



Continuous Deployment and Windows Azure: A Case Study

Intro

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Repre.ee is an online business manager for real estate agents and brokerages hosted on Microsoft Azure.

- ❑ Continuous Integration: Changes are frequently committed to the main repository
- ❑ Continuous Delivery: Continuous Integration + Automated Testing + Deployment to Test environments
- ❑ Continuous Deployment: Continuous Delivery + Automated Deployment to Production



**How do we minimize
the time between
writing and deploying
code?**

Old Process

Development

Development

Development

Development

Development

Testing

Code
Review

Testing

Code
Review

Testing

Code
Review

Testing

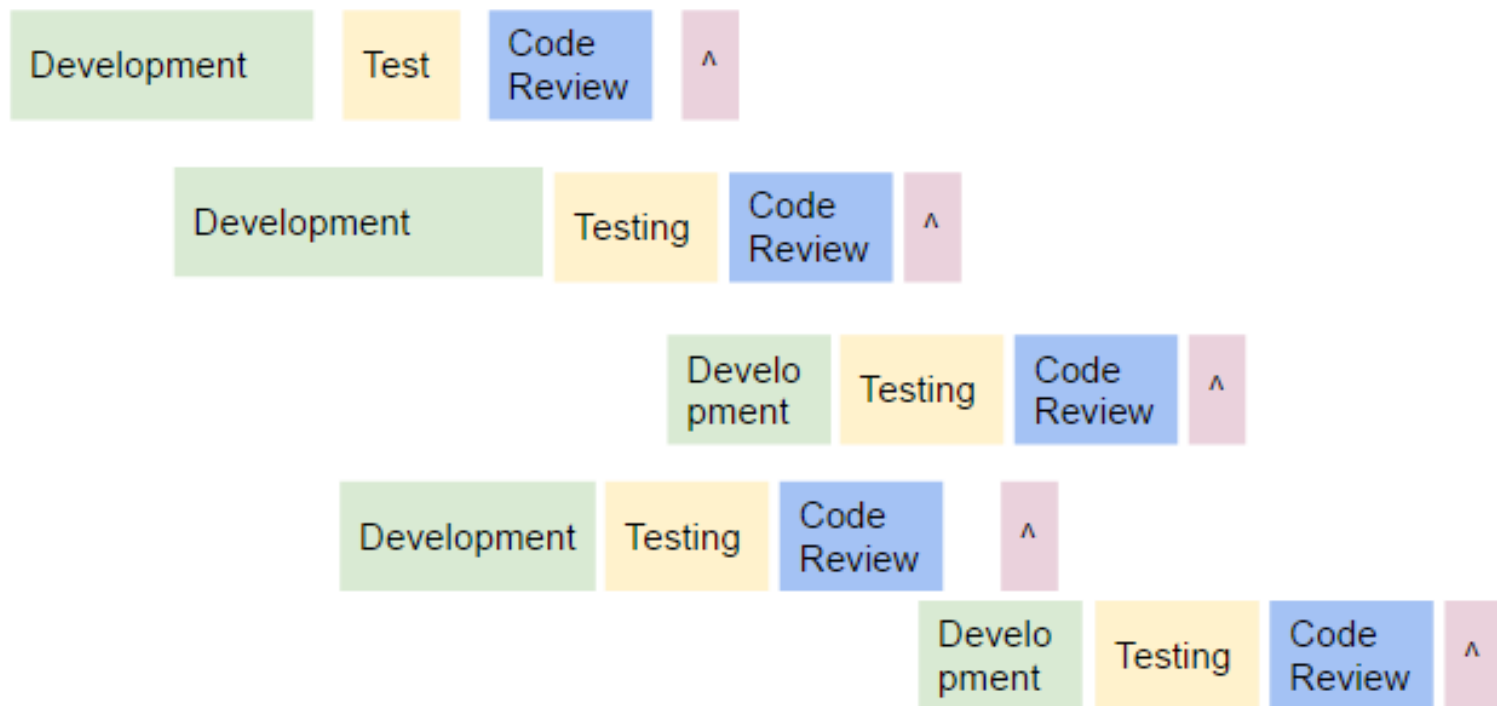
Code
Review

Testing

Code
Review

Release

New Process





30

Changes released this month

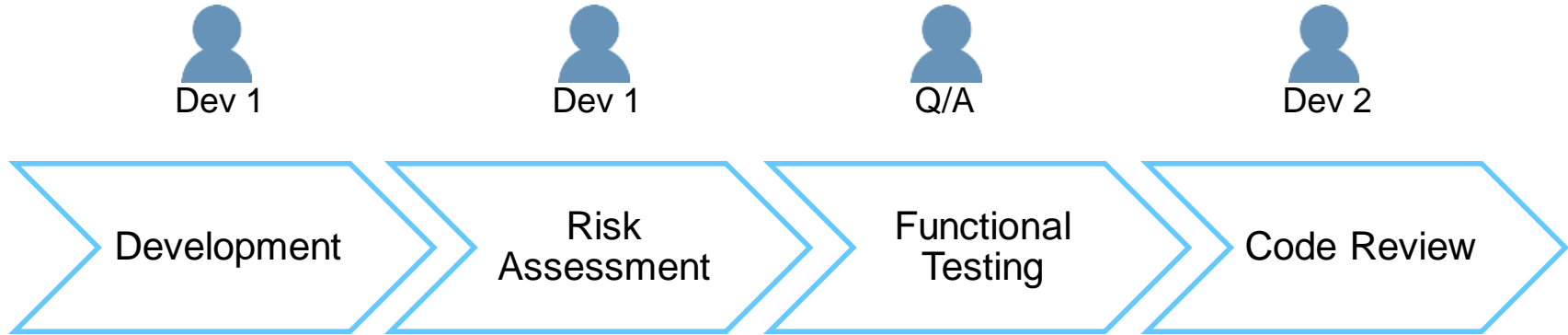
19

Total number of deployments this month

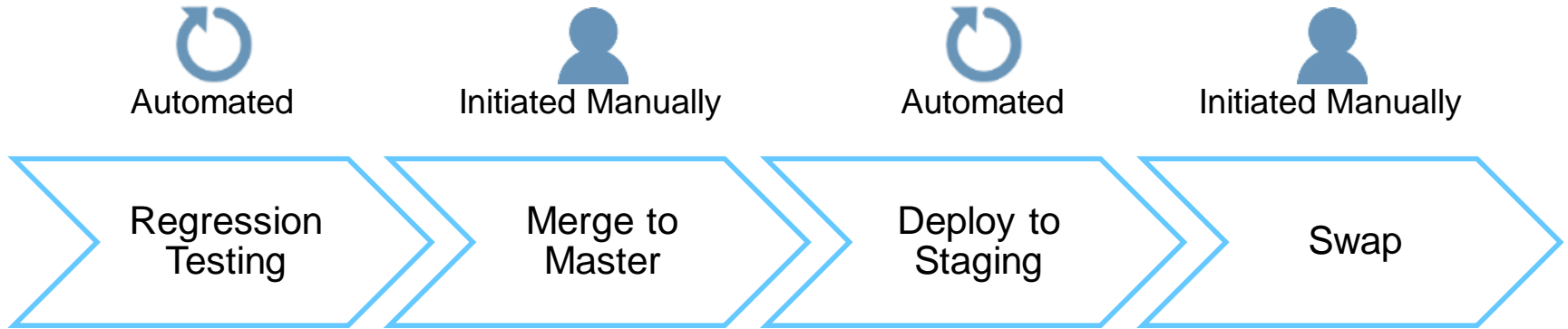
3

Most deployments in a single day

The Process



The Process (cont.)



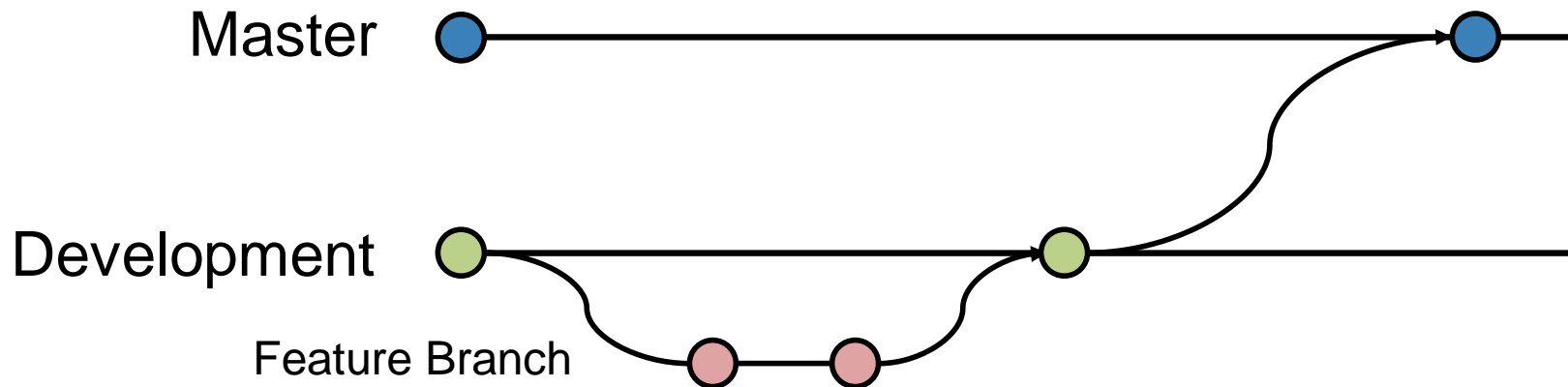
Development

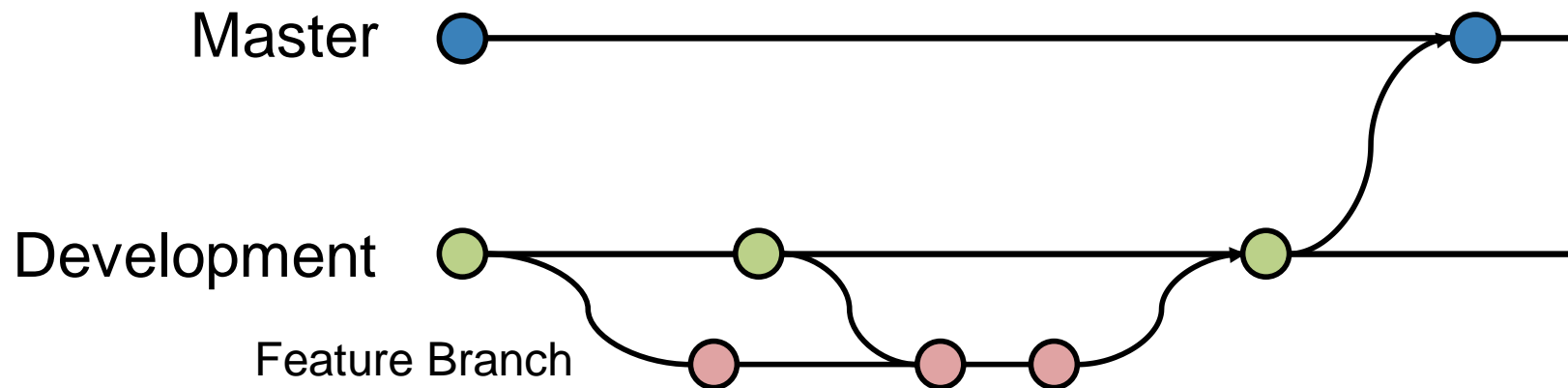


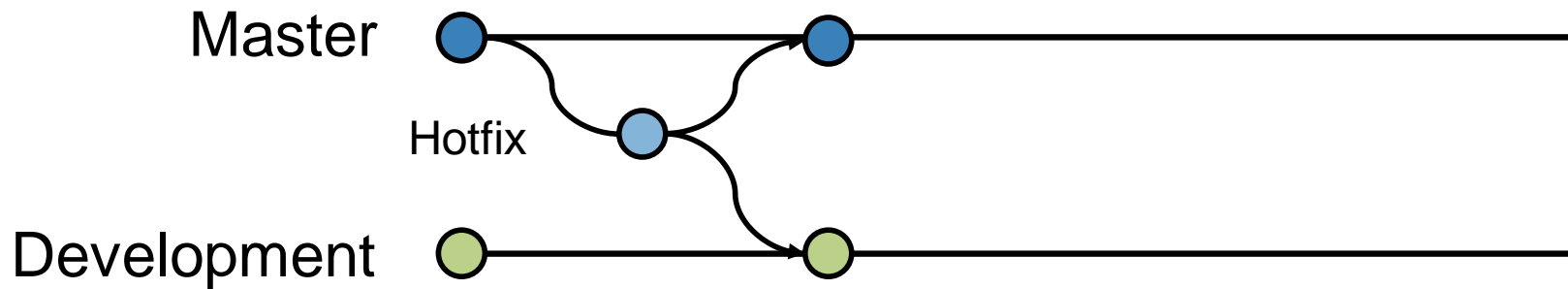
Dev 1



- Identify a ticket
- Create a branch
- Issue a Pull Request on completion
- Responsible for deployment







Database Changes:

- ❑ Entity Framework Code-First
- ❑ Follows the same dev/deployment pattern as code changes
- ❑ DB changes are deployed separately
- ❑ Additive changes only

Why separate & Additive-only?

- ▣ Decouple DB updates from code changes
- ▣ DB changes tested in isolation
- ▣ Safe rollbacks

Development



Dev 1



- Think about impact
- Checklist

Risk Assessment

Field Tab Risk Assessment

Has the Sales/Marketing team provided feedback?

None ▼

Leverage our Sales/Marketing team to help us understand the users perspective

Has the UX/UI team provided feedback?

None ▼

All UX/UI changes will require review and consultation with the UX/UI team.

Does this changes have an impact on the API and Integrations?

None ▼

Have you had an opportunity to consider the possible impact on other aspects of repree.

Does this change affect core functionality?

None ▼

Does this change affect core functionality? (Forms, Ratify, Email, etc)

What is the level of complexity of this change?

None ▼

How many files are touched with this change?

How complex is the algorithm's included?

Is there a lot of computational complexity?

Have you uploaded a Screenshot of this UX Change?

None ▼

Using Feedbag.io, please upgrade a screenshot of the change for any that has an impact on UX/UI

Does this require cross browser testing?

None
Chrome
Firefox
Safari
Internet Explorer

If so, indicate which browsers are of the greatest concern.

Have you added Kissmetrics Events to this change?

None ▼

Select key events within the functionality that will allow us to monitor and measure the usage?

The Process



Q/A



Development

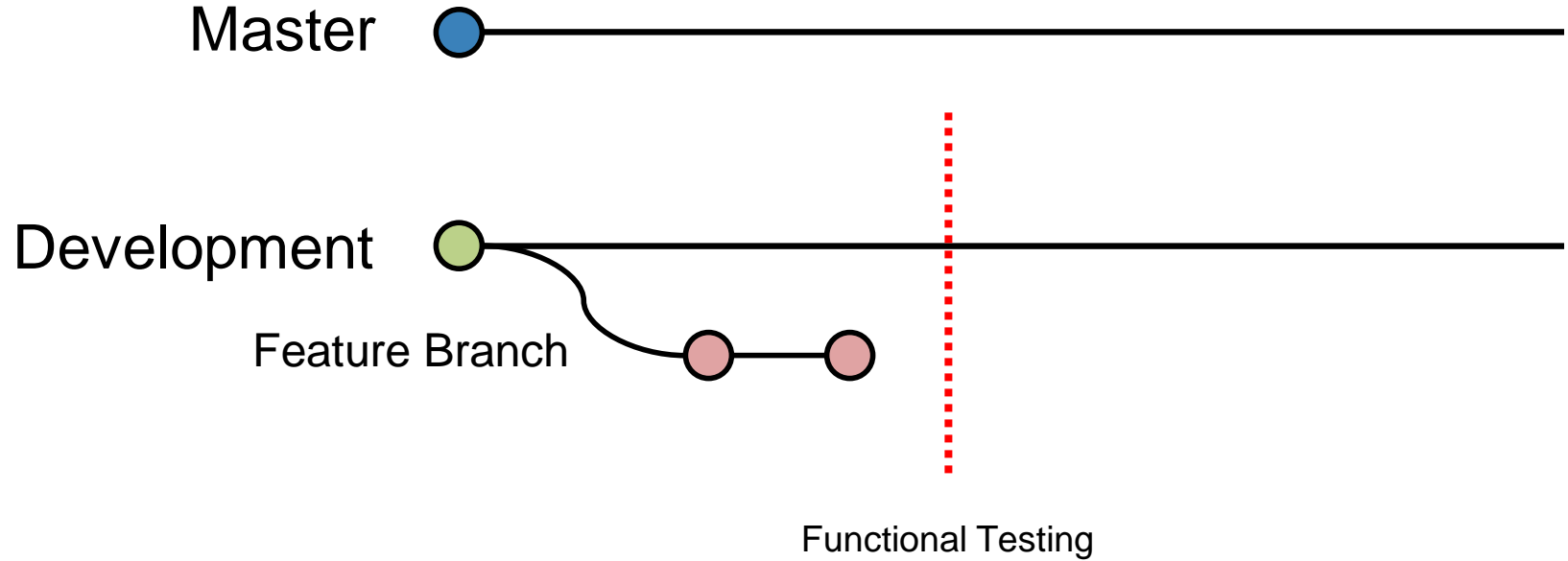
Risk
Assessment

Functional
Testing

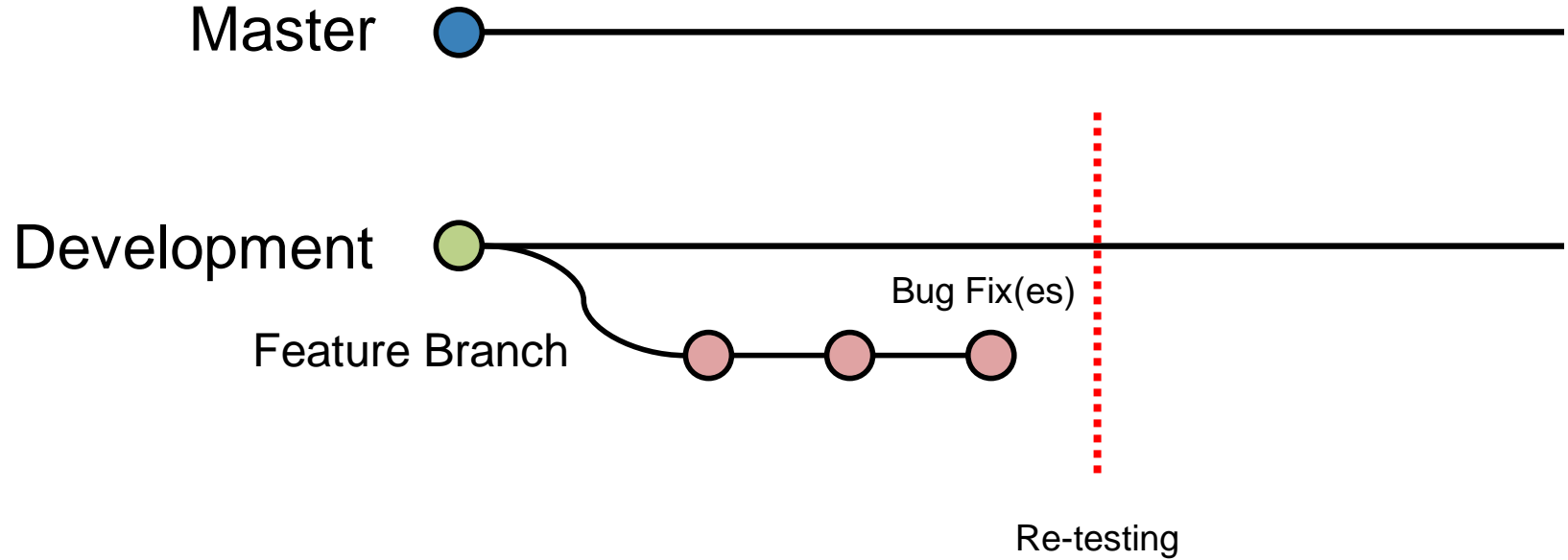
Code Review

- Validate Happy Path
- Identify/Test Edge Cases
- Coordinate with Dev on bug fixes

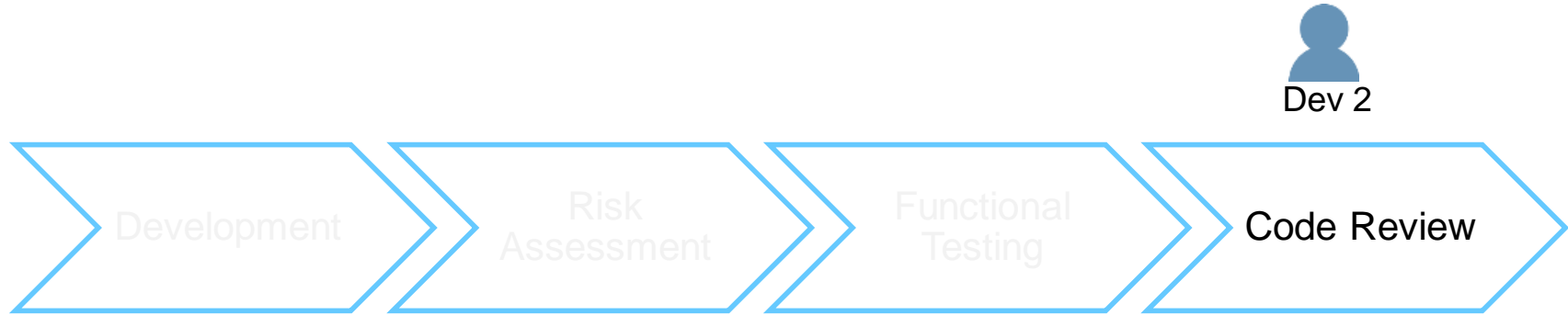
Functional Testing



Functional Testing

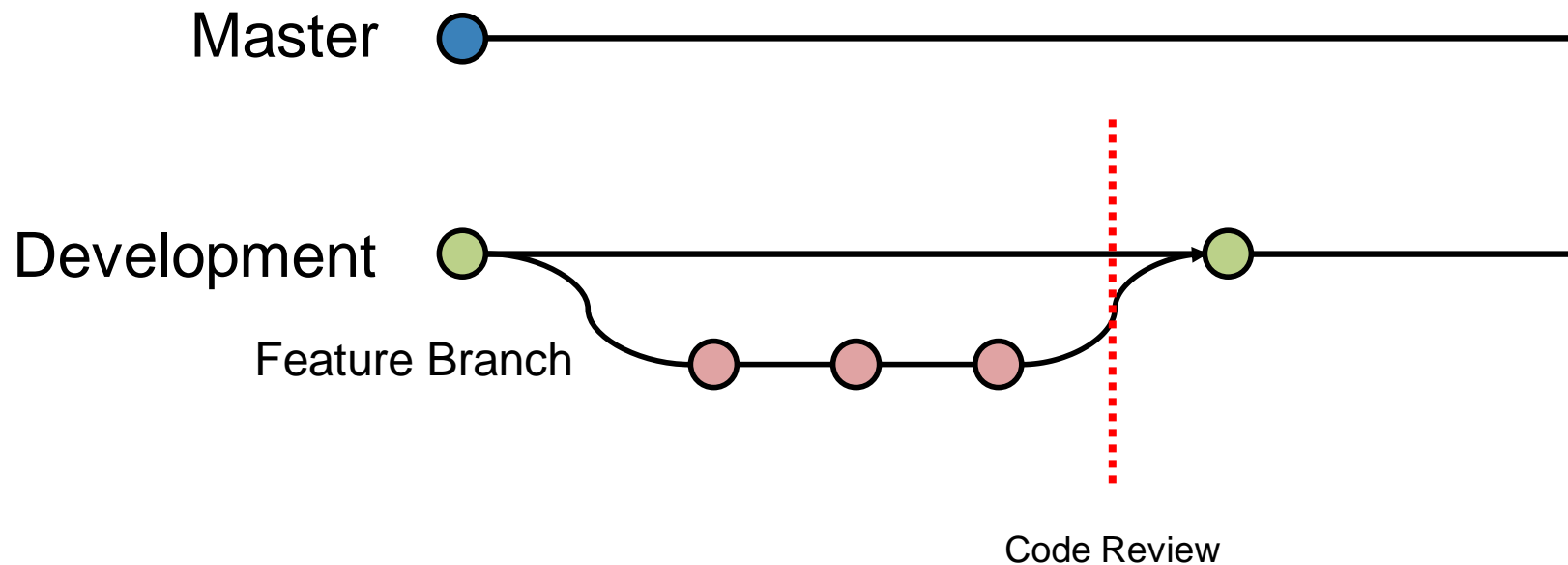


The Process



- Overview of code style & logic
- Optional UX/UI review
- Merge to Dev branch on pass

Code Review



The Process (cont.)



Automated

Regression
Testing

Merge to
Master

Deploy to
Staging

Swap

- Initiated on merge
- Uses Selenium to simulate DOM interactions
- Any errors must be fixed ASAP

Managing Tickets

repreer Deployment

Release ▾



QUICK FILTERS: [Only My Issues](#) [Recently Updated](#)

8 PR Created

Display issue in Update Credit Card Modal

Accounts/Billing
30/Jan/17 5:19 PM



REP-1533



Folder Type for New Transaction not being cached properly

Forms, Transactions
None



REP-1772



Form Creator Performance Issues After Continued Use

Forms
None



REP-1743



Users with Active Plans are being Prompted to Upgrade

Accounts/Billing

3 Testing Complete

(DB Update) As a user on a base plan, I would like access to the Ratify Dashboard

Accounts/Billing, Ratify
03/Mar/17 10:55 AM



REP-1723



As a User, I would like to be able to rotate documents to the correct orientation

Ratify
22/Dec/16 8:41 AM



REP-293



As a User, I want to start a signing session from the Forms Library

Forms, Ratify
03/Nov/16 8:44 AM



REP-1472



3 Approved and Merged

Adjust the Required Fields for Brokerage Information from the InitialProfileModal

None
06/Mar/17 1:38 PM



REP-1769



Unable to Convert a Brokerage to Self Service without an Agent

Org Unit Management
21/Feb/17 3:28 PM



REP-1738



Signing-Only Plans Should be connected to the "DocuSign" Feature

Accounts/Billing, Ratify
28/Feb/17 1:57 PM



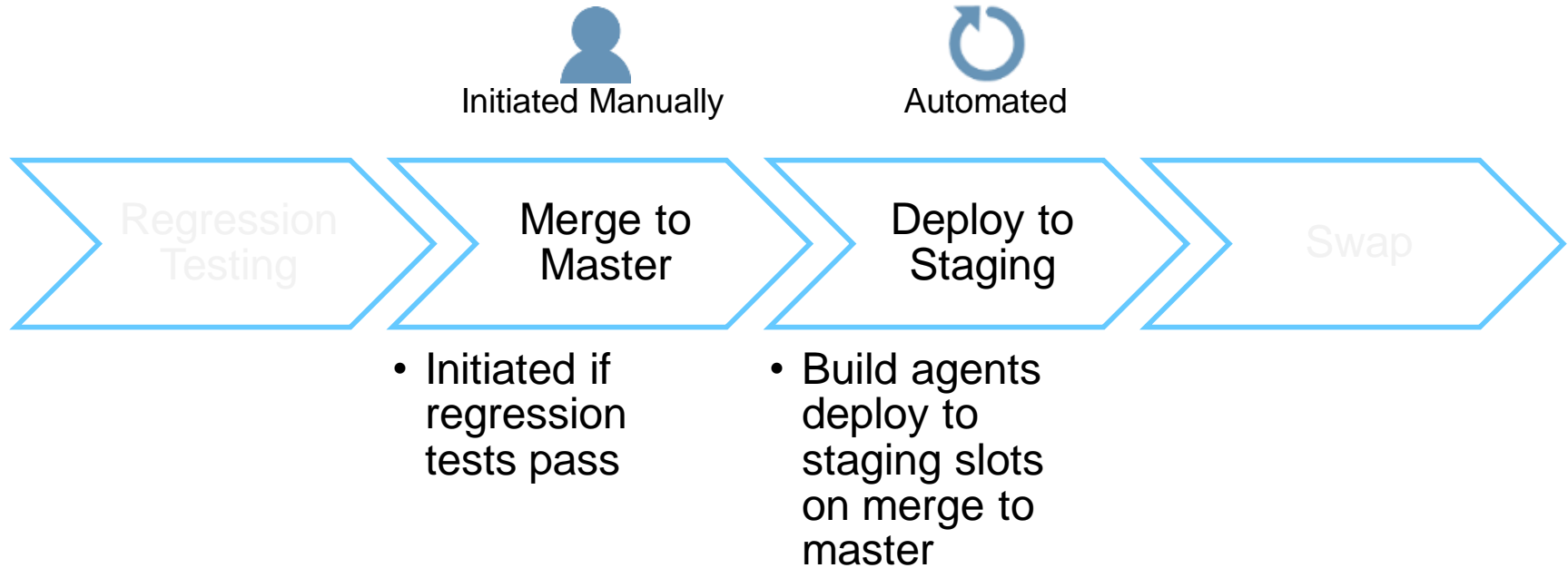
REP-1750



A photograph of a workspace on a wooden desk. In the background, a silver laptop is open, showing the Apple logo on its lid. To its right is a dark blue notebook. Further right is a tall, white, textured ceramic cup filled with coffee. In the foreground, a person's hands are visible, typing on a silver and white keyboard. The person is wearing a ring on their left ring finger and has pink nail polish. The word "Demo" is overlaid in a large, white, serif font in the center of the image.

Demo

The Process (cont.)

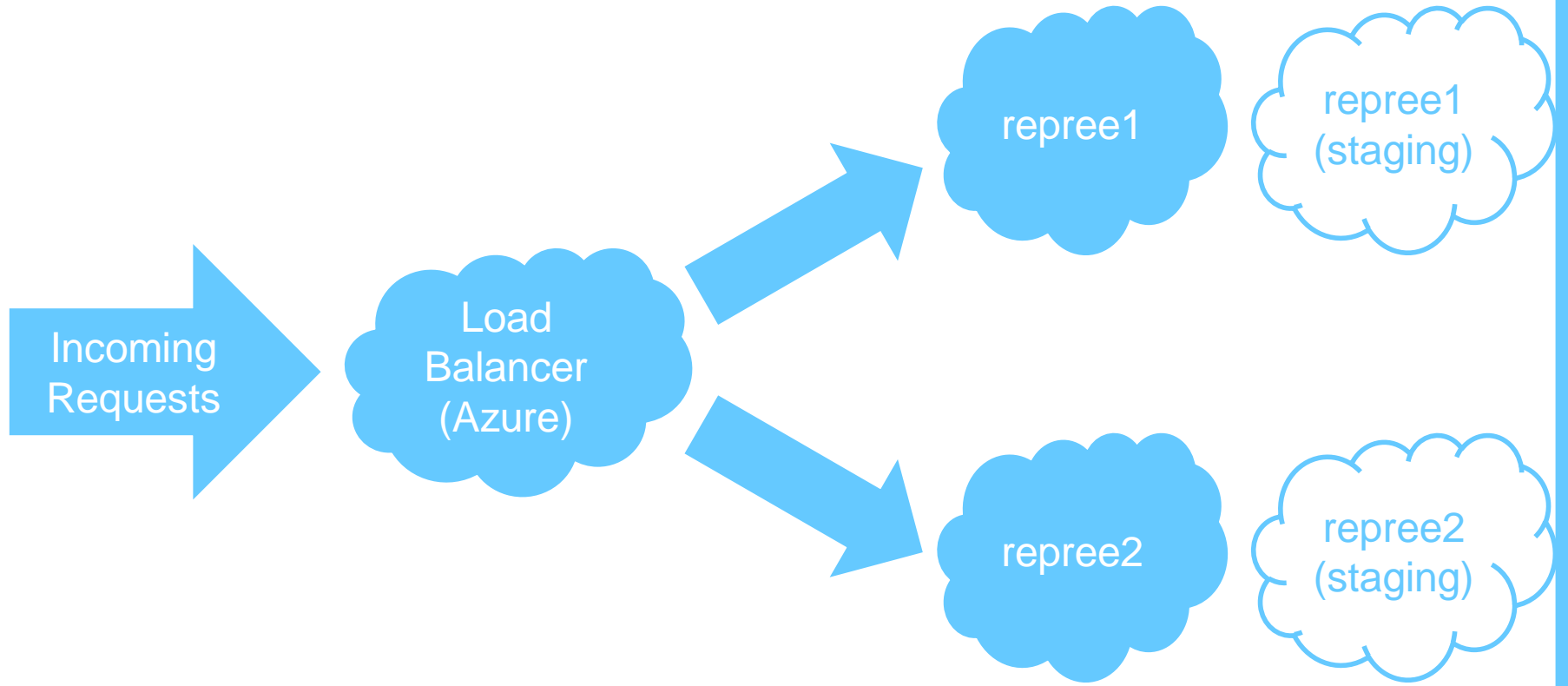


The Process (cont.)

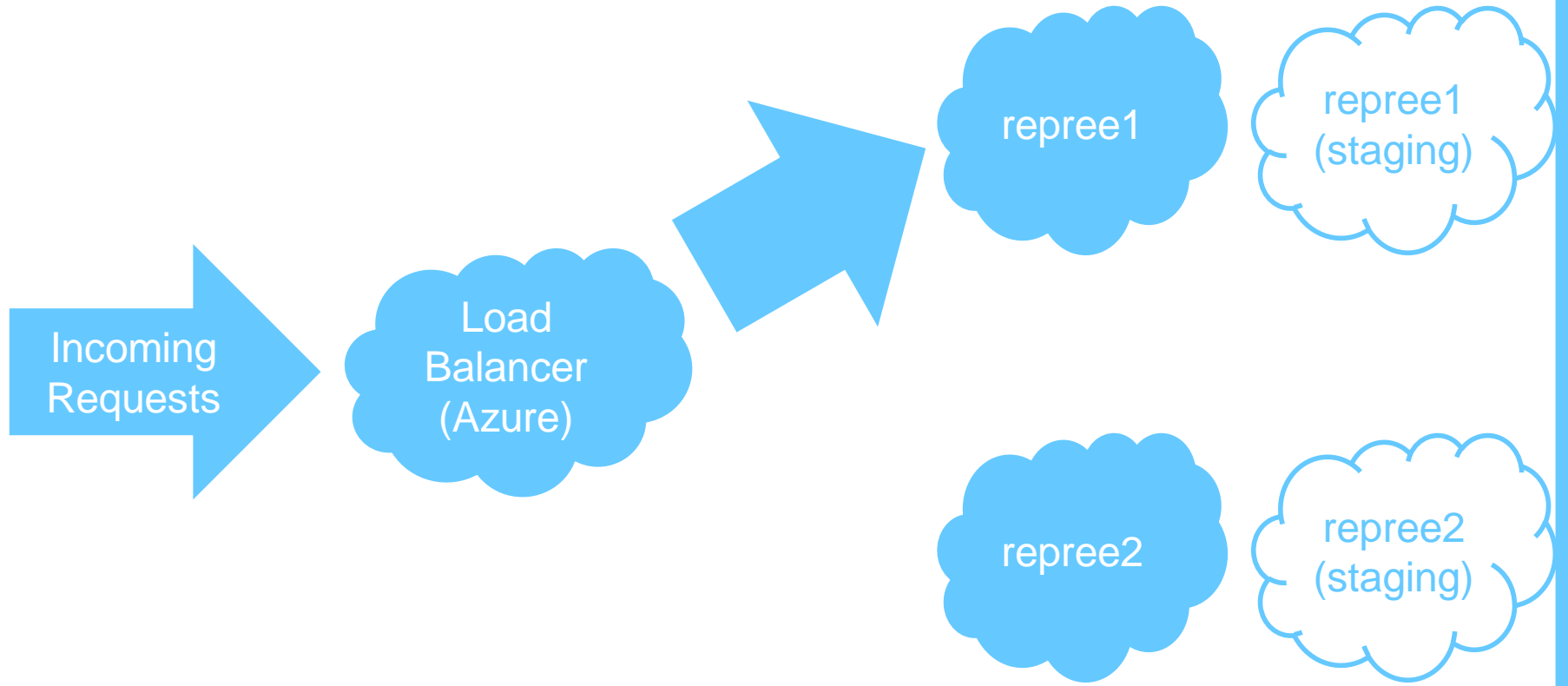


- Manual smoke test of staging deployments
- Initiate swap script if smoke tests pass

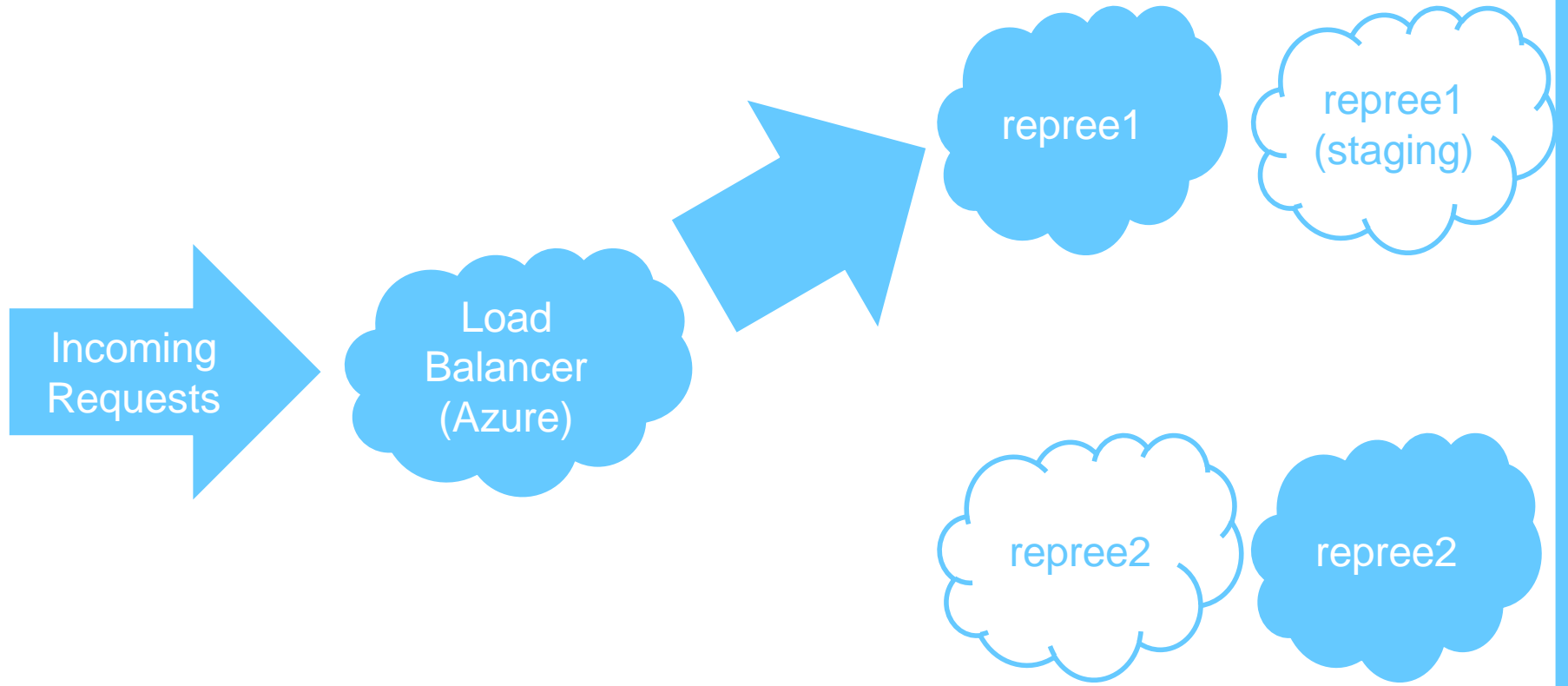
Swapping



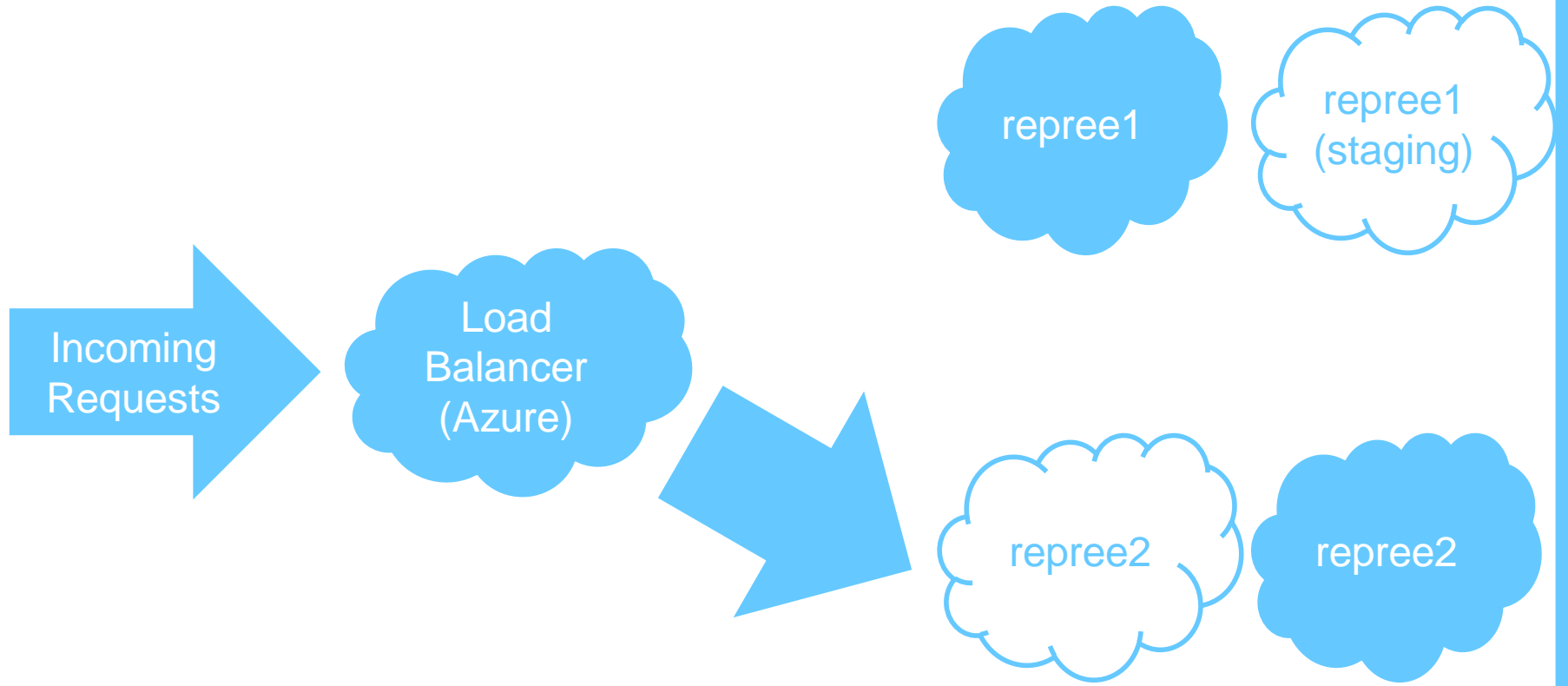
Swapping



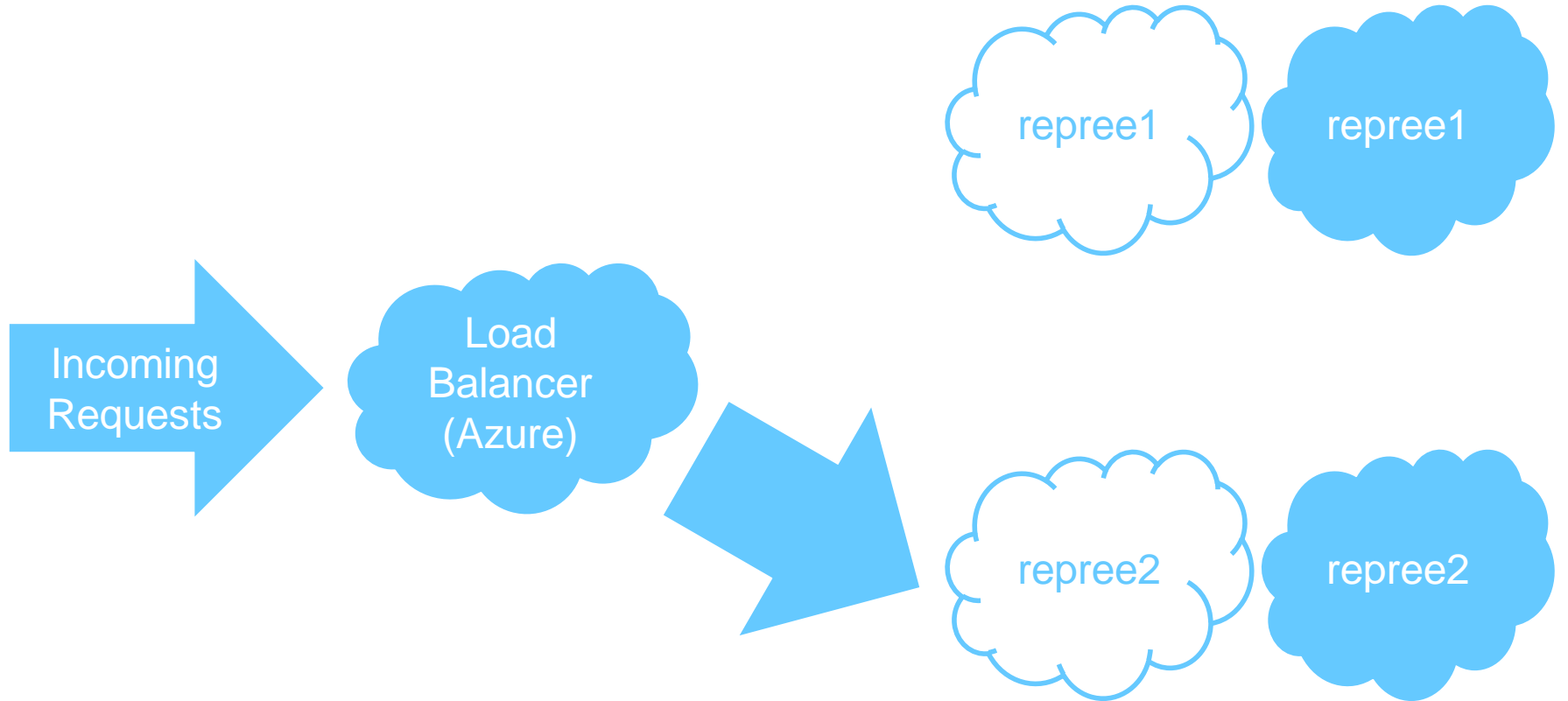
Swapping



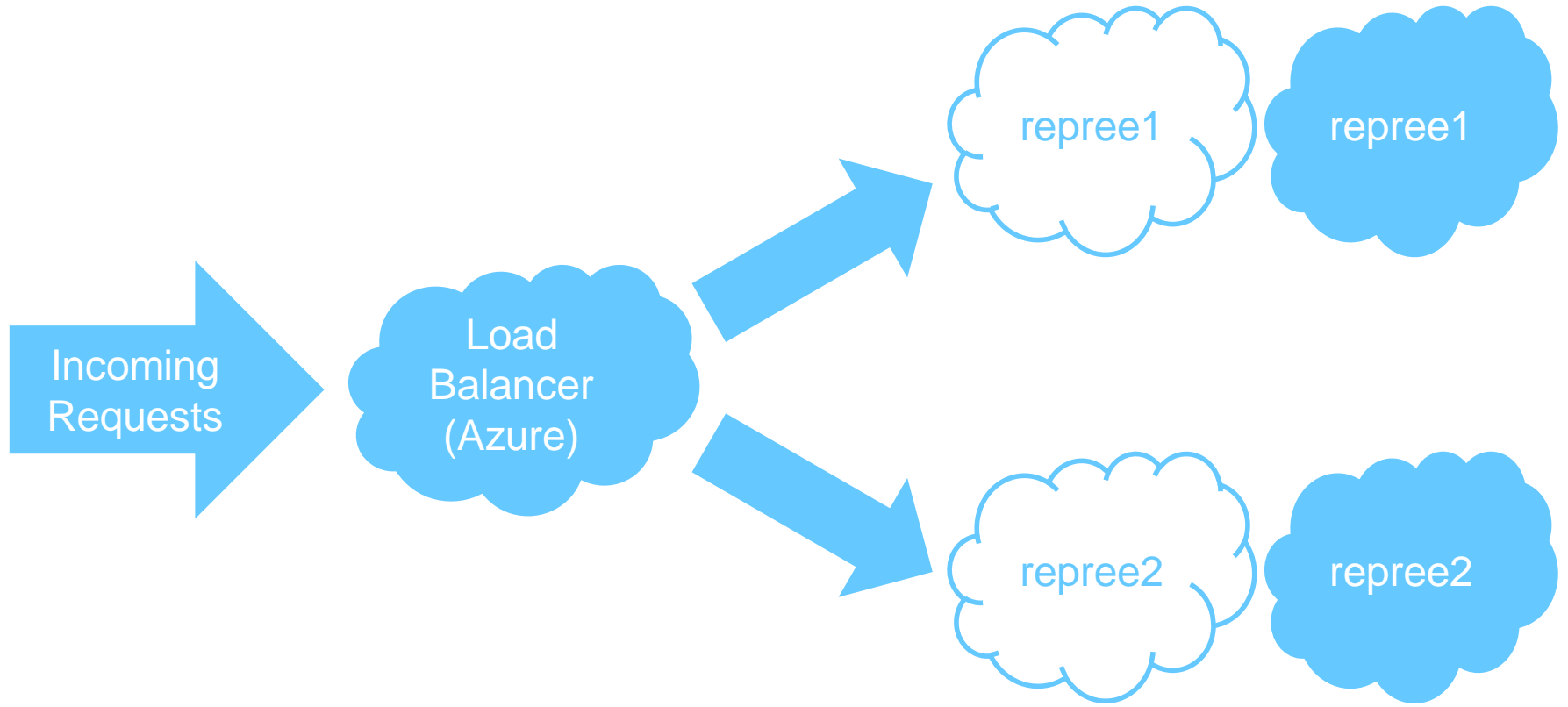
Swapping



Swapping



Swapping



Monitoring

(2) Glip

← → ↻ ⓘ https://app.glip.com

repre

JR Rafols

Search Glip...

Messages

repre Exception Notifications

Automated Deployment Channel

repre Exceptions - Dev Deployme...

Desk Support Tickets 1

Jira Tickets 1

Application Insights Alerts

Github

SalesForce Exception Channel

Satya Sahoo

Satya Sahoo, Steve Kenway

Carlo Panorel, Steve Kenway

Carlo Panorel, Hasan Qureshi, Stev...

Carlo Panorel, Hasan Qureshi, Jarry...

Saransh Singh, Steve Kenway

Brent Lauinger, Jarryl Bhagwat, Ste...

Jarryl Bhagwat

```
at System.Web.HttpResponse.set_Contenttype(String value)
at System.Web.Mvc.JsonResult.ExecuteResult(ControllerContext context)
at System.Web.Mvc.ControllerActionInvoker.<>cDisplayClass1a.<InvokeActionResultWithFilters>b17()
at System.Web.Mvc.ControllerActionInvoker.InvokeActionResultFilter(IResultFilter filter, ResultExecutingContext
preContext, Func`1 continuation)
at System.Web.Mvc.ControllerActionInvoker.InvokeActionResultWithFilters(ControllerContext controllerContext,
IList`1 filters, ActionResult actionResult)
at System.Web.Mvc.Async.AsyncControllerActionInvoker.<>cDisplayClass25.
<BeginInvokeAction>b22(IAsyncResult asyncResult)
at System.Web.M...see AppInsights for full details
```

repre Exception 3:07 PM

Exception while printing signing session report, Error: The remote host closed the connection. The error code is 0x800703E3.

SigningSessionId: d7a94567-b357-4f67-9d06-5b012baa39bd

User: jayloughhayes

Details: System.Web.HttpException (0x800703E3): The remote host closed the connection. The error code is 0x800703E3.

at System.Web.Hosting.IIS7WorkerRequest.RaiseCommunicationError(Int32 result, Boolean throwOnDisconnect)

at System.Web.Hosting.IIS7WorkerRequest.ExplicitFlush()

at System.Web.HttpResponse.Flush(Boolean finalFlush, Boolean async)

at System.Web.HttpResponse.End()

at repreWebRole.Controllers.SignController.Print(Guid id)

+

Post a message for repre Exception Notifications

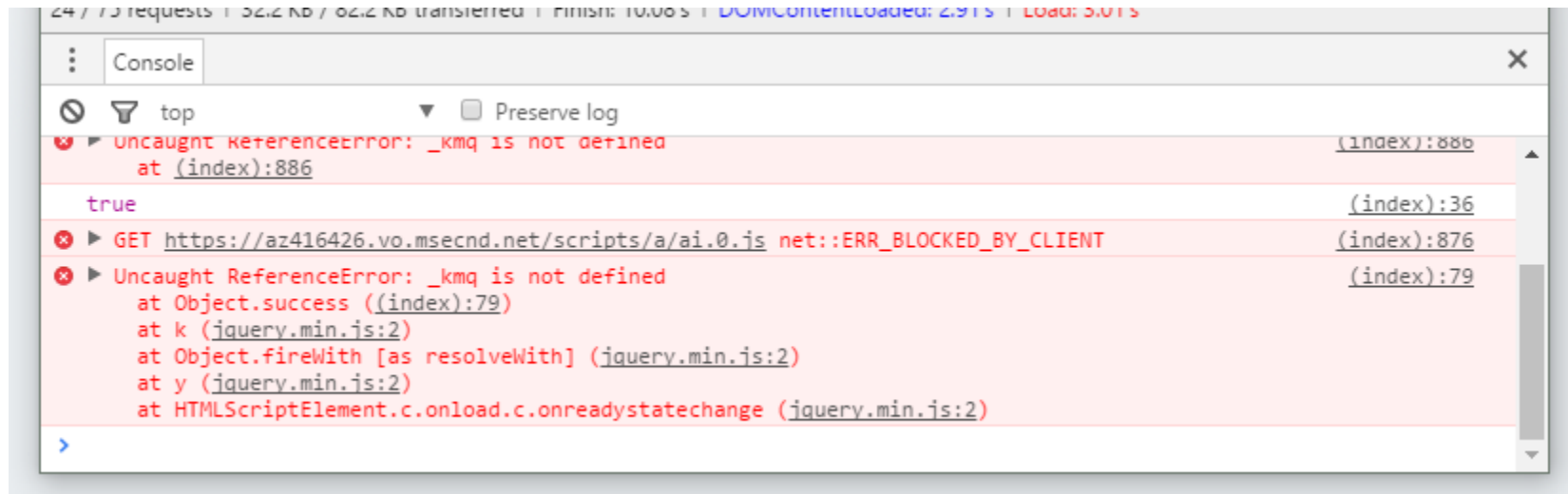
🔗 😊 gif

🖼 ⚙

- ▣ Verify the swap
- ▣ Notify team of the changes
- ▣ Continue to monitor exception channel

All done....or are we?

Uh-oh

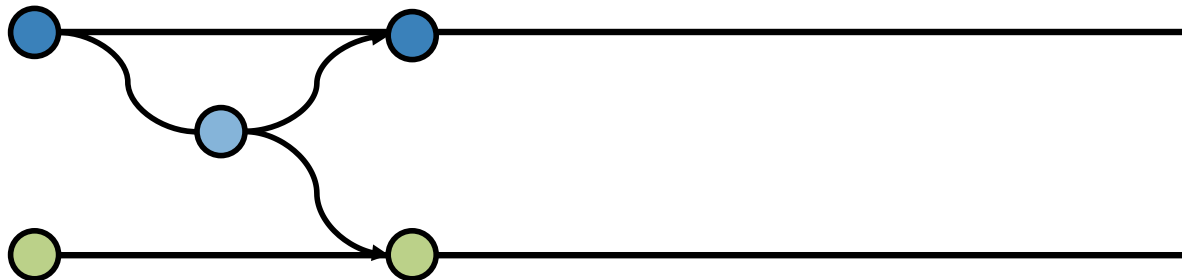


Swap Back?

- ❑ Previous build is still in the staging slot
- ❑ Assess severity of the bug

Hotfix?

- ❑ (or follow normal process?)
- ❑ What is the state of the Dev and Master branches?



Issue: Javascript syntax issue broke the app for IE

Action Taken: Issue was discovered in < 1h, fix was deployed ~1h after that

Lessons learned:

- Functional Test/Smoke test on IE
- JS Linting – to be added

Issue: Endpoint was inaccessible for one instance

Action Taken: Route all traffic to working endpoint. Redeploy. Contact Microsoft.

Lessons Learned:

- Verify each endpoint following swap

Issue: DB Update needed over Christmas break
to support Business initiative

Action Taken: Had to wait to deploy migration

Lessons Learned:

- Allow changes via the UI as much as possible
- Improve processes (communication, coverage)

- ❑ Issue Tracking: **JIRA**
- ❑ Development: **C#, ASP.NET MVC, Javascript**
- ❑ Web Services: **Windows Azure**
- ❑ Version Control: **Github**
- ❑ Testing: **Selenium**
- ❑ Build: **TeamCity, Powershell**
- ❑ Monitoring: **Application Insights, Glip**

- TDD & Unit testing
- Javascript build pipeline
- Improved regression testing
- One change per deployment
- Pushing code to live users

THANKS!

Any questions?

You can find me at
jrrafols@repreel.com

Slides: <https://github.com/jrrafols/continuous-deployment-presentation>