



Releasing Fast Code

dynaTrace
software

The DevOps Approach to Performance

Why Agile Development took off

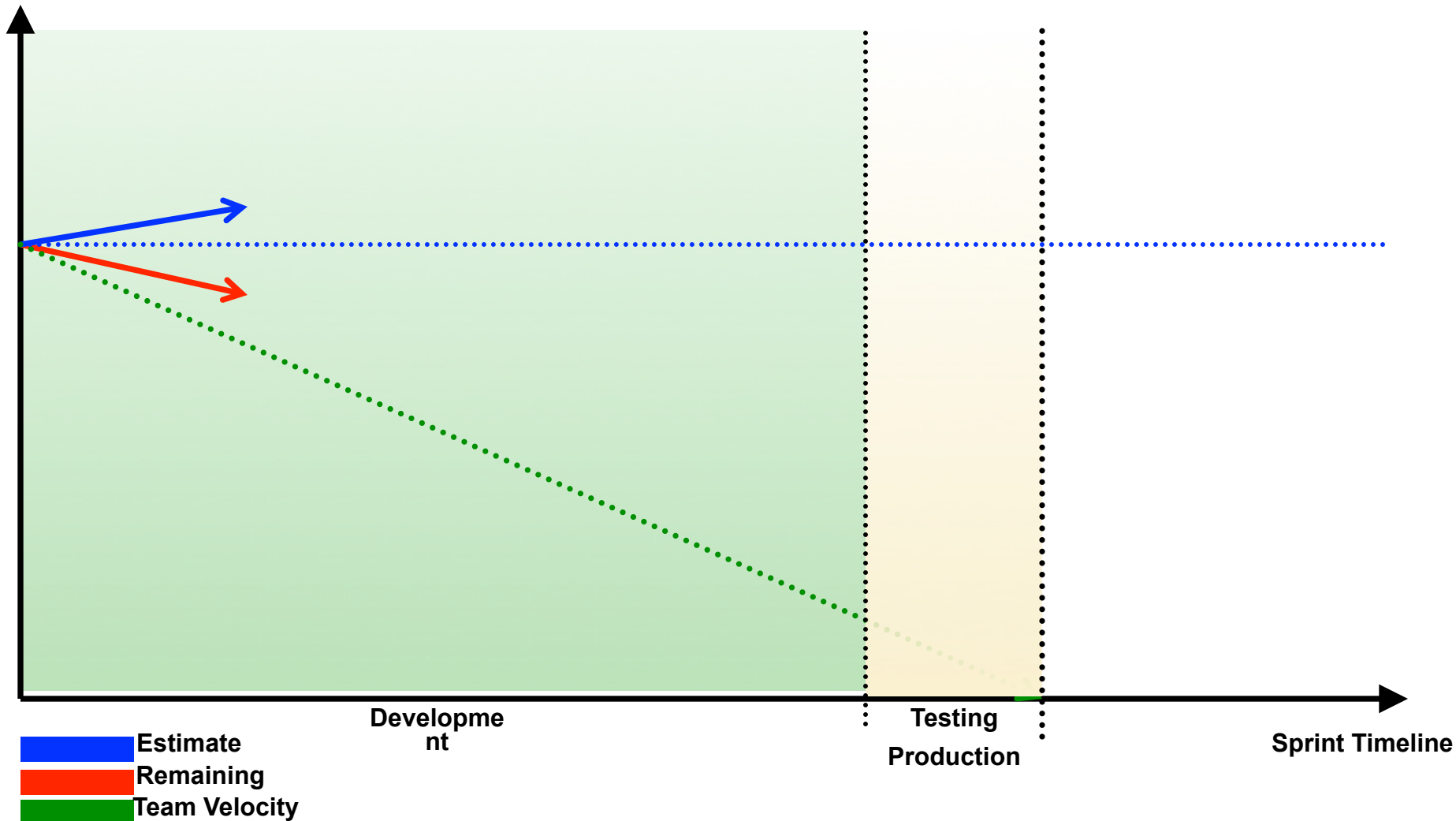


STEVE BLOOM



It's Sprint Time

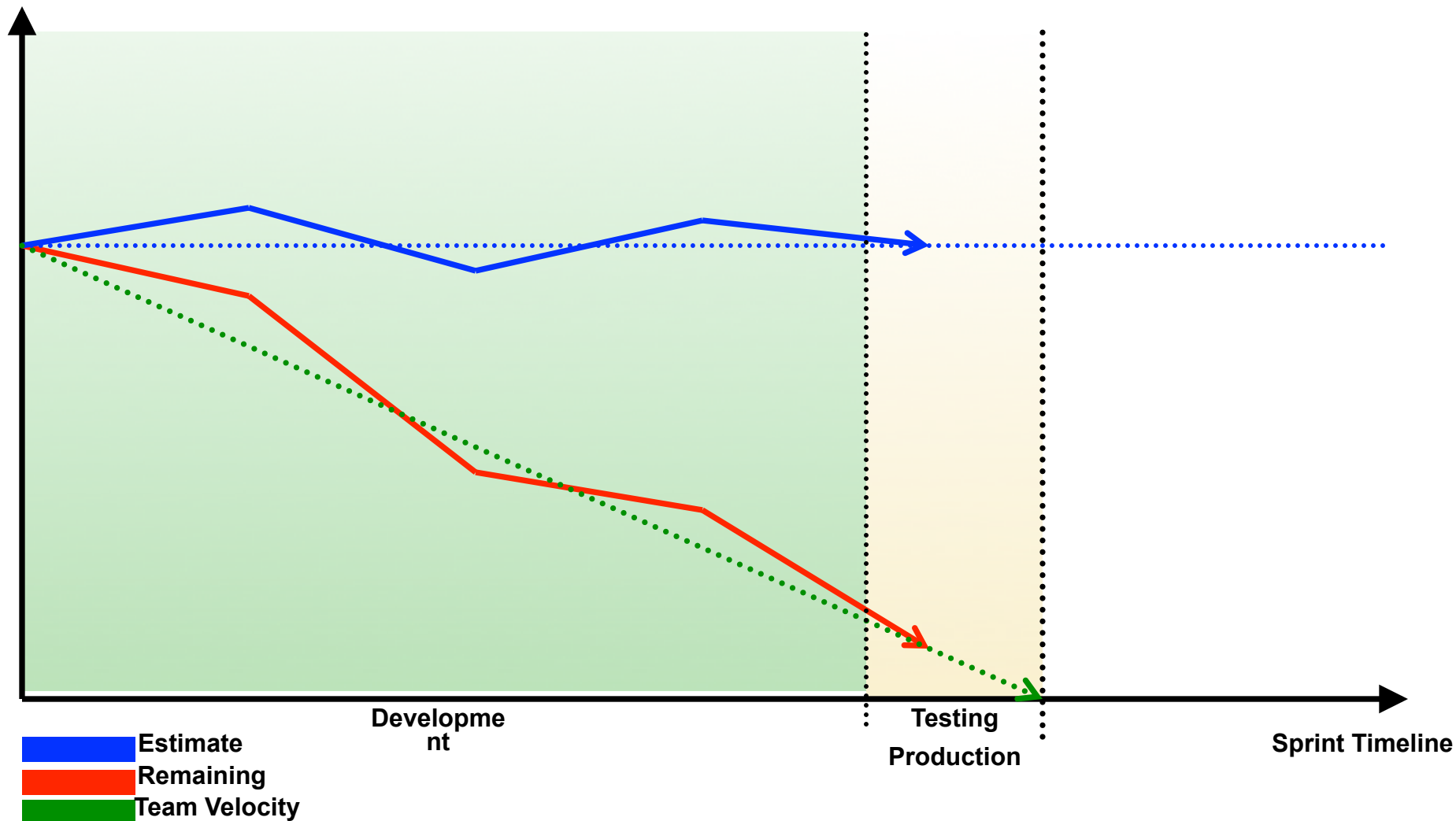
Story Points





You are in control

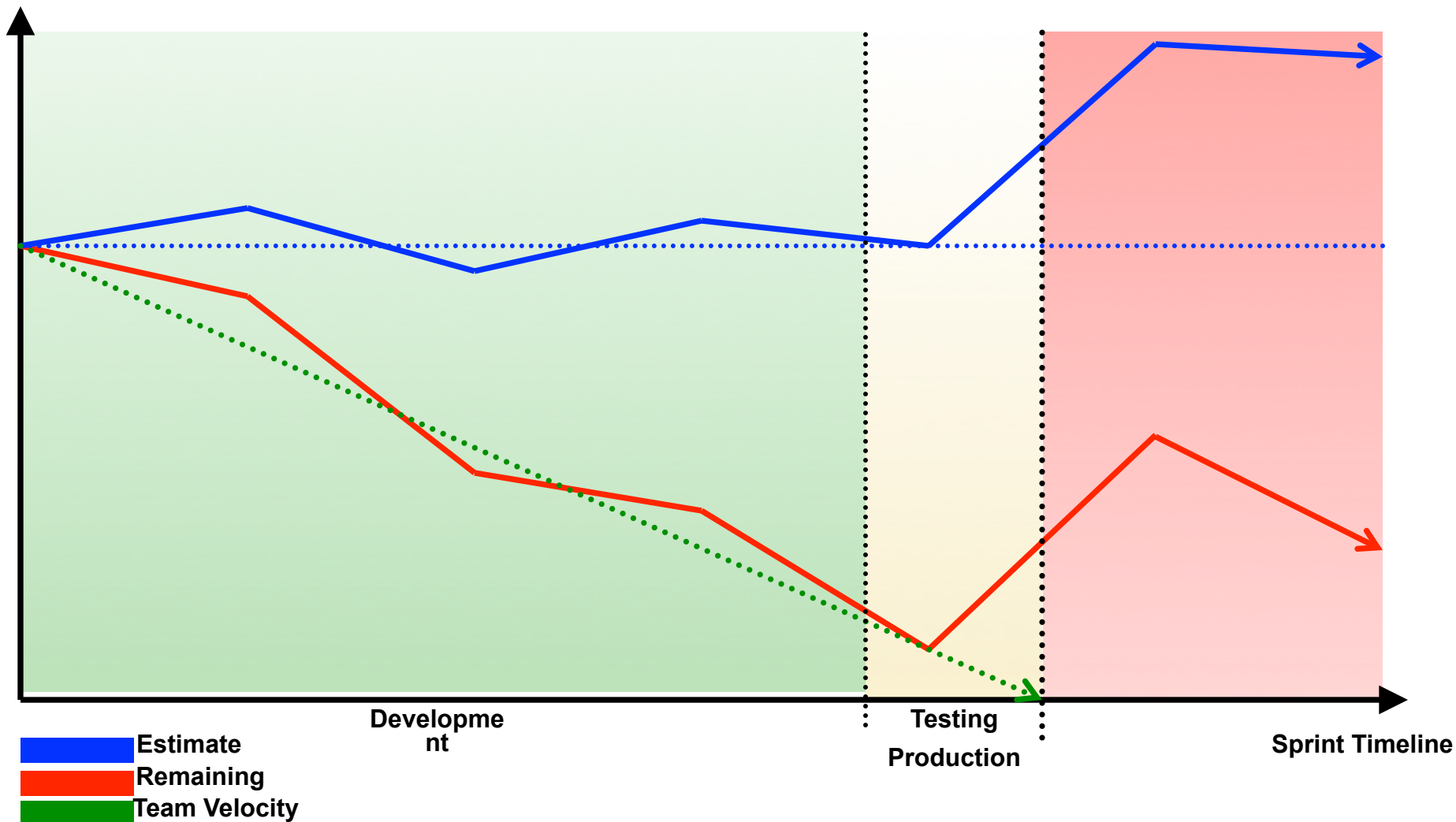
Story Points





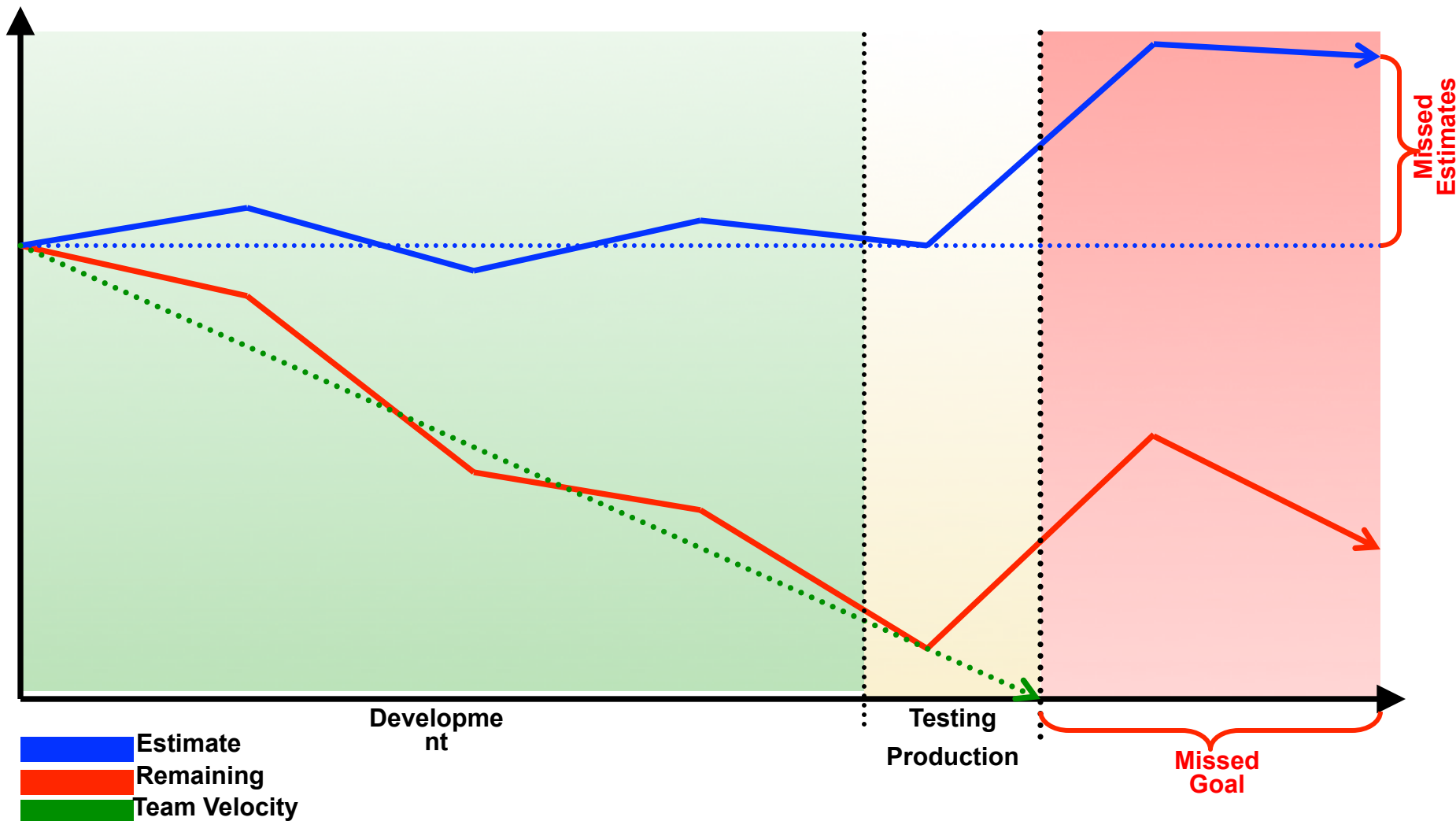
What happened?

Story Points



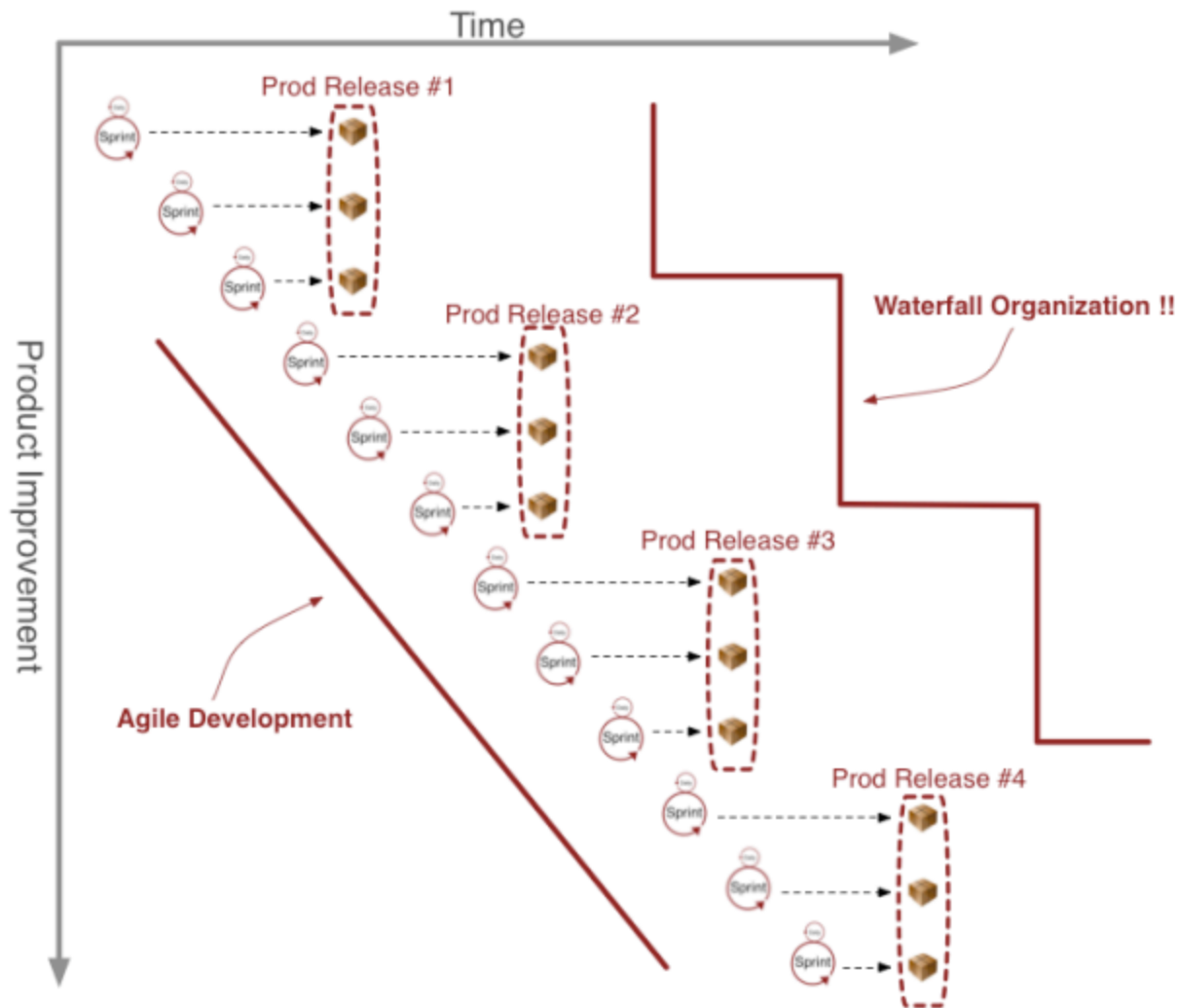
Missed Goals and Estimates

Story Points

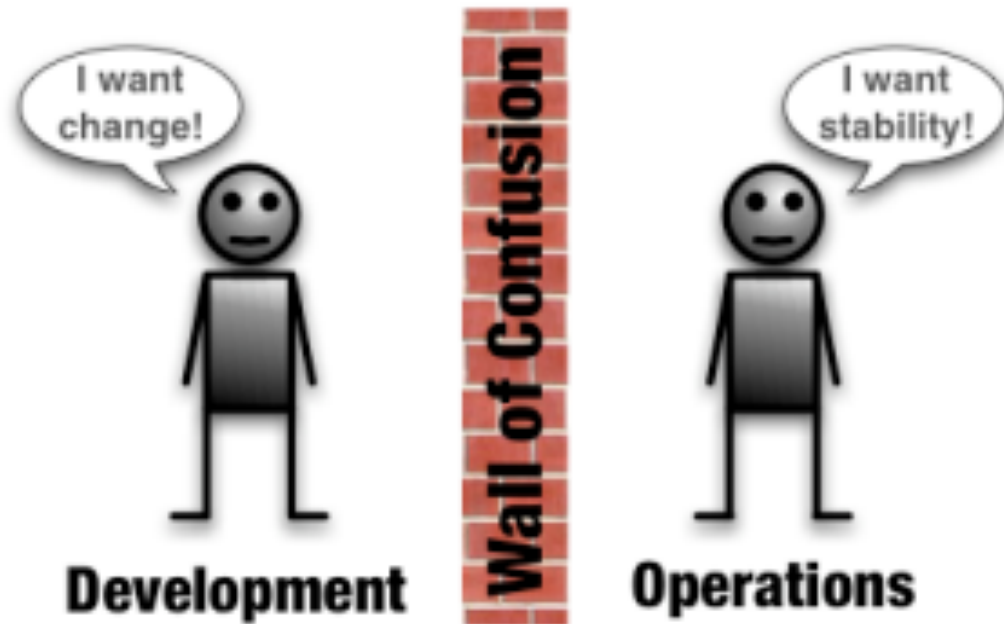




What is the Status Quo beyond Dev?



Problem #1: Different Mindset



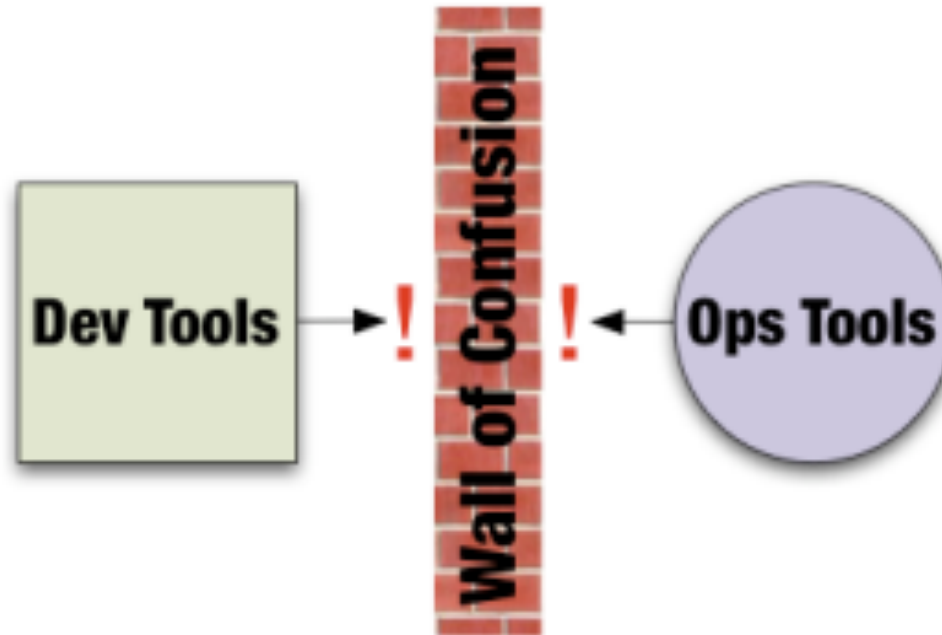
Problem #2: Dislocated Teams



Source: <http://dev2ops.org/blog/2010/2/22/what-is-devops.html>



Problem #3: Different Tools



Problem #4: Over the Fence Attitude



These Problems lead to ...



=





A potential Solution

DevOps =



*Real World
Feedback*

Perf Test in
CI

*ONE
Toolset*



Architecture
Validation

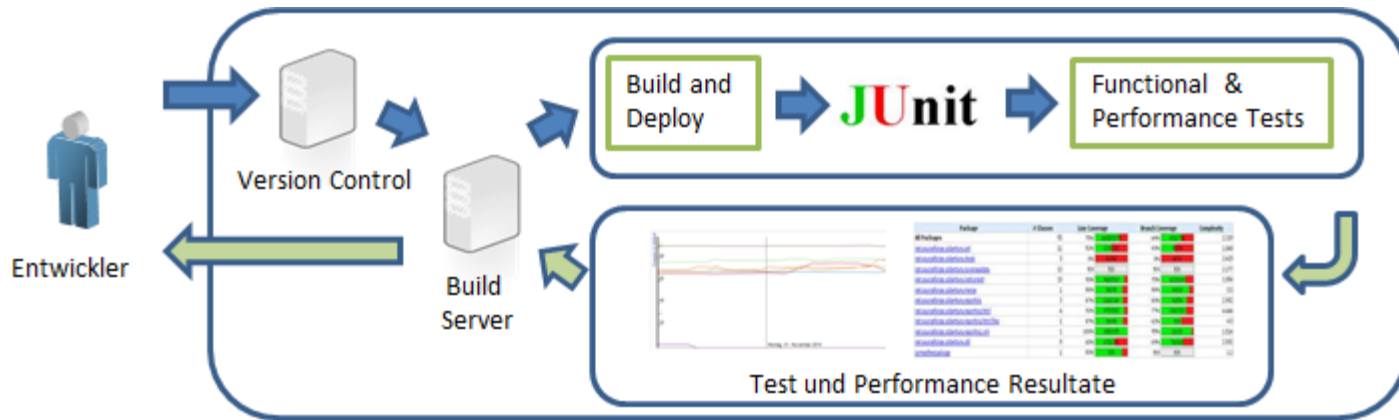
Cloud based
Testing

*Test in
Production*

*Traditional
Load
Testing*



Performance in Continuous Integration

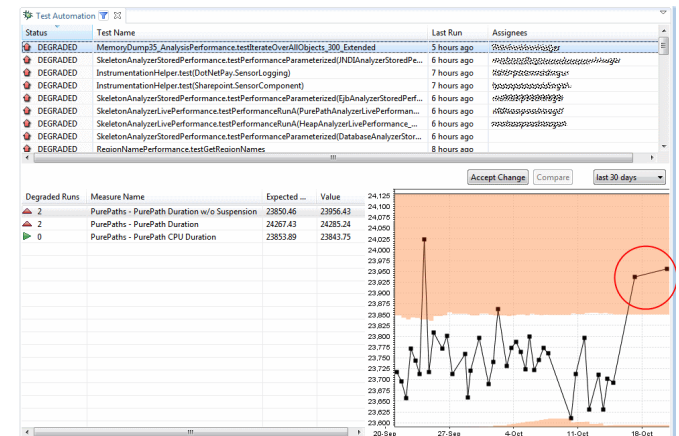


Architectural Analysis of GoSpace Last Minute Feature

Executed Database Statements

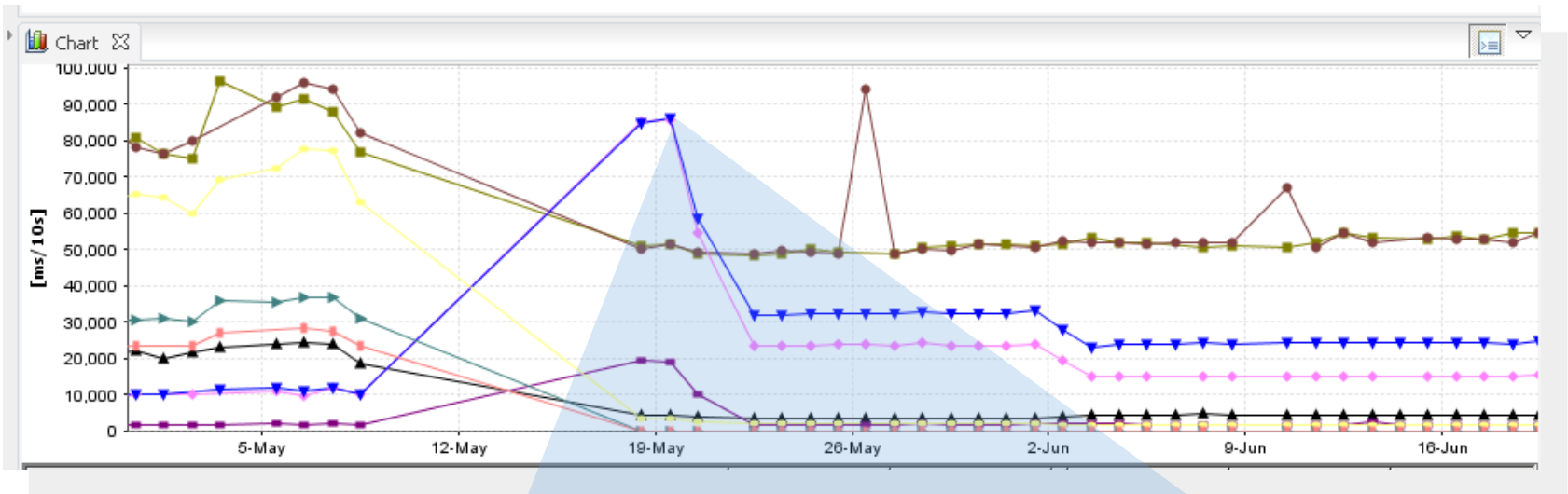
Verify Execution Time and Count (N+1 Problem Pattern...)

SQL Statement	Executions	Exec To...
SELECT PRICE, accomodation, flight, mealType, planet, r...	100	8.91
SELECT t0_OffserCmpEJB.ID FROM OFFER t0_OffserCmpEJB...	100	9.91
SELECT DEPT_TIME, ARR_TIME, class, ship, spaceport FR...	88	8.11
SELECT NAME, PICURI FROM ACCOMODATION WHERE ...	72	7.27
SELECT LOCATION, NAME, COUNTRY FROM SPACEPOR...	26	2.37
SELECT bed_count, GRAVITATION, apartment FROM RO...	16	2.23





Identify Performance Regressions Early



in <http://svn.dynatrace.local:81/svn/dev>

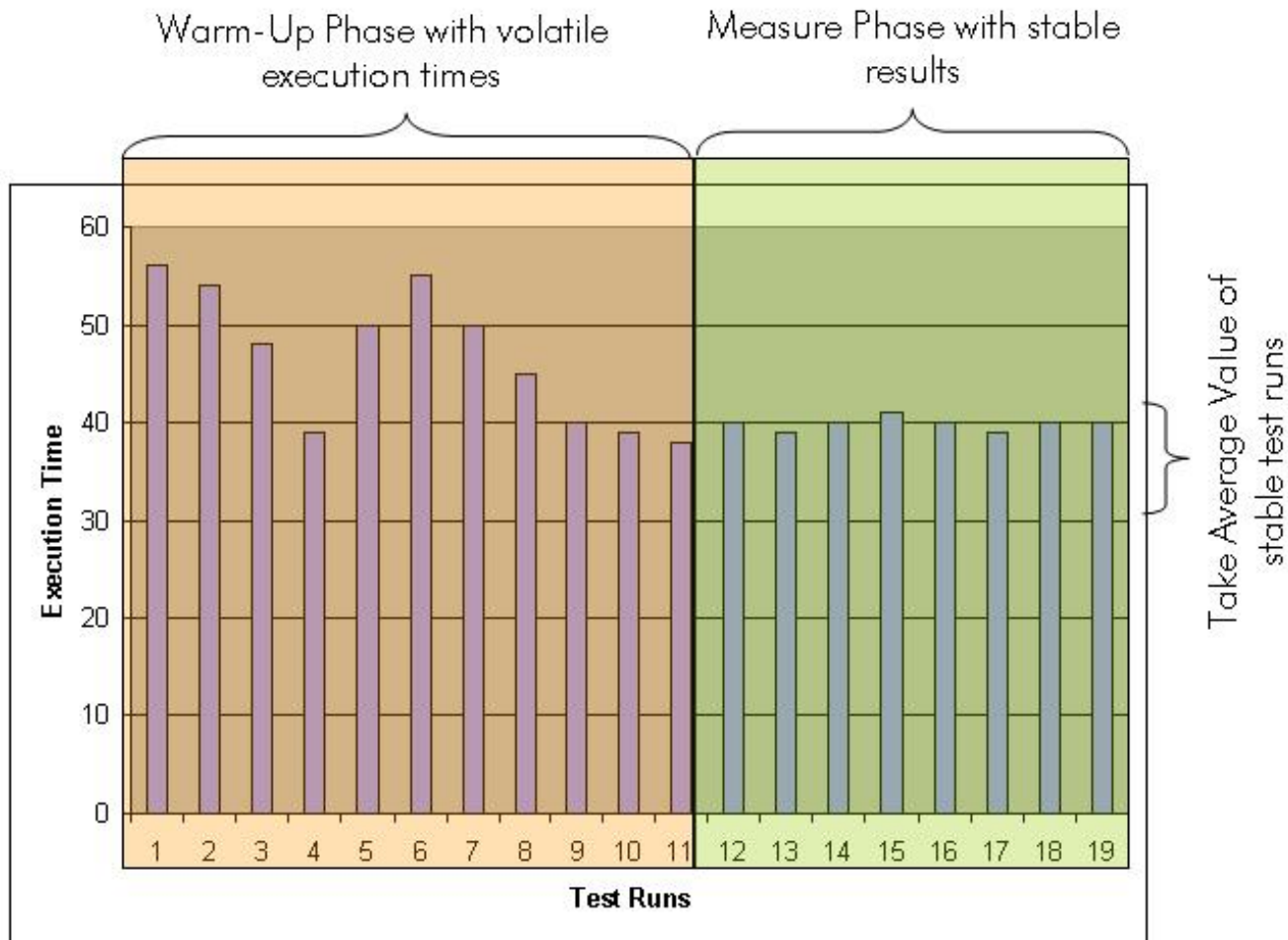
Comment

JLT-16308: Speedup DynSize calculation JLT-16290: Update of DynamicSize in Reference View
fix for failing test (throw exception)

Version Control History Lookup



Tip: Stable Environment



Tip: Exclude Garbage Collection

The screenshot displays the DynaTrace interface with two main views: PurePath Hot Spots and Method details.

PurePath Hot Spots Table:

PurePath	Duration [ms]	CPU Duration [ms]	Suspension Duration [ms]
957@<...	254.36	122.93	26.88
978@<...	174.23	2.12	2.52
954@<...	111.45	38.33	4.71
879@<...	102.51	76.61	3.90
878@<...	58.01	31.25	8.25
1019@...	54.24	33.42	7.88
1015@...	52.83	32.53	7.34
1002@...	44.96	16.85	1.38
935@<...	40.68	7.13	3.73
996@<...	37.92	15.62	2.19
892@<...	36.54	15.62	5.67
893@<...	25.45	6.19	3.12

Method Details Table:

Method	Class	Exec [ms]	CPU Exec [ms]	Suspension [ms]	Argument
ProcessRequest(System.Web.HttpContext)	ASP.mainform_aspx	0.37	0.37	-	System.Wr...
ProcessRequest(System.Web.HttpContext)	System.Web.UI.Page	63.32	63.32	21.70	System.Wr...
getDotNetPayBackend(System.Web.Ses...	DotNetPayFrontend.Do...	0.12	0.00	-	-
LoggedIn()	DotNetPayFrontend.we...	6.87	0.00	-	-
GetCustomFormControls()	DotNetPayFrontend.Gl...	0.04	0.00	-	-
getDotNetPayBackend(System.Web.Ses...	DotNetPayFrontend.Do...	0.06	0.00	-	-
getAccountInformation()	DotNetPayFrontend.we...	6.05	6.05	-	-
Synchronous Path	-	-	-	-	-
callLocalWebMethod(int)	DotNetPayBackend.Dot...	0.11	0.00	-	-
getAccountInformation()	DotNetPayBackend.Dot...	0.44	0.00	-	-
getAccountInformation(int)	DotNetPayBackend.db...	0.18	0.00	-	-
System.Data.IDbCommand.Ex...	System.Data.Common...	1.00	0.00	-	SELECT IB...
getDotNetPayBackend(System.Web.Ses...	DotNetPayFrontend.Do...	0.04	0.00	-	-
getAccountInformation()	DotNetPayFrontend.we...	11.07	0.00	-	-
getTransactionInformation(System.Strin...	DotNetPayFrontend.we...	10.52	10.52	-	-
CompareTo(System.Object)	DotNetPayFrontend.we...	0.10	0.00	-	-
CompareTo(System.Object)	DotNetPayFrontend.we...	0.09	0.00	-	-


Annotations:


- An orange callout points to the 'Suspension Duration [ms]' column in the PurePath Hot Spots table, labeled "Runtime Suspension per Transaction".
- Another orange callout points to the 'Suspension [ms]' column in the Method details table, labeled "Runtime Suspension per Method".



Architecture Validation

Method	Total [ms]
testFastLastMinuteTransactionRandomOffers()	602.28
getCurrentSpecialOffers(Integer, Calendar, Calendar, String)	599.35
@ invoke(Object[] params)	599.12
exception	-
exception	-
Synchronous Path (HTTP)	-
doFilter(ServletRequest request, ServletResponse response, FilterCha	554.34
@ doPost(HttpServletRequest request, HttpServletResponse respons	554.26
getHome()	0.40
getSpecialOffers(int)	306.38
getSpecialOffers(int amount)	298.37
getHome()	0.28
loadOffer(int)	0.68
loadOffer(int oid)	0.63
findByPrimaryKey(Integer)	0.62
setTransactionTimeout(int seconds)	0.01
start(Xid xid, int flags)	0.01
prepareStatement(String sql)	0.04
executeQuery()	0.07
prepareOfferForWebService(OfferLocal local)	3.25
loadOffer(int)	0.39

 Analyze your existing Unit Tests

 Validate against your Arch Rules

```
<analysisresult>
- <rule name="MaxDBCalls" description="Verify that we do not have more than 50 DB Calls per transaction">
  <result transaction="AddOrderItemTest" result="OK" resulttext="" />
  <result transaction="RemoveOrderItemTest" result="OK" resulttext="" />
  <result transaction="LastMinuteSearch" result="Error" resulttext="Contains 245 occurrences which exceeds 50" />
</rule>
- <rule name="NoSyncCalls" description="Verify that no synchronous remoting calls get executed">
  <result transaction="AddOrderItemTest" result="OK" resulttext="" />
  <result transaction="RemoveOrderItemTest" result="OK" resulttext="" />
  <result transaction="LastMinuteSearch" result="NotEvaluated" resulttext="Transaction excluded from verification" />
</rule>
- <rule name="MaxRemoteCallSize" description="A remoting call must not transfer more than 100k">
  <result transaction="AddOrderItemTest" result="OK" resulttext="" />
  <result transaction="RemoveOrderItemTest" result="OK" resulttext="" />
  <result transaction="LastMinuteSearch" result="Error" resulttext="Transaction transfers 685k which exceeds 100k" />
</rule>
</analysisresult>
```

Learn how foreign code works

- Get insight into whats going on „under the hood“
 - Understand internals of the frameworks you use
 - Choose the right usage for your use case

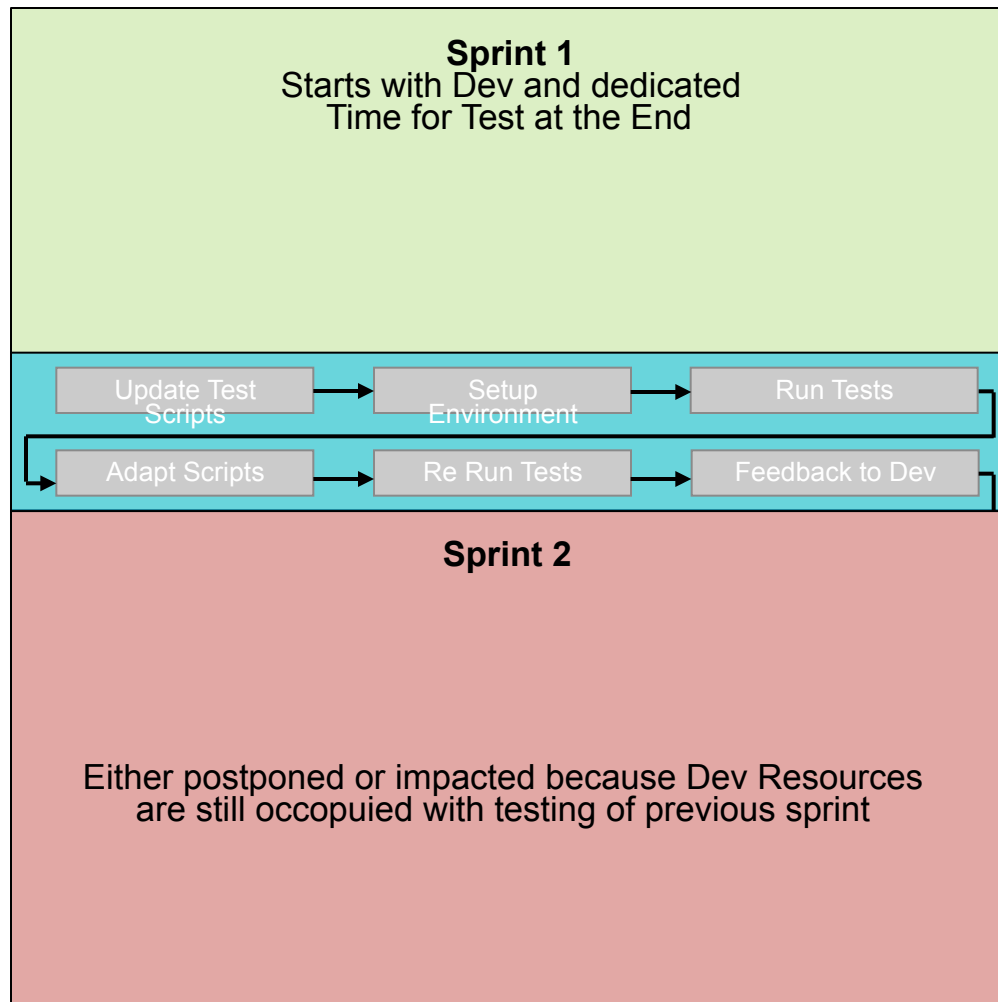
Method	Class	Argument
loadData()	com.dynatrace.sam...	
openSession()	org.hibernate.impl.S...	
beginTransaction()	org.hibernate.impl.S...	
createQuery(java.lang.String queryString)	org.hibernate.impl.S...	from Person p where p.id=1
list()	org.hibernate.impl...	
list(java.lang.String query, org.hibernate.enx...	org.hibernate.impl.S...	
isTransactionInProgress()	org.hibernate.impl.S...	
prepareStatement(java.lang.String)	org.apache.derby.d...	select person0_ID as ID0_ person0_firstName as firstName...
executeQuery()	org.apache.derby.d...	select person0_ID as ID0_ person0_firstName as firstName...
createQuery(java.lang.String queryString)	org.hibernate.impl.S...	from Person p where p.id=1
list()	org.hibernate.impl...	
list(java.lang.String query, org.hibernate.enx...	org.hibernate.impl.S...	
isTransactionInProgress()	org.hibernate.impl...	
prepareStatement(java.lang.String)	org.apache.derby.d...	
executeQuery()	org.apache.derby.d...	
managedFlush()	org.hibernate.impl...	

Method	Class	Argument
loadDataByClass()	com.dynatrace.sam...	
openSession()	org.hibernate.impl.S...	
beginTransaction()	org.hibernate.impl.S...	
load(java.lang.Class entityClass, java.io.Serializ...	org.hibernate.impl.S...	
load(java.lang.String entityName, java.io.Sei...	org.hibernate.impl.S...	com.dynatrace.samples.hibernate.dataobjects.Person
getFirstName()	com.dynatrace.sam...	
immediateLoad(java.lang.String entityName, ...)	org.hibernate.impl.S...	
prepareStatement(java.lang.String)	org.apache.derby.d...	select person0_ID as ID0_1_ person0_firstName as fir...
executeQuery()	org.apache.derby.d...	select person0_ID as ID0_1_ person0_firstName as fir...
load(java.lang.Class entityClass, java.io.Serializ...	org.hibernate.impl.S...	
load(java.lang.String entityName, java.io.Sei...	org.hibernate.impl.S...	com.dynatrace.samples.hibernate.dataobjects.Person
getHibernateLazyInitializer()	com.dynatrace.sam...	
getFirstName()	com.dynatrace.sam...	
managedFlush()	org.hibernate.impl.S...	
flush()	org.hibernate.impl.S...	
getHibernateLazyInitializer()	com.dynatrace.sam...	



Traditional Load Testing takes too long in an agile process

time





Common Mistakes

Only use Sample Data

No Server Side Data

Wrong Think Times

Overloaded Load Agents

No Error Detection

Infrastructure Issues



Load Testing needs to be „real“

Real **Size** and Content

Real Third Party Code

Real Infrastructure Setup

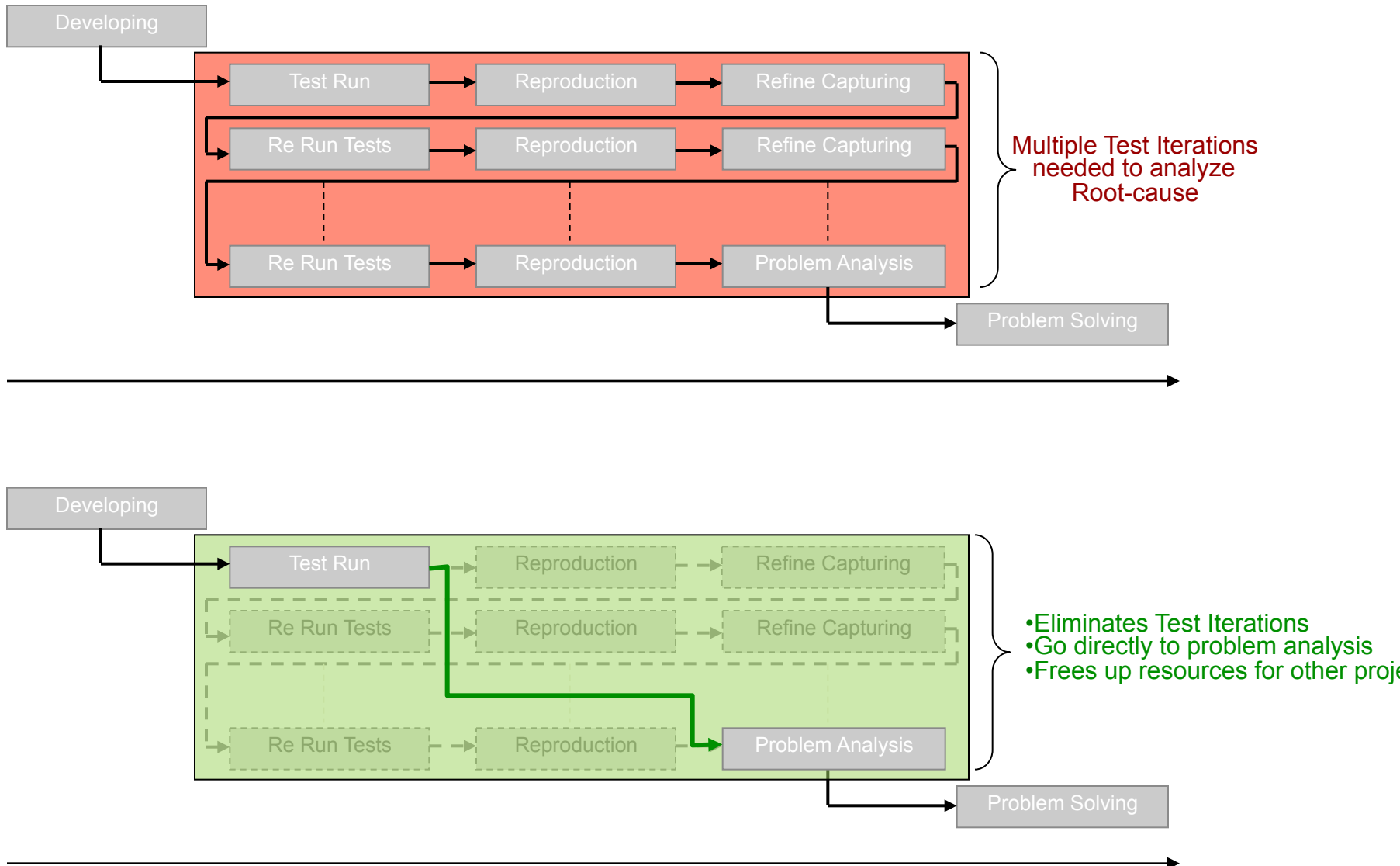
No Guarantees!

Real Load

Real **Number** of Users

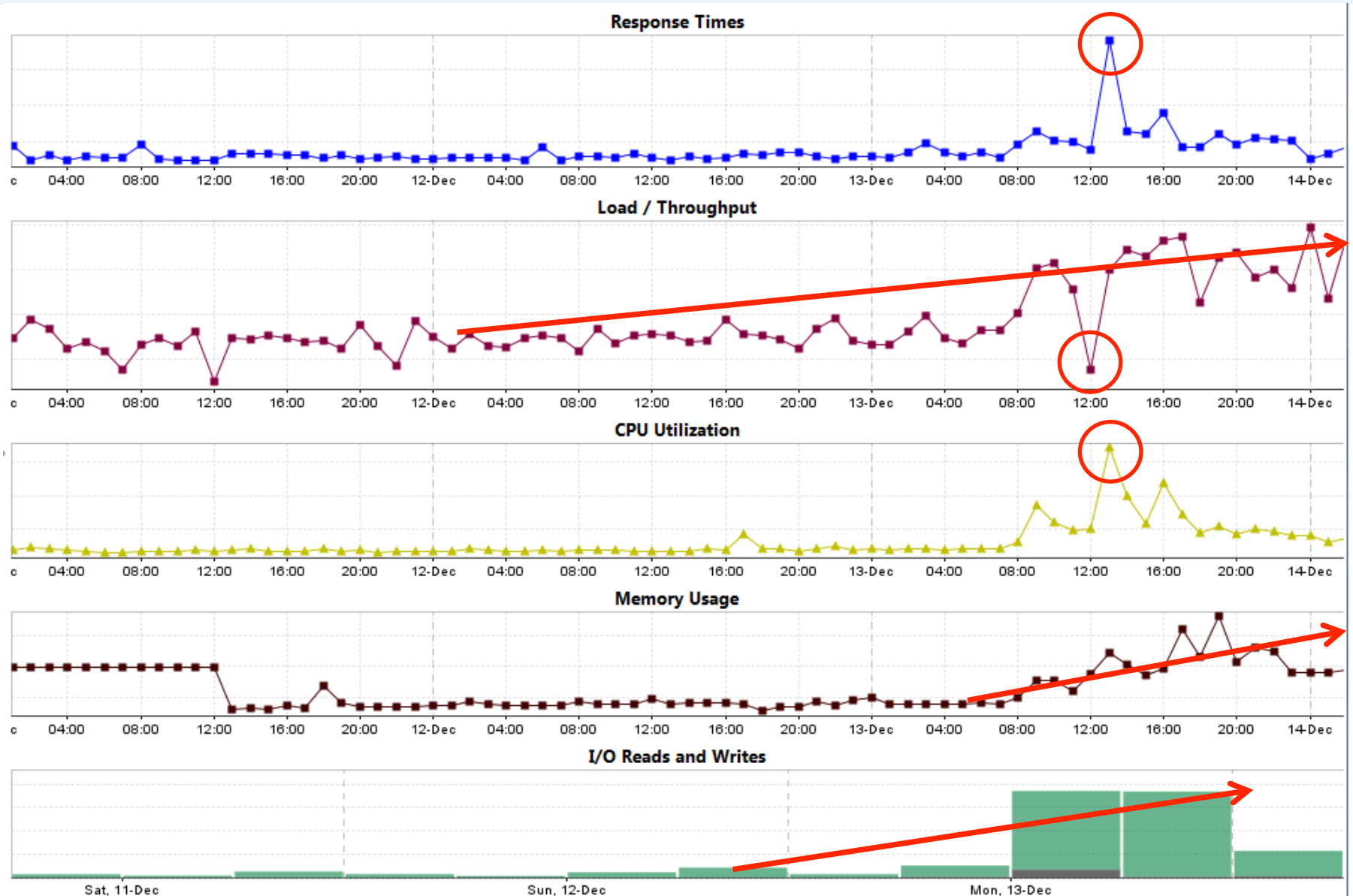


Minimize and automate real Load Tests





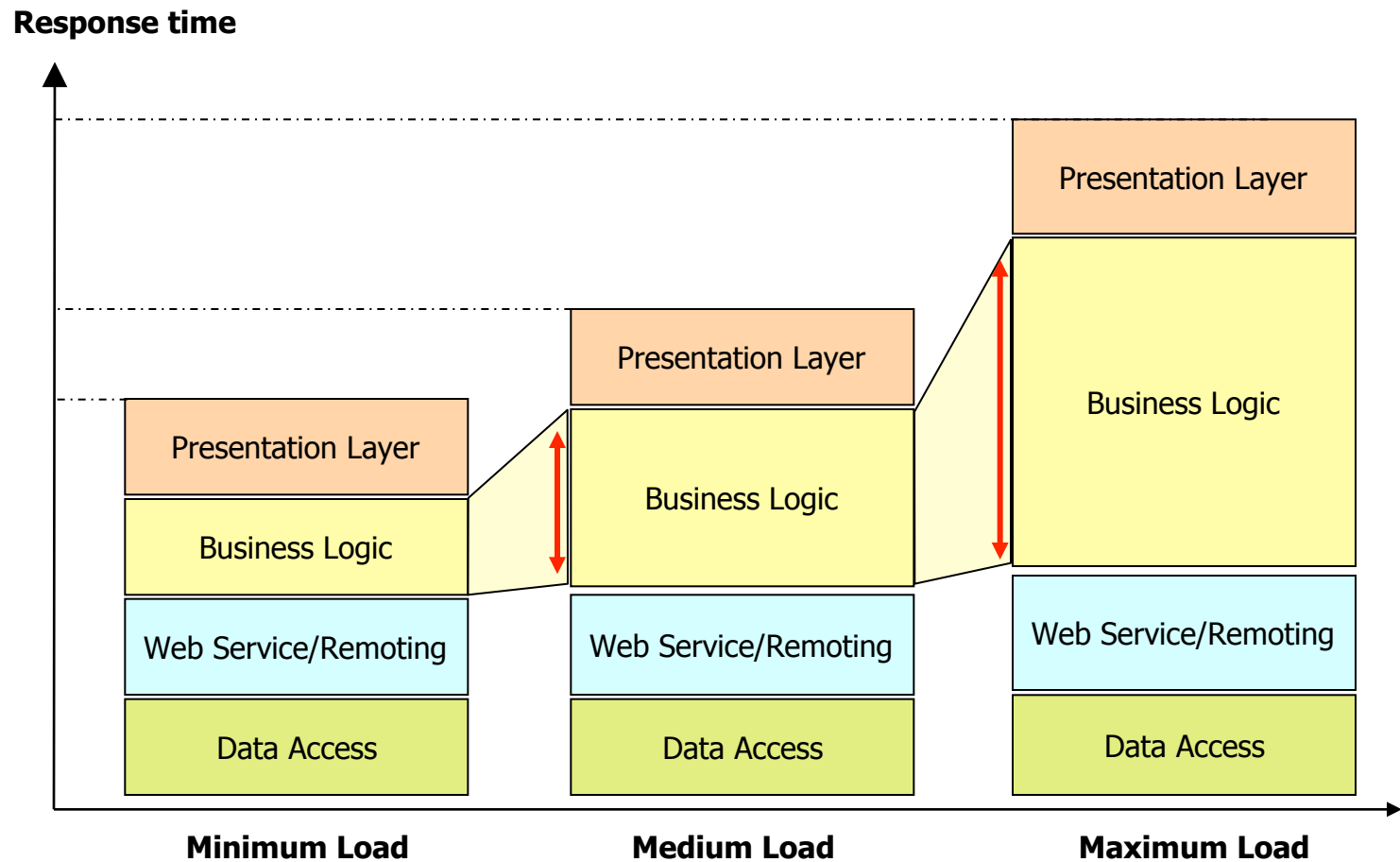
Tip: Measure more than Response Time





Performance vs. Scalability

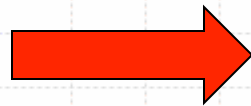
Tip: Identify Scalability Problems





Increasing Load Test is your friend

Performance Breakdown in Application Layers

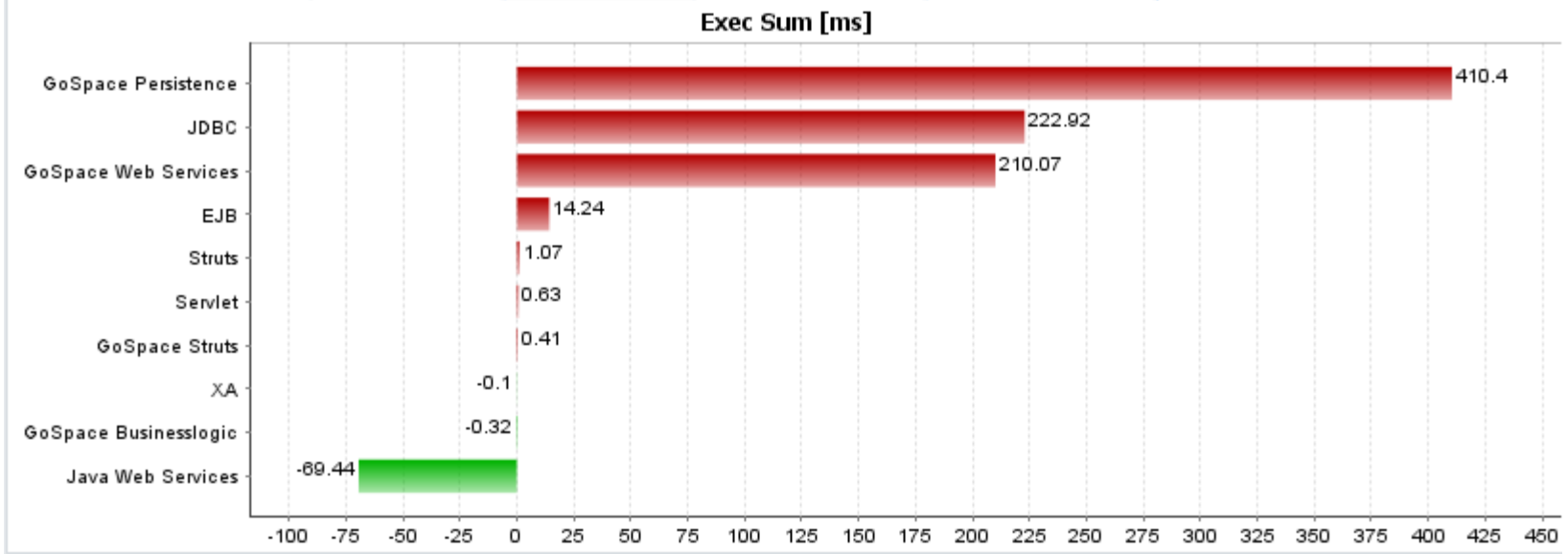


- ADO.NET
- RMI
- JMS
- DotNetPay Frontend
- GoSpace Persistence**
- DotNetPay Backend
- Java Web Services
- Struts
- JDBC
- ASP.NET
- Servlet
- GoSpace Bean
- GoSpace Businesslogic
- EJB**
- GoSpace Struts
- JNDI
- XA
- GoSpace
- GoSpace Communication



Tip: Identify Regressions on Code Level

API	Exec Avg [ms]	Exec Sum [ms]	CPU Exec Avg [ms]	CPU Exec Total [ms]
GoSpace Persistence	410.40 (56 %)	410.40 (56 %)	47.52 (196 %)	47.52 (196 %)
JDBC	222.92 (220 %)	222.92 (220 %)	64.20 (33506 %)	64.20 (33506 %)
GoSpace Web Services	210.07 (54 %)	210.07 (54 %)	168.91 (53 %)	168.91 (53 %)
EJB	14.24 (241 %)	14.24 (241 %)	0.00 (- %)	0.00 (- %)
Struts	1.07 (22 %)	1.07 (22 %)	0.18 (28 %)	0.18 (28 %)
Servlet	0.63 (1 %)	0.63 (1 %)	0.21 (2 %)	0.21 (2 %)
GoSpace Struts	0.41 (35 %)	0.41 (35 %)	0.41 (37 %)	0.41 (37 %)
XA	-0.10 (-47 %)	-0.10 (-47 %)	0.00 (0 %)	0.00 (0 %)
GoSpace Businesslogic	-0.32 (-35 %)	-0.32 (-35 %)	-0.33 (-39 %)	-0.33 (-39 %)
Java Web Services	-69.44 (-10 %)	-69.44 (-10 %)	-69.44 (-10 %)	-69.44 (-10 %)



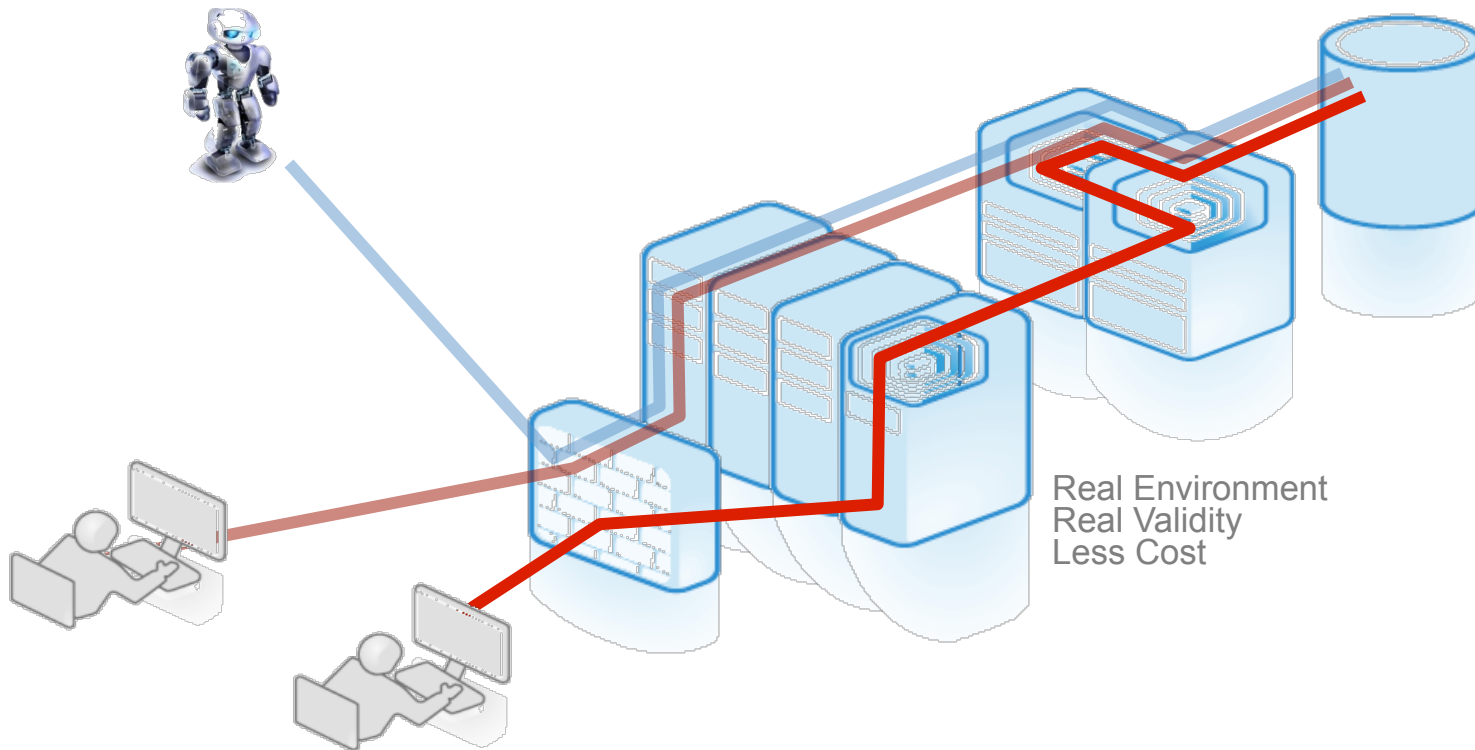


Tip: Get as granular data as possible

Method	Argument	Total [ms]	Exec [ms]
doFilter(ServletRequest request, ServletResponse response)		32545.98	0.12
doPost(HttpServletRequest request, HttpServletResponse response)		32545.87	0.22
selectModule(HttpServletRequest request, ServletContext context)		0.08	0.08
process(HttpServletRequest request, HttpServletResponse response)		32545.57	0.81
findActionConfig(String path)		0.04	0.04
createActionForm(HttpServletRequest request, ActionMapping mapping)		0.18	0.14
reset(ActionMapping mapping, HttpServletRequest request)		0.13	0.13
populate(Object bean, String prefix, String suffix, HttpServletRequest request)		0.22	0.22
validate(ActionMapping mapping, HttpServletRequest request, ActionForm form)		0.04	0.04
execute(ActionMapping mapping, ActionForm form)		32490.65	0.85
init(HttpServletRequest req)		0.00	0.00
lookup(String)		30.10	1.55
create()		1244.38	1135.54
isLoginValid(String username, String password)		31215.31	0.10
askForUser(String username, String password)		31215.21	0.34
getUser(String, String)		31214.87	645.29
Synchronous Path (RMI)		-	-
invoke(InvocationRequest)		30569.58	34.75
setSessionContext(SessionContext)		21.50	21.50
ejbCreate()		20.31	20.31
getUser(String username, String password)		30485.60	11.48
ejbRemove()		7.42	7.42
exception	org.jboss.util.NestedSQLException: No Ma...	-	-
log4j [ERROR]	TransactionRolledbackException in metho...	-	-
exception	org.jboss.util.NestedSQLException: No Ma...	-	-
findException(Class type)		0.27	0.10
applicationInstance(String className)		0.07	0.07
execute(Exception ex, ExceptionConfig ae, Action		0.19	0.07

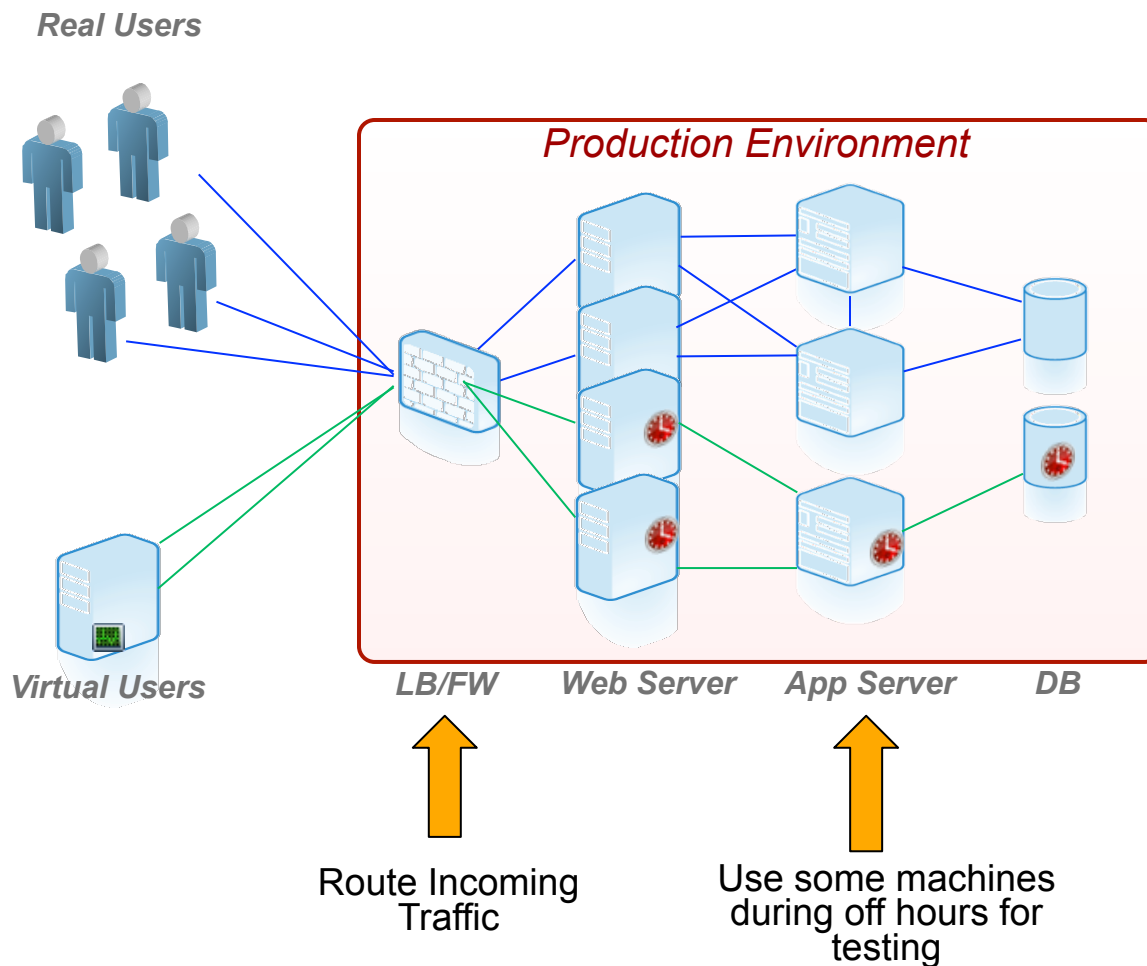


Test in your Production Environment

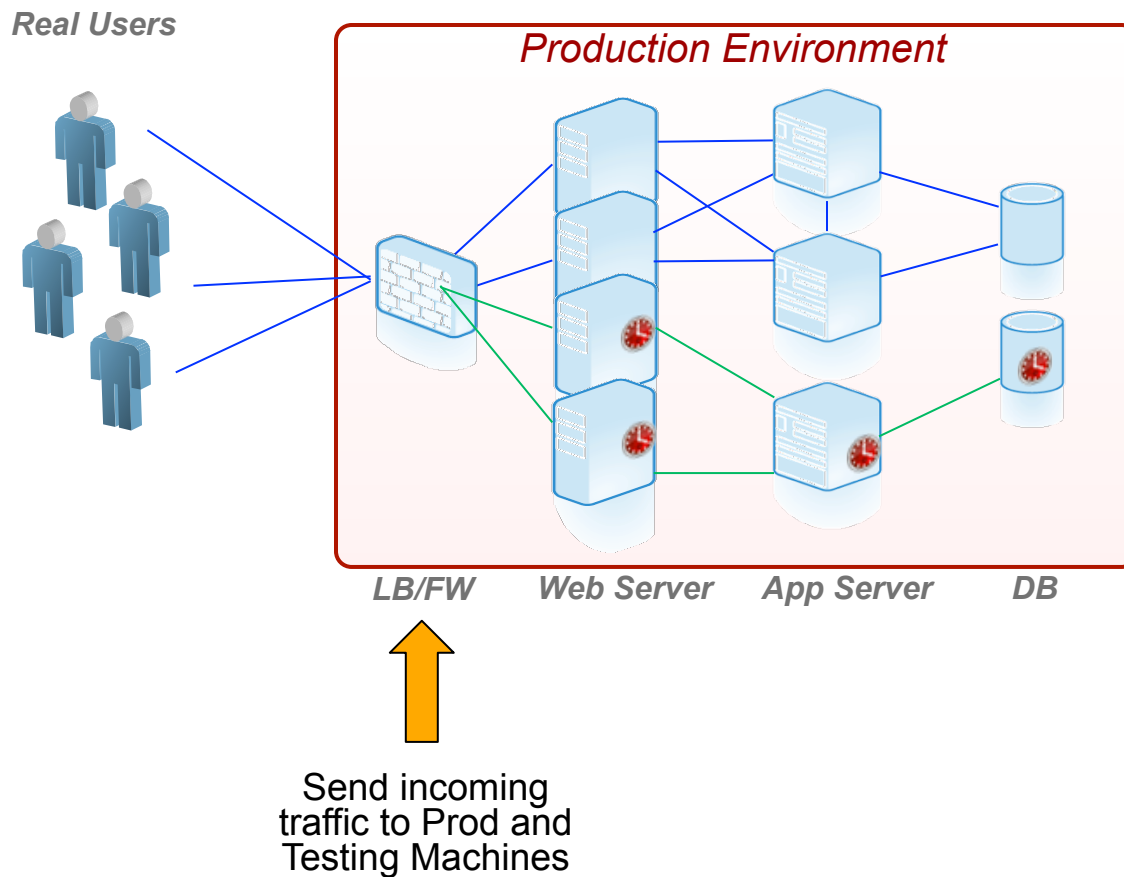




Scenario 1: Use Production Hardware

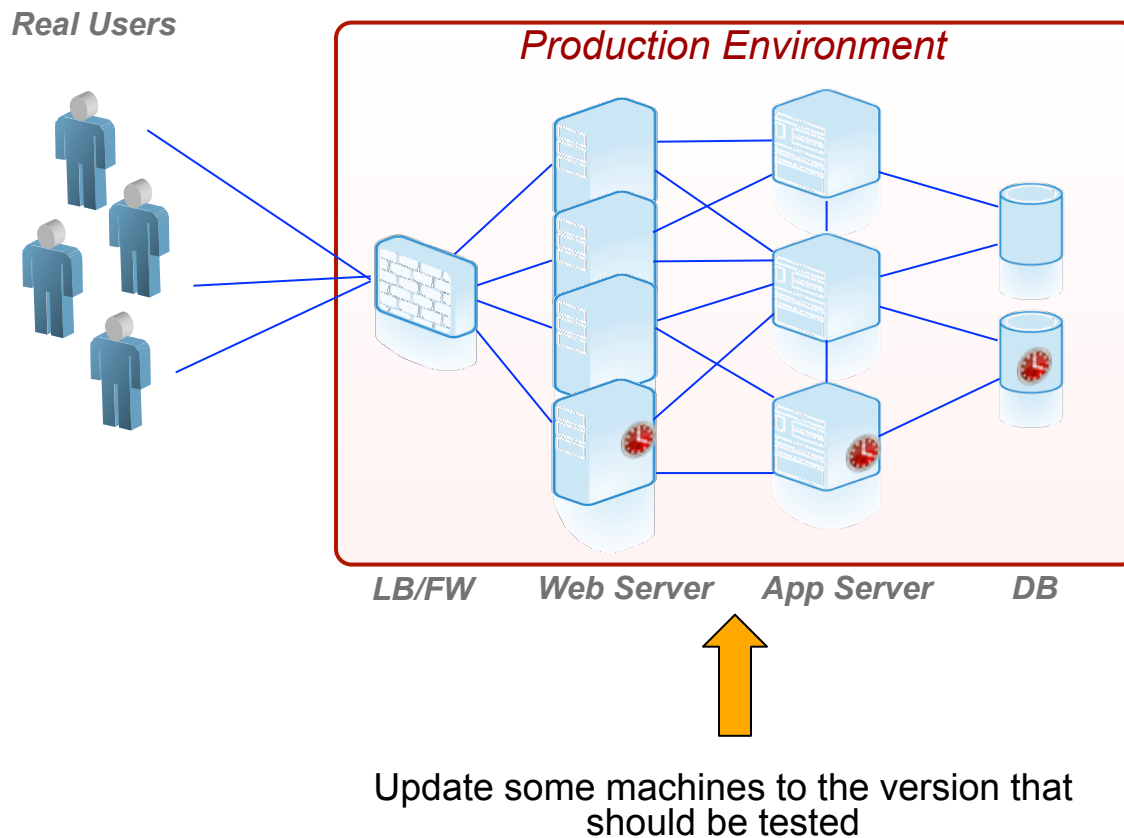


Scenario 2: Duplicate Traffic





Scenario 3: Partial Update





Use Cloud based Testing Services

Real End User Time

CDN

*High
Volume*



Proxies

*Control
Costs*

Last Mile

Load Balancers

SLD unavailable
 SLD unavailable (unexpected)
 OPS - Memory Error (removed)
 OPS - Memory Warning (removed)
 OPS - Excessive CPU (removed)
 OPS - Severe Excessive CPU (removed)

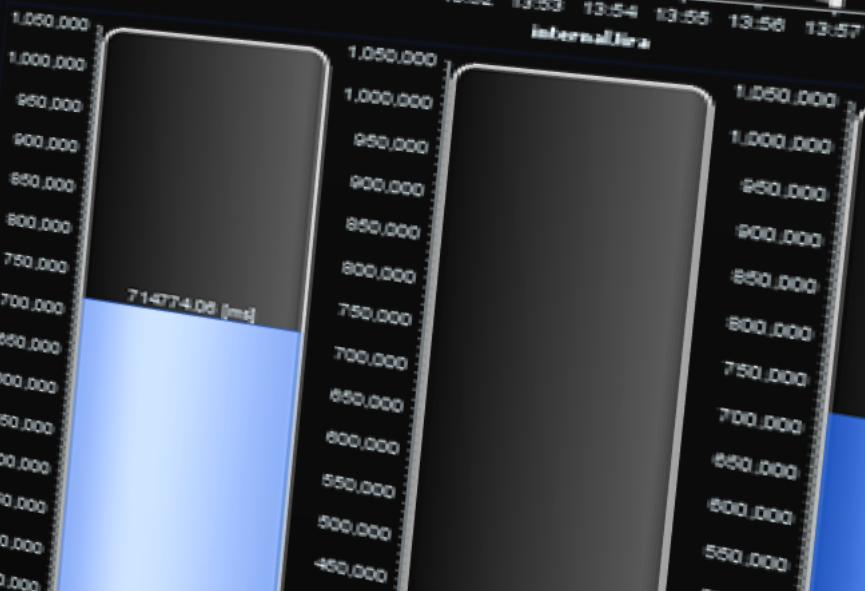
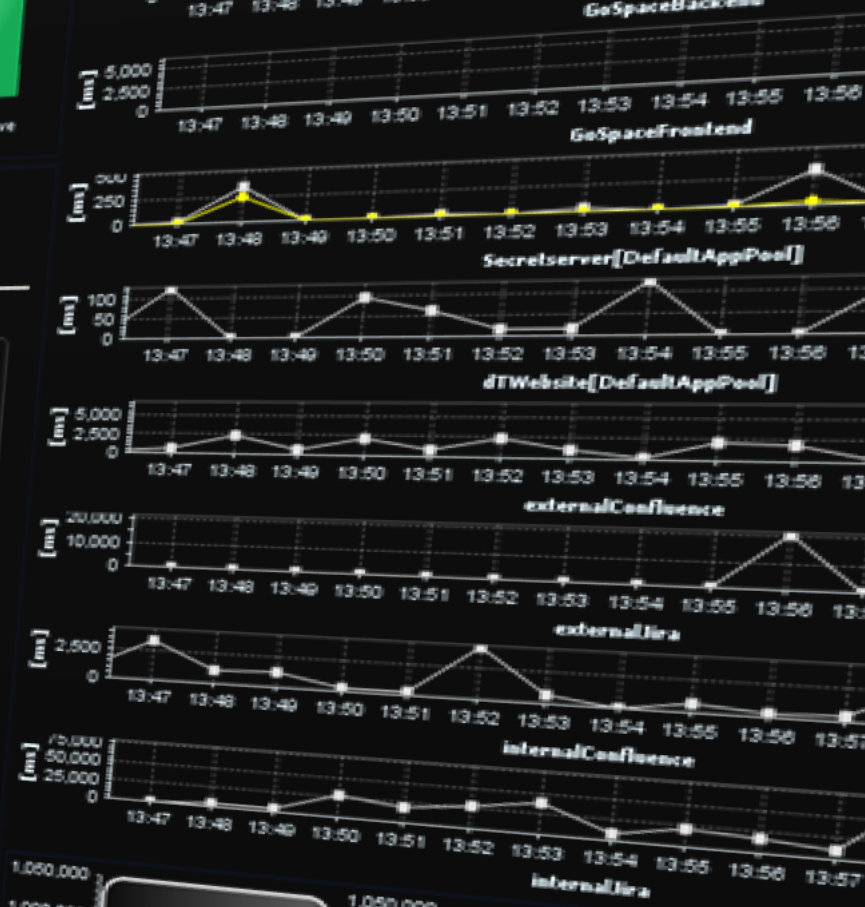
Real Life Feedback

PurePaths: 5/21/10 1:18 PM - 5/21/10 2:01 PM



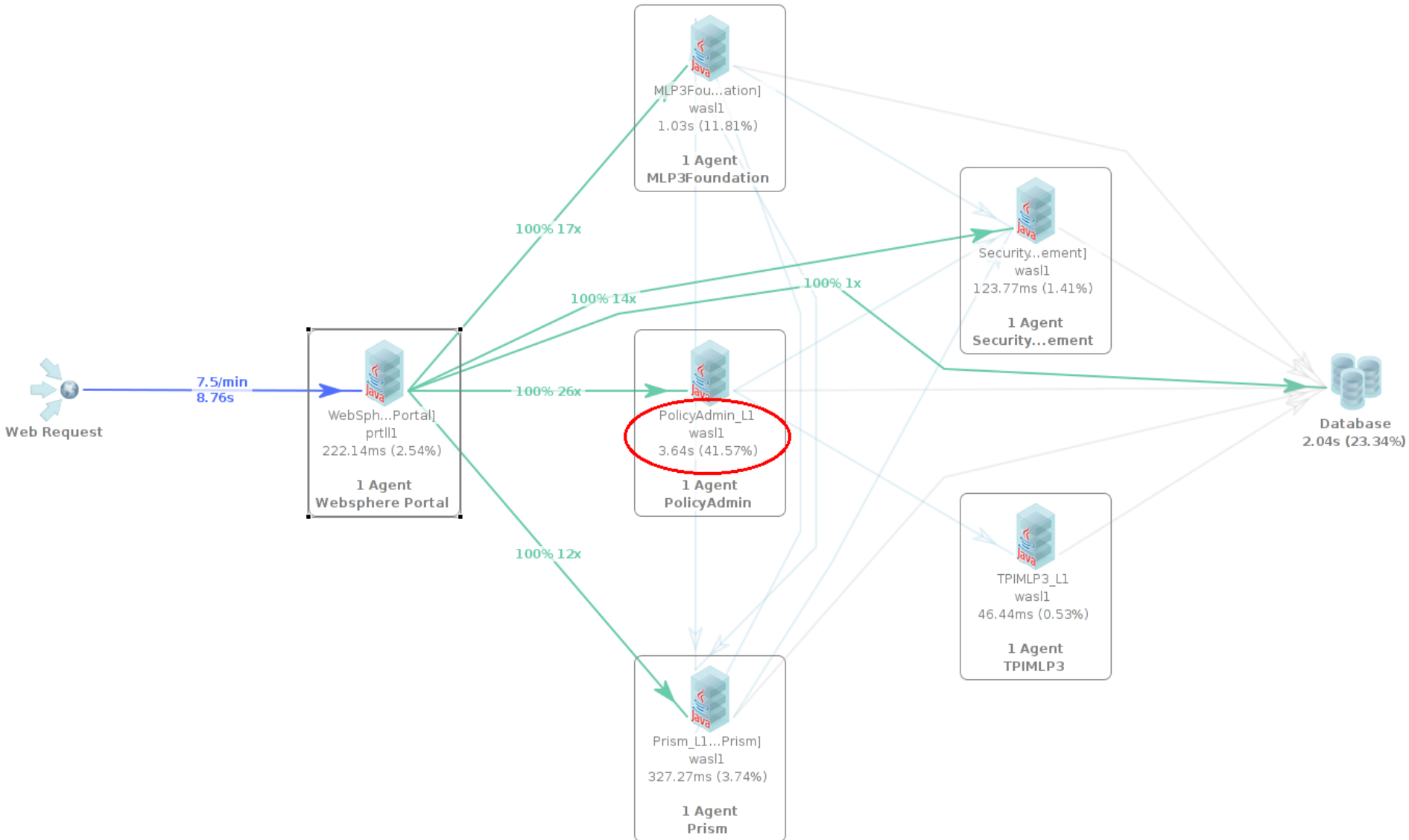
Monitor	PurePath Dur...	PurePath CPU D...	WR Count	Server Respons...	PurePath Durati...
dTWebsite	73248.73 [ms]	15.62 [ms]	106.00	169.36 [s]	73248.73 [ms]
InternalConfluence	6972.04 [ms]	3000.00 [ms]	754.00	58.54 [s]	6972.04 [ms]
InternalIra	4465.90 [ms]	2276.63 [ms]	1106.00	653.09 [s]	4465.90 [ms]
ExternalConfluence	4099.84 [ms]	1078.12 [ms]	256.00	113.80 [s]	4099.84 [ms]
ExternalIra	1814.80 [ms]	218.75 [ms]	7.00	13.01 [s]	1801.21 [ms]
AL TestAgents	958.02 [ms]	453.12 [ms]	10.00	2.84 [s]	951.03 [ms]
Secretserver	242.21 [ms]	203.12 [ms]		0.98 [s]	242.21 [ms]

Host	System Profile	Agent Mapping	Agent Group
name2009@dynaweb2009-7220	dynaTrace Monitoring	IIS	Webserver
site[ASP.NET V2.0]@dynaweb2009-	dynaTrace Monitoring	dTWebsite	dTWebsite
server[DefaultAppPool]@dynaweb2009-	dynaTrace Monitoring	dTWebsite	dTWebsite
server[DefaultAppPool]@inserv-111	dynaTrace Monitoring	Secretserver	Secretserver
inFrontend@LEFLEM-4712	dynaTrace Monitoring	New Agent	New Agent
inBackend@LEFLEM-5304	dynaTrace Monitoring	New Agent	New Agent
Confluence@dynaweb2009-7732	dynaTrace Monitoring	ExternalConF...	ExternalConF...
deap@dynaweb2009-9120	dynaTrace Monitoring		
ra@inserv-4144	dynaTrace Monitoring		
ra@inserv-376	dynaTrace Monitoring		
inConfluence@inserv-5648	dynaTrace Monitoring		



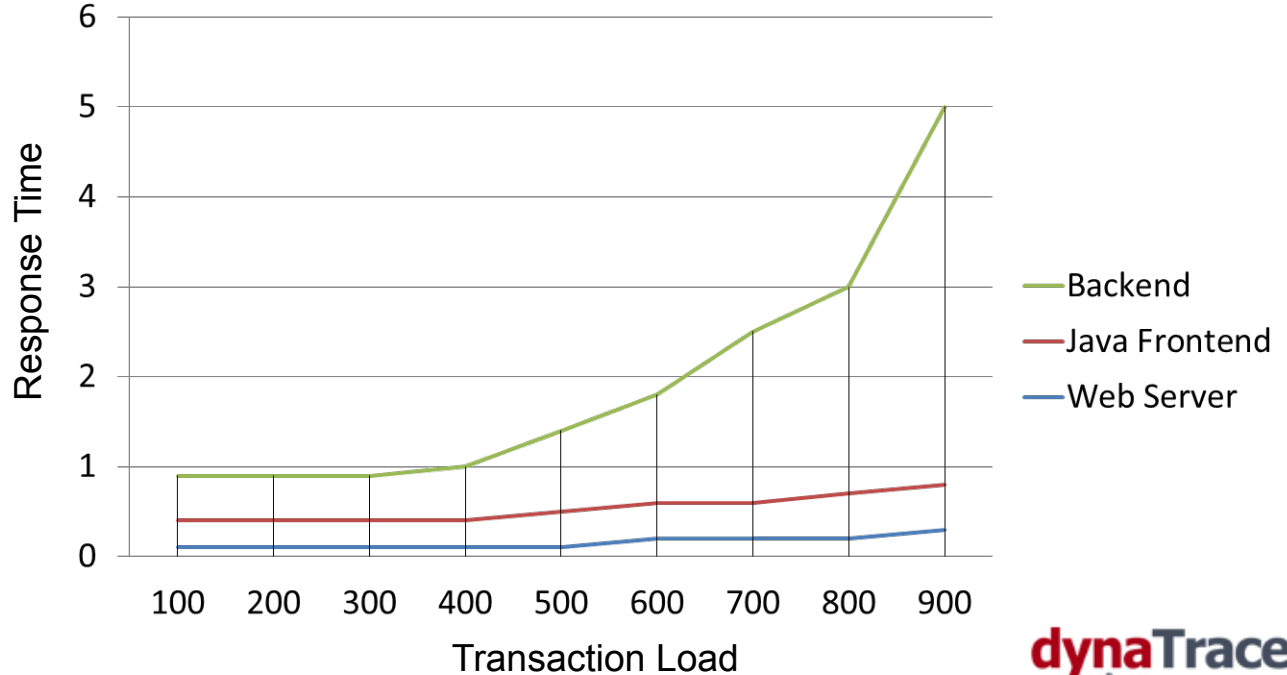
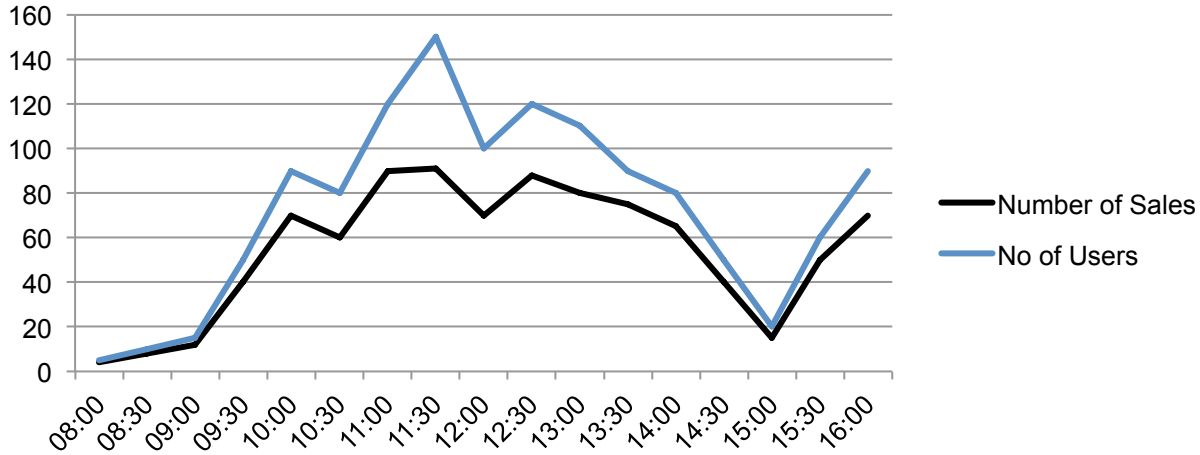


Understand your production environment





Focus on areas with biggest impact





ONE set of Tools

Communication



Collaboration



Brave new World

WE ARE NEVER DONE...



...WE CONSTANTLY IMPROVE

Andreas Grabner

andreas.graber@dynaTrace.com

<http://blog.dynatrace.com>

@grabnerandi

... and while you are here, bag yourself:



Visit dynaTrace booth

