



A TECHWELL EVENT

T9

Performance Testing

Thursday, October 4th, 2018 11:15 AM

Agile Performance Testing in the Real World

Presented by:

Amit Patel

Total Performance Consulting

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Amit Patel

As founder and CEO of Total Performance Consulting, Amit Patel brings more than fifteen years of experience in performance engineering, quality assurance, and software testing. Amit prides himself on being a vital part of his client's development team, delivering world-class performance engineering, quality assurance, and test automation during all stages of an application lifecycle. He is responsible for the firm's delivery of software quality and performance solutions. Amit has successfully delivered testing solutions to companies from startups to large enterprises in retail, banking, financial services, and education. Connect with Amit on LinkedIn or follow him on Twitter at @aapatel.

AGILE PERFORMANCE TESTING IN THE REAL WORLD

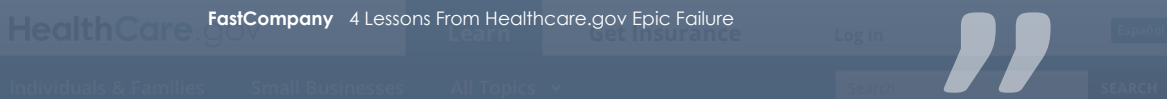
Amit Patel
Total Performance Consulting

PERFORMANCE



“

The **HealthCare.gov fiasco** is a clear example of how businesses can seriously undermine their business goals when launching a new app or user platform. **Brands must do performance testing** even when their app or website has much smaller loads than HealthCare.gov.



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OTHERS...



Nordstrom's website is crashing on one of the retailer's biggest shopping days of the year



Our app is currently down and we're working hard to get it back up and running for you! We apologize for any inconvenience. If you're a current member and had to pay out of pocket, please submit your ticket stub or receipt to refunds@moviepass.com.

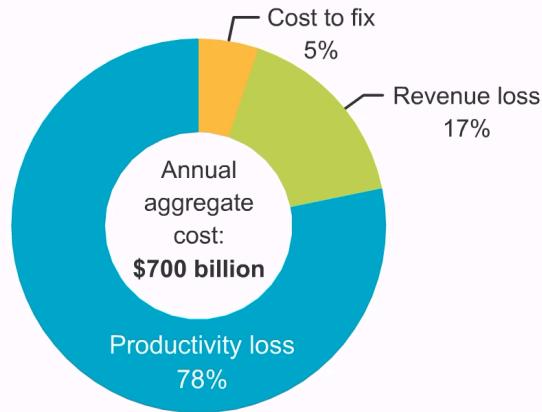


At least four retailers — Macy's, Lowe's, and U.K.-based retailers the Perfume Shop and Game — were affected by technical glitches on Black Friday that slowed purchasing activity and transaction processing on the busiest shopping day of the year. In each case, the problems were reportedly resolved within hours.



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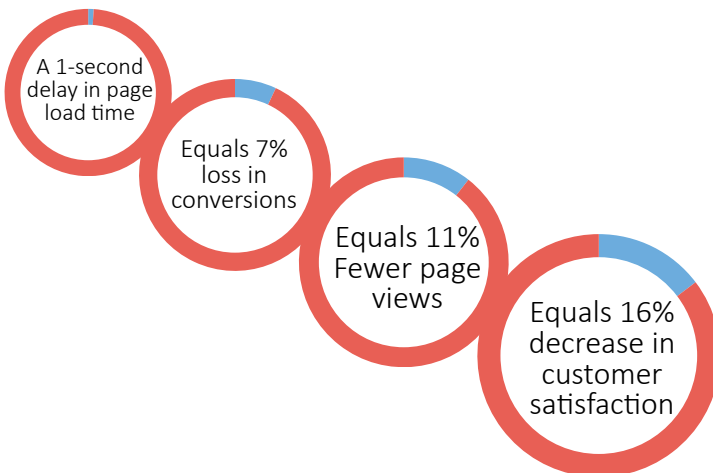
IT downtime costs North American businesses \$700 billion annually, mostly due to loss of employee productivity



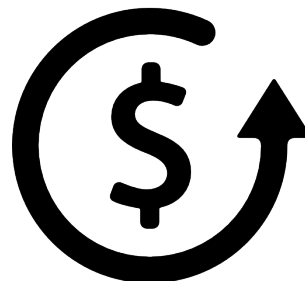
© IHS, *IHS Infonetics The Cost of Server, Application, and Network Downtime: Annual North American Enterprise Survey and Calculator; 2016*



PERFORMANCE MATTERS



IN DOLLAR TERMS, this means that if your site earns \$100,000 a day, you could lose **\$2.5 MILLION** in sales.



NOT ALL ABOUT THE MONEY

Is the risk of customer complaints really worth not performance testing?

Predicable deployments

Understand scalability with or w/o cloud

CDN performance

Container scalability

Customer satisfaction

Proper infrastructure sizing



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More frequent releases

Automation implemented as part of the SDLC, some CI, CD maybe not

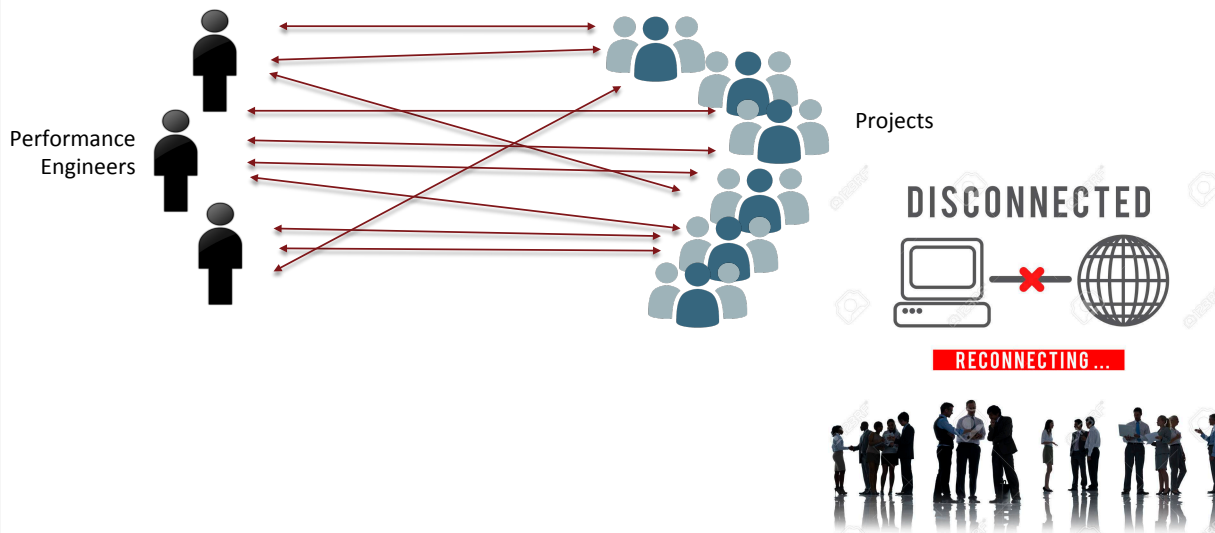
Teams still not fully connected



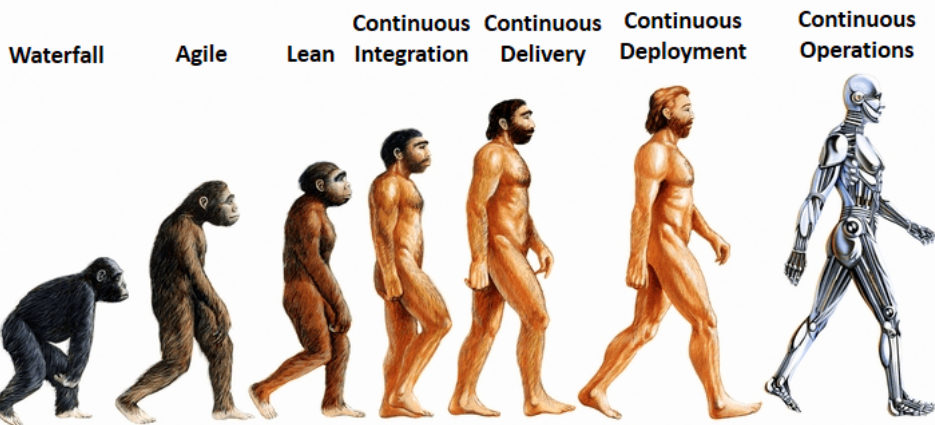
Performance still often left until the end

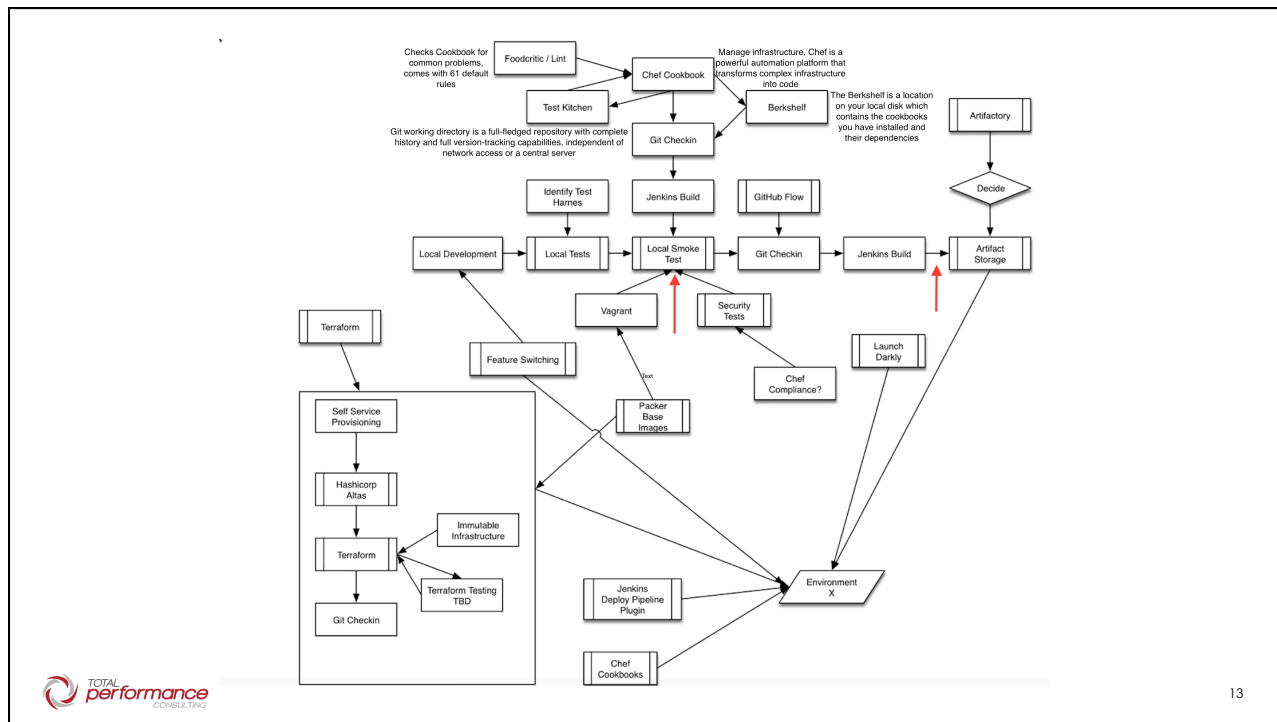
Performance often not included until major releases

CHALLENGES



DevOps Movement





NEW REQUIREMENTS

- Start to think about performance early from requirements to initial architecture decisions
- Include performance as stories and backlog items
- Integrate with different team members
- Testability
- Creating Performance Defects

TEAMWORK



MEETINGS

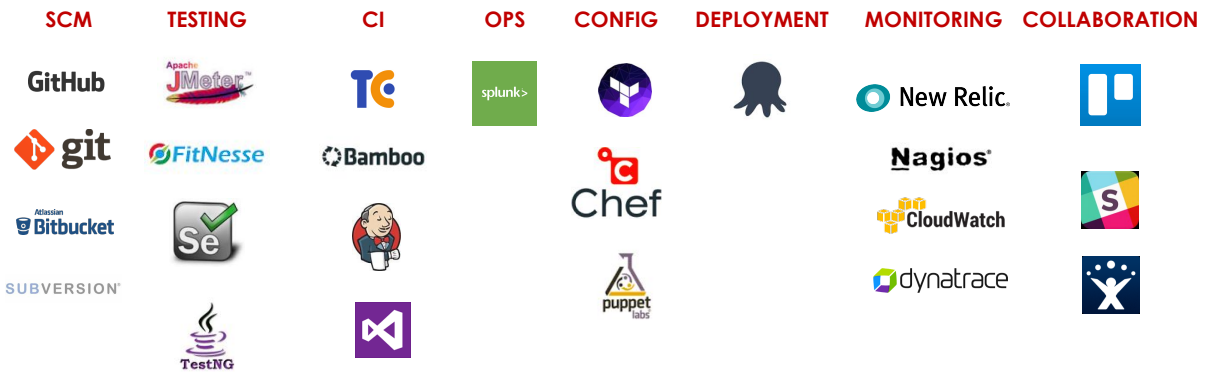


FEEDBACK

AUTOMATION AUTOMATION AUTOMATION

- DevOps emphasizes automation
- Build performance into the DevOps automation process
- More data analysis conducted
- Testing is automated
- Scripting challenges

DEVOPS TOOLS



LOAD TESTING TOOLS

TYPICAL REQUIREMENTS:

- Project and product requirements
- Cloud based load
- Internal vs external traffic or both
- Skill sets required
- Budget

THINGS TO ALSO CONSIDER:

- Integration with CI solutions (s)
- Monitoring integrations
- SLAs
- API testing



CI TOOLS

- Scheduling performance tests
- SLA pass/fail (error rates, response times, throughput...)
- Allows data to be trended over time (Response Times, Errors, Throughput...)



APM SOLUTIONS

- Production feedback loop
- Monitoring QA and Staging environments
- Compare Pre-PROD data with PROD
- Automate collection of data

APPDYNAMICS

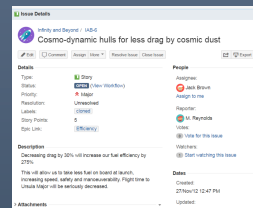
PINPOINT

 New Relic®

 dynatrace

PRODUCTION FEEDBACK LOOP

Name	Combined Avg	Page Views	Browser Avg	Server Avg	Avg Dom Processing Duration	DomProcessing Duration (95%)	Avg Page Rendering Duration	Page Rendering Duration (95%)	Combined (95%)	Browser 95%	Backend (95%)	Impact Rate
Search	6.50	190128	4.60	1.90	2.29	6.61	2.30	8.38	16.05	12.03	4.02	3,051,364
Login	8.77	76081	1.37	7.41	1.27	4.32	0.10	0.22	34.62	2.33	32.28	2,633,696
View Cart	15.93	29486	14.60	1.33	14.54	49.75	0.06	0.12	50.82	48.52	2.30	1,498,508
Add To Cart	11.59	10640	9.10	2.49	9.05	34.01	0.05	0.09	38.35	33.76	4.59	408,055
Checkout	19.33	5998	18.25	1.08	18.20	60.56	0.05	0.11	61.88	60.00	1.89	371,168
Category	6.92	3841	3.15	3.76	2.11	4.60	1.04	2.95	32.68	4.28	28.39	125,505
Registration	12.33	2621	11.73	0.60	11.68	46.93	0.05	0.15	47.64	46.57	1.07	124,857
My account	13.26	3898	0.75	12.52	0.71	2.04	0.04	0.11	30.64	1.02	29.62	119,431
Update password	32.00	1056	30.08	1.92	30.00	93.94	0.08	0.36	97.23	92.03	5.21	102,679
Delete item from cart	6.16	2749	0.92	5.23	0.90	2.51	0.03	0.04	30.04	0.74	29.30	82,591
Homepage	12.96	1597	12.30	0.66	12.23	41.88	0.07	0.13	42.86	41.57	1.29	68,439
Filter/Facet	8.17	4783	1.37	6.80	0.86	6.00	0.51	0.11	12.45	1.70	10.75	59,539
Search	6.07	1903	0.71	5.36	0.68	1.58	0.03	0.11	26.96	1.14	25.81	51,299
Login	5.77	1830	3.82	1.95	0.65	2.04	3.17	15.00	19.44	14.72	4.71	35,568
View Cart	19.18	600	17.96	1.21	0.37	0.78	17.60	46.41	50.37	47.24	3.13	30,223
Add To Cart	7.70	1138	6.43	1.27	6.41	20.92	0.02	0.04	24.04	17.62	6.41	27,352



APM DEPLOYMENT

QA

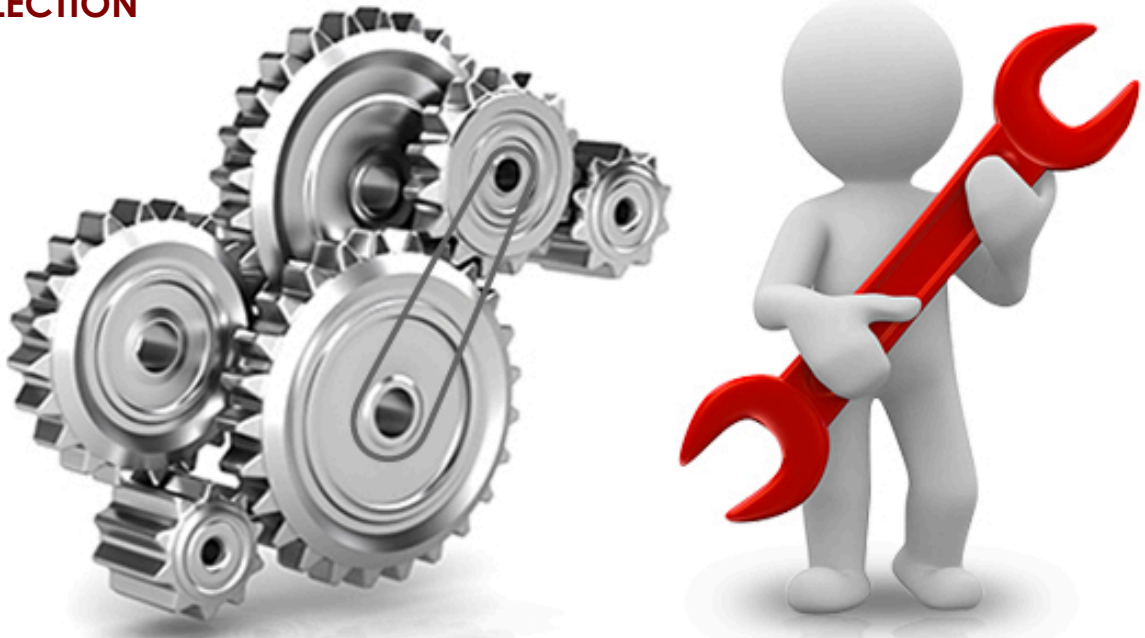
STAGE

PROD

DEPLOY APM TOOL IN ALL ENVIRONMENT

COMPARE DATA ACROSS ENVIRONMENT

AUTOMATING DATA COLLECTION



NEXT STEPS



1. Requirements and KPIs
2. Setup Performance CI Environment
3. Performance Scripting Process
4. Define your SLAs
5. Results incorporated into CI solution

REQUIREMENTS & KPIs

- Understanding what is the goal and KPIs required for success
- Understanding cross team requirements
- Types of Tests
- Team responsibilities



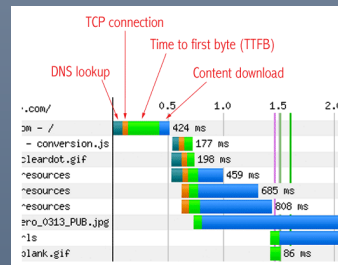
Sample KPIs

- Database query performance
- Traffic being sent Mb/s
- Right amount of logging
- Response times
- Time to deploy new code
- Rollback time
- Response sizes

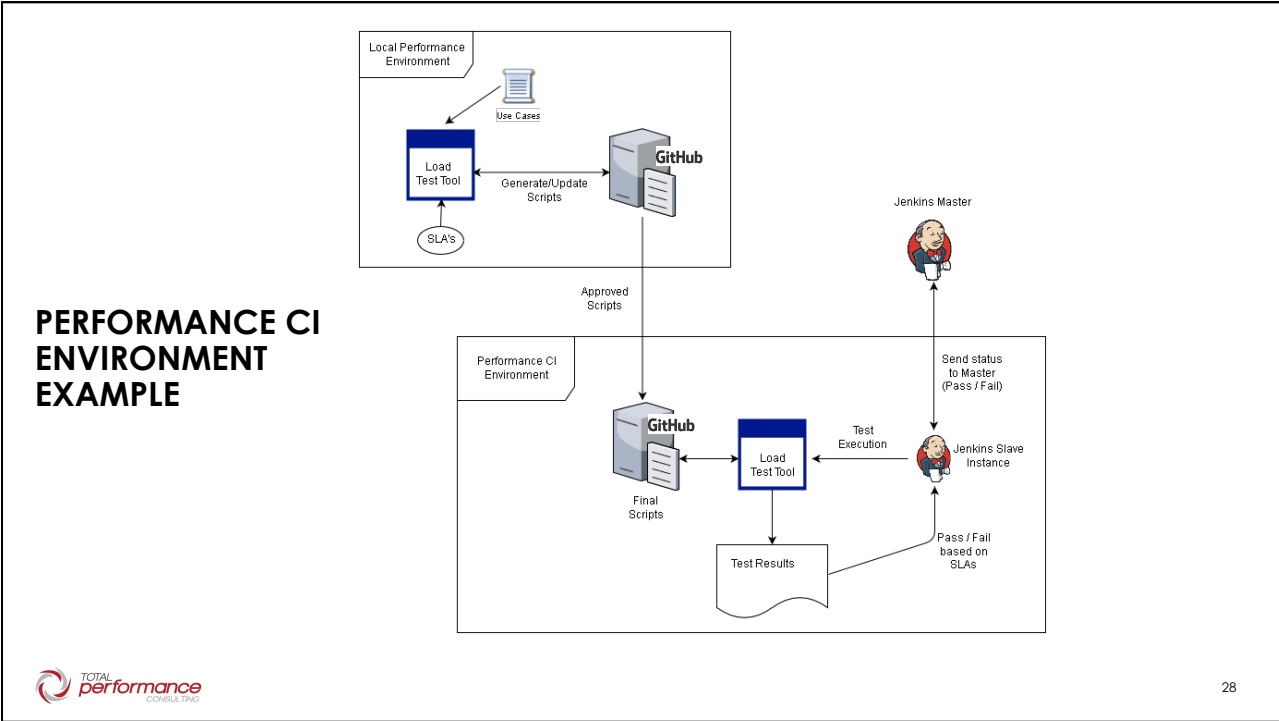
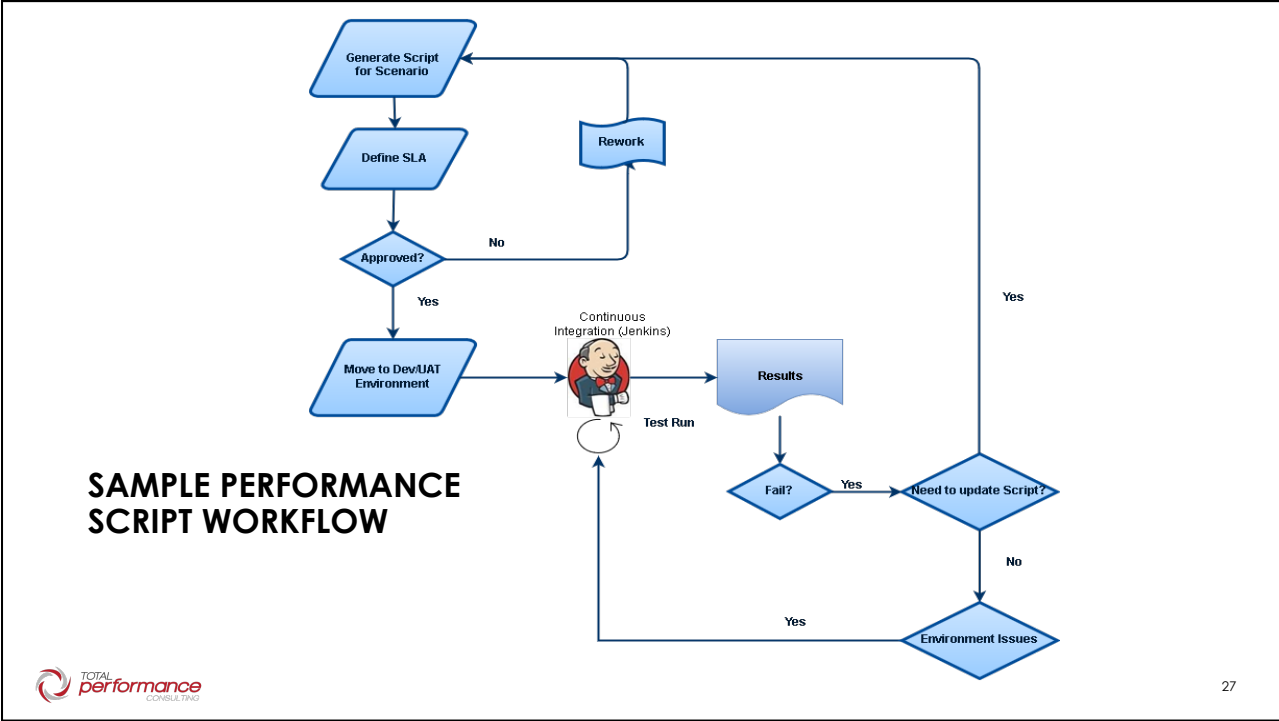
25

TYPES OF TESTS

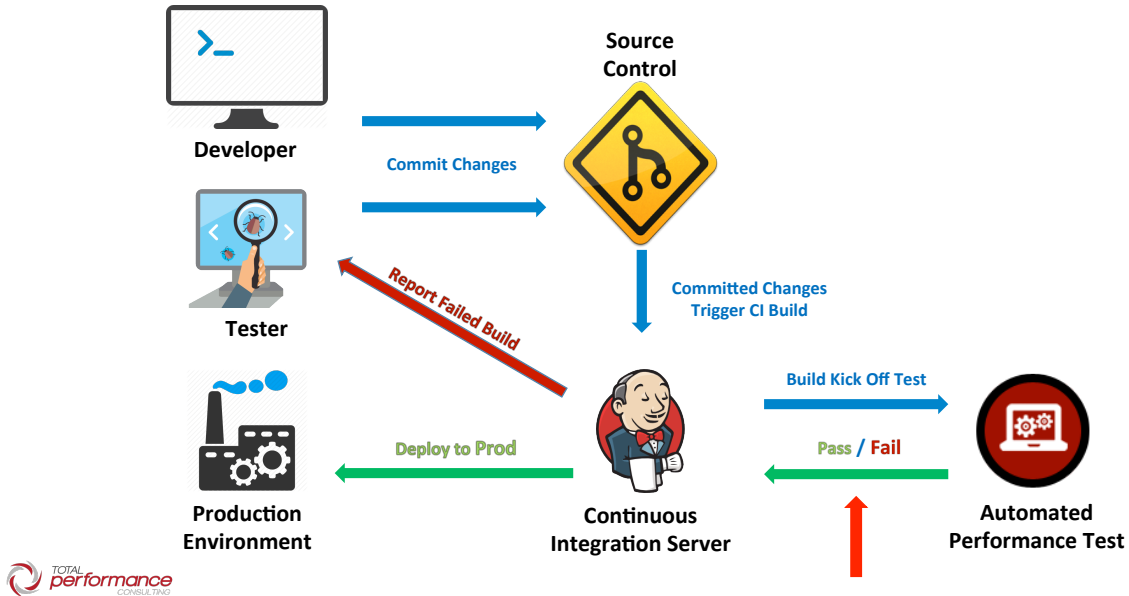
- End-User tests (UI)
- Traditional load tests
 - Scaled down tests
 - Large scale tests
 - Memory leak tests
- API tests (Service level tests)
- Integration tests



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HIGH-LEVEL AUTOMATION WORKFLOW EXAMPLE



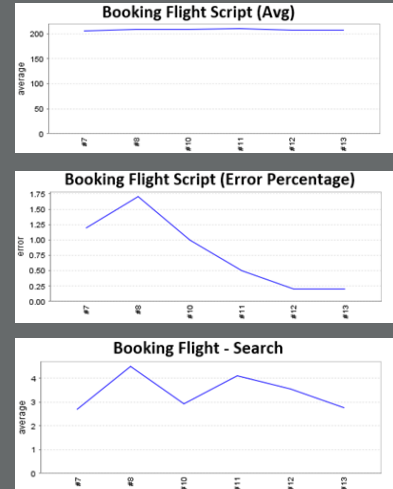
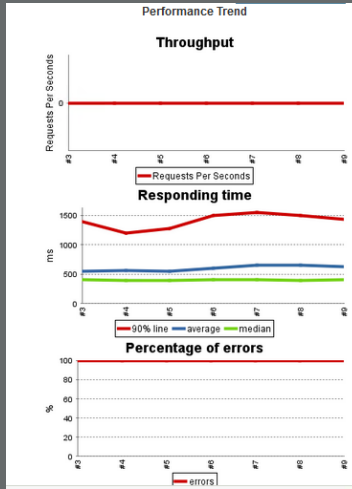
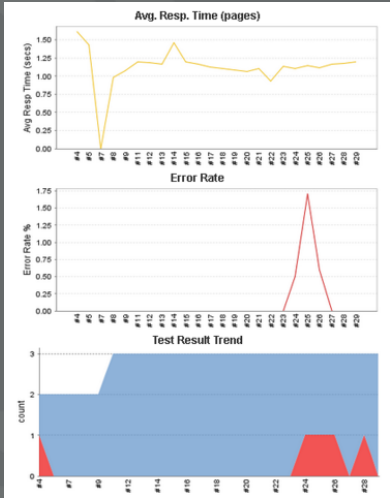
29

SLAs

- Transaction level response times
- Request response times
- API response times
- Use case / script level response times
- Total # of Errors / Error rate
- Throughput
- Response sizes

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RESULTS



KEY CHALLENGES



- Integration Timeouts
- Unable to diagnose and resolve issues

3

Back to back months of integration call issues

50%

Handled only 50% of projected peak traffic

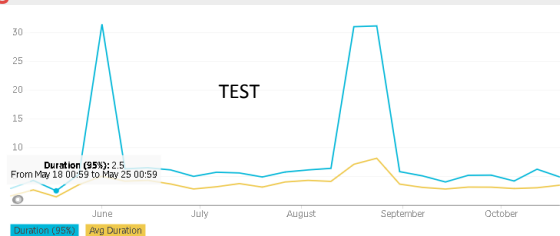
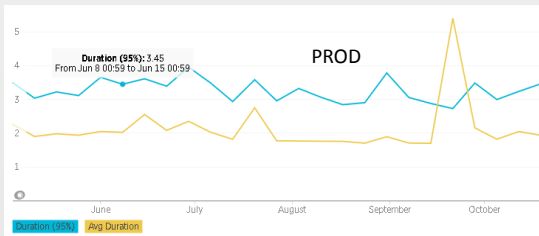
10

Struggled to handle 10 concurrent users without seeing integration errors

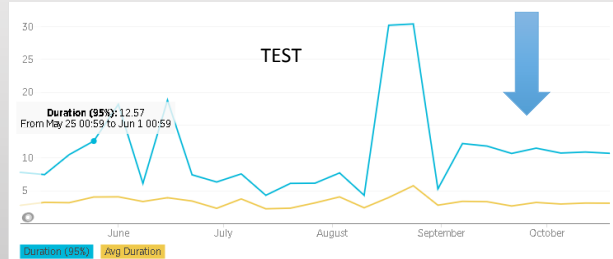
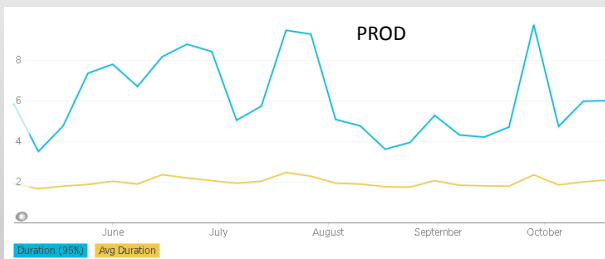


CASE OF THE INTEGRATION CALLS

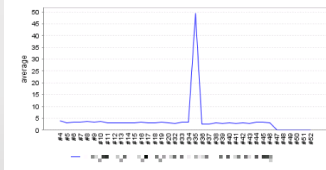
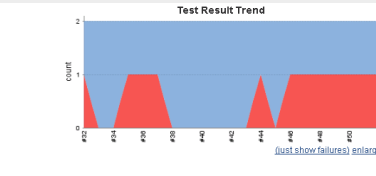
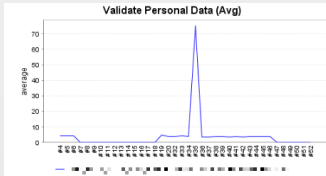
ProductIntegrationDLL



BankIntegrationDLL



TESTING INTEGRATION CALLS



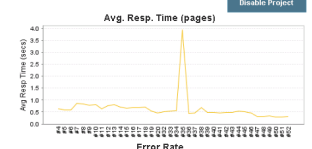
- [Back to Dashboard](#)
- [Status](#)
- [Changes](#)
- [Workspace](#)
- [Build Now](#)
- [Delete Project](#)
- [Configure](#)
- [Copy Project](#)

Project Integration Calls Test

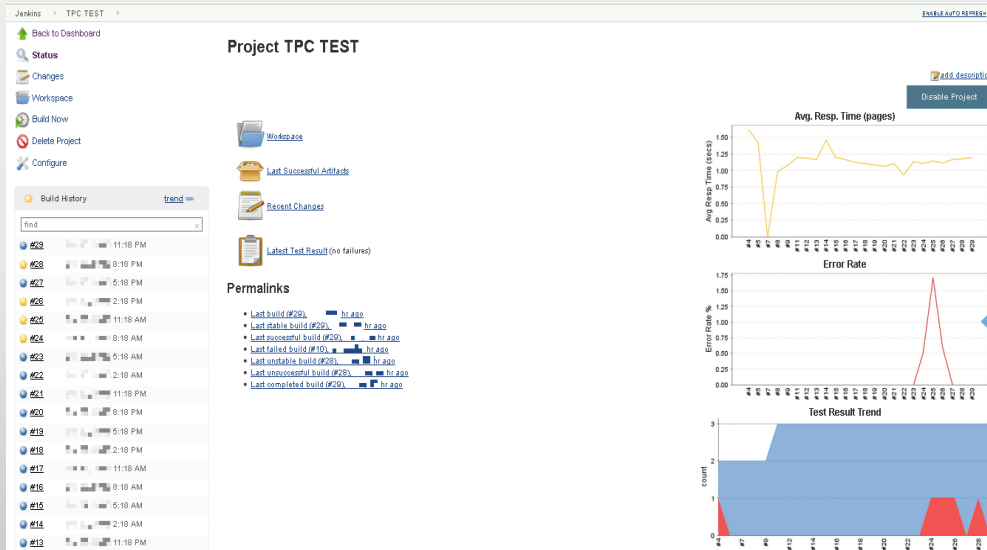
- [Workspace](#)
- [Last Successful Artifacts](#)
- [Recent Changes](#)
- [Latest Test Result \(1 failure / 1 st\)](#)

Build	Status	Time	Artifacts
452	Success	AM	
451	Success	PM	
450	Success	PM	
449	Success	PM	
448	Success	PM	
447	Success	PM	
446	Success	PM	
445	Success	PM	
444	Success	PM	
443	Success	PM	
442	Success	PM	
441	Success	PM	
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439	Success	PM	
438	Success	PM	
437	Success	PM	
436	Success	PM	
435	Success	PM	
434	Success	PM	

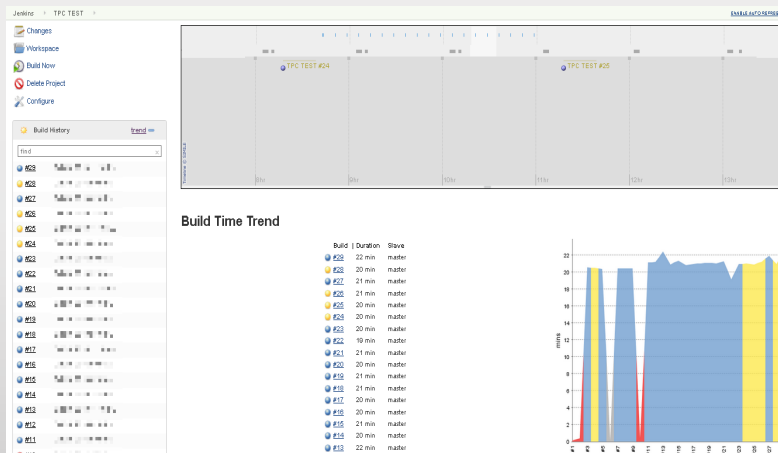
- Permalinks**
- [Last build \(#52\), 1 hr 2 min ago](#)
 - [Last stable build \(#45\), 18 hr ago](#)
 - [Last successful build \(#52\), 1 hr 2 min ago](#)
 - [Last unstable build \(#52\), 1 hr 2 min ago](#)
 - [Last unsuccessful build \(#52\), 1 hr 2 min ago](#)
 - [Last completed build \(#52\), 1 hr 2 min ago](#)



CI SERVICE LEVEL TESTS



CI SERVICE LEVEL TESTS – BUILD TRENDS

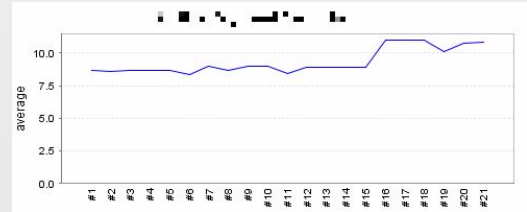


UI LEVEL TESTS – TRANSACTION TRENDS

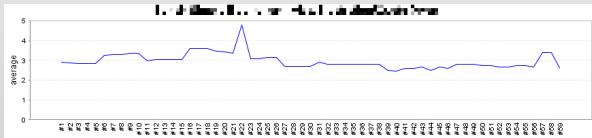
Print



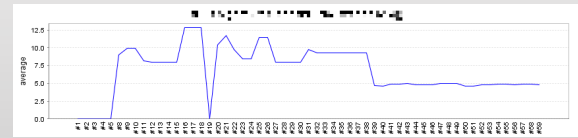
Approve Case



Review Application



Search

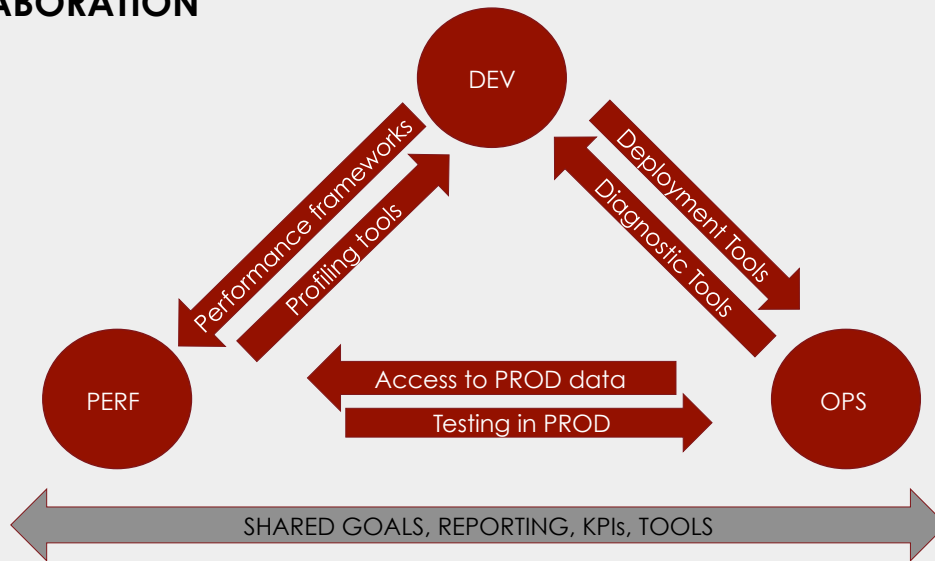


TAKE AWAYS

- Collaboration
- Testability
- Setting up the right tests
- Comparing results over time
- Automate result collection

AUTOMATE, LEARN, UPDATE, ITERATE

COLLABORATION



ADDITIONAL THOUGHTS

- 1 Incorporate performance into every team
- 2 Plan for large scale on-demand tests
- 3 Notifications (i.e. Emails, Chat)



QUESTIONS

THANK YOU FOR ATTENDING THIS SESSION

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