

Agile Performance Testing

Cesario Ramos

Independent Consultant

AgiliX Agile Development Consulting



Overview

- Why Agile performance testing?
- Nature of performance testing
- Agile performance testing



Why Agile Performance Testing?

We experience

Primary problems after project release are
NOT system crashes or incorrect system
responses

Primary problems are

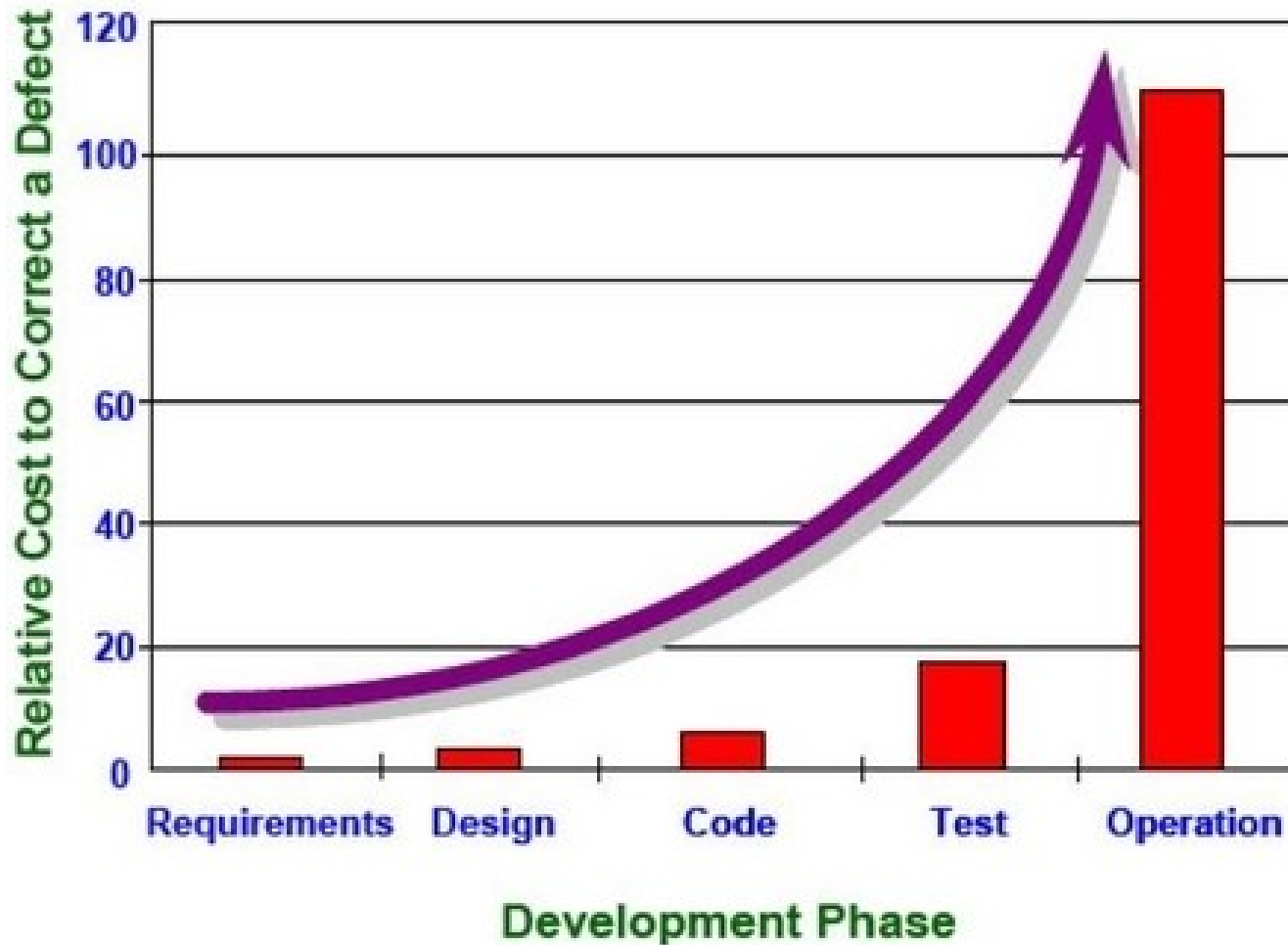
1. Responsiveness degradation
2. Inability to handle required throughput

Source: Weyuker E.

Webshop for phones

- Worked good during testing
- In production system failed after 15 minutes
 - Authentication server load was not taken into account ☹️

We know



We see



Hand-offs



Defects



Delay



Relearning

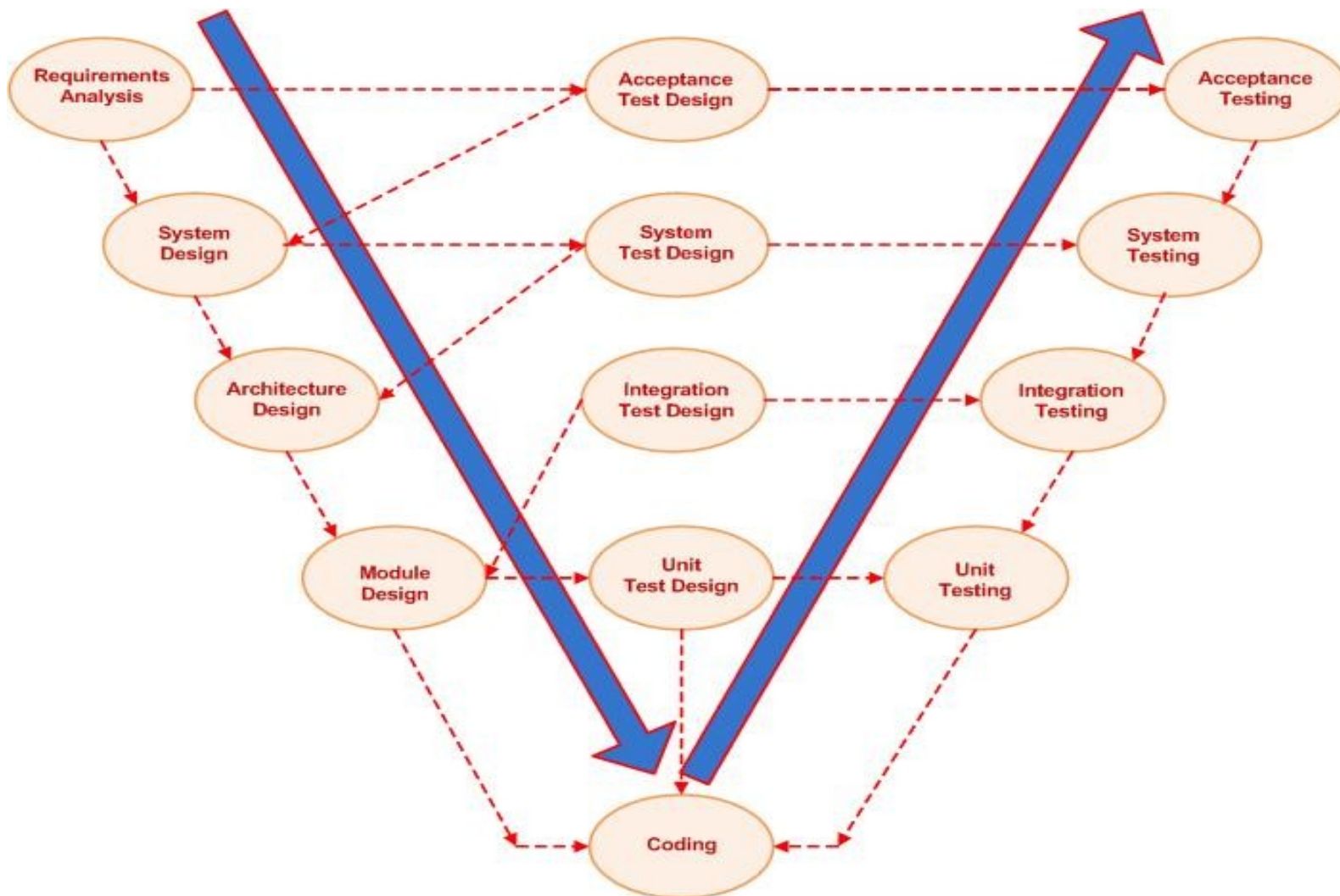


Task Switching



Inventory

We use



We expect?

- To decrease overall lead-time
 - Throughput accounting v.s. Cost accounting
- To have less problems in production
 - Decrease risk, increase reliability
- To achieve overall better quality
 - Usability, Stability, Performance

Still we see mostly
Pre-production validation only!



WHY?

WHY?

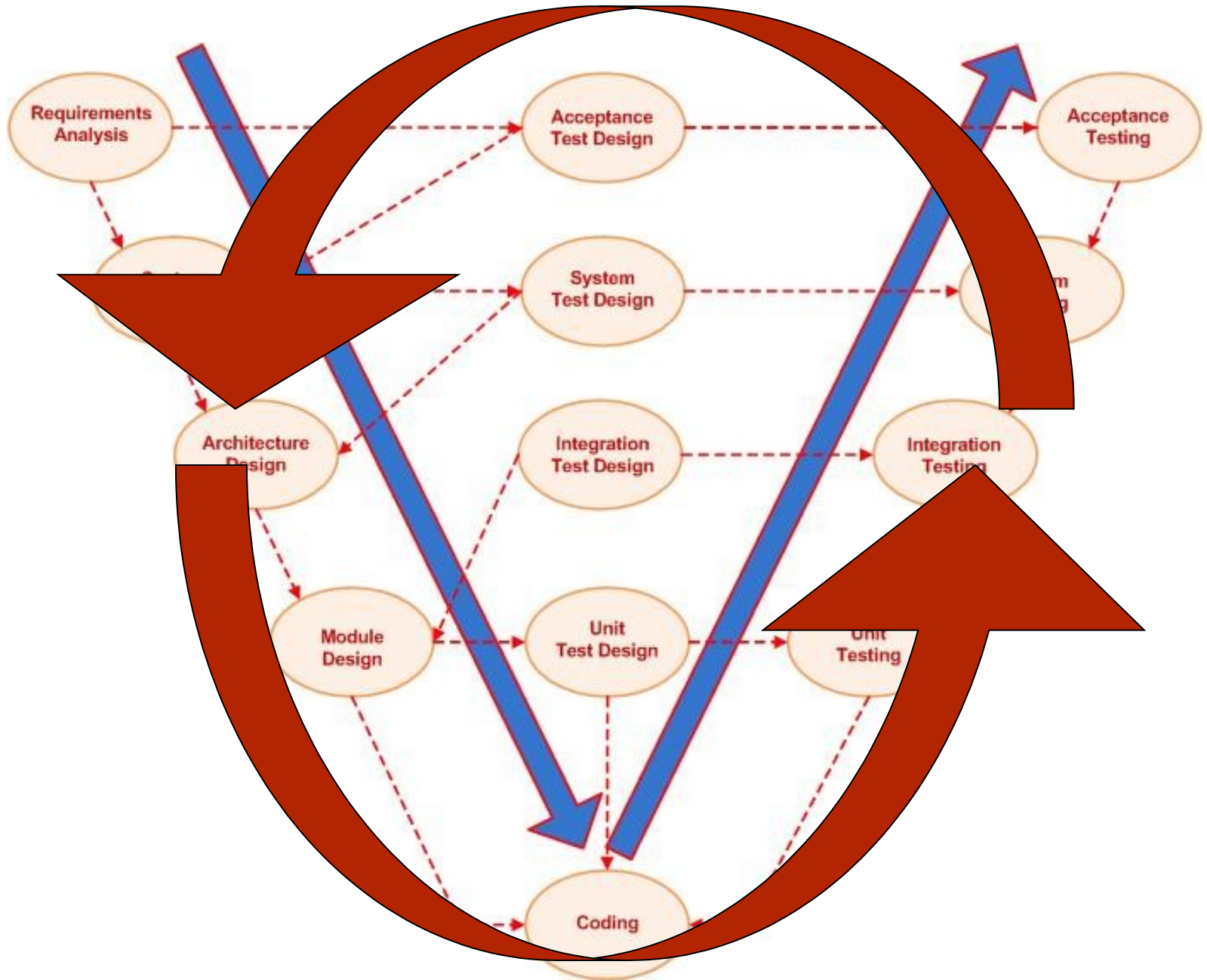
- Performance test team is expensive, overworked
 - We can only test the complete system
 - Performance testing against a moving target
 - What happens to my baselines during sprints?
 - “First make it work, then make it fast”
- Deployment team is expensive, overworked
 - Deploying to test environment is very difficult and time consuming
 - The fewer deployments the better

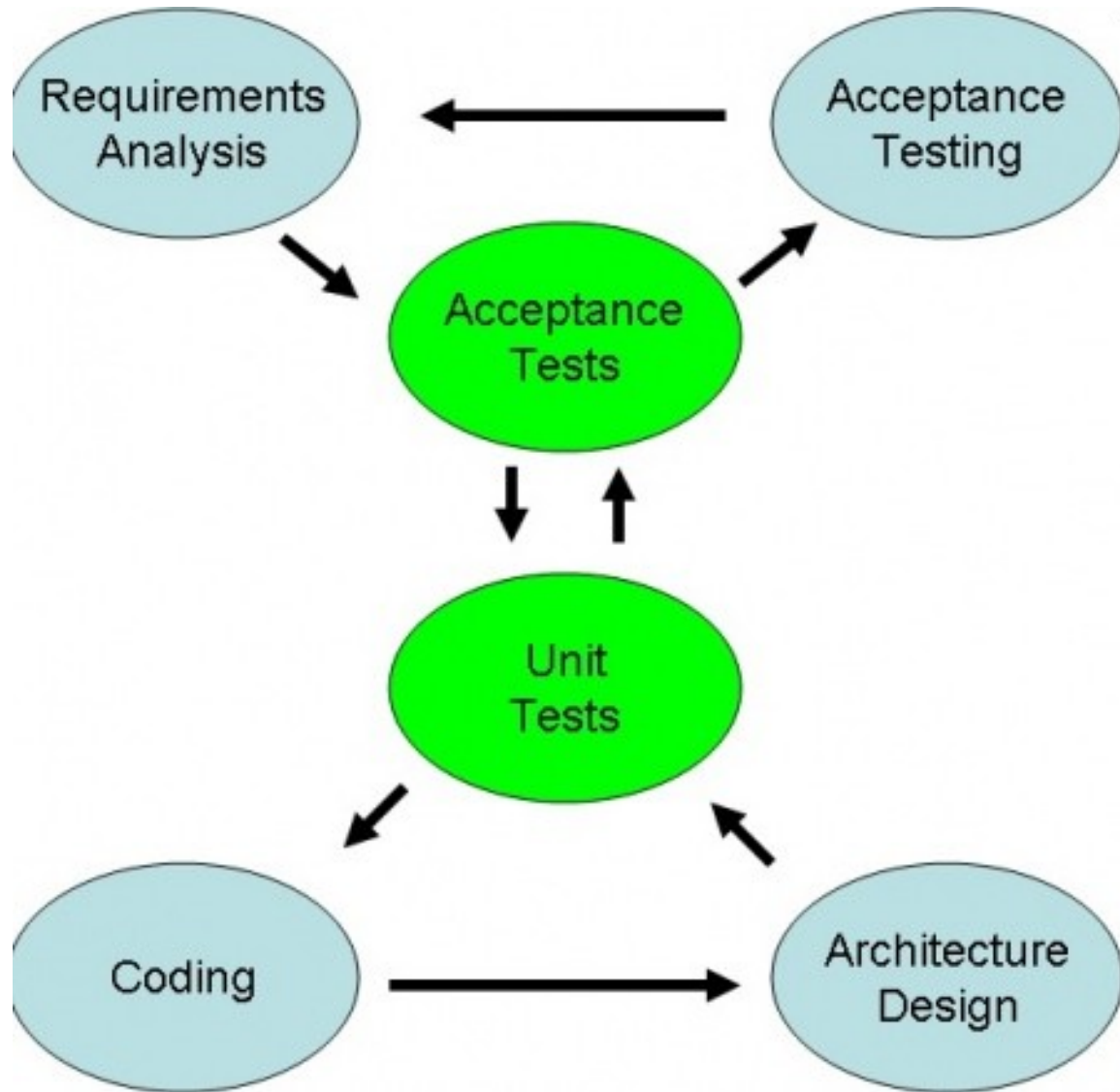
WHY?

- “premature optimization is waste!”
- Separate teams
 - Developers, Testers, Deployers, Analysts
- Costs are high for frequent deployment
- Production like environments are expensive
- We need specialists for performance
- ...



What could we do?





Performance tests executed throughout the project



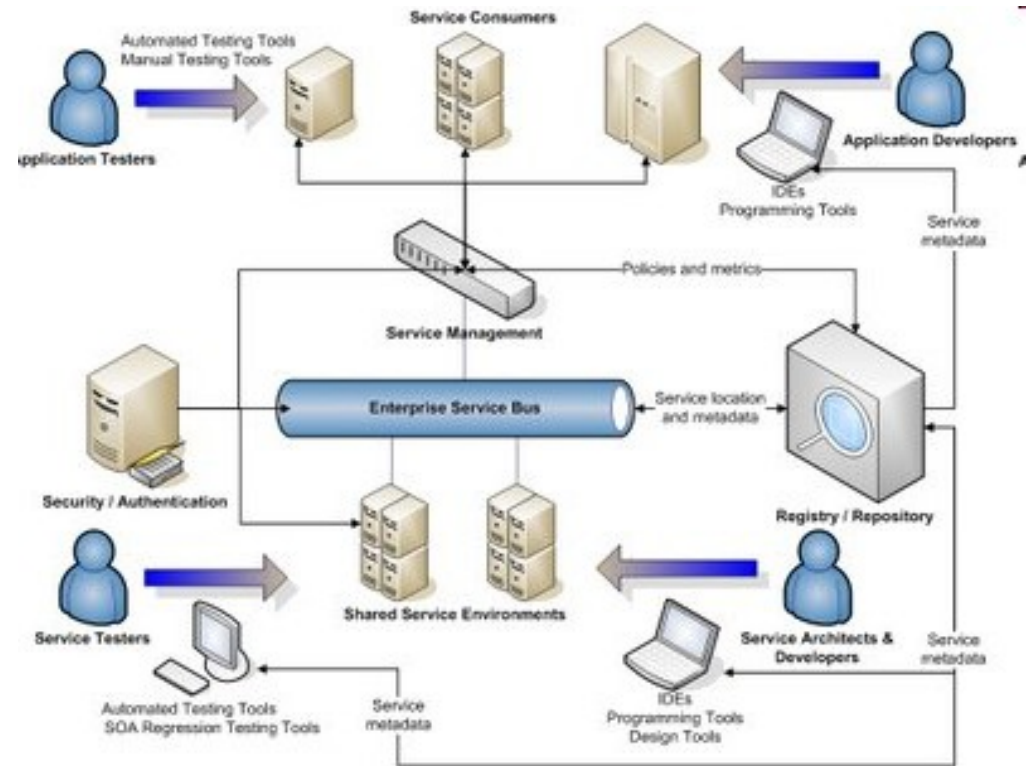
Performance activities, refined and executed in collaboration.



What's in it for you?

- Project manager
 - Improved quality.
 - Decreased risk.
- Developer
 - Will have effective discussions with requirement engineers and performance testers.
- Tester
 - Not waste any time on trivial problems.
 - Help the team earlier and more efficiently.

Nature of performance testing



Grey box testing

- You must understand how it works in order to write relevant test scripts.
- You must understand the architecture.

Beware of

Integration points

Chain reactions

Blocked threads

Unbalanced capacities

No more simple record playback

Source: Nygard M.

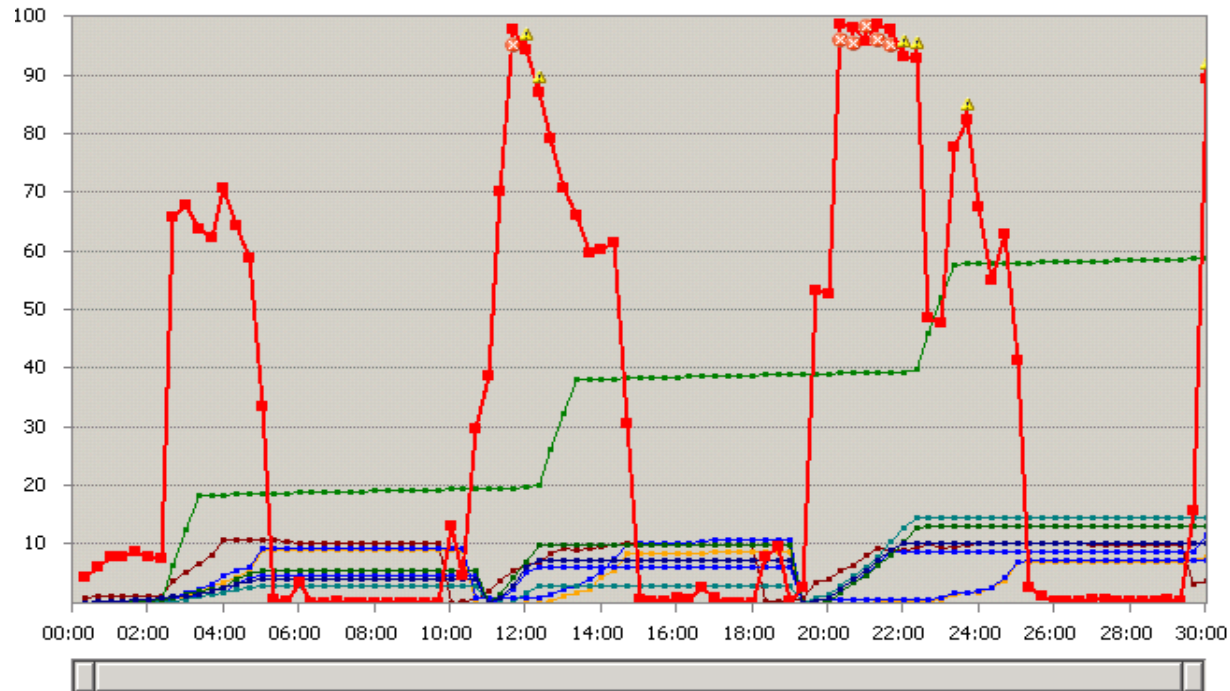
Build stub components

- Simulate SLA's
 - Test against the stubs
- Create failure modes
 - Slow network responses
 - Huge data responses

Correlation problem

Per server

- Thread pools
- Connection pools
- Request Response times
- CPU usage
- Memory usage
- JVM behavior
- Code hotspots



Counter	Instance	Category	Computer	C...	Range	Max	Avg
<input checked="" type="checkbox"/> % Processor Time	_Total	Processor	BPI8X32PERF01		100	99.1	31.4
<input checked="" type="checkbox"/> User Connections	-	SQLServer:General St...	BPI8X32PERF01		10000	1,093	785
<input checked="" type="checkbox"/> Documents received	RecActHost	BizTalk:Messaging	BPI2X64PERF02		100000	9,119	4,987
<input checked="" type="checkbox"/> Documents received	RecActHost	BizTalk:Messaging	BPI2X64PERF03		100000	10,923	5,643
<input checked="" type="checkbox"/> Total Tests	_Total	LoadTest:Test	BPI2X64PERF01		100000	58,991	33,749
<input checked="" type="checkbox"/> Orchestrations completed	XlangHost	XLANG/s Orchestrations	BPI2X64PERF04		10000	1,190	552
<input checked="" type="checkbox"/> Orchestrations completed	XlangHost	XLANG/s Orchestrations	BPI2X64PERF05		10000	1,486	598
<input checked="" type="checkbox"/> Orchestrations completed	XlangHost	XLANG/s Orchestrations	BPI2X64PERF06		10000	1,337	781
<input checked="" type="checkbox"/> Orchestrations completed	XlangHost	XLANG/s Orchestrations	BPI2X64PERF07		10000	1,047	613

Tuning

Who dominates the CPU?

- Operating system? (OS system load on CPU)
- JVM? (object lifecycle, garbage collection)
- Application? (algorithms)
- None (blocked threads most of the time)

There's always one most prominent performance problem

All performance problems express themselves in the hardware

Source: Kirk Pepperdine

ALTERNATIVE

NET

NET

DIRX

BOARD VORDER B

Agile performance testing

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Hochwert

NET
Cody's
Check Case

DIRX

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Opt. Cache

NET
Performance

SQL

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OPHALEN PDF

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Suchmaschinen

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Load PDF

NET
Opt. Generate PDF

SQL

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SQL

Red = KAPOT
blauw = happy flow light



- Feature driven planning is needed
 - Build a release plan where you performance test every few sprints, when couple of related features are done!
- Need for establishing Baselines
 - Deployed and production
 - Useful when architecture stabilizes

- Invest in automatic
 - Deployment
 - Smoke tests
 - Integration testing

Exploratory performance testing

- Local performance tests
 - Memory leaks
 - Memory usage patterns
 - Threading issues
- Code Reviews
 - Checks on use of boundedness, use of timeouts
 - Use of caching, cache configuration
 - Best practices on algorithms, synchronization, designs, value objects, functional programming, modularization, ...

- Deployed performance tests
 - Workload issues
 - #clients, request frequency, arrival rate, duration
 - Configuration
 - Thread pool sizes, Connection pool sizes, Cache sizes, JVM configuration, queue sizes, ...
 - Application
 - Replication, remote methods calls, database interactions, asynchronous messages, security service, ...

When a performance problems is found

1. write a failing test for it
2. make it work local
3. make it work on the deployed environments

Summarizing

Performance testing is agile and iterative by nature!

Grey box testing

Avoid re-runs

Automatic deployment

Need to correlate various measurement results

Establish baselines

Agile Performance Testing

Cesario Ramos

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AgiliX Agile Development Consulting

www.agilix.nl

www.codecentric.nl

cesario@agilix.nl