Jenkins at Splunk> - Bill Houston

Splunking> Jenkins - Ali Raza

Agenda

- 1 minute introduction to Splunk
- Development process and build pipelines at Splunk using Jenkins
- How Release Eng. uses Splunk to improve developer productivity and experience
- Quality Engineering at Splunk using Jenkins
- How QTI uses Splunk to improve QE productivity and experience
- Making sense of all the Jenkins, development, and testing data using Splunk

Splunk Introduction

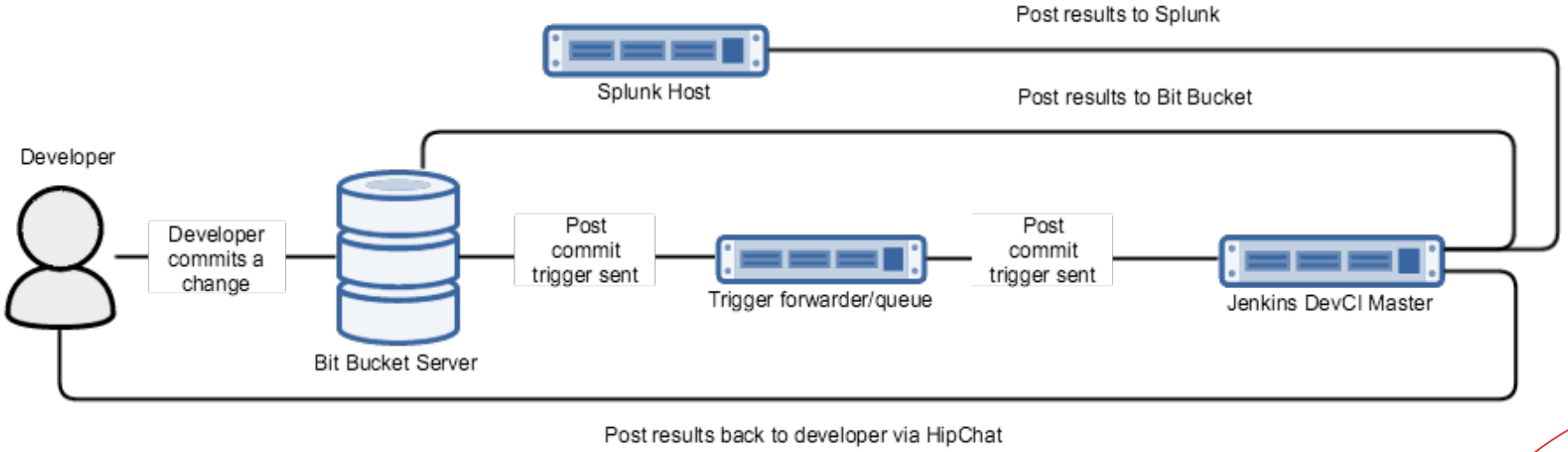
- What is Splunk
  - Splunk Enterprise makes it simple to collect, analyze, and act upon untapped value of the big data generated by your technology infrastructure, security systems, and business applications (like Jenkins). Splunk gives you the insights to drive operational performance and business results
  - Commercial Enterprise Software
  - Free download (500 MB/day)
  - Bill and I don't work in sales so you can relax ☺

Jenkins at Splunk

- Multiple Jenkins clusters at Splunk performing a variety of different functions
  - Engineering Dev CI system to test each pull request and commit to Bit Bucket
  - QE CI system for automated testing of multiple builds a day across multiple branches
  - Splunk Cloud deployment
  - Application testing in Shanghai
  - Other misc. housekeeping and testing tasks
- Our talk will focus on the use of Jenkins and Splunk in our Dev and QE CI systems
- We will do a live demo using our new Splunk plugin for Jenkins along with a Jenkins App for Splunk. Both of these are geared toward the overall Jenkins community.

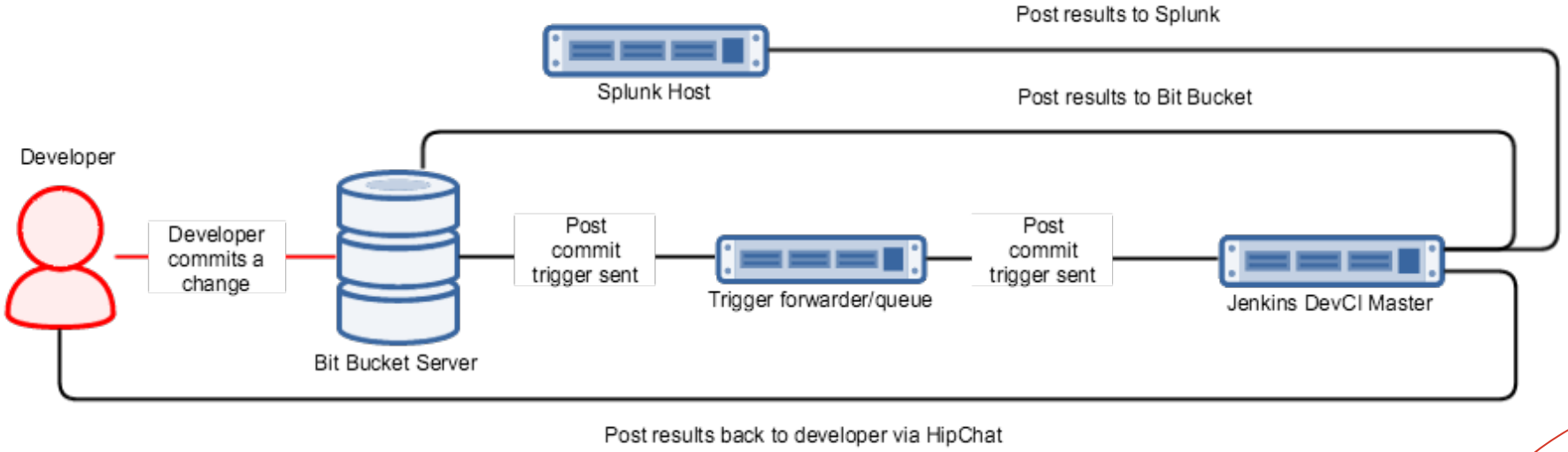
Development Pipeline

Testing of Every Commit to Certain Branches



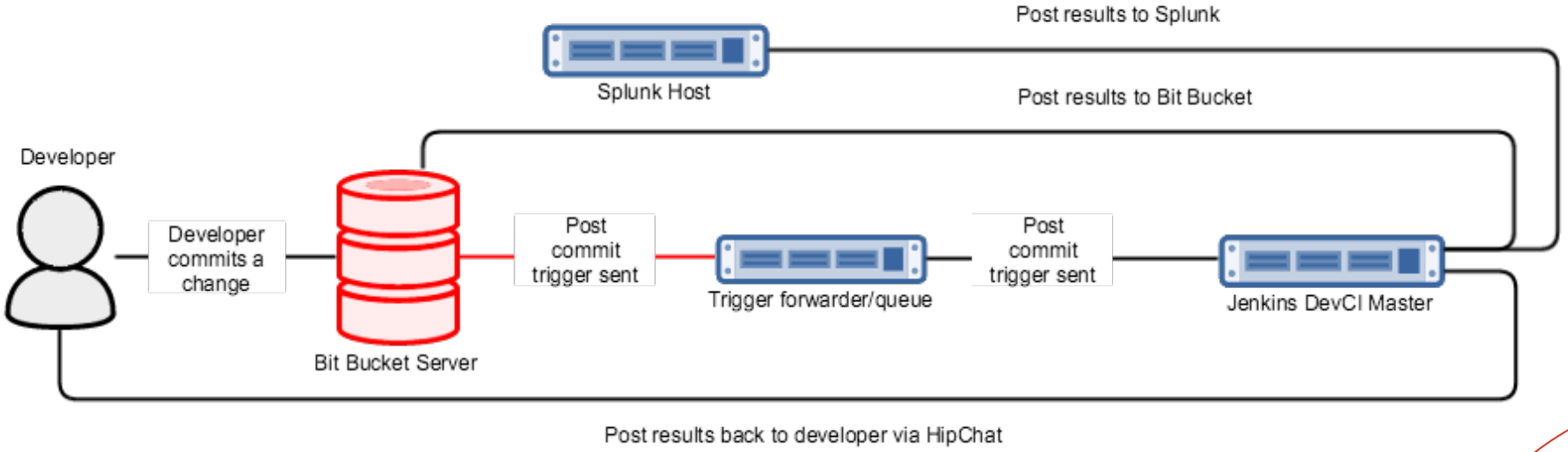
Tests run for a limited number of branches

Testing of Every Commit to Certain Branches



Developer commits a change to Bitbucket

Testing of Every Commit to Certain Branches



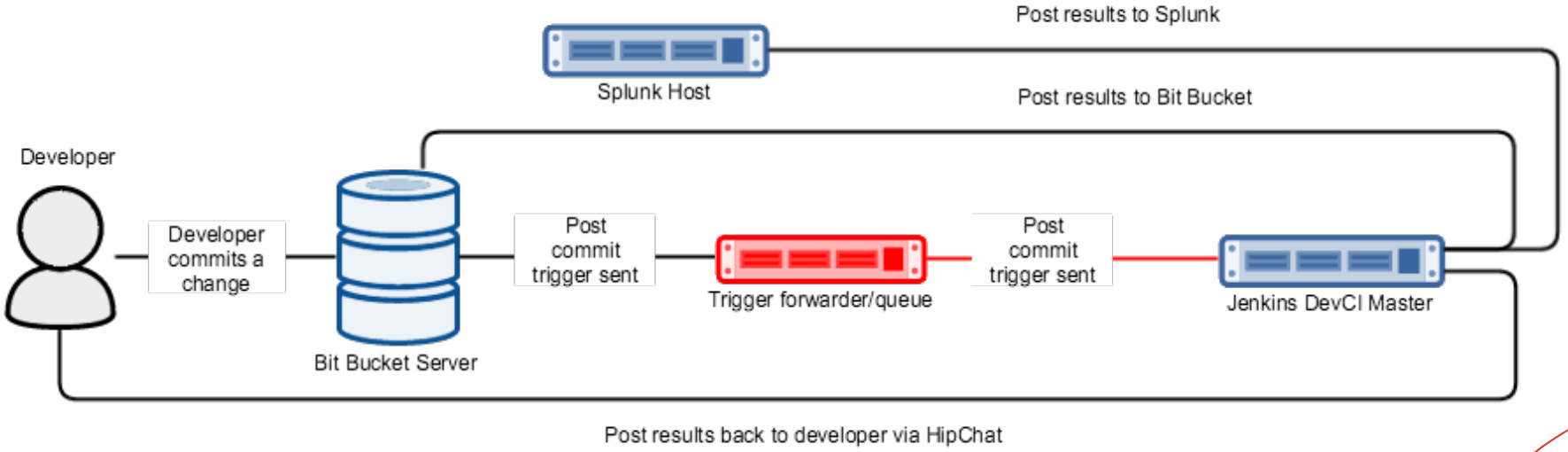
An HTTP Request Post receive hook sends a trigger

Testing of Every Commit to Certain Branches

Why have a trigger forwarder/queue system?

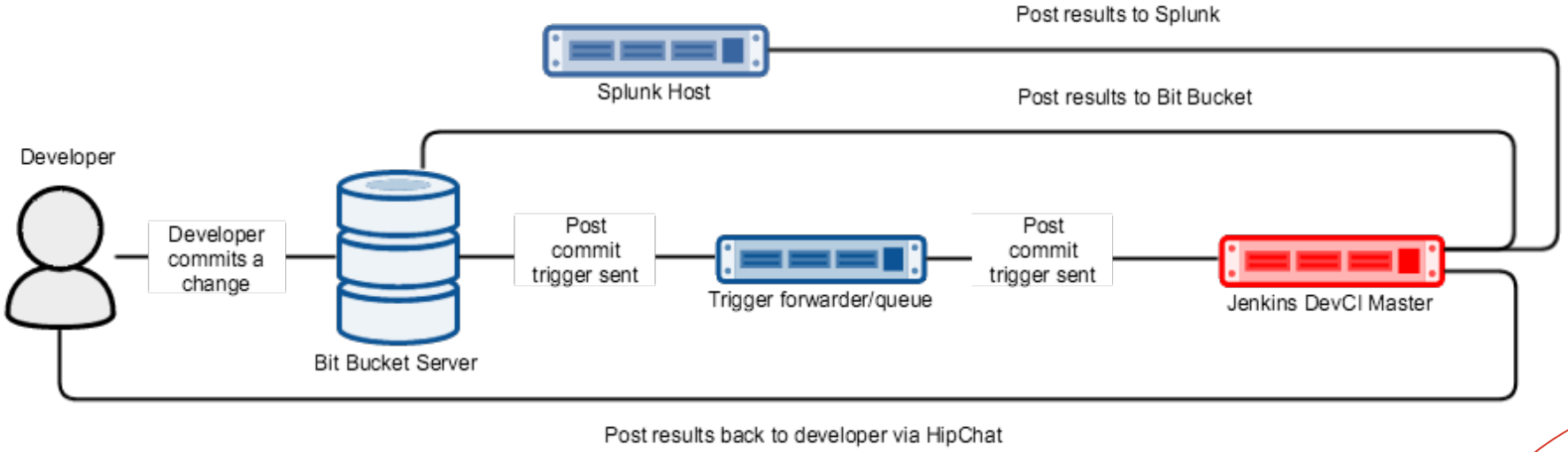
- Provides a layer of security
- A single switch is used to inhibit trigger forwarding
- Multiple Triggers can be forwarded
- Verifies that the trigger was properly received
- Implemented with Jenkins

Testing of Every Commit to Certain Branches



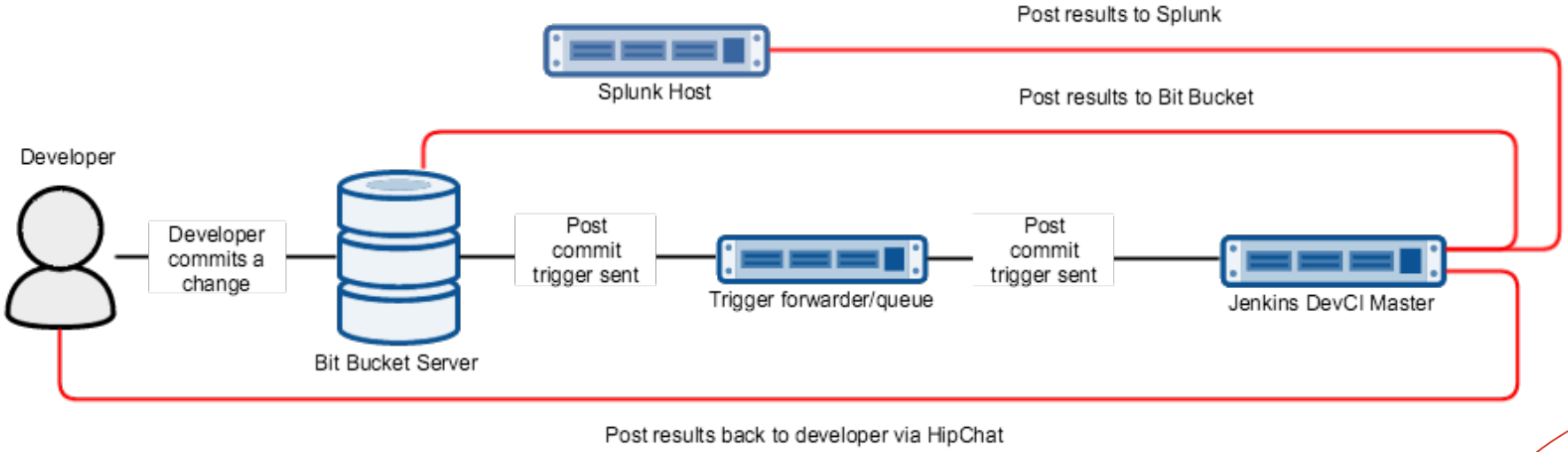
Forwarder sends the trigger on

Testing of Every Commit to Certain Branches



Jenkins master starts the required tests

Testing of Every Commit to Certain Branches



Results are posted to Bitbucket, the developer and Splunk

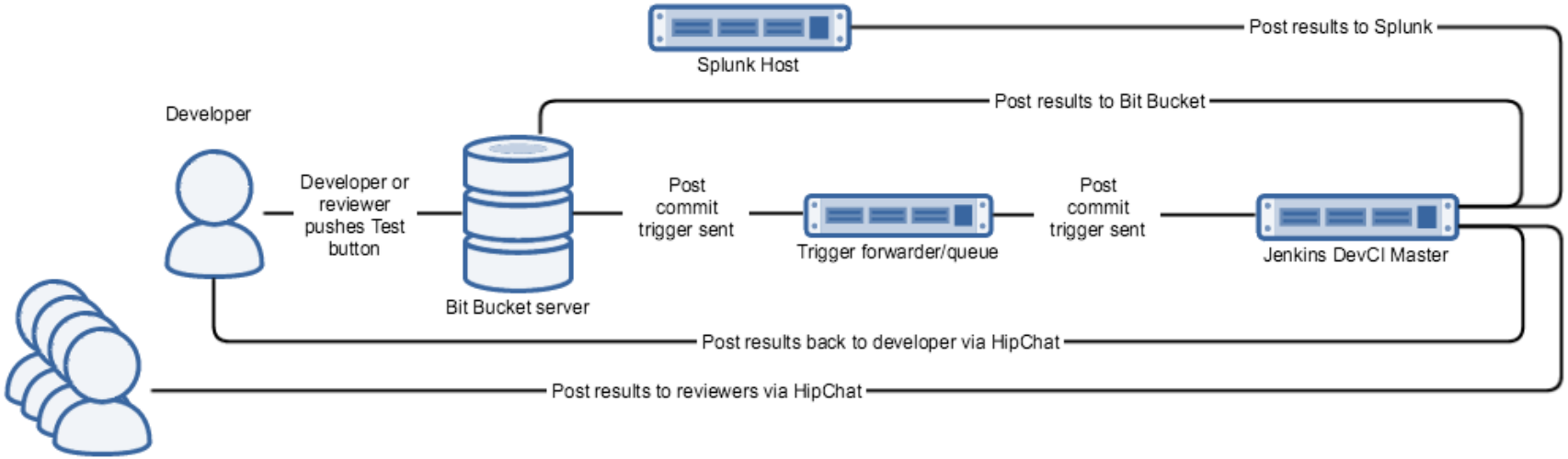
Testing of Every Commit to Certain Branches

About the Hipchat Notifications

- Send timely test updates without “Spamming” the team
- Sent to targeted individuals
- Sent with Groovy script using the Hipchat REST api

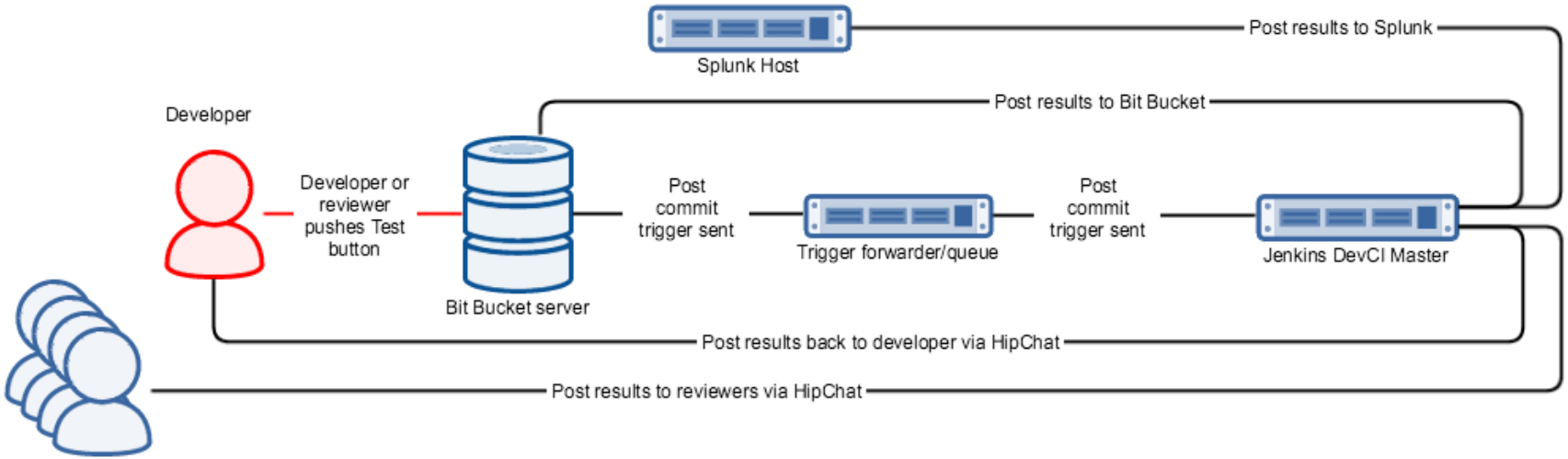
```
json_message = "{ \"message\":\"Trigger for testing of Pull Request: ${pr_ID} has been received\", \"notify\":true }”
cmd = [ "bash” , "-c" , "curl -k -v -X POST -H 'Authorization: Bearer ${hipChat_token}' -H 'Content-Type: application/json'
-d '${json_message}' https://hipchat.splunk.com/v2/user/${emailAddress}/message"]
try {
        HipChat_Process = new ProcessBuilder(cmd)
        process = cmd.execute()
        process.waitFor()
        println "curl GET exit value: ${process.exitValue()}"      }
 catch (e) {
        println "failed to send the Hipchat message"
}
```

Testing of Every Pull Request



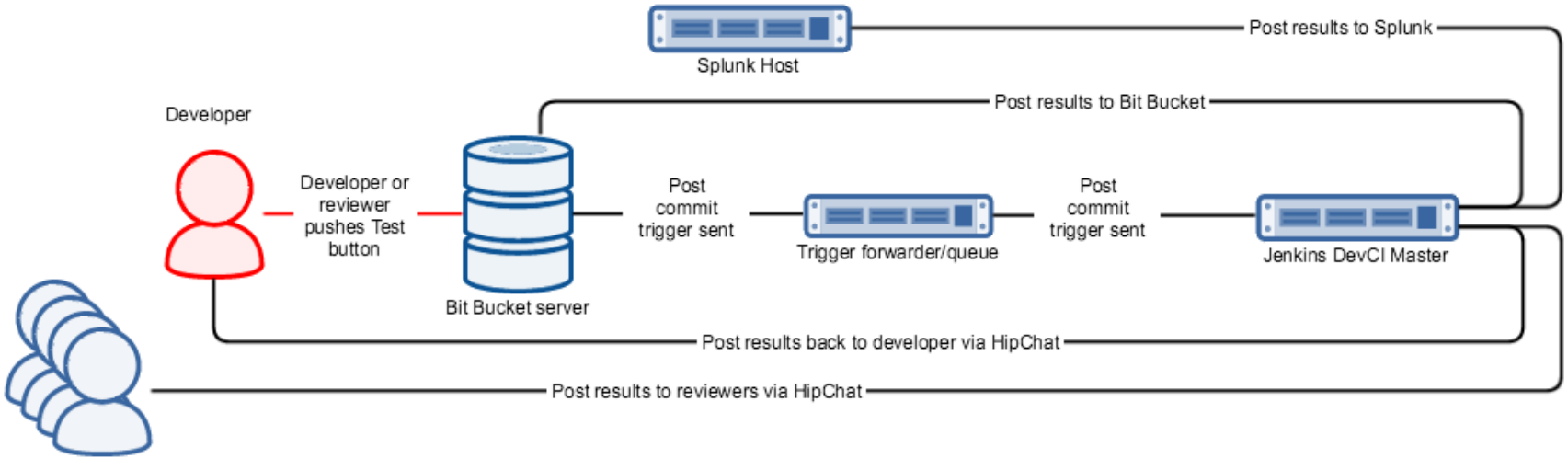
Basically similar to commit tests

Testing of Every Pull Request



A test is automatically triggered when a pull request is opened

Testing of Every Pull Request



Further tests are manually triggered with a button in the UI

Testing of Every Pull Request

Pull request

#10026 OPEN | bugfix/bhouston → develop ⚠ Merge | Decline | Edit | Trigger Dev CI

small change to allow pull request

Overview | Diff | Commits

Details

Bill Houston created a pull request 29 May 2016

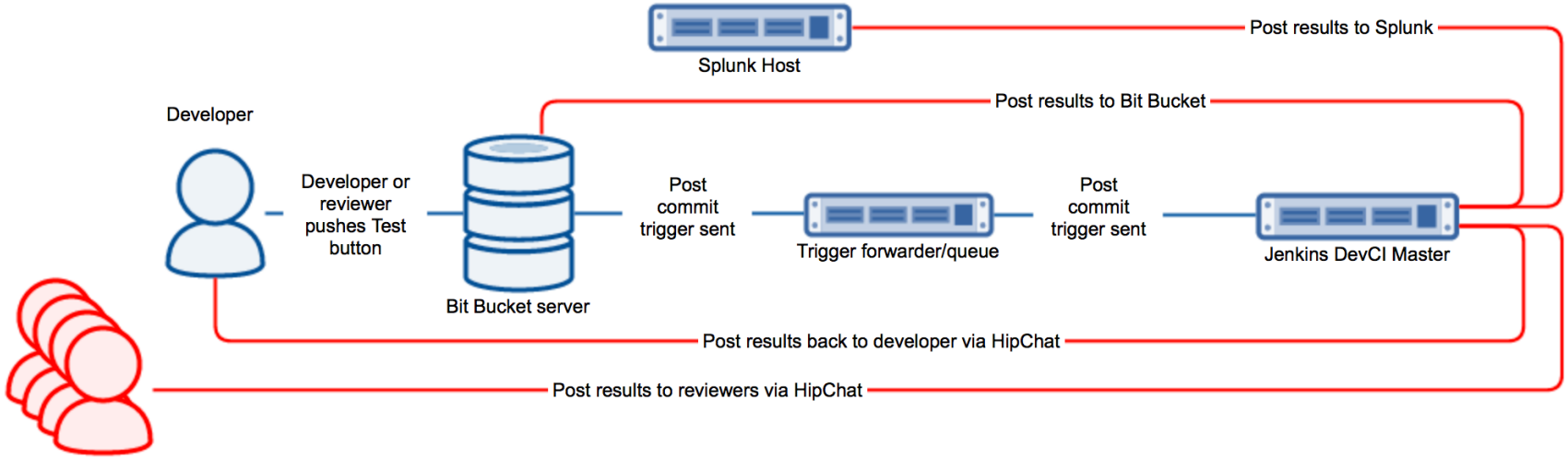
No description for this pull request. Add one

1 Participant

Unwatch this pull request

Learn more

Testing of Every Pull Request

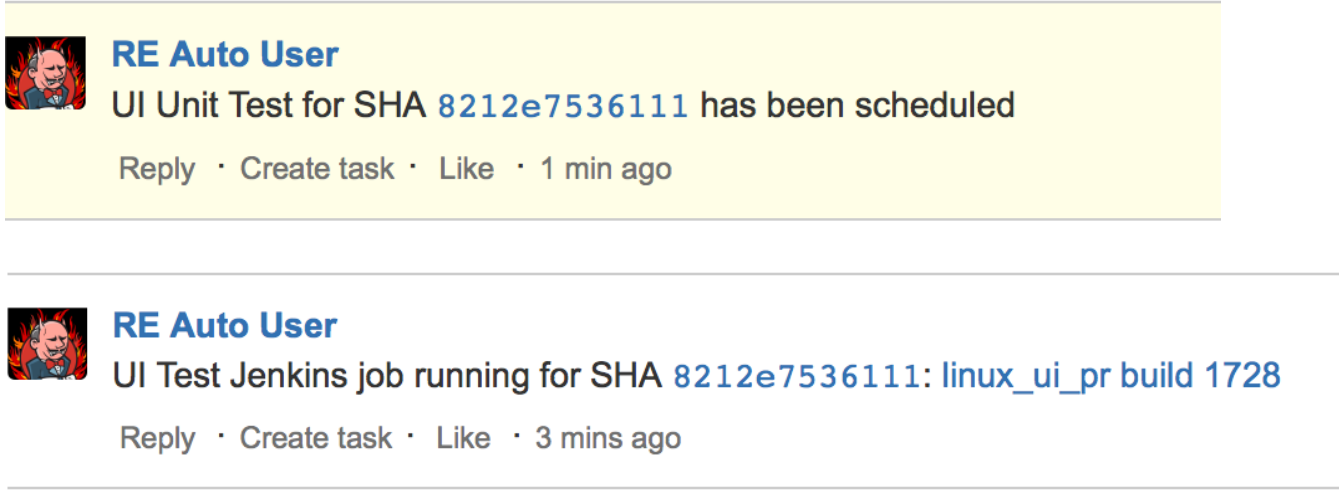


Test progress and results are posted to the Bitbucket PR UI in a comment.

Test start notification and results are posted to the developer via Hipchat and to Splunk via the Splunk plugin.

Test results are posted to the pull request reviewers via Hipchat.

Real-Time Notifications in Bitbucket Comments



Goal: provide meaningful input to reviewers, don't "spam" the pull request UI.
A comment is created for each trigger then updated as the test progresses.

Real-Time Notifications in Bitbucket Comments

RE Auto User

Result of backend tests was: **Successful**.

Summary:

- All tests passed.
- From sha: `45abaade87dc16f2ae49ee1468d9bf3745a9806a`

View detailed test results here

Reply · Create task · Like · 29 May 2016

Real-Time Notifications in HipChat

Release Engineering - do not reply · 12:52 PM
Trigger for testing of Pull Request: 11777 has been received

Release Engineering - do not reply · 1:47 PM
This is an automated message from the Jenkins DevCI system.
Testing of PR11777 is complete: https://git.splunk.com/projects/SPLCORE/repos/main/pull-requests/11777/overview

Hipchat notifications have links back to the Bitbucket pull request UI where the results are posted in comments

A link in the pull request UI sends Developers directly to the test results page in the Jenkins UI

Most developer interaction can take place in Bitbucket or in Splunk

Keeping the System Maintainable/Extensible

- The projects are as generic as possible.
- All scripts and property files are stored in Bitbucket.
- The Jenkins master pulls a fresh copy of the files on a commit.
- Each slave node pulls a fresh copy of the files at the start of a job
- A Jenkins Staging system is used for new development and bug fix testing

Keeping the System Reliable

- Some nodes are restarted regularly
- A script analyzes the results at the end of each test
- Test runs that fail due to an infrastructure issue are retriggered on a different node.
- The Jenkins home directory is stored on an NFS mount
- The Splunk plugin monitors the Jenkins master and all nodes
- Alerts are setup in Splunk to warn of pending and active failures

Be Responsive to Developers Needs

- Maintain a Bitbucket reference repository on each node
- Defer lower priority tests/tasks during high load periods
- Data for each job is sent to Splunk
- Splunking our Jenkins systems has allowed us to be more efficient, and responsive
- Diagnosing build and test failures at the end of each test

Be Responsive to Developers Needs

- Common issues such as source code merge conflicts, compile or link errors are identified
- Each failure of a build or test is compared with the results of previous tests

RE Auto User

Result of backend tests was: **Unsuccessful**, fix the issues and then try again.

Summary:

- 3 tests failed out of 864. 2 were new failures and 1 matched failures in the last tested commit to the target branch.
- From sha: `1b57ec496822718ed8baa8da7881262a16455dbb`

View detailed test results here

Quality Engineering Pipeline

Quality Engineering at Splunk

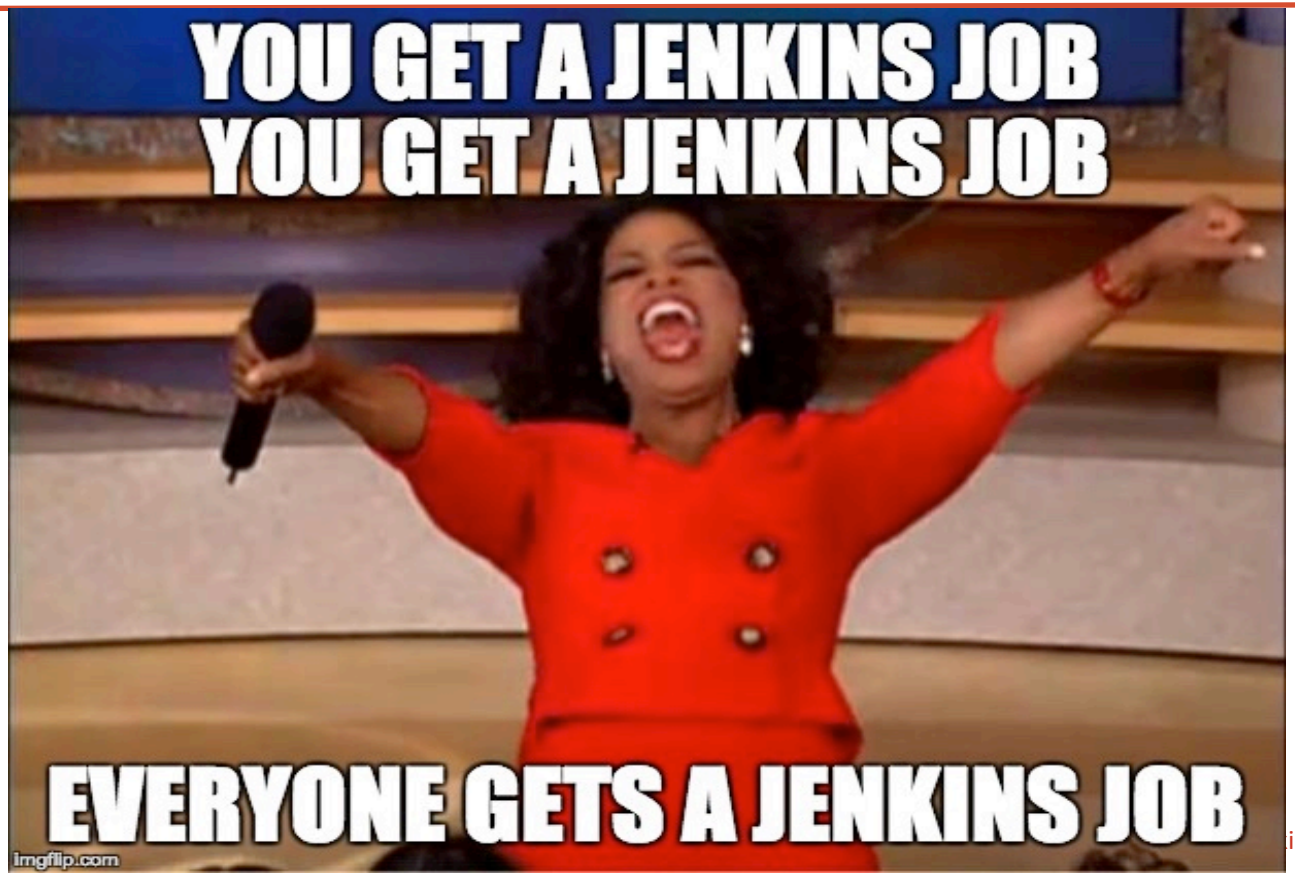
- Enterprise Software Testing is Complex:
  - Distributed nature of applications
  - Various complex deployment topologies
  - Destructive testing –> prevents sharing of test environments
  - Various platforms

Quality Engineering at Splunk

Initial Jenkins roll out strategy for QA

- Let's empower everyone to do whatever they want in Jenkins
- As long we monitor Jenkins, everything should be fine

Jenkins – Do as you please



Jenkins – Do as you please results

- Jenkins Infrastructure became the Wild Wild West
- Constant Jenkins infrastructure and scalability issues
- No control and insight into who is doing what and why
- Lack of ownership
- Ridiculous amount of data to process
  - Jenkins console logs
  - Test Results
  - Artifacts (crash logs, test logs, etc)

Jenkins – My team's daily job

What to do ?

- Engineering Dilemma:
  - Can’t even figure out what to fix and where to start
  - Not sure if touching anything will break something else

- Let’s skip all the stage of grief and go straight to ‘Acceptance & Hope’
  - Current setup and design is not designed to scale
  - Throw out the current setup and start fresh
  - Learn from our mistakes

New Team setup

- QA Tools and Infrastructure Team (QTI)
  - Laser focused on QA productivity and needs
  - Infrastructure and Deployment services
  - Test Architecture and Testing Tools
  - Jenkins
  - Analytics using Splunk

- QA Engineering
  - Focused on testing our product - Splunk
  - Works side by side with developer, product managers, etc.

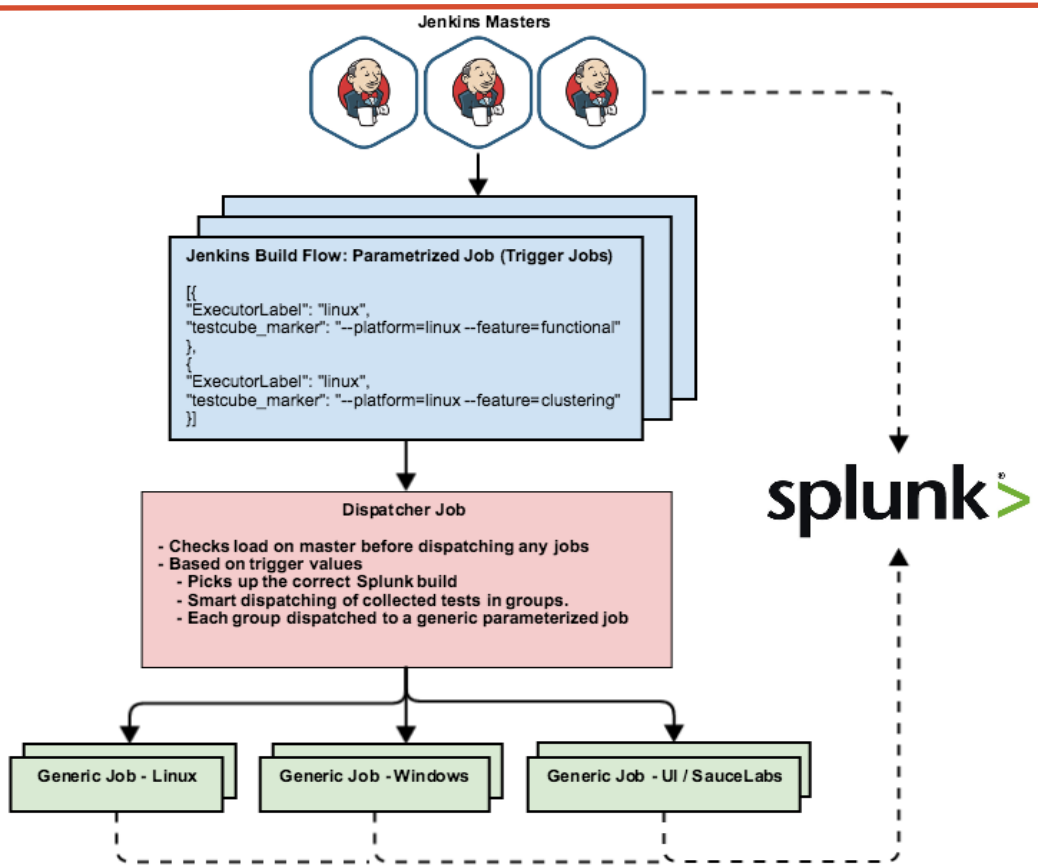
Jenkins Resurrection

- New Jenkins architecture Goals
  - Limited Jenkins privileges for most engineers. Only build access
  - Provide a test framework abstracter layer in Jenkins using Build Flow
  - Performance tune and scale the hell out of Jenkins

- Leverage Splunk for
  - Discovering issues in Jenkins and Testing infrastructure
  - Real-Time alerts
  - Test Analytics
  - Log everything
  - KPIs for management

Jenkins – Builds Galore

Jenkins Resurrection – Workflow



Jenkins Data - Some Use Cases

- Jenkins operational data for administrators
  - Monitor multiple Jenkins clusters
  - Jenkins masters and slaves health (JVM, logs, logins, etc.)
  - Security and Auditing of jobs and plugin configurations
  - Build queue times, long running builds, and trends
  - Real-Time console logs
  - KPIs for management

- Jenkins Builds data for normal users
  - Build and jobs console logs, artifacts, results
  - Deep tests analytics, trends, and triaging capabilities
  - Preserve this data for a very long time

What can Splunk> do for you?

- Fixing engineering issues is the easy part. Finding out what to fix is difficult.
- Splunk won't fix your Jenkins infrastructure BUT it can be instrumental in exposing issues in your setup.
- Operational Intelligence into your Jenkins or other CI application infrastructure is crucial to increasing developer/QA productivity and keep your organization moving at a faster pace

Splunk + Jenkins

- Jenkins plugin for Splunk
  - Once configured, it will send a lot of information about your Jenkins environment to Splunk
  - No need to install any Splunk Forwarder
  - No need to modify any jobs. All job and build activity is intercepted, captured, and sent to Splunk in real-time.
  - Highly configurable. Send as much or as little data as you need

- Splunk App for Jenkins
  - Standard App in Splunk. Install in 2 minutes
  - Prebuild collection of dashboards for providing deep visibility into your Jenkins environment
  - Specifically designed for Release Engineers, Jenkins Administrators, and QA Engineer use cases

Live Demo

Jenkins World
2016

Jenkins Plugin + Jenkins App Release

https://www.surveymonkey.com/r/splunk-jenkins

Contributors

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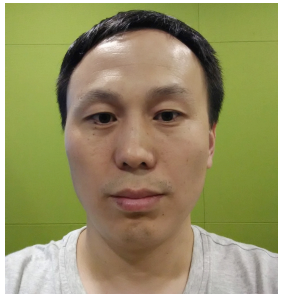

Ted Xiao

Alan Yu

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