

Mission

Quality³, **predictable** and **timely**⁴ maintenance that is a no-brainer to **deploy**¹ and **manage**² for customers, with **lower cost**.

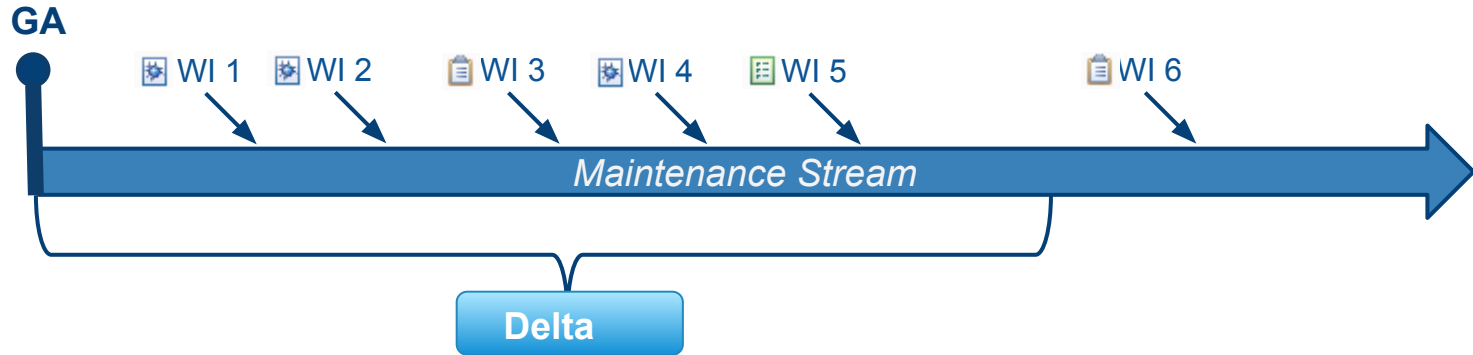
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L3 Subtitle:

Make **customers happier, faster, with less resources**

What is required of CLM Maintenance?



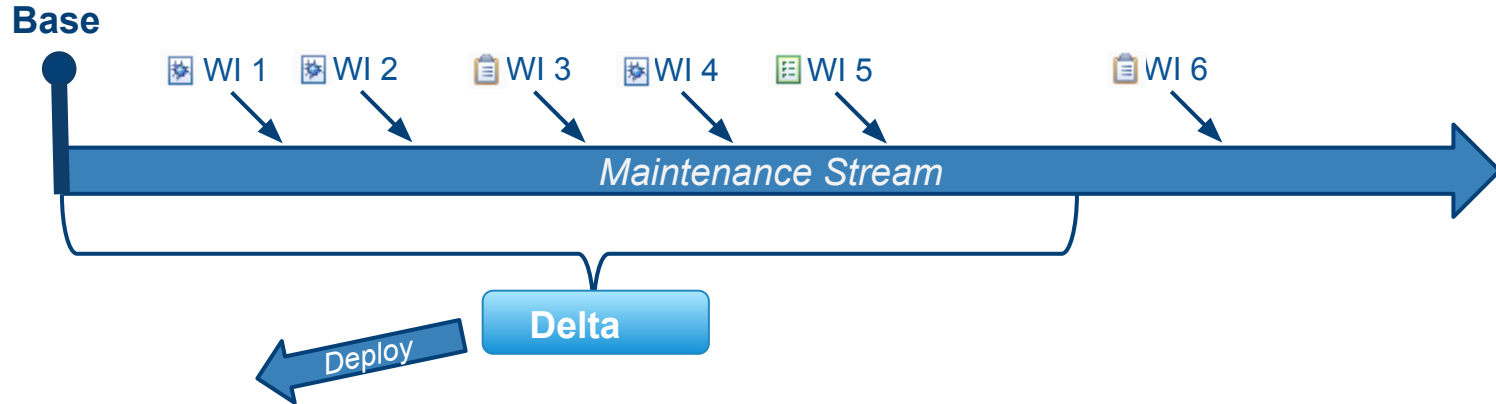
Scope:

- Corrective + Proactive Fixes
- Changes on Maintenance Stream after GA

Goal:

- Deliver the “delta”: timely, frequently, and iteratively with high quality
- Deploy the “delta”: easily, quickly, and continuously with low risk

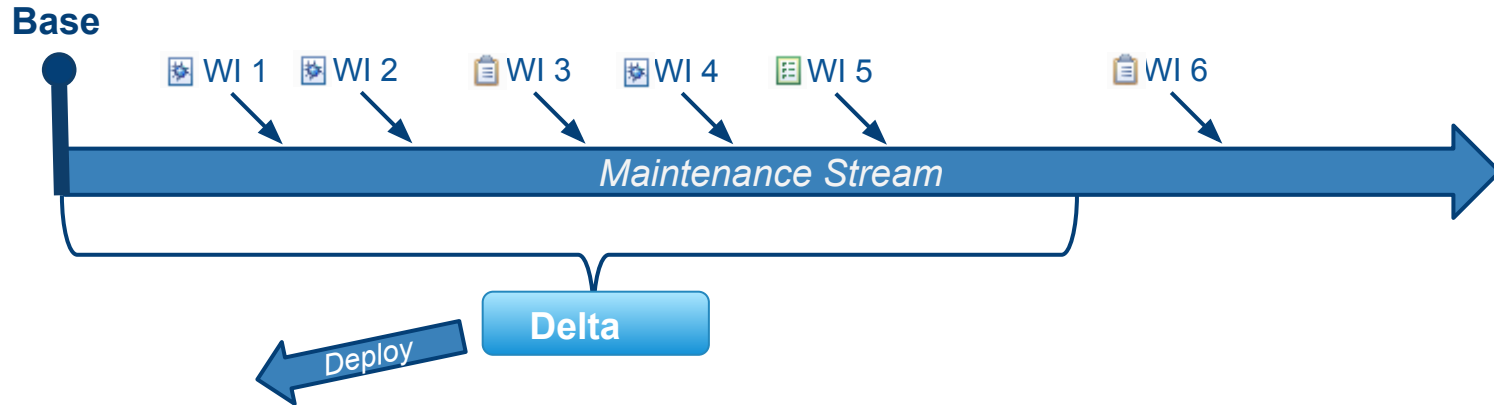
1 The Deploy & Build problem



Traditional Installer

1. directly modify existing installed bits
2. can not rollback
3. big footprint
4. **can't do *iterative update***

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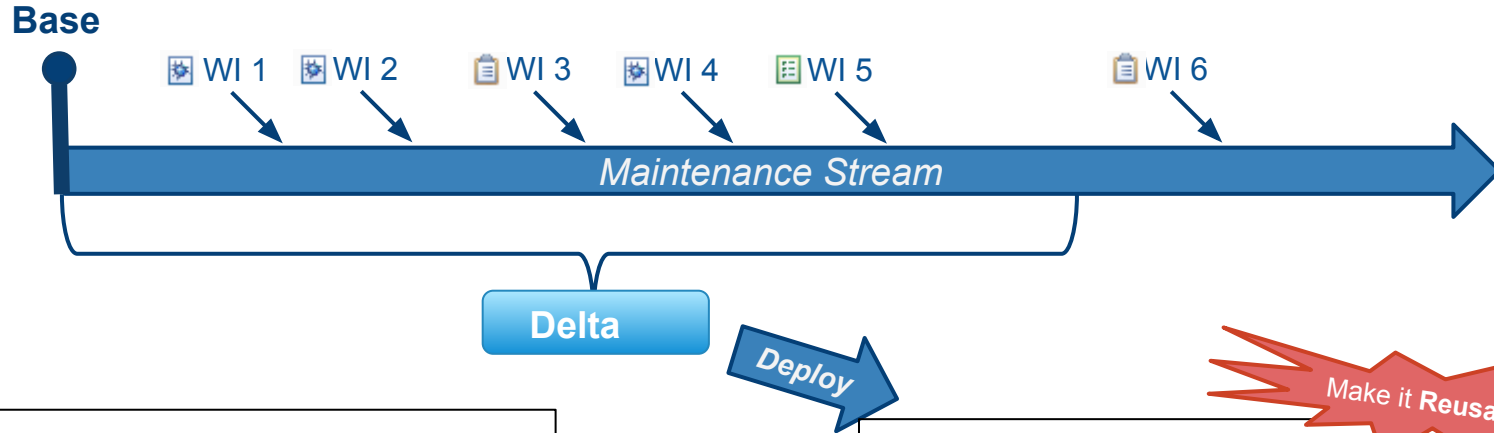
New Approach

Patch Service

Drop in *one file* to patch the entire server.

1. does not modify existing bits, run-time
2. fast, easy install, easy rollback
3. very lean
4. ***iterative update* possible**

1 The Deploy & Build problem



Make it Reusable!

Traditional Installer

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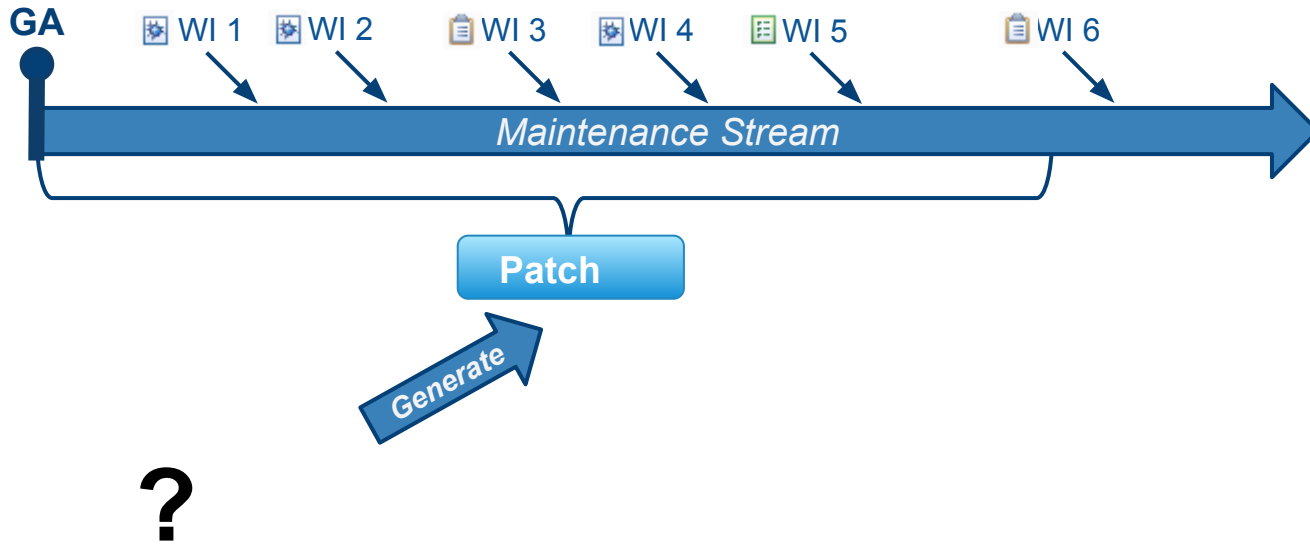
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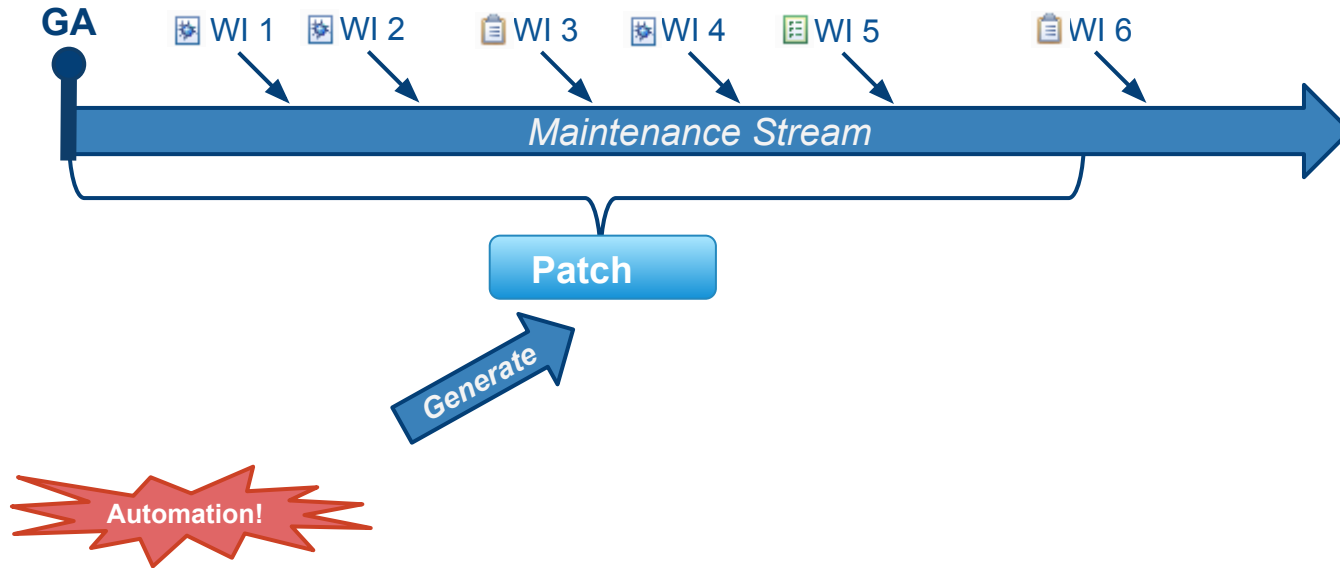
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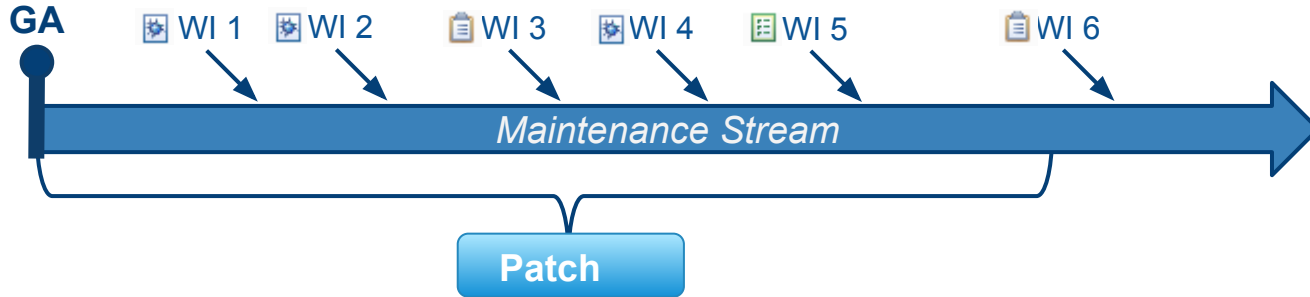
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Build calm.501.maintenance CALM501M-I20141028-2031

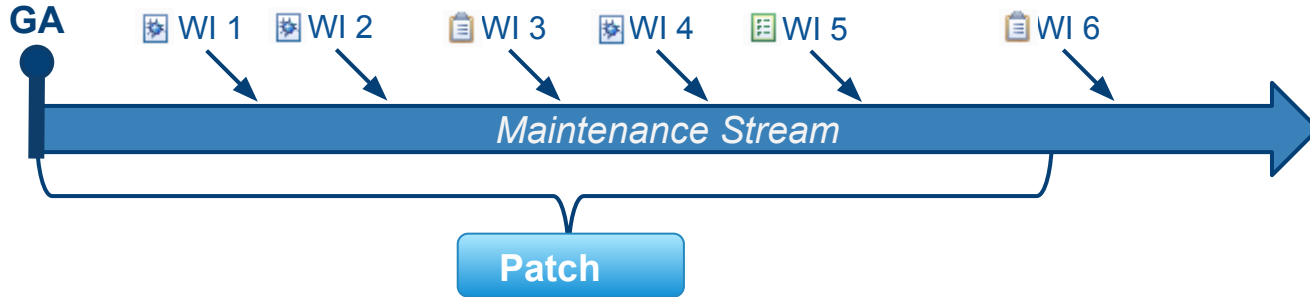
Artifact Downloads

Automation!

| File | Description |
|--|---------------------|
| Zip | |
| Patch Service | |
| relog.patch.prepopulate.file | Patch Prepopulate F |
| readme.txt | Patch Readme File |
| publish.txt | Publish output file |
| missingFile.txt | Missing File List |
| CLM_server_patch_5.0.1.0-CALM501M-I20141028-2031.zip | CALM Patch Zip Lin |
| CLM_client_patch_5.0.1.0-CALM501M-I20141028-2031.zip | Client Jar Zip File |
| changeFile.log | Change File Log |
| Installation Manager | |

Generate

1 The Deploy & Build problem



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Artifact Downloads

Automation!

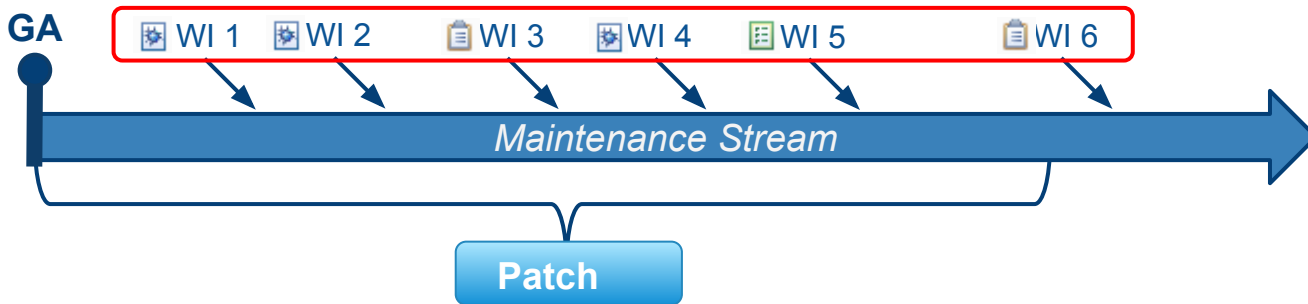
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Overview Activities Downloads Logs External Links Properties

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2 Easy to manage: Traceability



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2 Easy to manage: Traceability



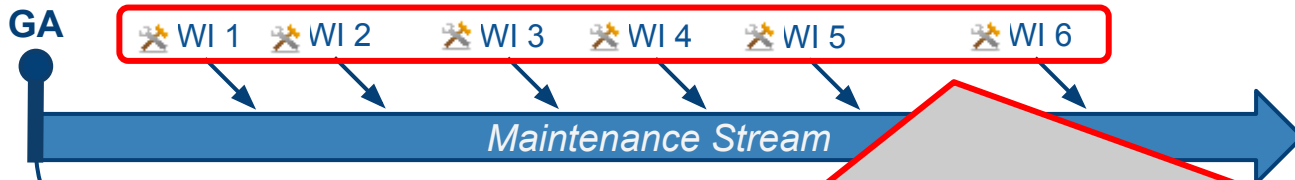
The screenshot shows the details of a Maintenance Item with ID 349289. The summary is 'WebUI - infinite calls to PlanRe'. The details section includes the following fields:

- Type: Maintenance Item
- Backport From: 339559: WebUI - infinite calls to PlanRestService# (with Add, Open, and Remove buttons)
- Fixed In Release: 6.0 Sprint 10
- APAR ID: PIB0729
- Patch Service Compliant: Yes - can be applied by patch serv
- Non-patch Install Instruction: (empty)

A red starburst graphic with the word 'Automation' is overlaid on the left side of the screenshot. A red-bordered box highlights the 'Fixed In Release' and 'APAR ID' fields.

- Build calm.501...
- Artifact Downloads
- File
- Automation
- Zip
- Patch Service
 - relog.patch.p
 - readme.txt
 - publish.txt
 - missingFile.txt
 - CLM_server_pa
 - CLM_client_pa
 - changeFile.log
- Installation Manager

2 Easy to manage: Documentation



The screenshot shows a software interface for managing maintenance items. On the left, a sidebar lists artifacts like 'Build calm.5', 'Artifact Downloads', and 'Patch Service'. The main area displays details for 'Maintenance Item 349289'. The summary is 'WebUI - infinite calls to PlanRe'. The type is 'Maintenance Item'. The backport from is '339559: WebUI - infinite calls to PlanRestService#'. The 'Fixed In Release' is '6.0 Sprint 10' and the 'APAR ID' is 'PIB0729'. A red starburst labeled 'Automate' points to the 'Patch Service' section. A blue arrow labeled 'Traceability' points from the 'Fixed In Release' field to a 'readme.txt' file. The 'readme.txt' file contains the following text:

```
Interim fix CLM_502_iFix000.rtf
This interim fix is only valid for the CLM 5.0.2.0 release.
After this interim fix, upgrade to CLM 6.0 or later.

CONTENTS OF THE INTERIM FIX

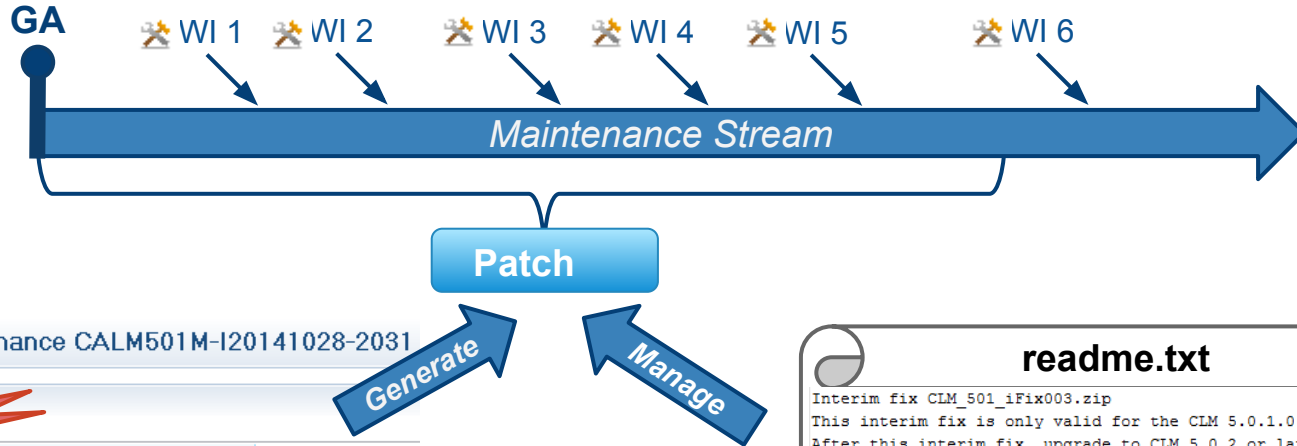
1. Server patch file: CLM_server_patch_5.0.2.0-CALM502M-I201
2. Rational Team Concert Eclipse client update site: Update:
3. readme.txt (this file)

1. SERVER PATCH
To install the server patch:
a. Stop the CLM server.
b. Copy the server patch file CLM_server_patch_5.0.2.0-CALM502M-I201 to the /server/patch directory.
d. Start the server.

This server patch contains fixes for the following defects:

+-- Product RJF
Fixed in release 6.0:
[APAR PI28526] [NPE in ManagedFloatingLicenseClient$LeaseCa
https://jazz.net/jazz/resource/itemName/com.ibm.team.workite
[APAR PI28909] [Diagnostics Oracle JDBC Driver version chec
https://jazz.net/jazz/resource/itemName/com.ibm.team.workite
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1 2 Deploy, Build and Documentation



Build calm.501.maintenance CALM501M-I20141028-2031

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Overview Activities Downloads Logs External Links Properties

readme.txt

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After this interim fix, upgrade to CLM 5.0.2 or later.

CONTENTS OF THE INTERIM FIX

... ..

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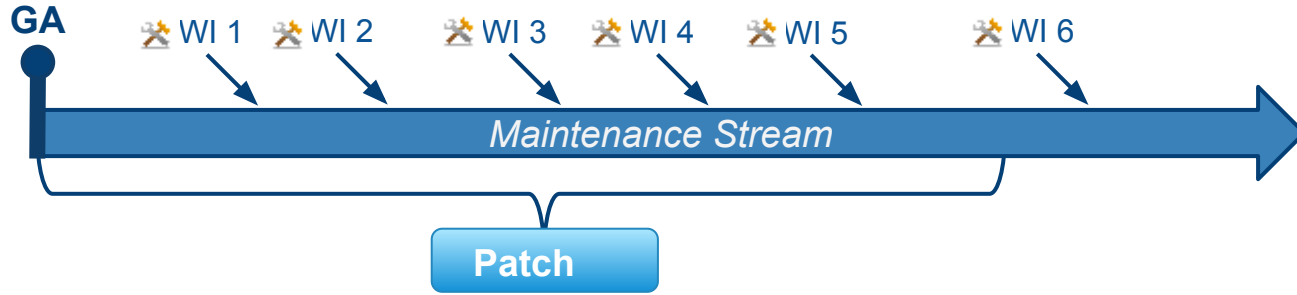
Fixed in release 5.0.2:

[APAR PI25436] [Add back flag for HTTP support] [
<https://jazz.net/jazz/resource/itemName/com.ibm.team.workit>

[APAR PI25436] [Fix regression in report performance] [
<https://jazz.net/jazz/resource/itemName/com.ibm.team.workit>

[APAR PI25462] [Fix report caching causing errors in the lo
<https://jazz.net/jazz/resource/itemName/com.ibm.team.workit>

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Build calm.501.maintenance CALM501M-I20141028-2031

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Automation!



readme.txt

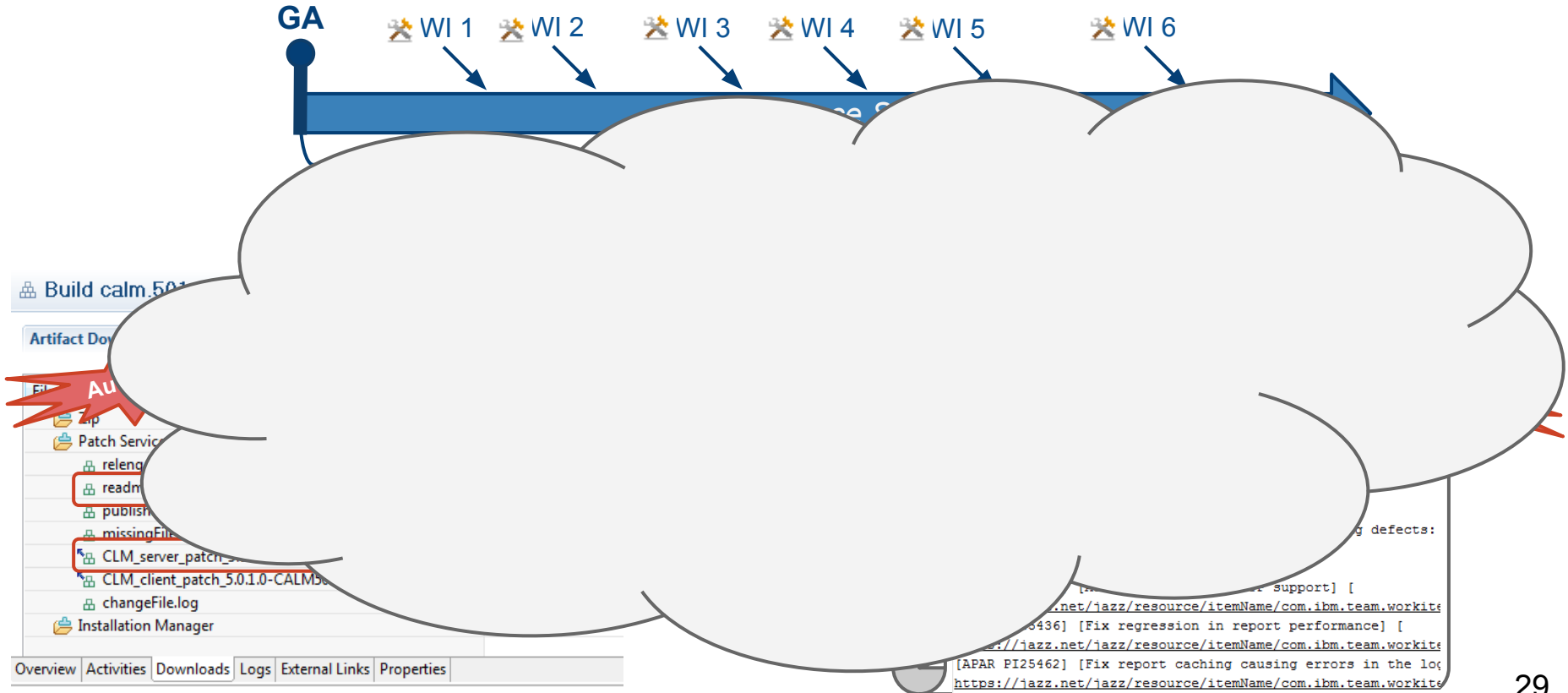
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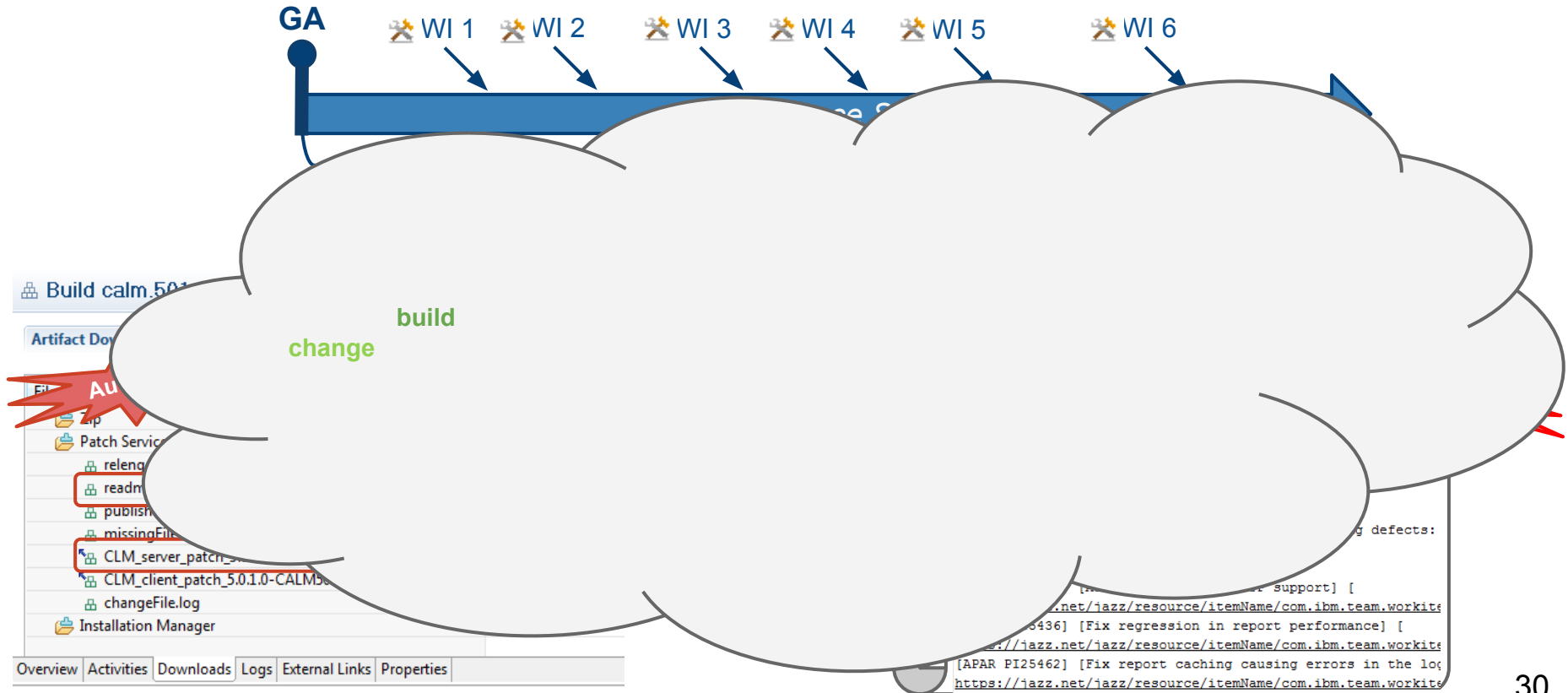
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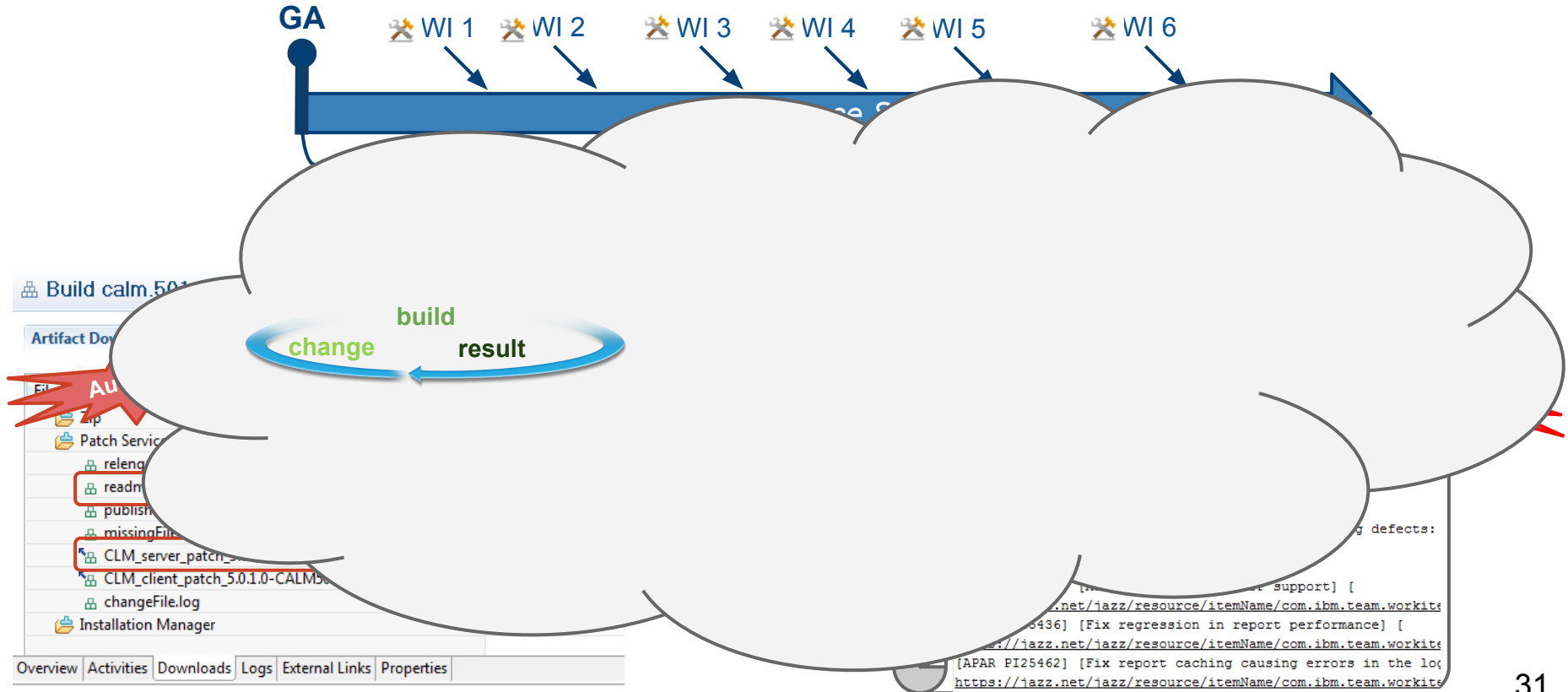
1 2 Deploy, Build and Documentation



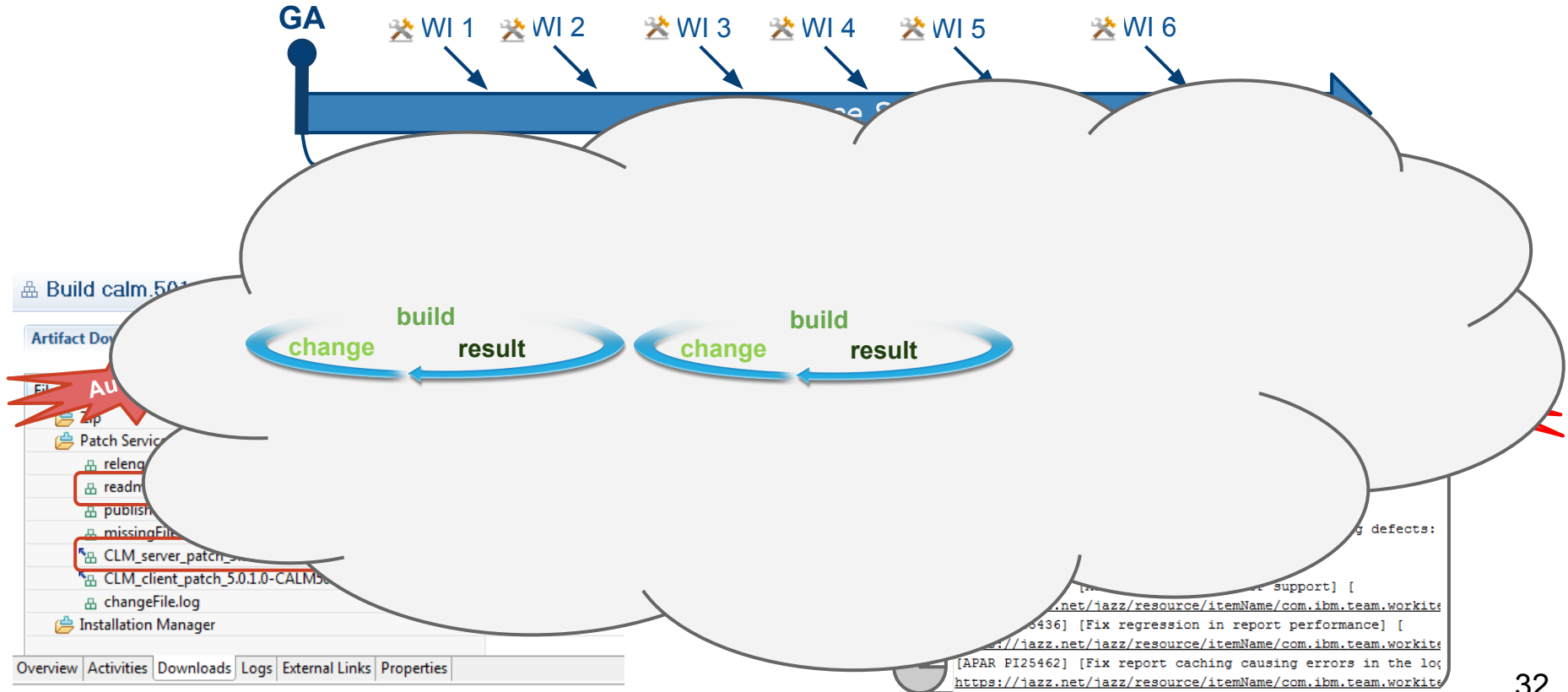
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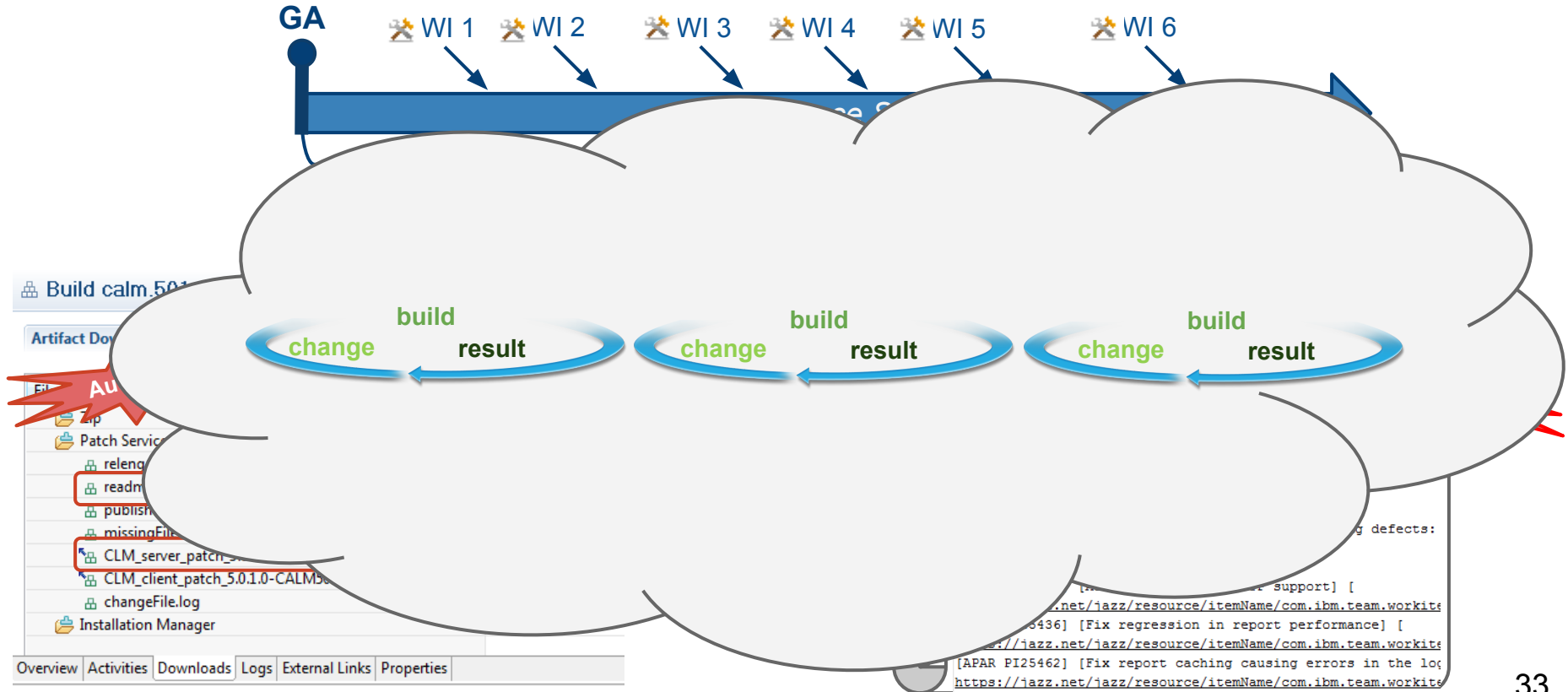
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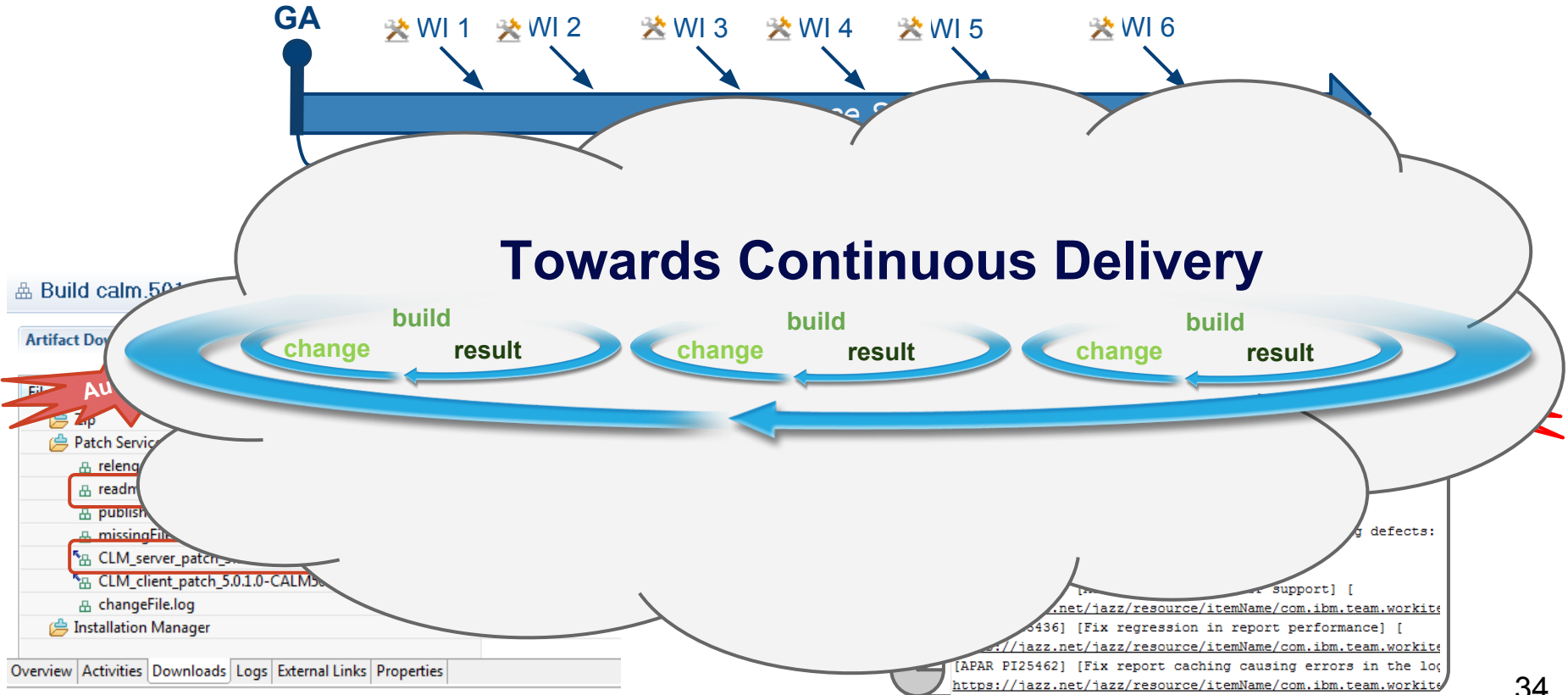
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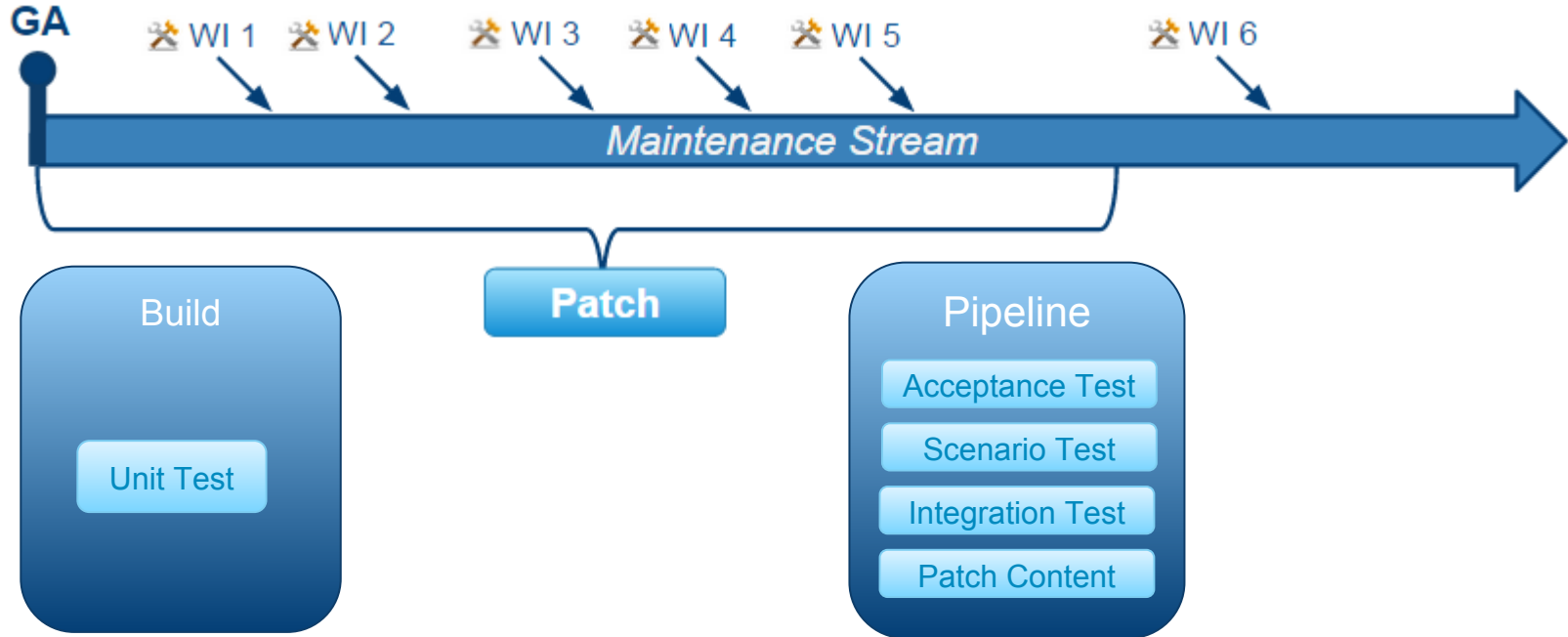


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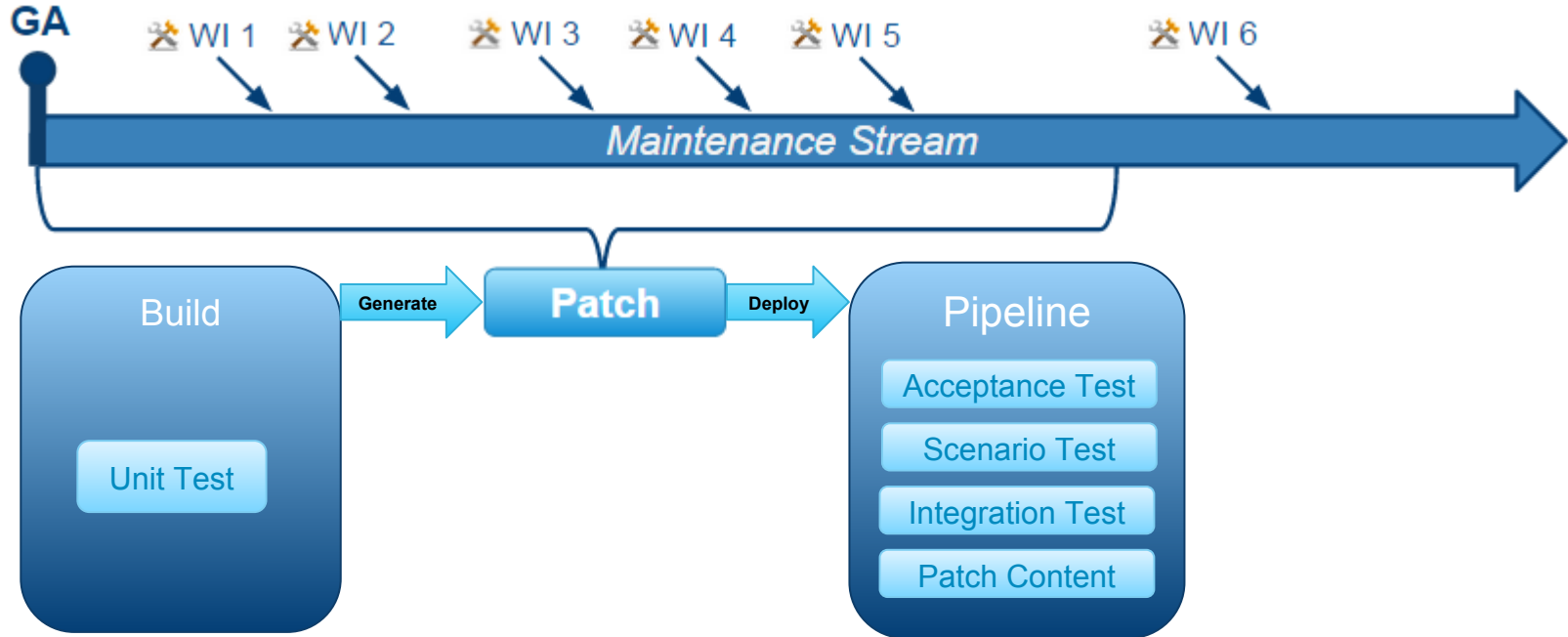
3

Quality: Continuous Testing



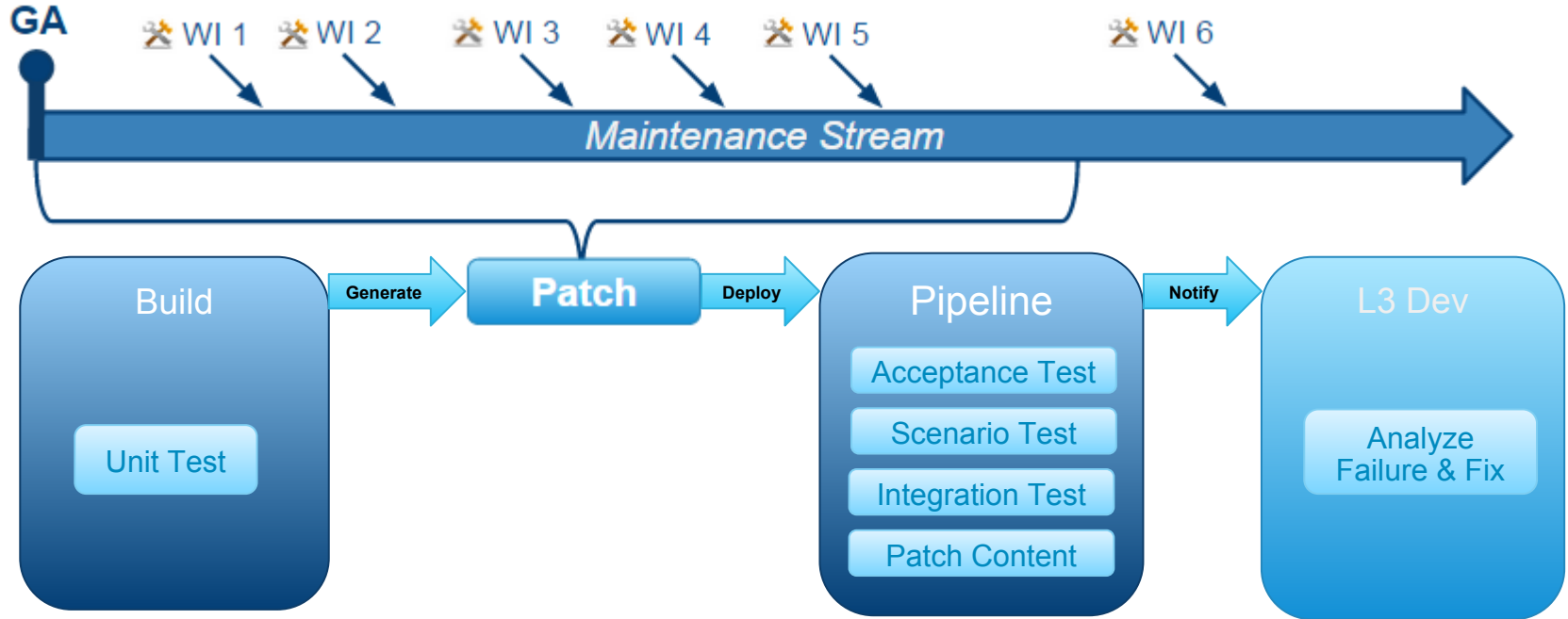
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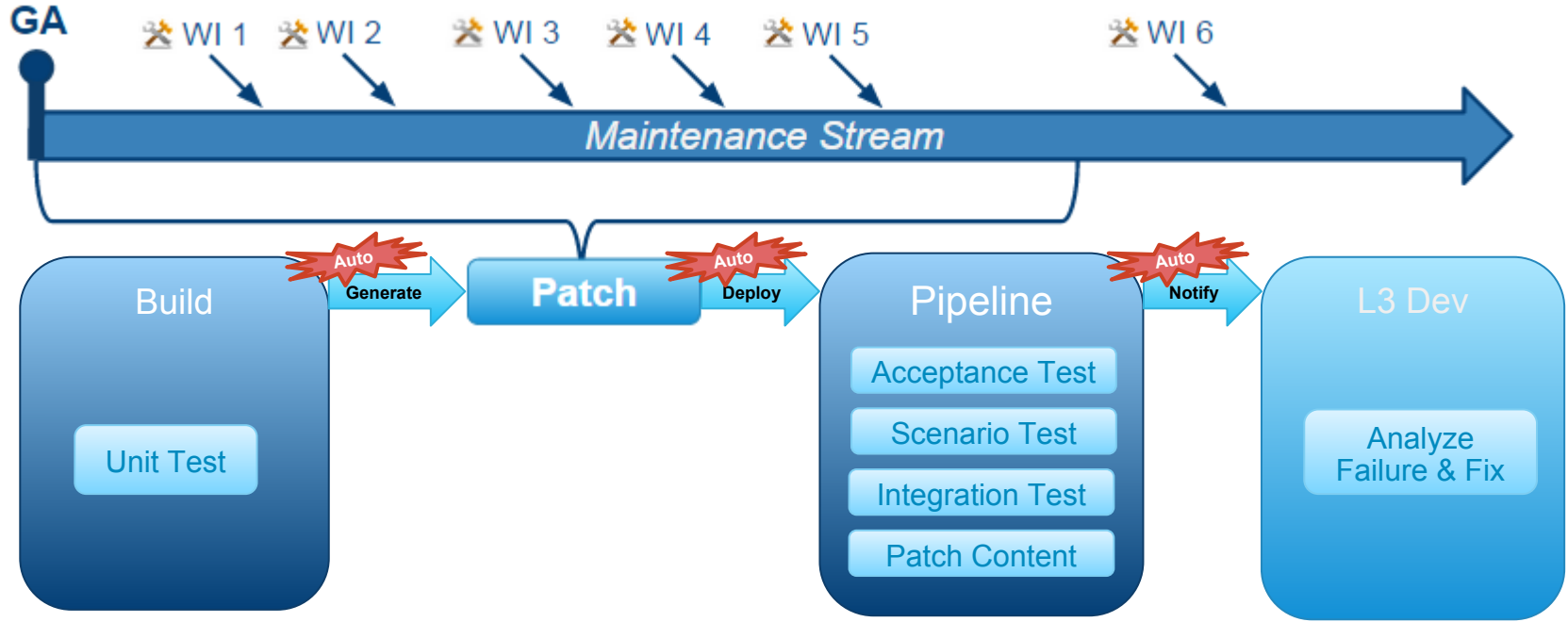


3

Quality: Continuous Testing

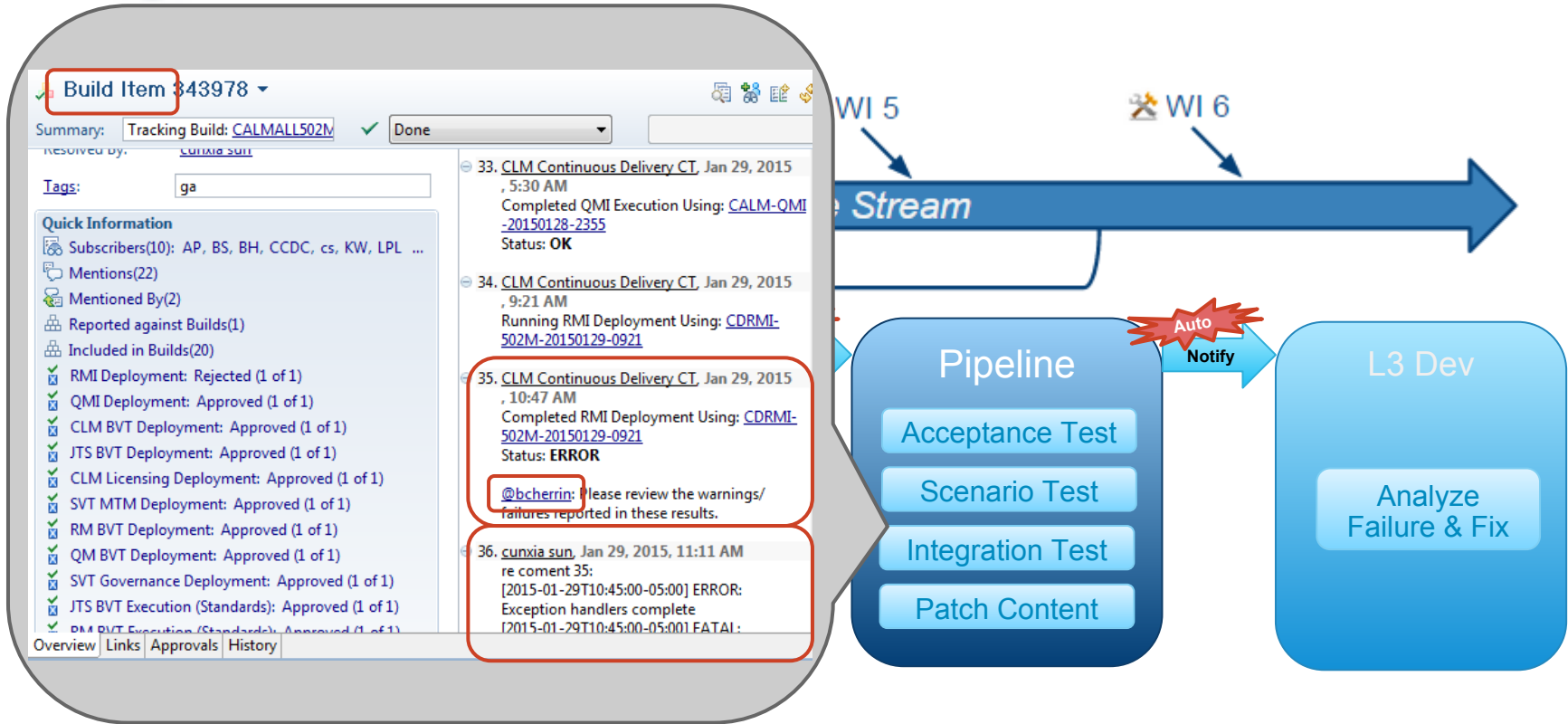


3 Quality: Continuous Testing

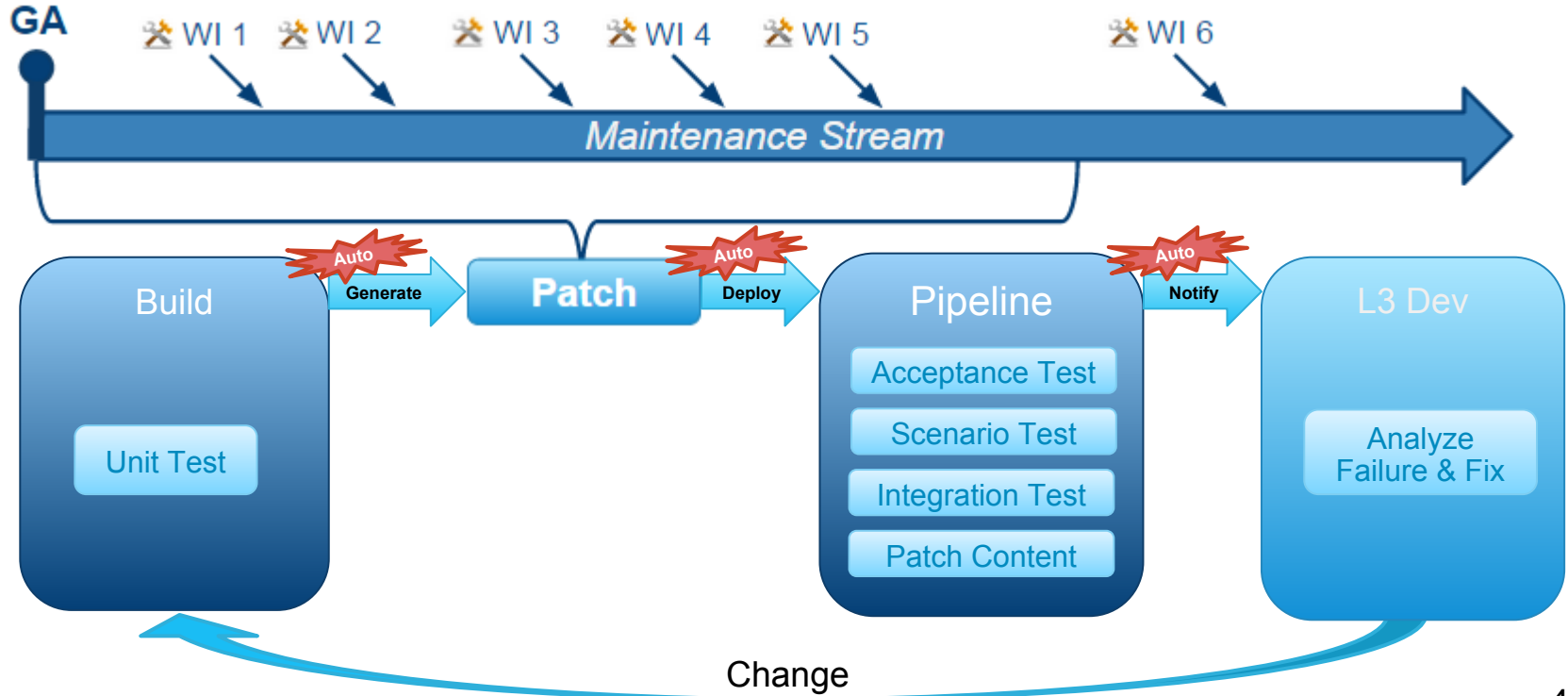


3

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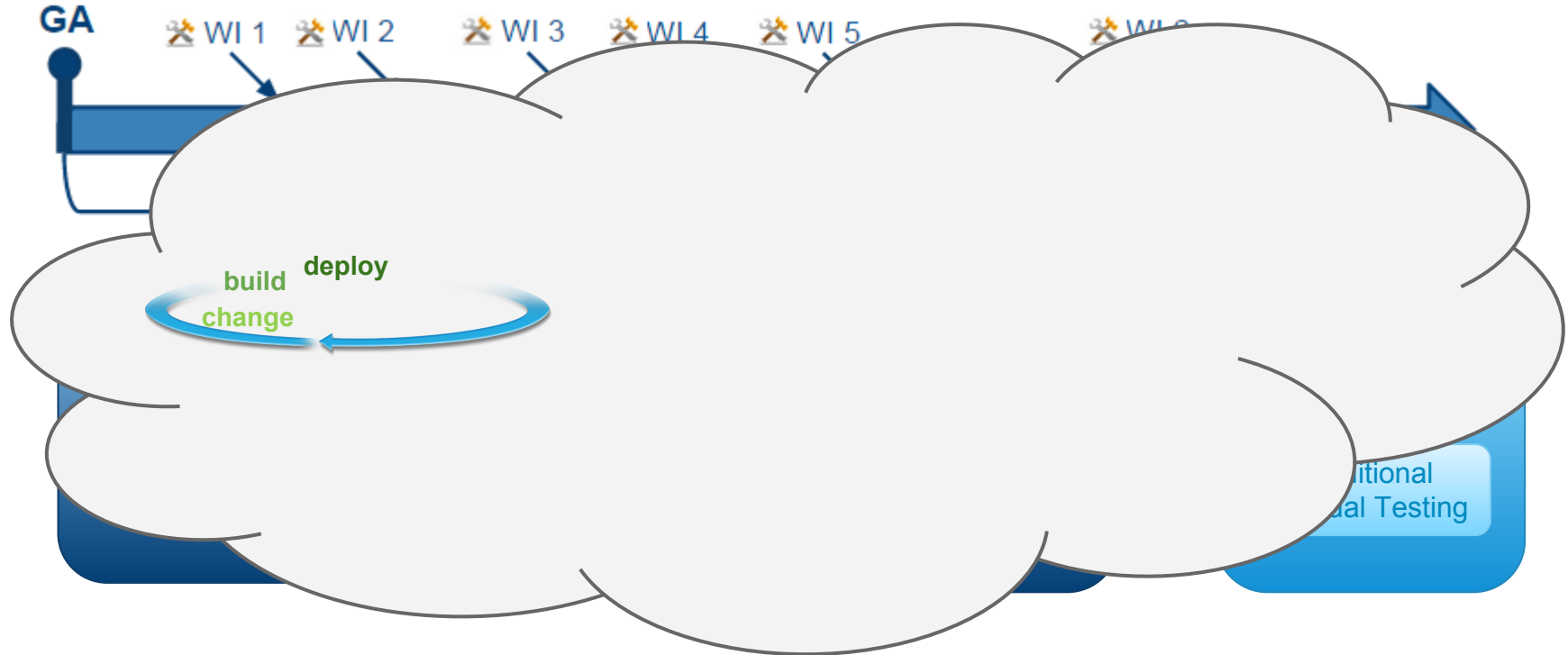
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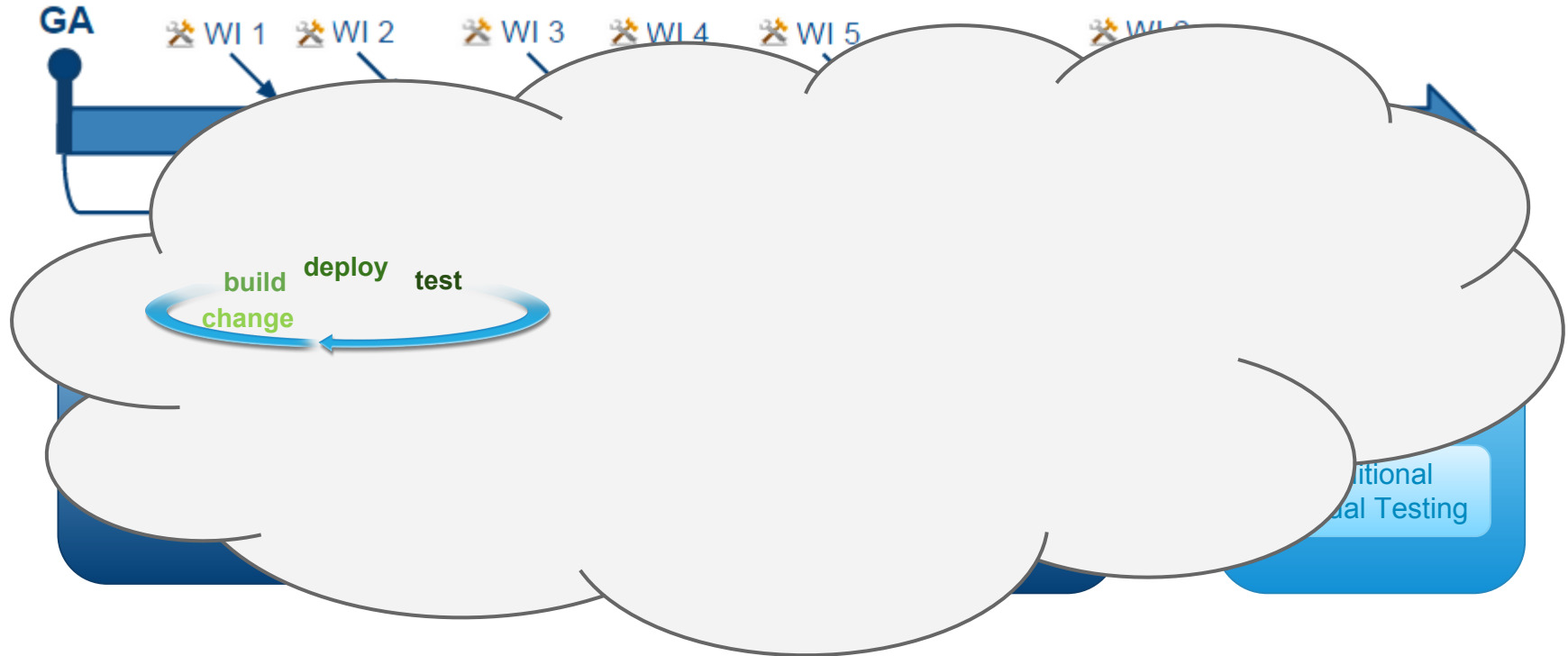
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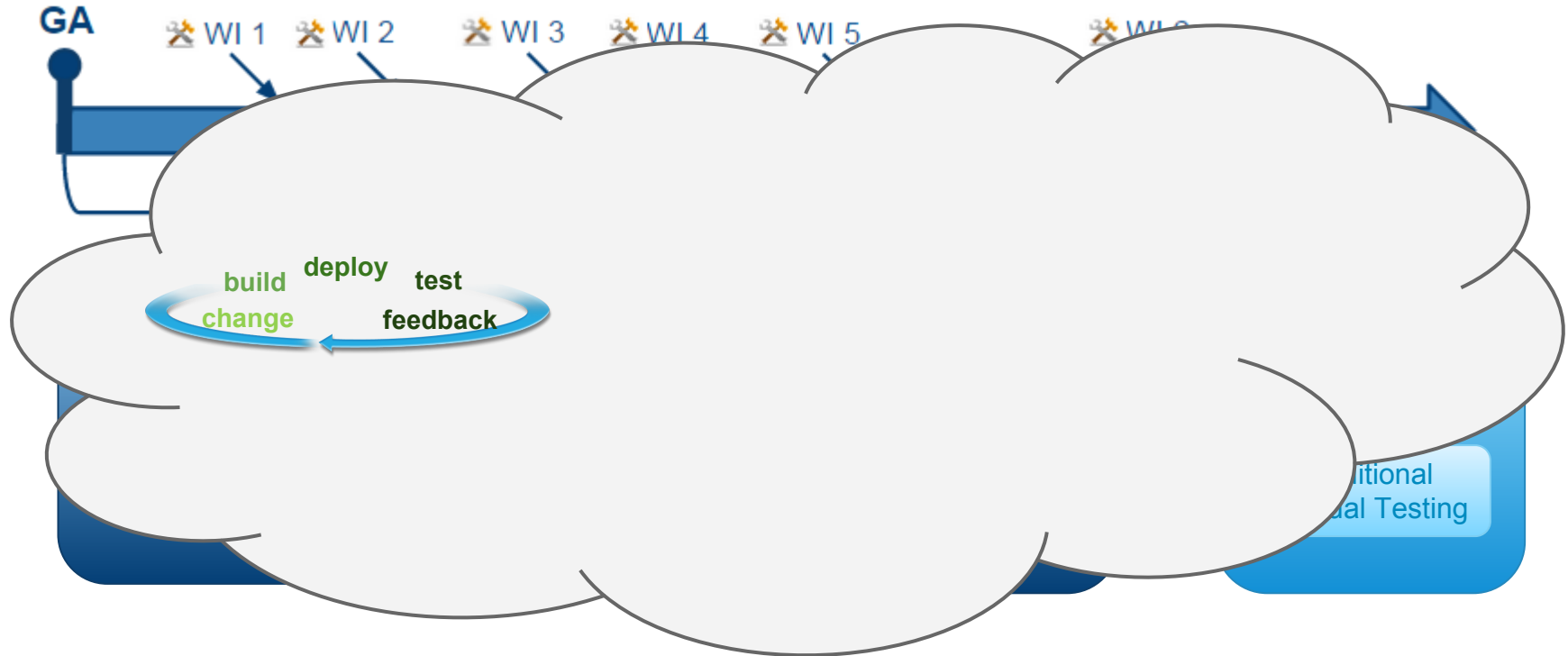
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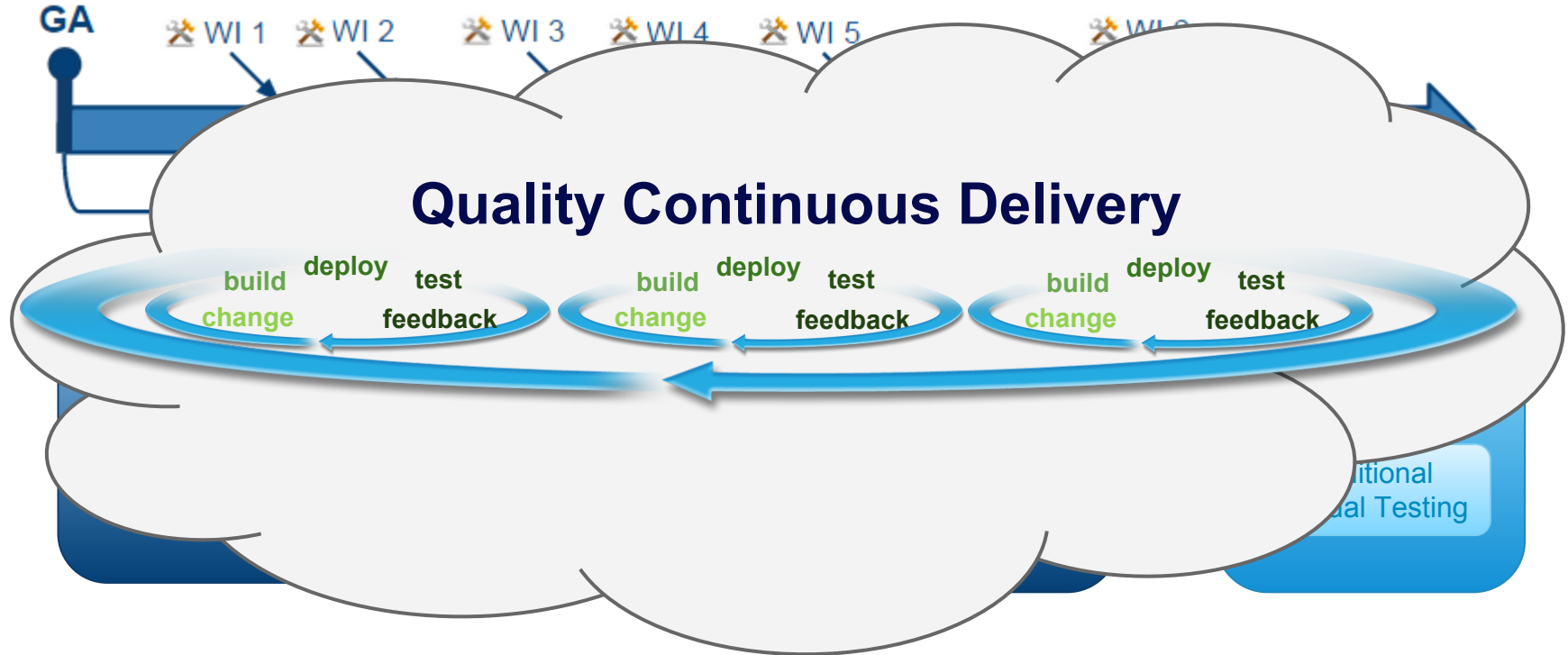
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Quality: Continuous Testing



3

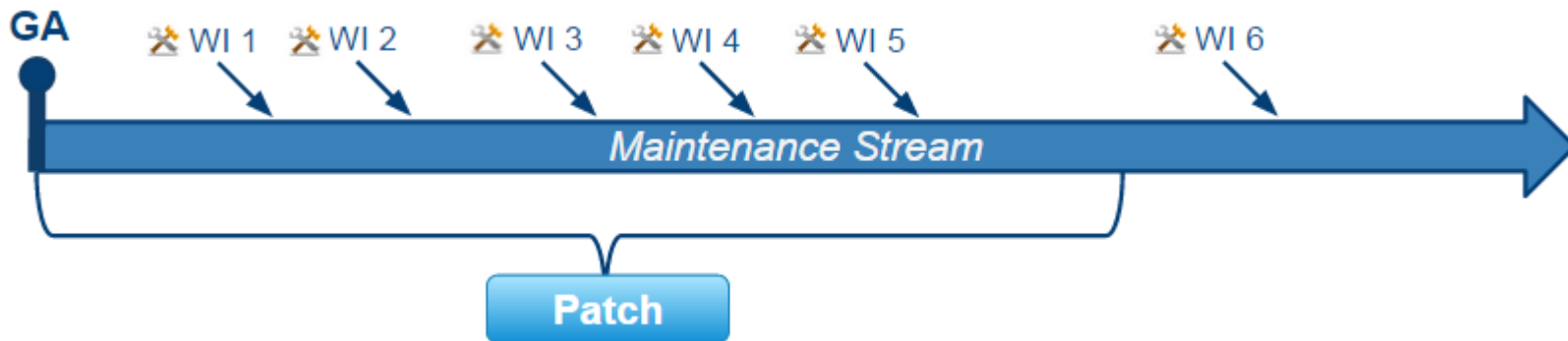
Quality: Continuous Testing



Mission

Quality³, **predictable** and **timely**⁴ maintenance that is a no-brainer to **deploy**¹ and **manage**² for customers, with **lower cost**.

4 Process: Development & Delivery



→ Maintenance: Foundation 5.0 [5/26/14 - unknown]

Foundation 5.0 iFix001 [5/26/14 - 6/27/14]

Foundation 5.0 iFix001 Dev&Validation [5/26/14 - 6/13/14]

Foundation 5.0 iFix001 Regression Test [6/16/14 - 6/20/14]

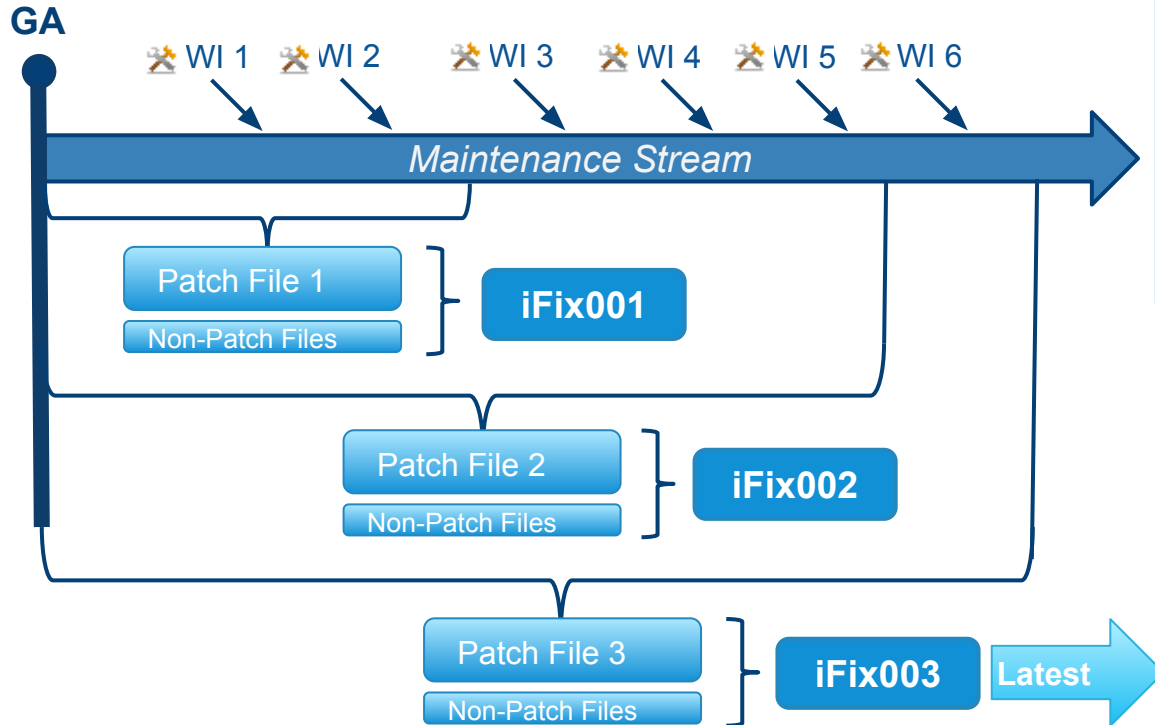
Foundation 5.0 iFix001 Final, Publish [6/23/14 - 6/27/14]

• 1 Code Review, 1 Team Lead Approval

• 1 Code Review, 2 Team Lead Approvals

• 1 Code Review, 2 Team Lead Approvals, 1 PMC Approval

Maintenance via iFix



- Cumulative
- Continuous deploy
- Predictable
- Treacibility
- Upgrade Path
- Consistent
- Customer Feedback
- Agile



Mission

Quality³, **predictable** and **timely**⁴ maintenance that is a no-brainer to **deploy**¹ and **manage**² for customers, with **lower cost**.

CLM Maintenance Improvements

| Lifecycle Measurements | 2013 | 2014 | Total Improvement |
|------------------------------|---------------|---------------------------|---|
| Time to Resolution | 4 months | 4 weeks | 12 weeks |
| Security Issues Addressed | 4 months | 4 weeks | 12 weeks |
| Predictability for Customers | Unannounced | Monthly Cadence | Customer Satisfaction |
| Adoption for Customers | Hours to Days | 10 minutes | At least 30% less down time. More for most customers |
| Variance in the Field | 720+ hotfixes | 1 <u>iFix</u> per release | Clarity for Support |
| Innovation / Maintenance | 58% / 42% | 64% / 36% | +20% / -20% |

“The process to get the iFixes for CLM works perfect. I’m up and running with V.5.0.1 ifix004 within 30min after announcement on first server. A big compliment to IBM Rational for this ifix concept and the implementation of it. It’s a huge improvement for us as customers and it gives a lot of trust into the product.”

Take away: DevOps Architecture

Continuous Architecturing



1. **Smaller improvement, faster feedback loop**
2. **Short term investment, long term gain**
3. **Make it reusable, make it repeatable**
4. **[leadership] More on the why, less on the how**

Resources

- Jazz.net - <https://jazz.net/>
- IBM DevOps - <http://www.ibm.com/ibm/devops/us/en/>
- Bianca Blog - <https://jazz.net/blog/index.php/2014/06/27/devops-for-clm-maintenance-1/>
- Working Like a Startup - <http://radar.oreilly.com/2014/09/working-like-a-startup-at-ibm.html>
- IBM Support Lifecycle - <http://www-01.ibm.com/software/support/lifecycle/lc-policy.html>
- Enterprise DevOps Best Practices for Executives - <https://ibm.biz/BestPracticesExec>
- Inspirational Leadership TED talk - http://www.ted.com/talks/simon_sinek_how_great_leaders_inspire_action



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