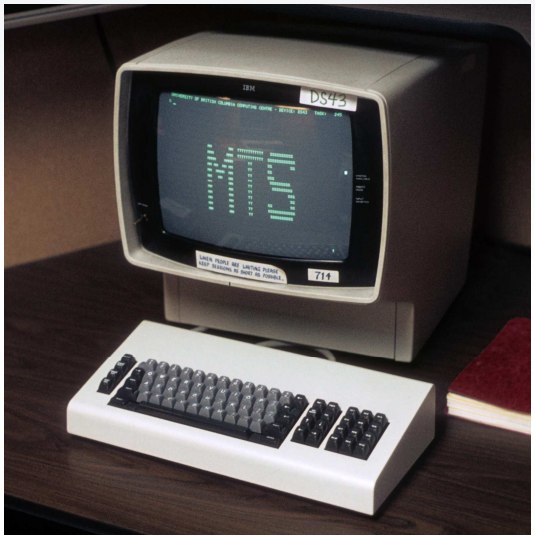
Compuware APM

CONTINUOUS ARCHITECTURE VALIDATION

Wolfgang Gottesheim
Compuware APM

Compuware

Compuware?



+ dynaTrace software

= Compuware APM

What We Do

Business

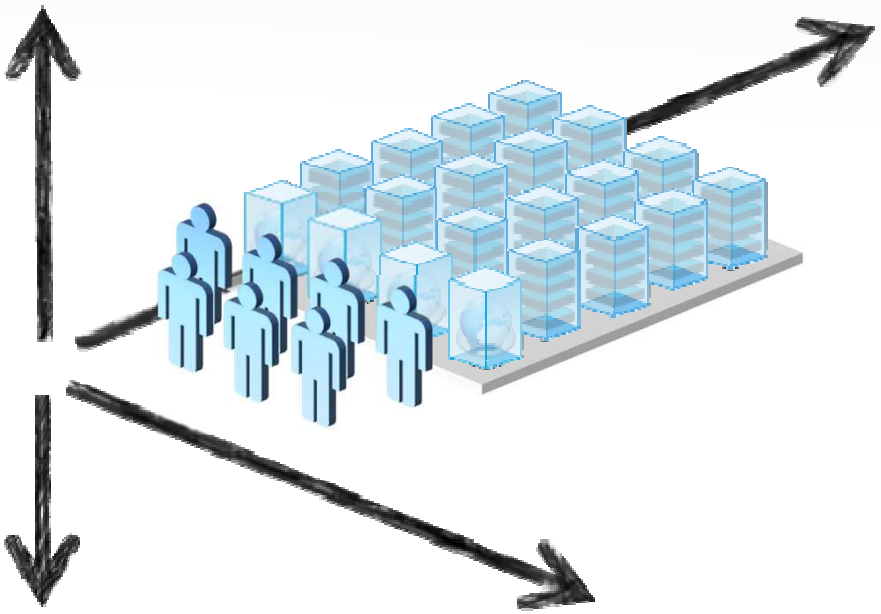
User Experience

Service Level Mgmt.

Impact Analysis

Transaction Types

Conversions



End-to-end transaction capture

Across Java, .NET, PHP, Mainframe, NGINX,...

Deep

Code-Level

Context Information

Full Coverage

24x7 Transaction Tracing

All Transactions & Users

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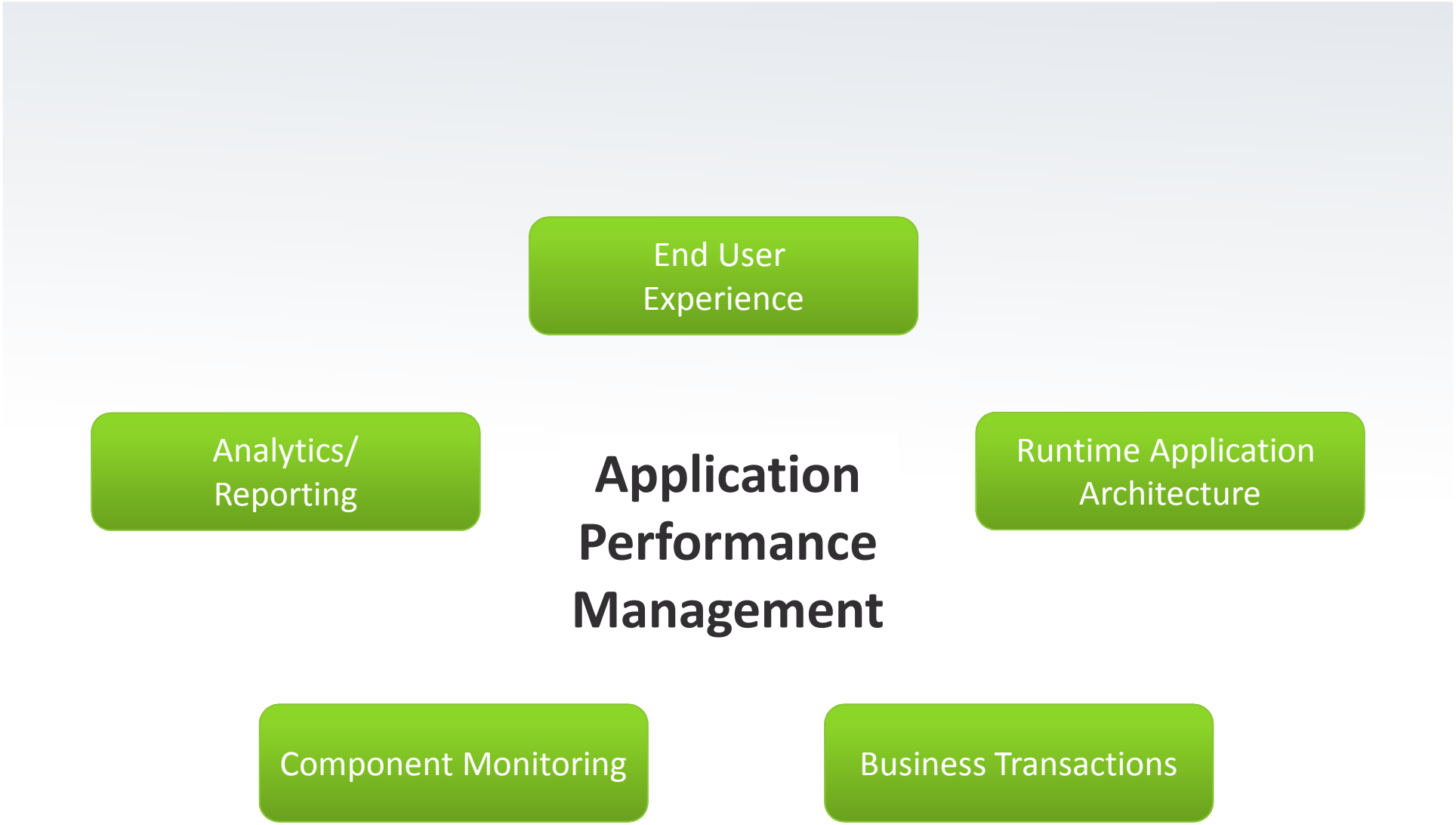
Why do we care about architectures?


End User Experience
Analytics/ Reporting
Application Performance Management
Runtime Application Architecture
Component Monitoring
Business Transactions

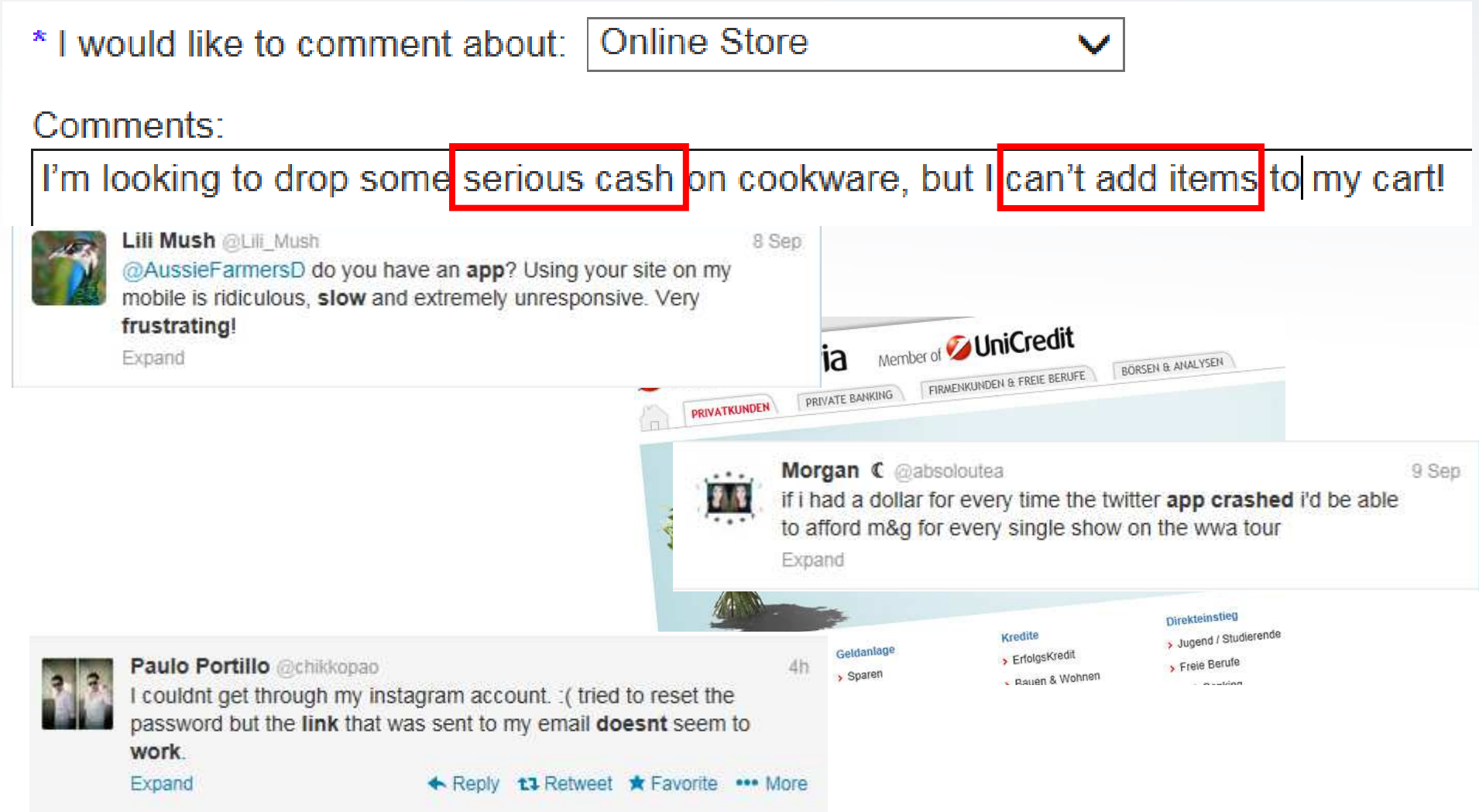
Runtime Application Architecture

…from a performance angle

- Understand relations and dependencies at runtime
- Raise awareness for performance impact of architectural problems among developers, testers, operators
- Help with the identification and resolution of architectural problems

- How does architecture relate to performance issues?

The Problems We Solve



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What We Often See

"I couldn't help but notice your pain."

"My pain?"

"It runs deep. Share it with me!"

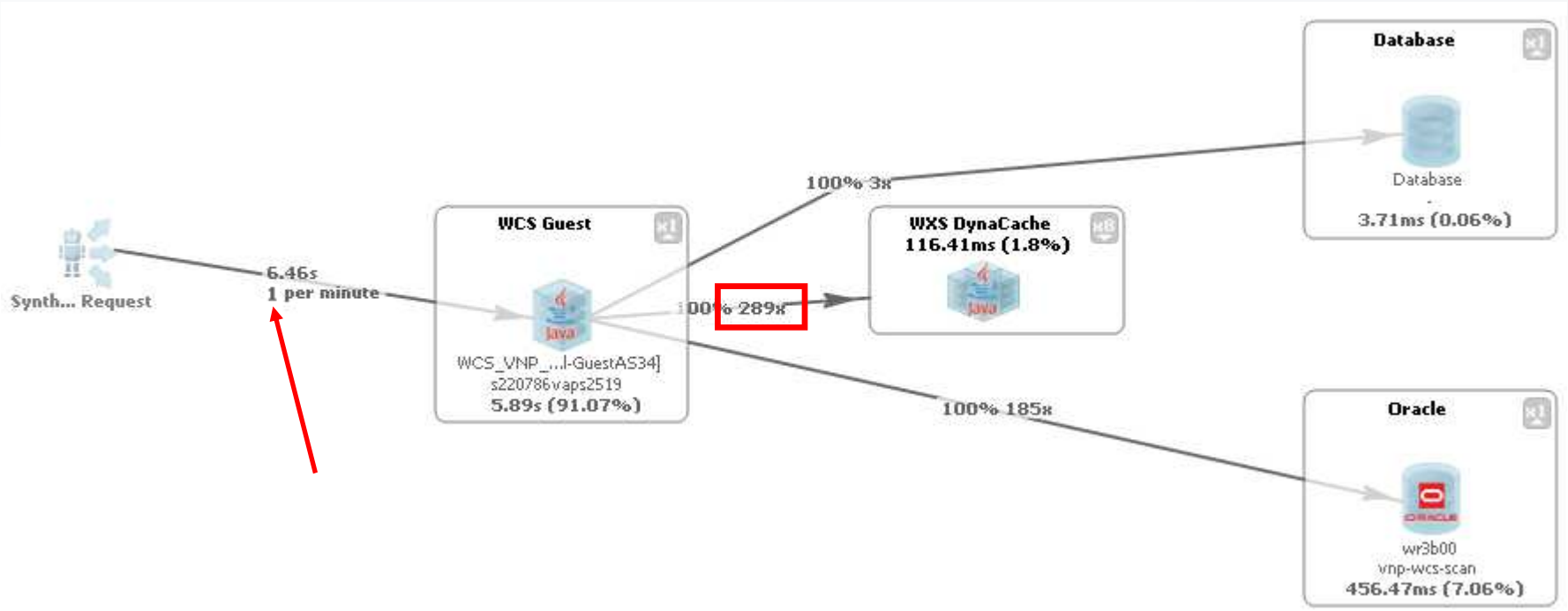
(Star Trek V)

- Performance is not a band aid you can stick on your application
- Architecture has enormous influence on performance

→ You have to make sure your architecture supports your performance requirements!

How does your architecture become a problem for performance?

#1: Chatty Components



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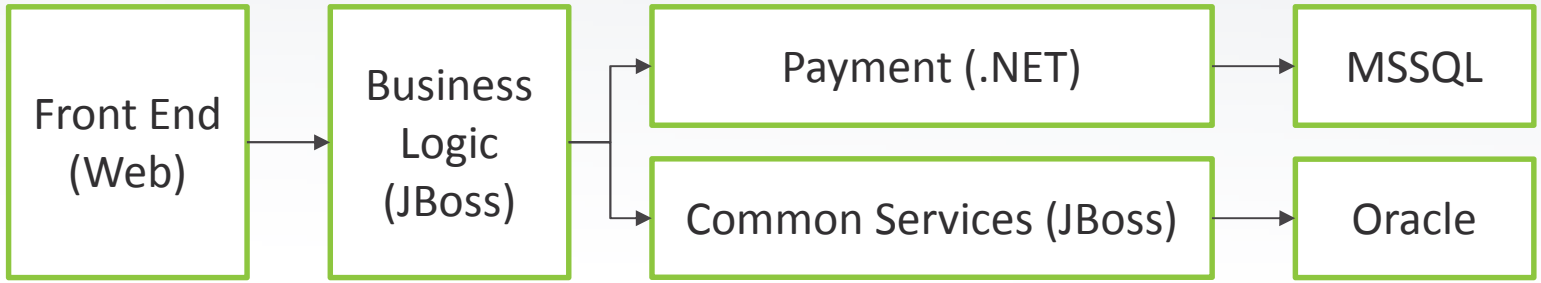
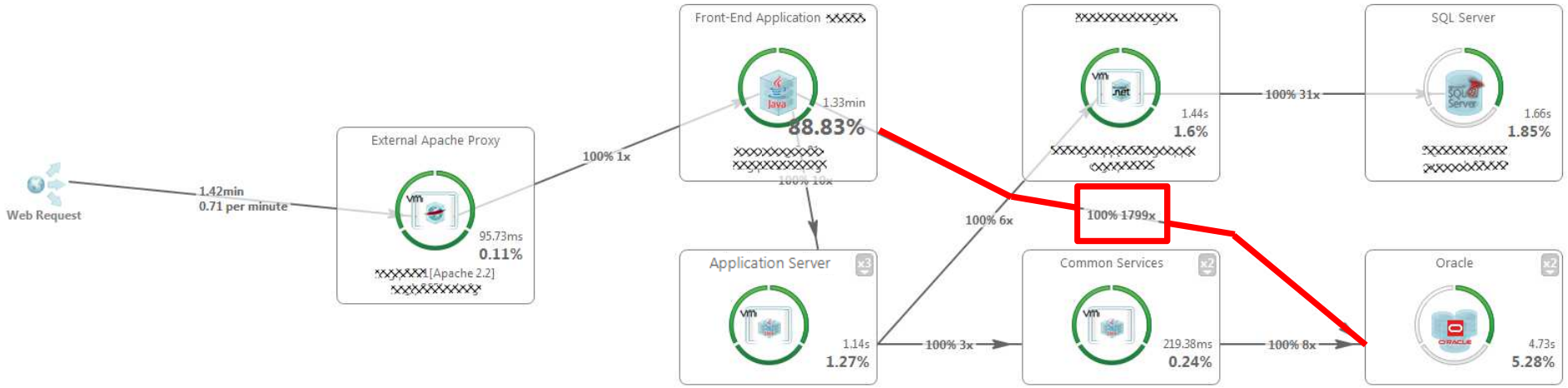
#2: Implementation Flaws





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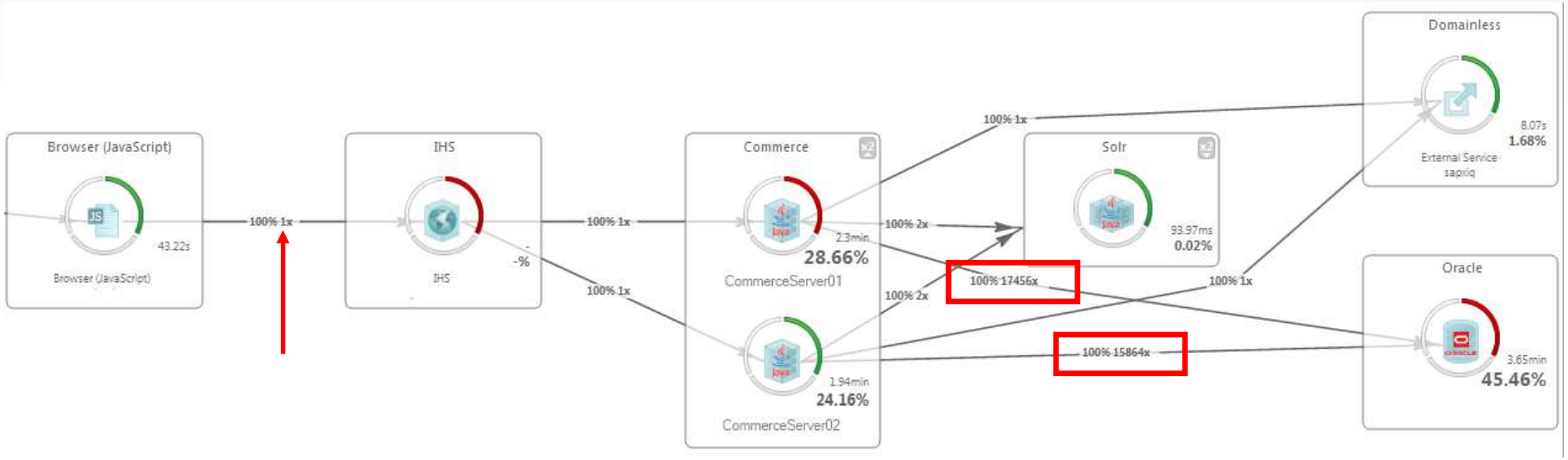
#3: Too Many Database Calls



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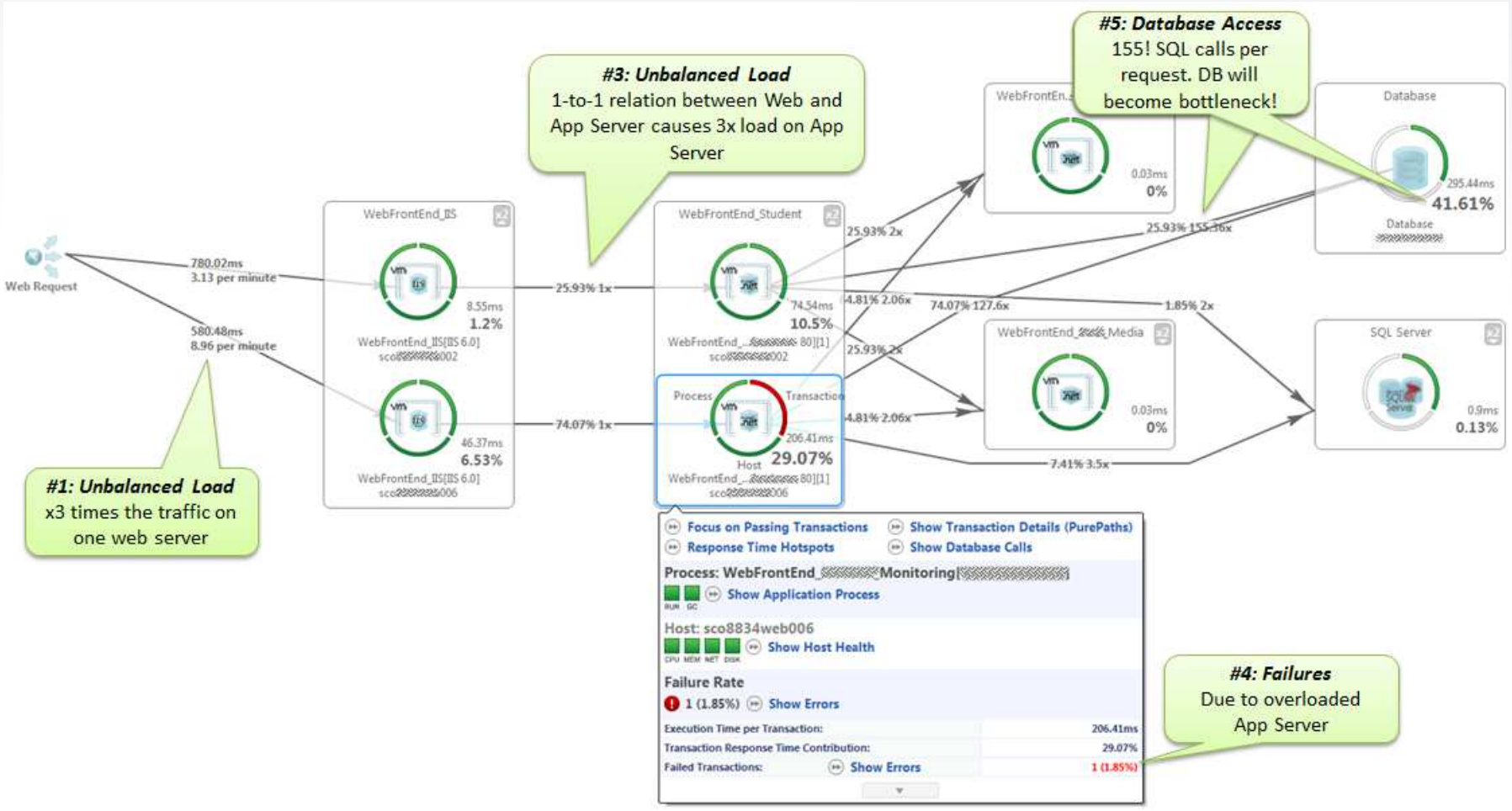
#3: Too Many Database Calls

Method	Argument	Exec Total [ms]	Breakdown	Class	API
prepare()	SELECT v.name AS name, v.value AS value FROM variable v WHERE (name IN (:db_condition_placeholder_0, :db_co...	0.02	cpu (93.0%) io	PDO	Database
execute()	SELECT v.name AS name, v.value AS value FROM variable v WHERE (name IN (:db_condition_placeholder_0, :db_co...	1.06	io (93.0%)	PDOStatement	Database
prepare()	SELECT value FROM variable WHERE name = :name	0.04	cpu (95.0%) io	PDO	Database
execute()	SELECT value FROM variable WHERE name = :name	0.91	io (93.0%)	PDOStatement	Database
prepare()	SELECT value FROM variable WHERE name = :name	0.01	cpu (93.0%) io	PDO	Database
execute()	SELECT value FROM variable WHERE name = :name	1.79	cpu (53.0%) io (47.0%)	PDOStatement	Database
prepare()	SELECT value FROM variable WHERE name = :name	0.02	cpu (91.0%) io	PDO	Database
execute()	SELECT value FROM variable WHERE name = :name	0.61	cpu io (88.0%)	PDOStatement	Database
prepare()	SELECT value FROM variable WHERE name = :name	0.02	cpu (91.0%) io	PDO	Database
execute()	SELECT value FROM variable WHERE name = :name	1.01	io (95.0%)	PDOStatement	Database
prepare()	SELECT value FROM variable WHERE name = :name	0.02	cpu (91.0%) io	PDO	Database
execute()	SELECT value FROM variable WHERE name = :name	0.72	io (93.0%)	PDOStatement	Database
prepare()	SELECT value FROM variable WHERE name = :name	0.05	cpu (51.0%) io (49.0%)	PDO	Database
execute()	SELECT value FROM variable WHERE name = :name	0.61	cpu io (89.0%)	PDOStatement	Database
prepare()	SELECT value FROM variable WHERE name = :name	0.02	cpu (90.0%) io	PDO	Database

SQL	Execs/calling Tran...
SELECT value FROM variable WHERE name = :name	2464.00
INSERT INTO search_total (word, count) VALUES (:db_insert_placeholder_0, :db_insert_placeholder_1)	587.00
UPDATE block SET module=:db_update_placeholder_0, delta=:db_update_placeholder_1, theme=:db_up	296.00

prepare()	SELECT value FROM variable WHERE name = :name	0.02	cpu (93.0%) io	PDO	Database
execute()	SELECT value FROM variable WHERE name = :name	1.41	io (97.0%)	PDOStatement	Database
prepare()	SELECT value FROM variable WHERE name = :name	0.02	cpu (92.0%) io	PDO	Database
execute()	SELECT value FROM variable WHERE name = :name	0.52	io (90.0%)	PDOStatement	Database
prepare()	SELECT value FROM variable WHERE name = :name	0.02	cpu (93.0%) io	PDO	Database
execute()	SELECT value FROM variable WHERE name = :name	0.53	io (91.0%)	PDOStatement	Database
prepare()	SELECT value FROM variable WHERE name = :name	0.02	cpu (90.0%) io	PDO	Database
execute()	SELECT value FROM variable WHERE name = :name	0.53	cpu io (88.0%)	PDOStatement	Database
prepare()	SELECT value FROM variable WHERE name = :name	0.01	cpu (92.0%) io	PDO	Database
execute()	SELECT value FROM variable WHERE name = :name	0.52	io (90.0%)	PDOStatement	Database
prepare()	SELECT value FROM variable WHERE name = :name	0.03	cpu (92.0%) io	PDO	Database
execute()	SELECT value FROM variable WHERE name = :name	0.76	cpu io (88.0%)	PDOStatement	Database
prepare()	SELECT value FROM variable WHERE name = :name	0.01	cpu (92.0%) io	PDO	Database
execute()	SELECT value FROM variable WHERE name = :name	1.58	io (96.0%)	PDOStatement	Database
prepare()	SELECT value FROM variable WHERE name = :name	0.02	cpu (92.0%) io	PDO	Database
execute()	SELECT value FROM variable WHERE name = :name	2.06	io (97.0%)	PDOStatement	Database
prepare()	SELECT value FROM variable WHERE name = :name	0.02	cpu (91.0%) io	PDO	Database
execute()	SELECT value FROM variable WHERE name = :name	0.79	io (93.0%)	PDOStatement	Database
prepare()	SELECT value FROM variable WHERE name = :name	0.02	cpu (92.0%) io	PDO	Database

#4: Architecture affected by Deployment



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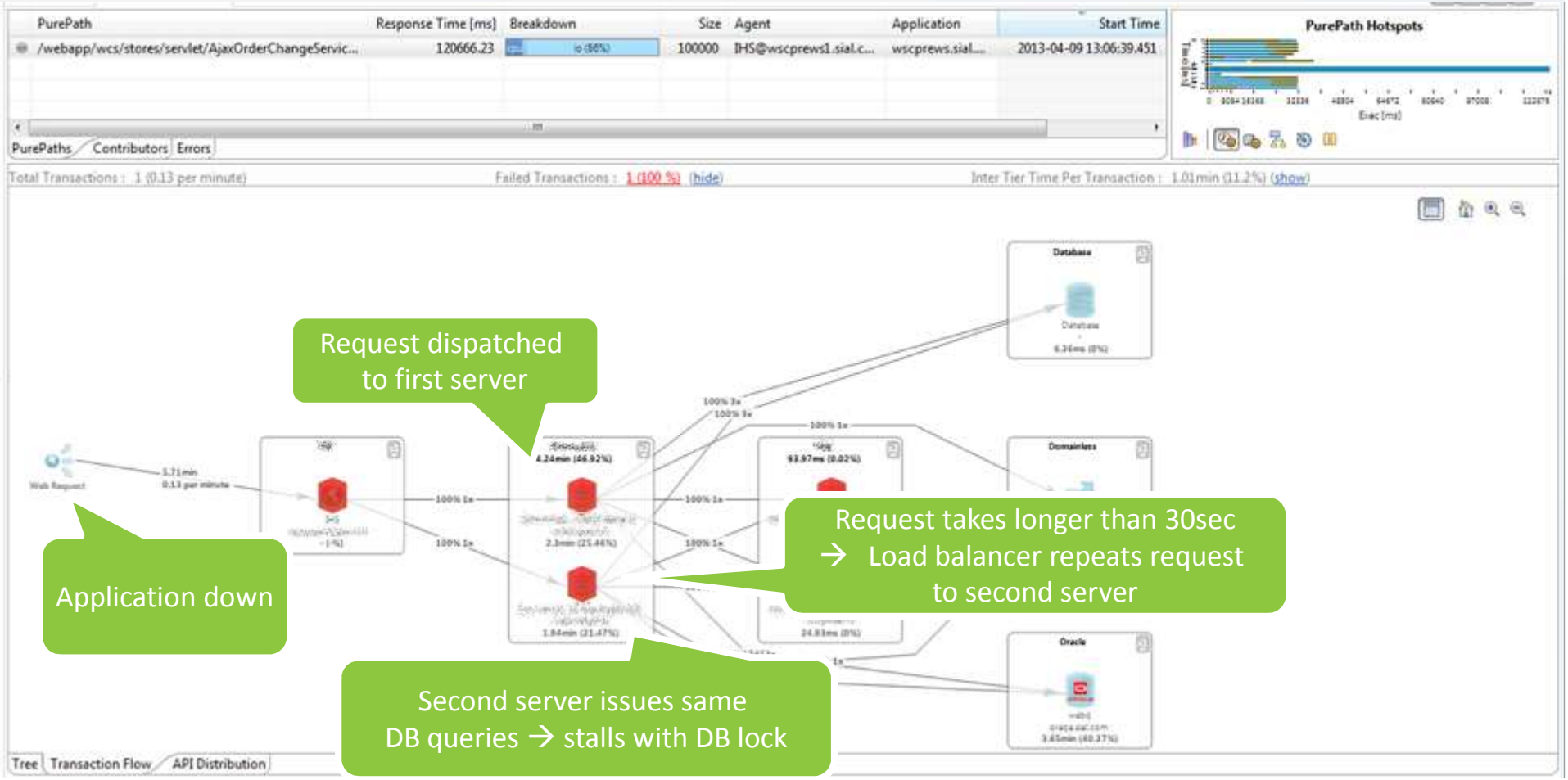
#5: “Falling Dominoes”



Smith, C. U., & Williams, L. G. (2003). More new software performance antipatterns:
Even more ways to shoot yourself in the foot. In *Computer Measurement Group Conference* (pp. 717-725).

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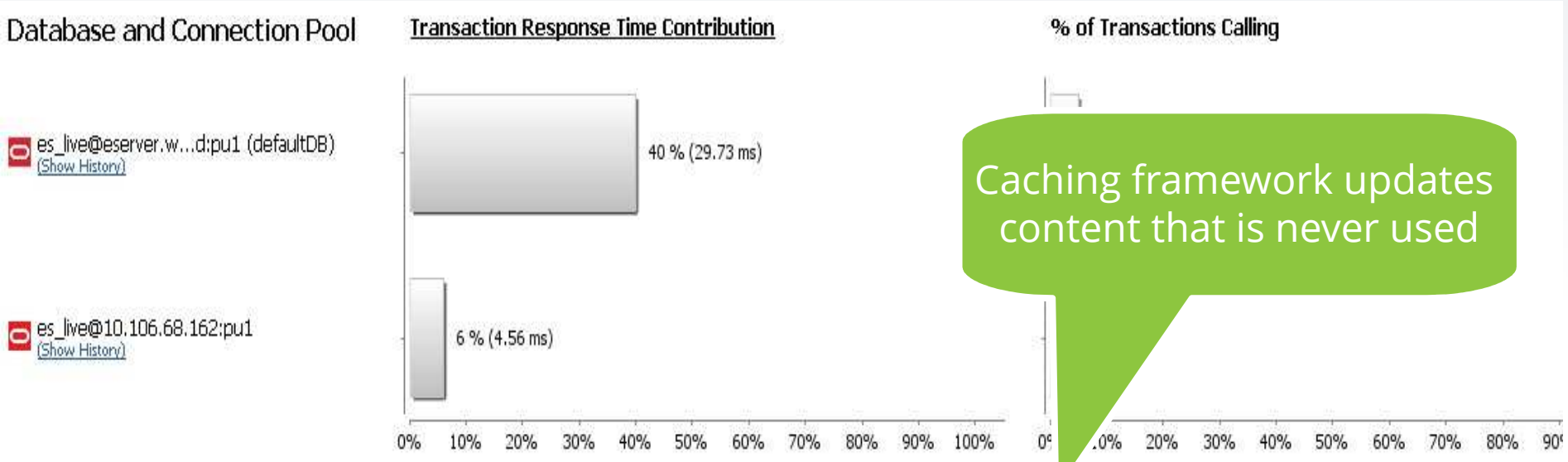
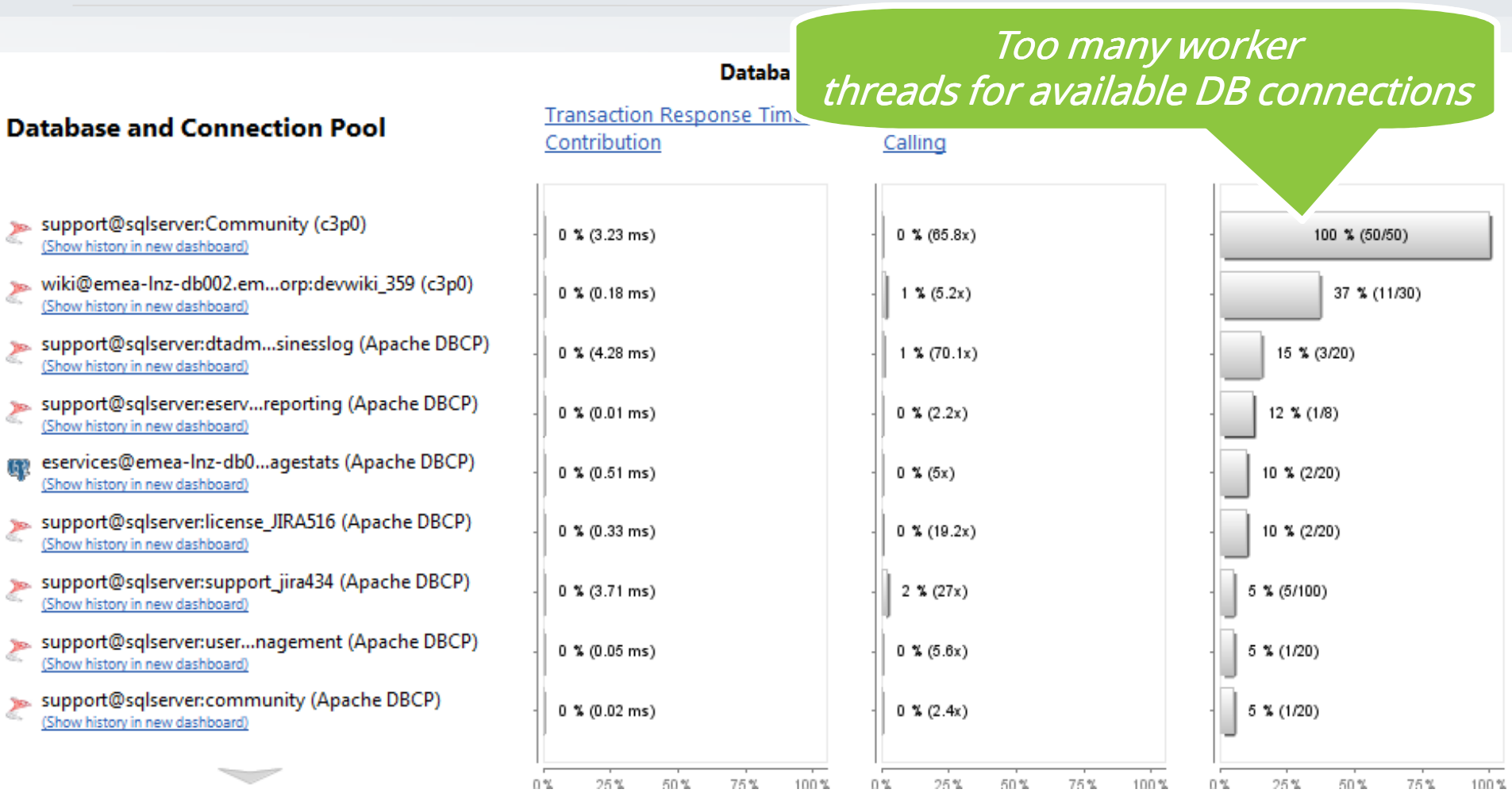
#6: Unnecessary work



Database and Connection Pool	RT/Trans [ms]	Executions	Exec Avg [ms]	Exec Min [ms]	Exec Max [ms]
es_live@eserver.world:pu1 (defaultDB)	29.73	798772	13.51	0.84	14914.98
/*search/ProductSearchQuery (Cartridge swa_b2c_app)*/ select a.productID as productID,a.catalog	0.02	1	6284.08	6284.08	6284.08
/*search/GetOrderForSearch (Cartridge swa_enterprise_app)*/ SELECT opi.uuid AS opiuuid, COUNT(	0.02	1	5614.66	5614.66	5614.66
/*search/ProductSearchQuery (Cartridge swa_b2c_app)*/ select a.productID as productID,a.catalog	0.01	1	3720.67	3720.67	3720.67
/*search/GetOrderForSearch (Cartridge swa_enterprise_app)*/ SELECT opi.uuid AS opiuuid, COUNT(	0.01	1	3446.98	3446.98	3446.98
/*search/ProductSearchQuery (Cartridge swa_b2c_app)*/ select a.productID as productID,a.catalog	0.01	1	2151.42	2151.42	2151.42
/*search/ProductSearchQuery (Cartridge swa_b2c_app)*/ select a.productID as productID,a.catalog	0.01	2	2012.36	1967.03	2057.69
/*search/GetOrderForSearch (Cartridge swa_enterprise_app)*/ SELECT opi.uuid AS opiuuid, COUNT(	0.02	5	1575.58	905.66	3205.31
/*search/ProductSearchQuery (Cartridge swa_b2c_app)*/ select a.productID as productID,a.catalog	0.00	1	1460.08	1460.08	1460.08
/*search/GetOrderForSearch (Cartridge swa_enterprise_app)*/ SELECT opi.uuid AS opiuuid, COUNT(	0.03	7	1325.69	834.60	2707.77

#7: “More is Less”



Smith, C. U., & Williams, L. G. (2003). More new software performance antipatterns:
Even more ways to shoot yourself in the foot. In *Computer Measurement Group Conference* (pp. 717-725).

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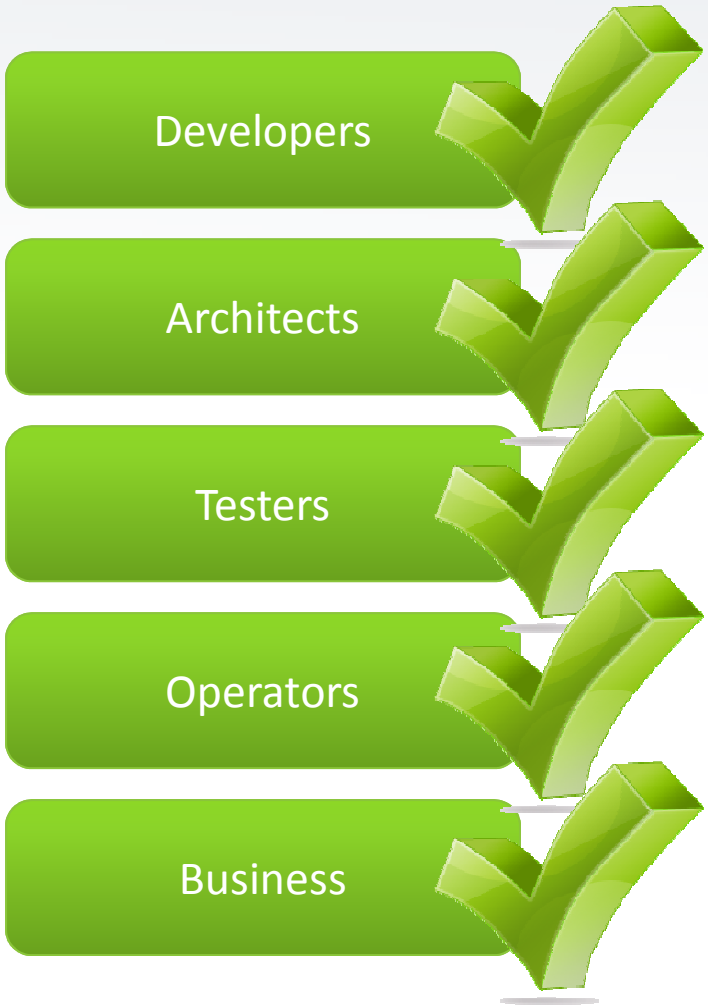
What can we do?

Who Cares About Performance?

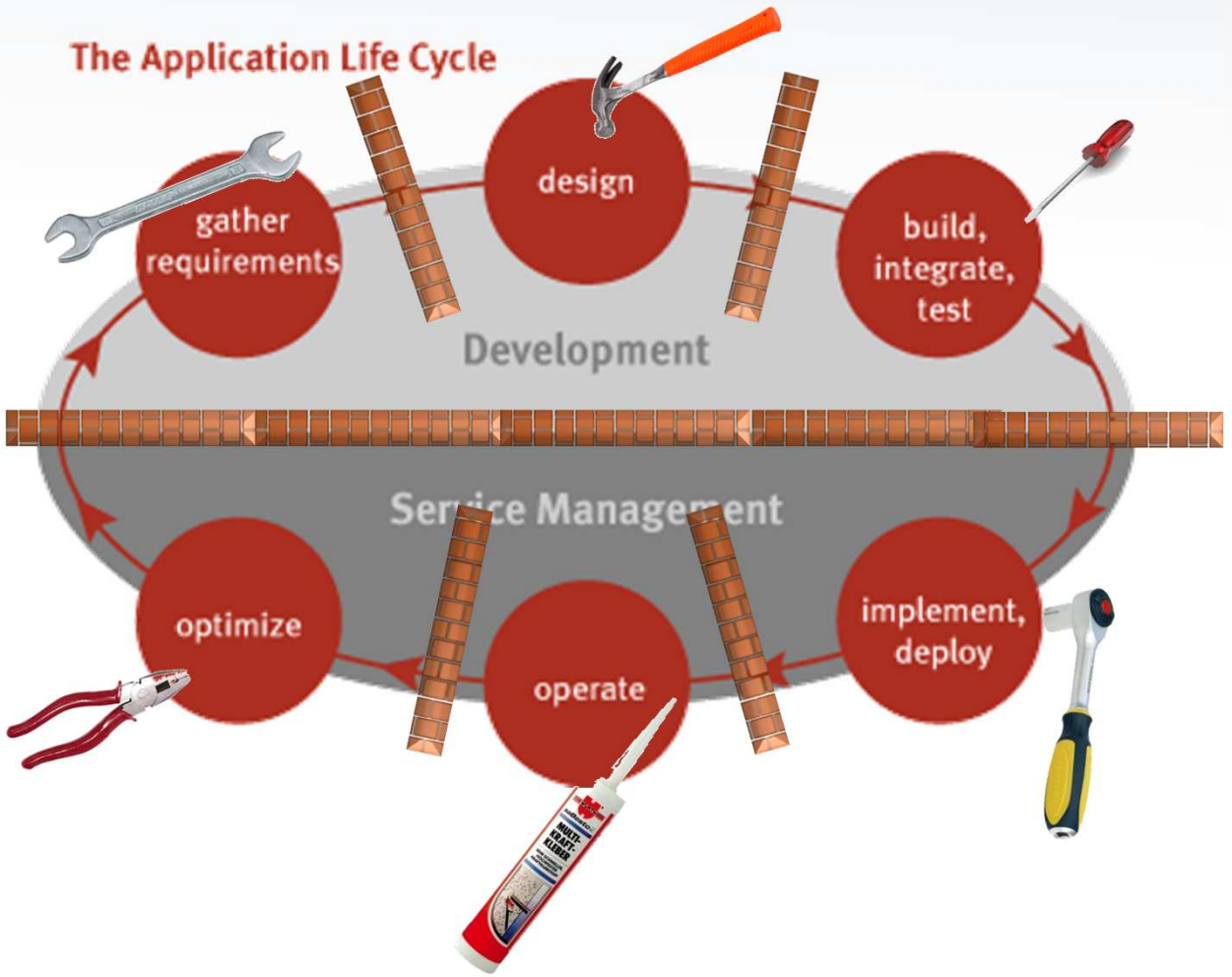
- Developers?
- Architects?
- Testers?
- Operators?
- Business?

Everone!

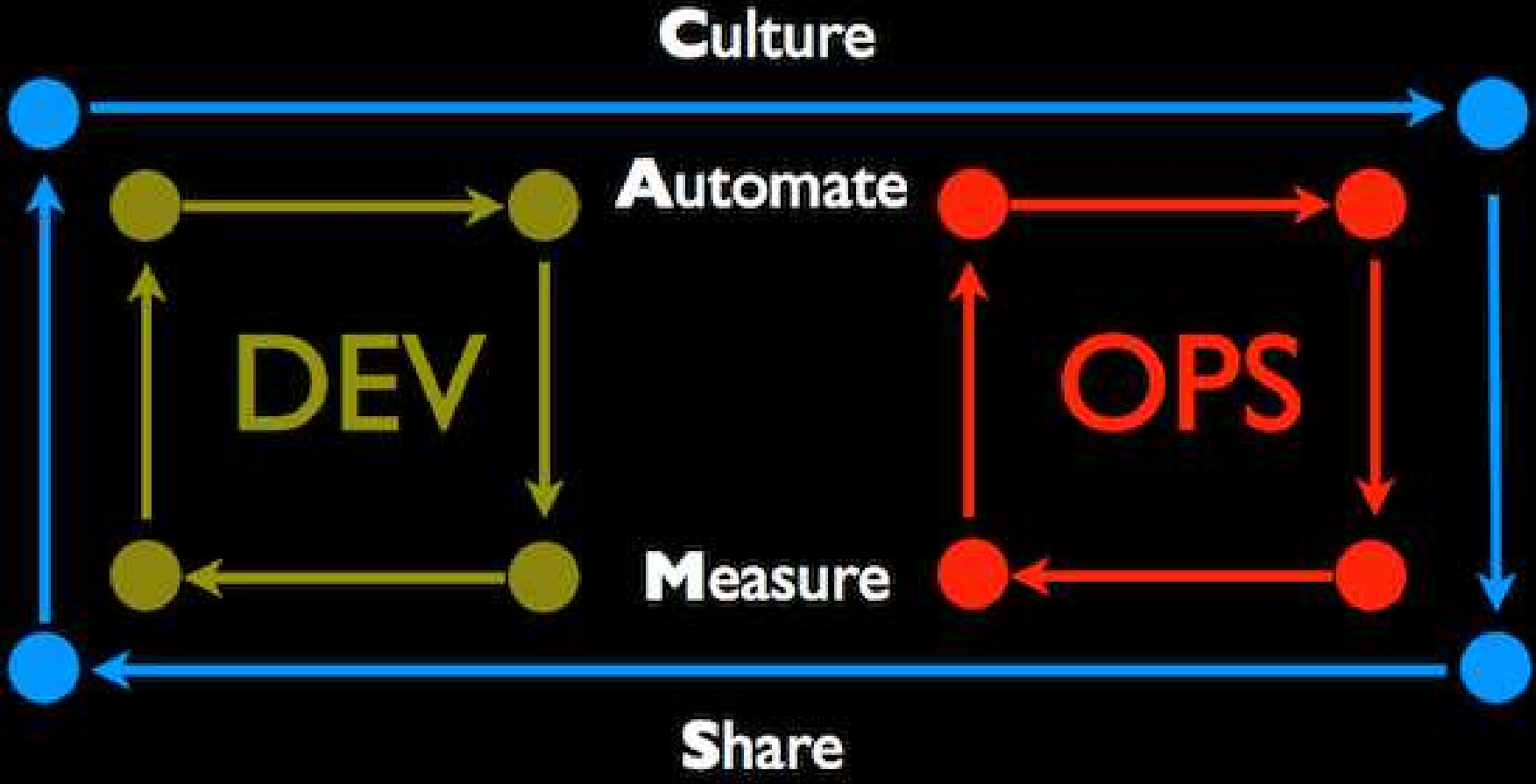


But remember:

Monitor Architecture Across the Lifecycle



Source: http://www.teamquest.com/solutions/itil/application-management/



http://www.opscode.com/blog/2010/07/16/what-devops-means-to-me/

Define Architectural KPIs accepted by all teams

of Web Service Calls

Response Times

MBs / Uses

# of SQL Executions

# of Log Lines

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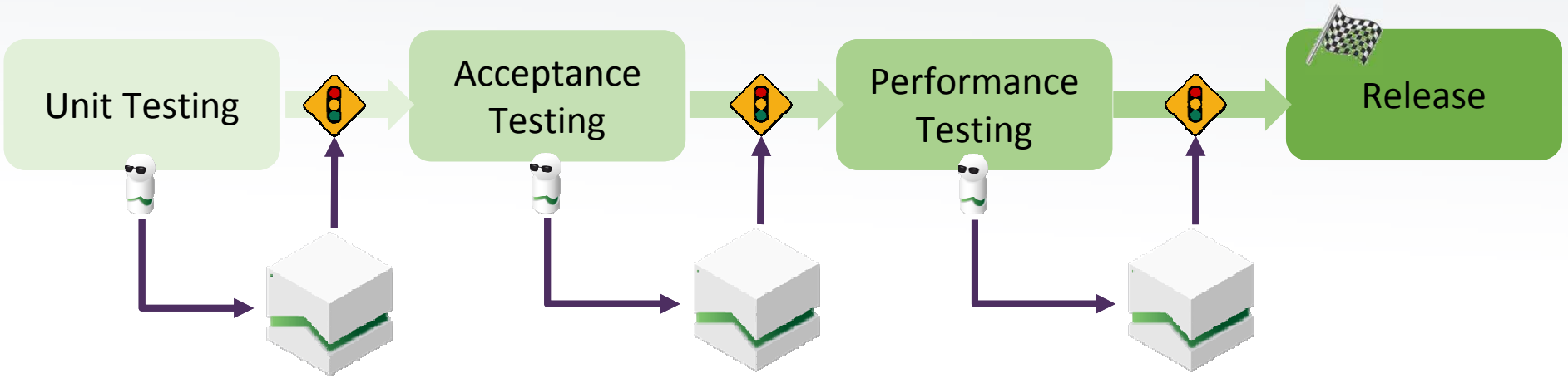
How?

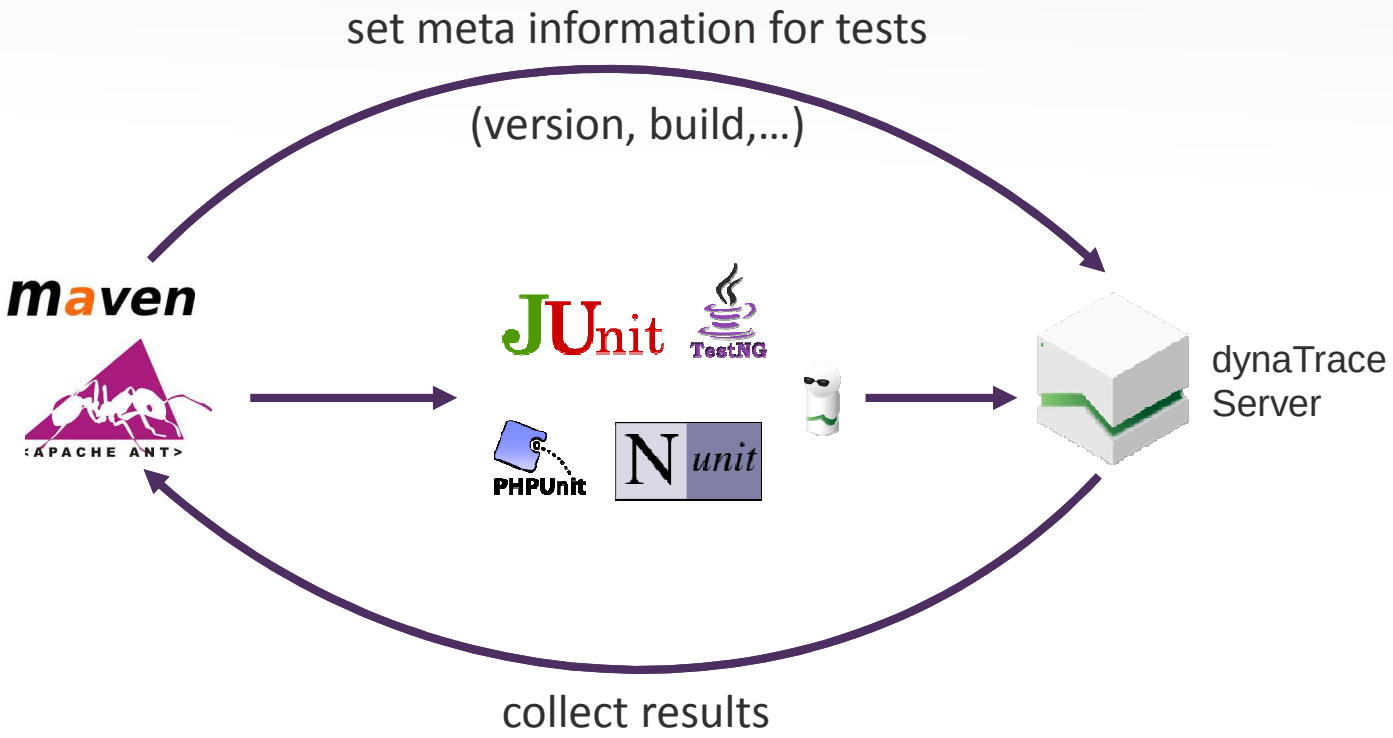


Monitor Tests

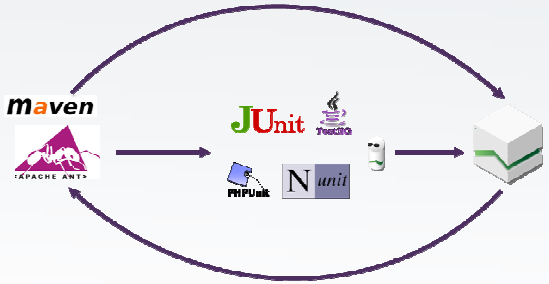
Analyze Results

Integrate with Build Infrastructure

Monitor Automated Tests



Analyze Results



PurePath

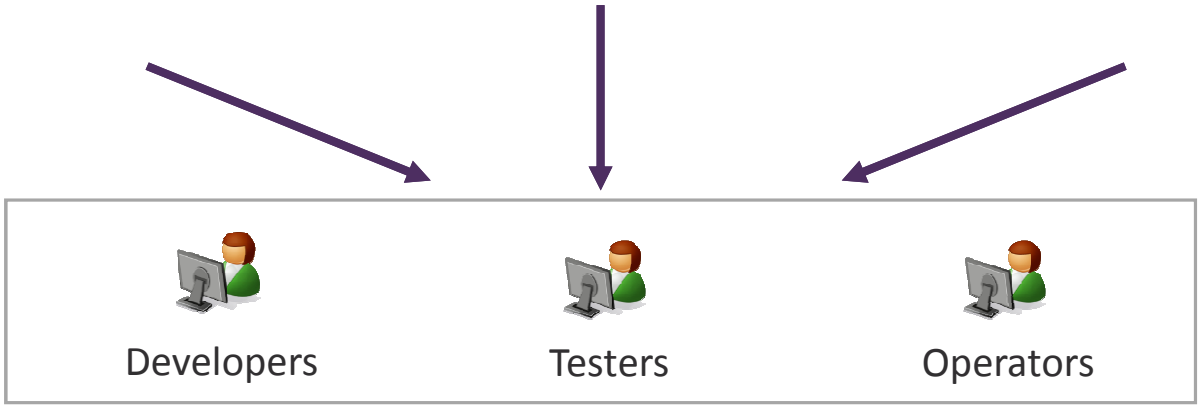
- Architecural validation
  - # of DB calls
  - # Exceptions
- Response time of tests
- Method hotspots

Automatic Baseline

- No need to define thresholds manually
- Identify tests that are not normal

Test Automation Dashlet

- Analyze tests
- Compare tests
- Configure alerting



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Continuous Performance Validation

Lets look behind the scenes

Test Framework Results			Architectural Data	
Build #	Test Case	Status	# SQL	# Excep
Build 17	testPurchase	OK	12	0
	testSearch	OK	3	1
Build 18	testPurchase	FAILED	12	5
	testSearch	OK	3	1
Build 19	testPurchase	OK	75	0
	testSearch	OK		1
Build 20	testPurchase			0

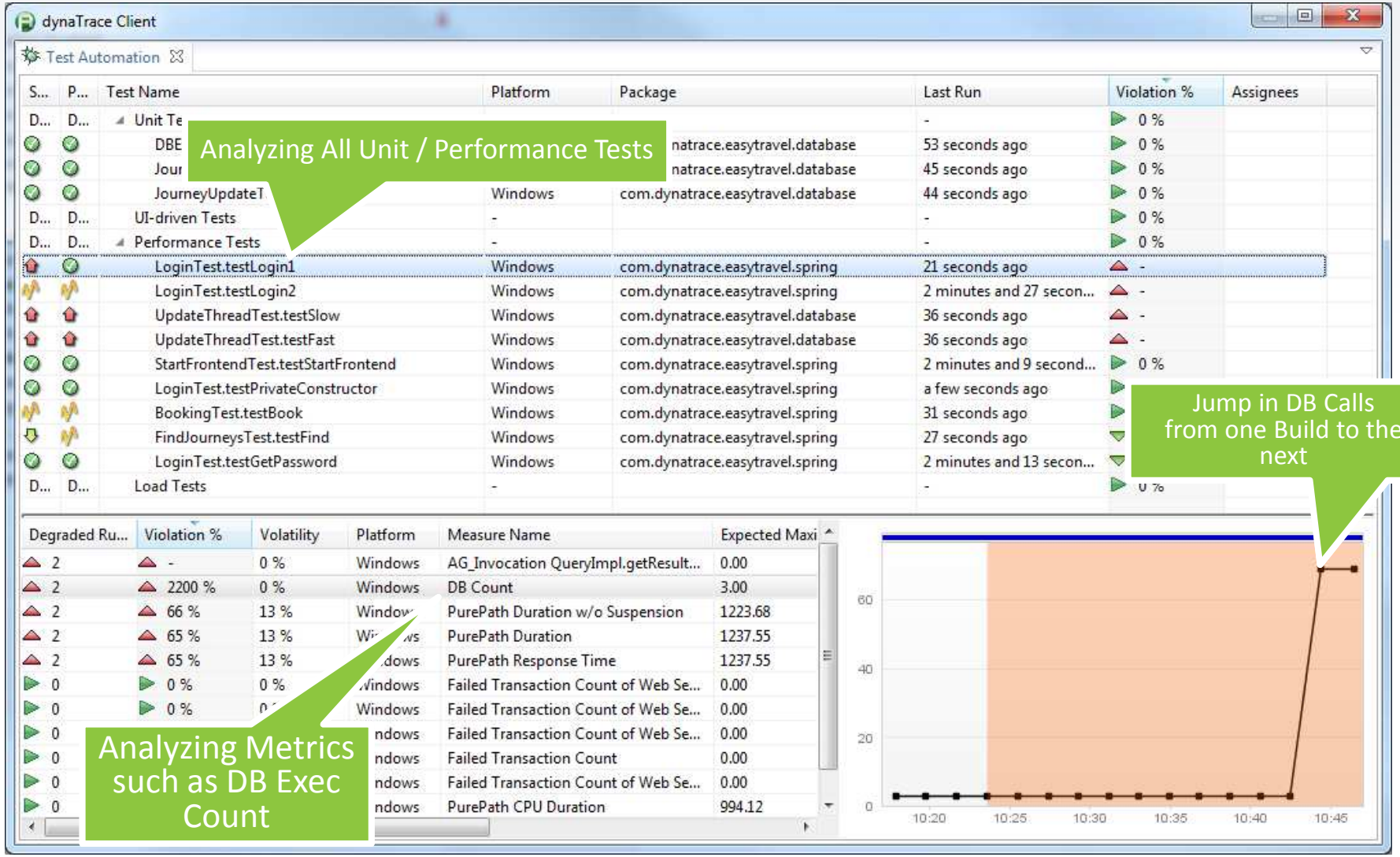
We identified a regression

ons probably reason

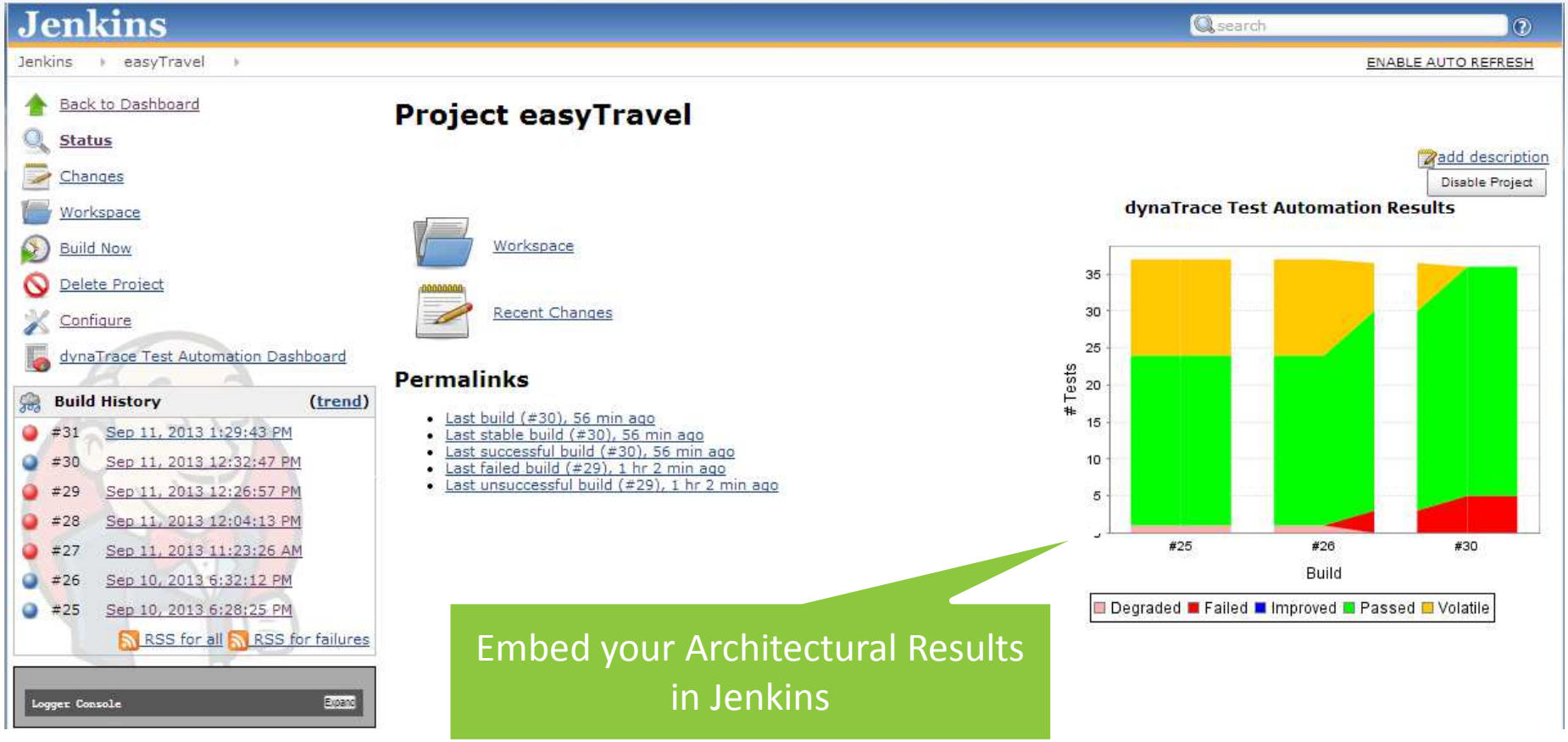
but now we have an tural regression

Now we have the functional and architectural confidence

Performance Focus in Test Automation



Performance Focus in Test Automation



Embed your Architectural Results in Jenkins

Performance Focus in Test Automation

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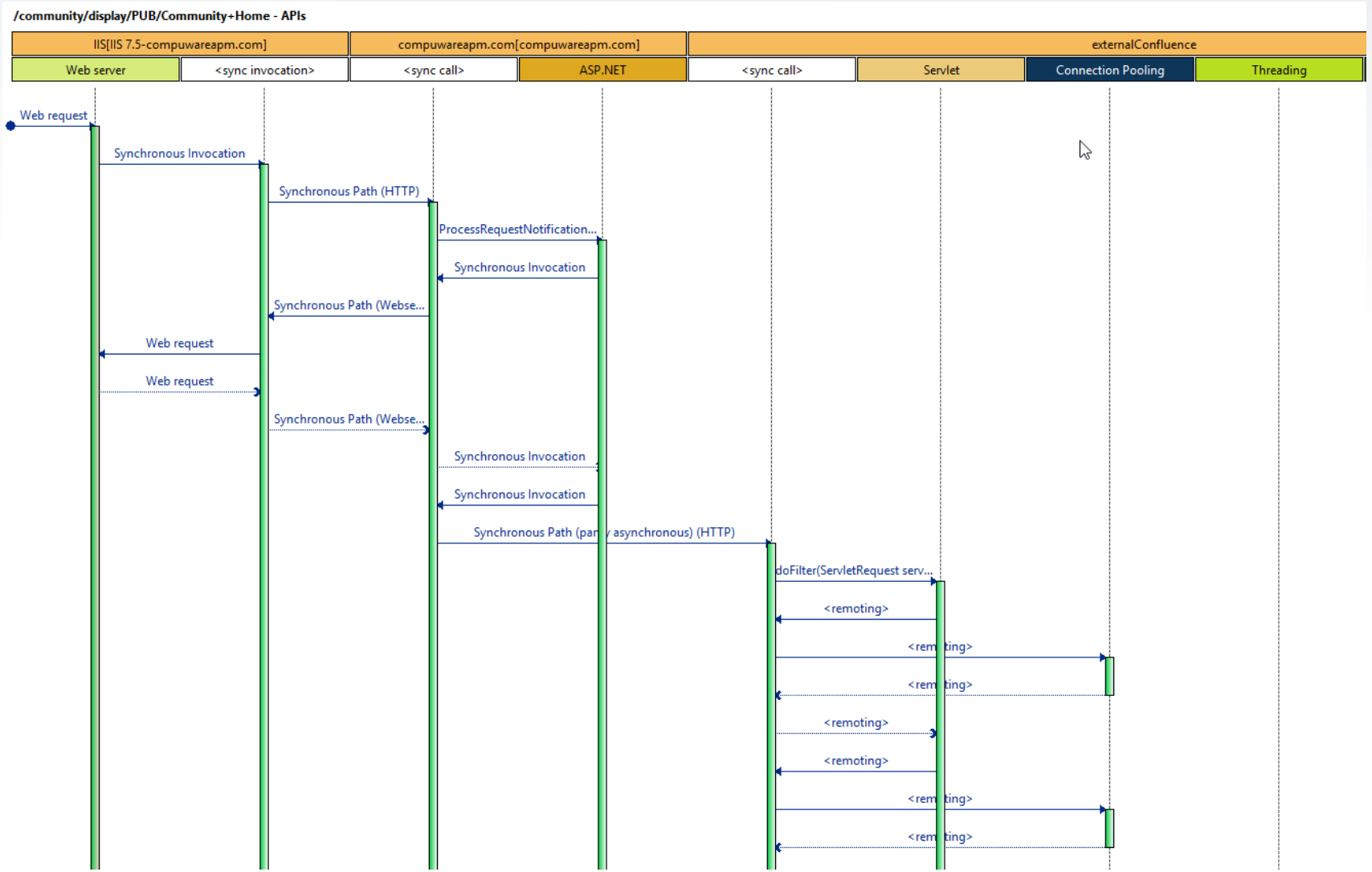
Sequence Diagram Generation



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Check out our trial

http://bit.ly/dtecsa2014

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SIMPLY SMARTER