What to Performance Test:

Choose Wisely

Derived from:

Microsoft patterns & practices

Performance Testing Guidance for Web Applications

By: J.D. Meier, Carlos Farre, Prashant Bansode, Scott Barber, Dennis Rea

http://www.codeplex.com/PerfTestingGuide

Scott Barber

Chief Technologist

PerfTestPlus, Inc.

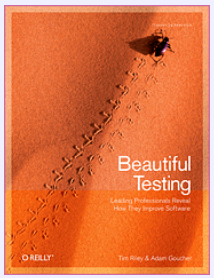
Performance Testing Software Systems

Scott Barber, CTO, PerfTestPlus, Inc.
sbarber@perftestplus.com
www.perftestplus.com

Executive Director, Association for Software Testing
www.associationforsoftwaretesting.org

Co-Founder, Workshop On Performance and Reliability
www.performance-workshop.org

Beautiful Testing



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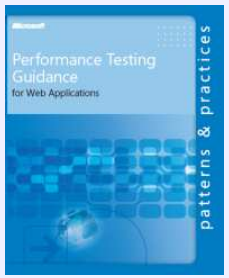
Performance Testing Guidance for Web Applications



www.codeplex.com/PerfTestingGuide
www.amazon.com/gp/product/0735625700

Primary Goal of this Course

To teach you how to *think about*, *organize*, and *manage* performance testing effectively, under time and resource constraints, by *wisely choosing* which tests to design and execute to based on your project *context*.

I Assume That You:

Test software performance or manage someone(s) who does.

Have at least some control over the design of your tests and some time to create new tests.

Have at least some influence over your test environment.

Are worried that your test process is spending too much time and resources on things that aren't important AND/OR

Are worried that your test process doesn't leave enough time and resources to determine what IS important.

Believe that good testing requires thinking.

Test under uncertainty, resource limitations and time pressure.

Have a major goal to find important problems quickly.

Want to get very good at testing software performance.

Credits

Some of the material in this presentation was inspired by *High Performance Web Sites: Essential Knowledge for Front-End Engineers*, by Steve Souders, O'Reilly, 2007.

Some of this material was developed for, or inspired by, *Performance Testing Guidance for Web Applications*, a Microsoft patterns & practices book by J.D. Meier, Scott Barber, Carlos Farre, Prashant Bansode, and Dennis Rea.

Many ideas in this presentation were inspired or enhanced by colleagues including Alberto Savoia, Roland Stens, Richard Leeke, Mike Kelly, Nate White, Rob Sabourin, Chris Loosley, Ross Collard, Jon Bach, James Bach, Jerry Weinberg, Cem Kaner, Dawn Haynes, Karen Johnson, the entire WOPR community, and by students who took previous versions of this course, back to 2001.

Most of the concepts in this presentation are derived from publications, presentations, and research written and/or conducted by Scott Barber.

This course has been heavily influenced by:
Rapid Software Testing (James Bach & Michael Bolton, ©1995-2007 Satisfice, Inc.)
Just-In-Time Testing (Robert Sabourin, ©1998-2007 Amibug, Inc.)

What is Performance Testing (Part 1)

Performance Testing: An empirical, technical investigation conducted to provide stakeholders with information about the quality of the product or service under test with regard to speed, scalability and/or stability characteristics.

Performance Investigation: A deliberate data-collection and data-interpretation activity typically focused on data related to speed, scalability, and/or stability of the product under test. The collected data are primarily used to assess hypotheses about the root cause of one or more observed performance issues.

Performance Validation: A deliberate activity that compares speed, scalability and/or stability characteristics of the product under test to the expectations of representative users of the product.

What is Performance Testing (Part 2)

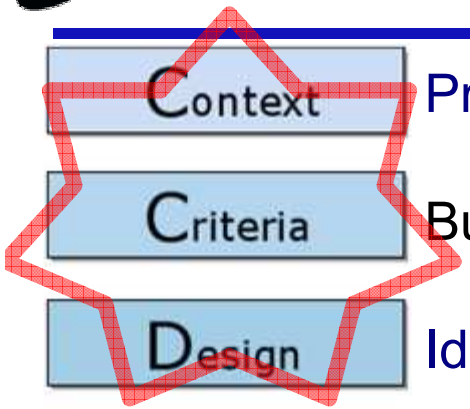
In Other Words:

I help and/or teach individuals and organizations to *optimize software systems* by balancing:

- Cost
- Time to market
- Capacity

while remaining focused on the *quality of service to system users.*

Performance Testing Principles



Context	Project context is central to successful performance testing.
Criteria	Business, project, system, & user success criteria.
Design	Identify system usage, and key metrics; plan and design tests.
Instrument	Install and prepare environment, tools, & resource monitors.
Script	Script the performance tests as designed.
Execute	Run and monitor tests. Validate tests, test data, and results.
Analyze	Analyze the data individually and as a cross-functional team.
Report	Consolidate and share results, customized by audience.
Iterate	"Lather, rinse, repeat" as necessary.

Why Test Performance?

To choose tests wisely, we must know what we are testing for.

To determine compliance with requirements?

To evaluate release readiness?

To assess user satisfaction?

To assist in performance tuning?

To estimate capacity?

To validate assumptions?

To generate marketing statements?

“Just test it” Isn’t Enough

Do you know your performance testing mission?

Do you know the “Commander’s Intent”?

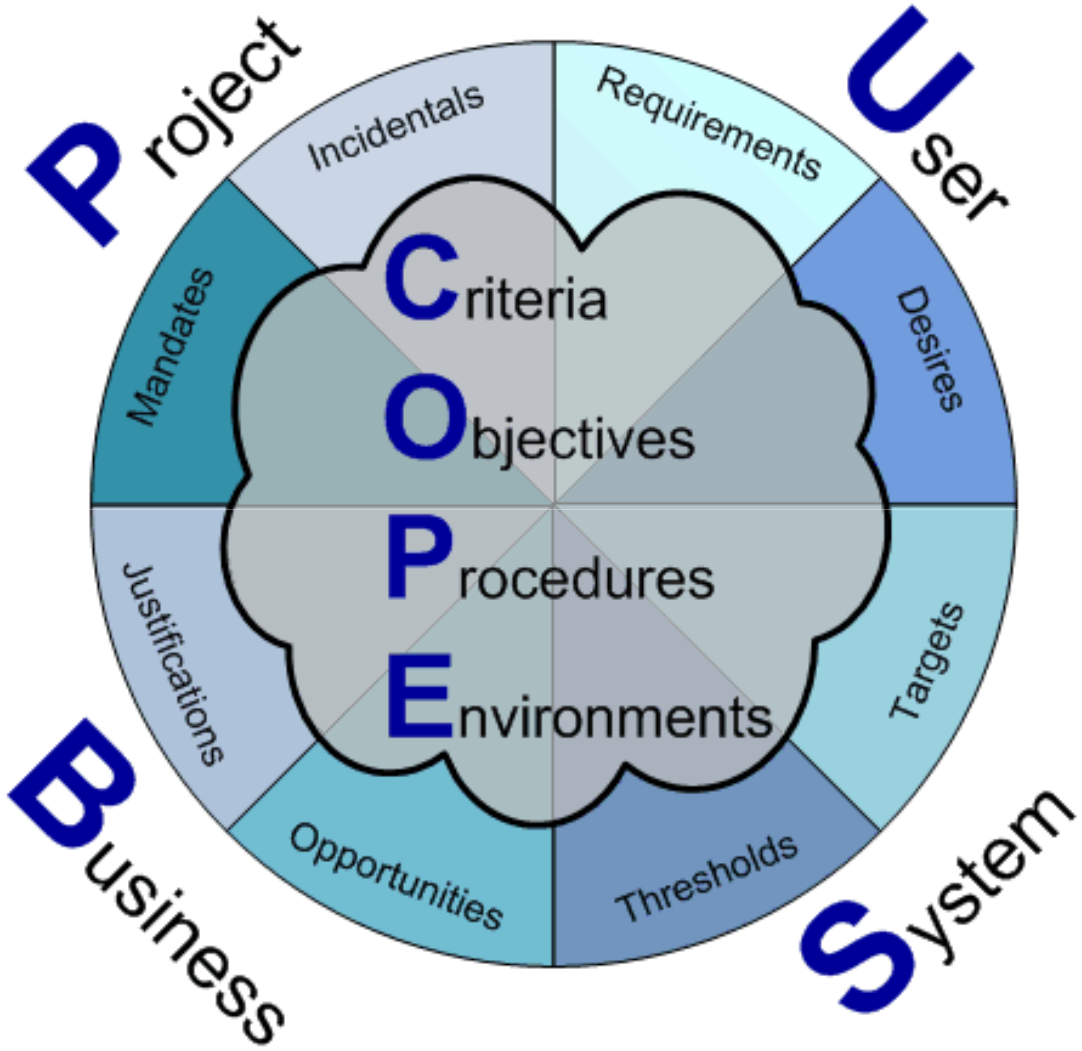
Can you find out?

Example from my days as a U.S. Army LT:

Mission: Secure hilltop 42 NLT 0545 tomorrow.

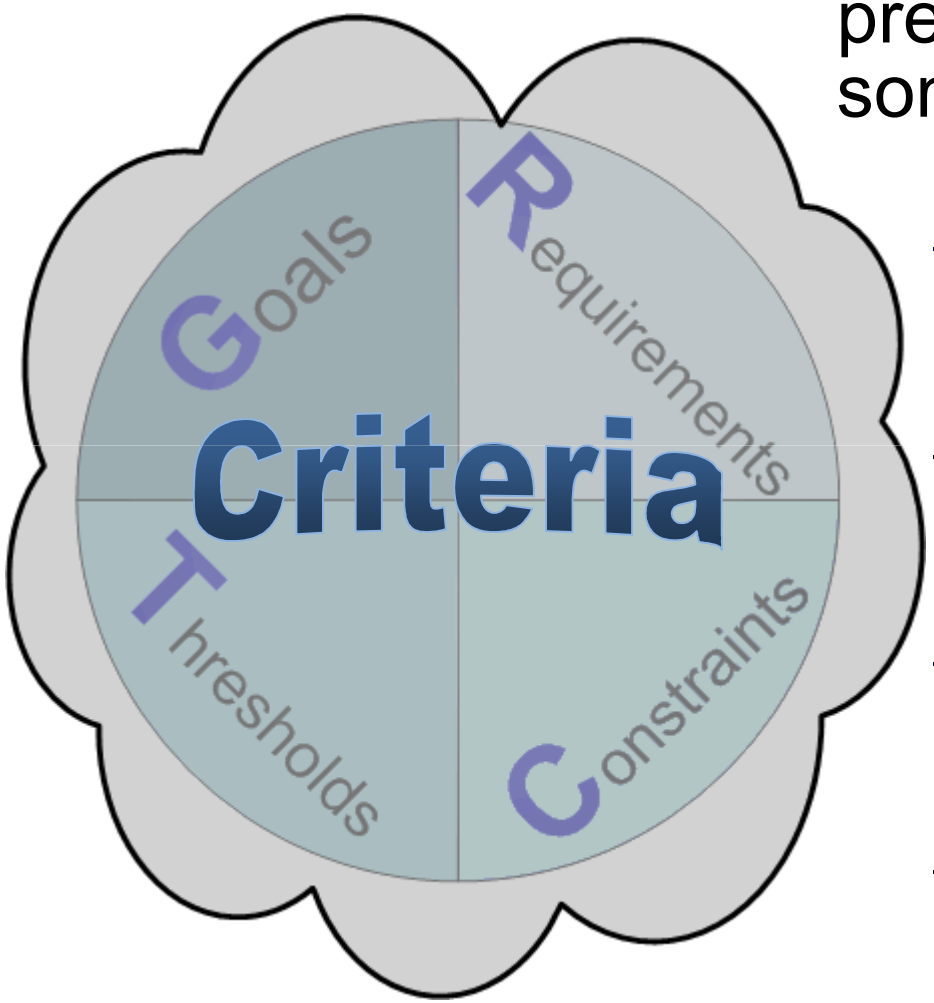
Commander’s Intent: It is my intent that the supply convoy safely cross the bridge spanning the gorge between hilltop 42 and hilltop 57 between 0553 and 0558 tomorrow.

COPE in PUBS



What Matters

Performance Criteria are *boundaries* dictated or presumed by someone or something that matters.



Goals: Soft Boundaries
(User Satisfaction)

Requirements: Firm Boundaries
(Business or Legal)

Thresholds: Hard Boundaries
(Laws of Physics)

Constraints: Arbitrary Boundaries
(Budget or Timeline)

ACQUIRE

Accept	Use your active listening skills
Converse	Validate and demonstrate interest
Question	Probe, educate, and learn
Understand	Summarize priorities and value statements
Investigate	Repeat with other stakeholders, make comparisons, prototype, quantify, etc.
Restate	Return with testable, quantified criteria and/or conflicting criteria/priorities
Evolve	Embrace and communicate changing criteria

Performance Testing Objectives

What we actually hope to gain by testing performance

Are sometimes completely unrelated to stated requirements, goals, thresholds, or constraints

Should be the main drivers behind performance test design and planning

Usually indicate the performance-related priorities of project stakeholders

Will frequently override goals in “go-live” decisions

Now we can design tests to help us achieve our objectives!

IVECTRAS

Do I need this test to:

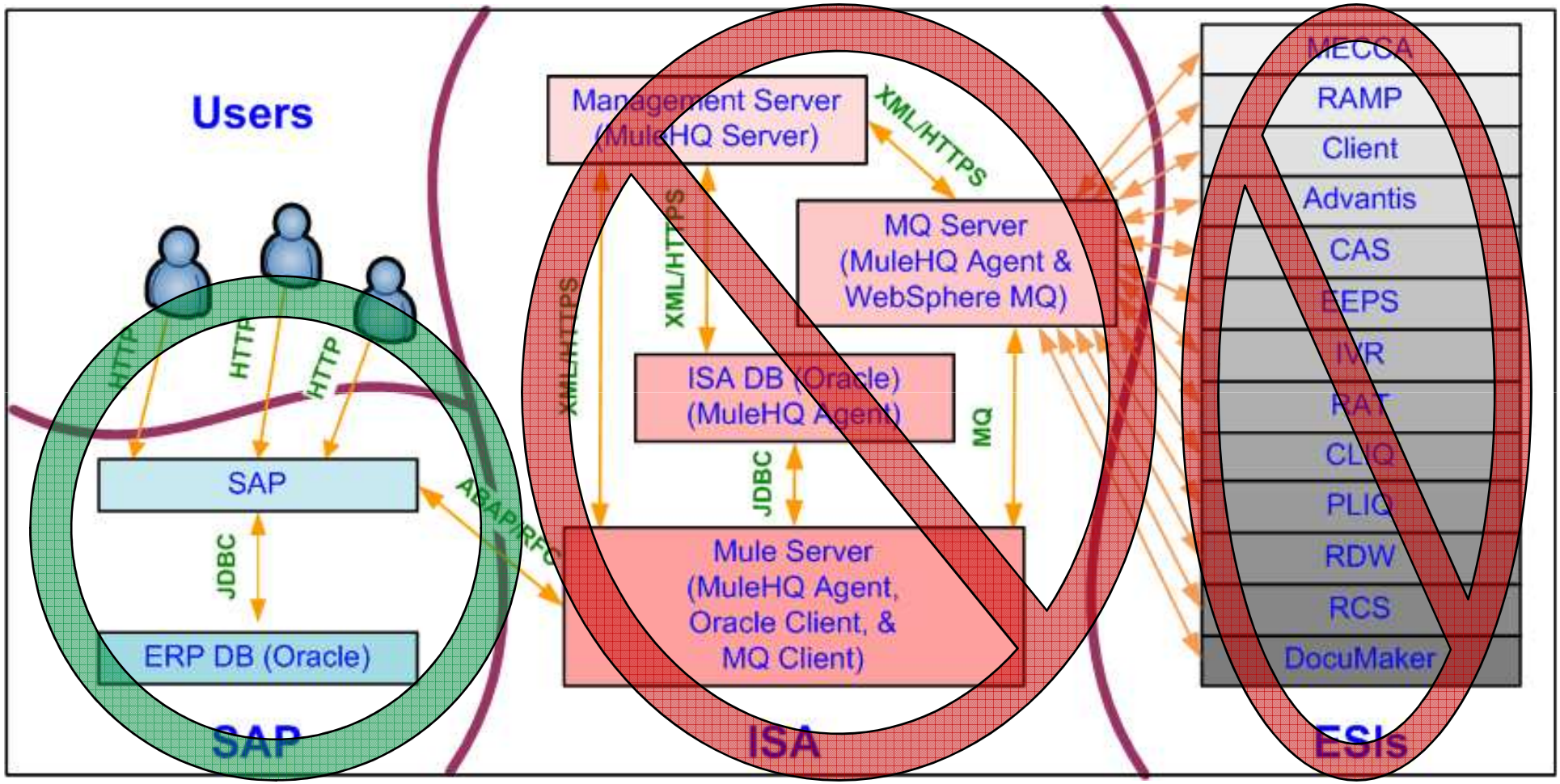
Investigate *or* **Validate/Verify**

End-to-End *or* **Component**

response **Times** *and/or* **Resources** *utilized*

under **Anticipated** *or* **Stressful** *conditions*

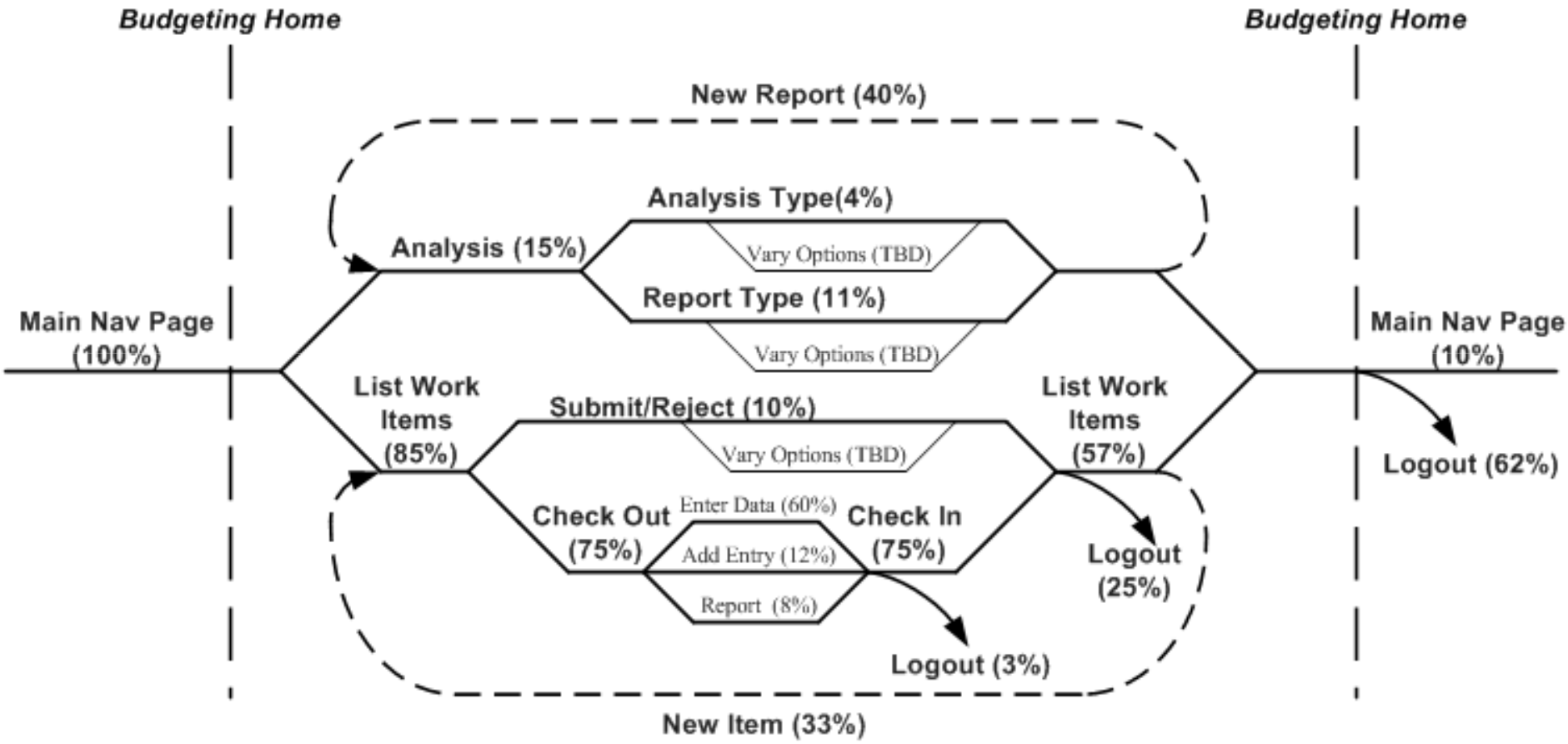
Communicating Design



FIBLOTS

Frequent	Common activities (get from logs)
Intensive	e.g. Resource hogs (get from developers/admins)
Business Critical	Even if these activities are both rare and not risky
Legal or Contract	SLA's, Contracts and other stuff that will get you sued
Obvious	What the users will see and are mostly likely to complain about. What is likely to earn you bad press
Technically Risky	New technologies, old technologies, places where it's failed before, previously under-tested areas
Stakeholder Mandate	Don't argue with the boss (too much)

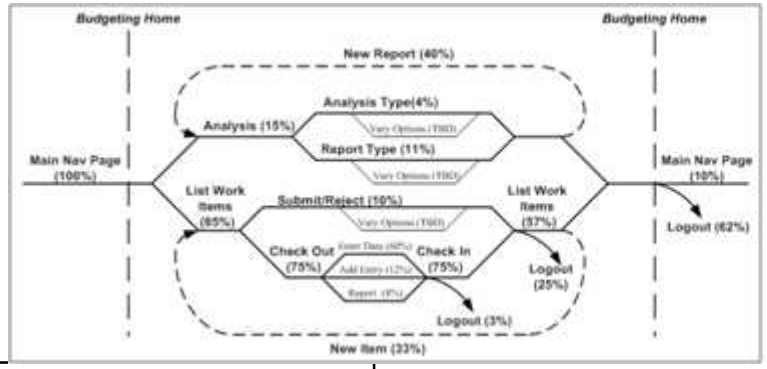
Communicating System Usage

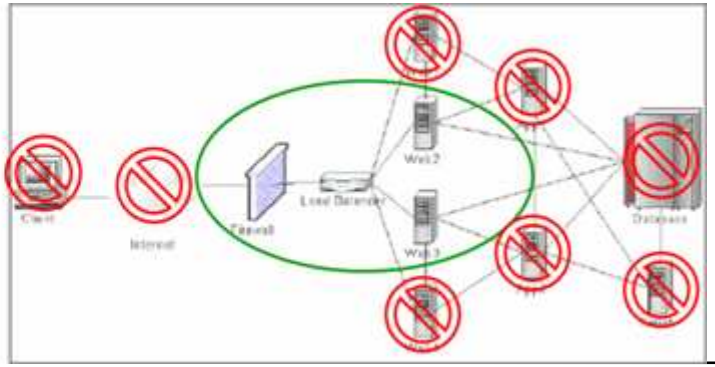


SCORN

Size	Media, HTML, styles & scripts – compress & minify.
Caching	The end-user's browser cache can be your best friend, or your worst nightmare, use it wisely.
Order	Get the load order of your scripts and styles wrong, and you'll lose your users every time – even though response time hasn't changed!
Response Codes	3, 4, & 5xx series response codes on individual objects are bad things.
Number	When it comes to performance, less is more (usually).

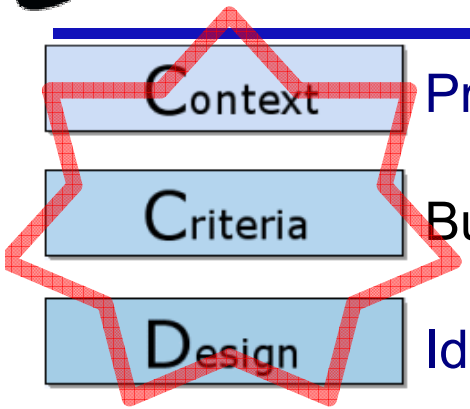
Performance Test Strategy





Intent of Investigation:	Collect configuration data for tuning. Collect data to assist in validating existing network.
Prerequisites:	Static prototype deployed on future production hardware.
Tasks:	Determine network bandwidth, validate firewalls & load balancer, evaluate web server settings.
Tools & Scripts:	Load generation tool, HTTP scripts to request objects of various sizes from a pool of IP addresses.
External Resources Needed:	Firewall, Load Balancer, Network Admins, network monitors, 20 IP addresses for spoofing.
Risks:	Schedule delay, availability of administrators, configuration of load generation tool for IP spoofing,
Data of Special Interest:	Network bandwidth & latency, load balancer effectiveness, resource consumption, response times.
Areas of Concern:	No internal expertise on load balancer configuration.
Pass/Fail Criteria:	Adequate available bandwidth, architectural assumptions validated.
Completion Criteria:	Critical data collected and assumptions validated.
Planned Variants:	1 to 20 IPs, volume of 1 to 500, size from 1Kb to 1mb, configuration settings.
Execution Duration(s):	6 days: 2 days ea. network & bandwidth, firewall and load balancer, web server configuration.

Performance Testing Principles



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Questions

Contact Info

Scott Barber

Chief Technologist

PerfTestPlus, Inc

E-mail:

sbarber@perftestplus.com

Web Site:

www.PerfTestPlus.com