# Project: SBAC Performance Testing

*Project Code: SBAC-002*          *Version: 1.0 Runbook*          *Date: 2014/07/09*

***Table of Content***

## Purpose

Provide the Smarter Balanced Assessment Consortium (SBAC) with the planned execution of performance test that illustrates the load on the SBAC Digital Library server.

This document will encompass the scope, approach, execution and results. Therefore this document is to act as a living document, runbook, until the end of the initial performance testing exercise.

## Scope

The performance test is executed against software release 1.2 on a designated server used for performance testing.

### Composite Testing

The server tuning process will utilize the results of the composite test for analysis and action against. The test creates the heaviest load on the server. It removes think time, and pacing to create the highest activity on the server to test on. The goal is to see what the server is capable of at this level and tune it where the highest activity is measured.

Additionally, to fine tune the server and have more detailed analysis, the composite test will be broken down into more focussed test to evaluate the performance of the server.

The performance test consist of a composite test to measure the ability of the server to handle the concurrent usage of:

- Viewing
- Searching
- Updating

Each component will have some variation of activities on the server to randomize the load on the server. There activity of the components will look like:
- Viewing - Navigating to a resource and viewing the resource with the resource expected to be of different sizes
- Searching - Utilizing the search function with specific terms that will return different results sizes
- Updating - Taking action on the site that will cause the the database to be written to

There will also be other activities occurring in the script to compensate for the functionality of the site, such as logging in, and the occasional action, such as admin reports.

## Concurrent Usage Breakdown for Composite Test

To extrapolate the reasonable usage of users on the server, the activity is broken down as follows:

| Activity | Percentage | Description |
|---|---|---|
| Viewing | 70% | Most activities on the site is to view resources on the site. |
| Searching | 20% | Most of the content are easily navigated to, however the interaction on the site allows users to easily find the resources they need. |
| Writing | 10% | For most users, viewing will be the primary activity, however all users have some ability to write to the server in simple activities such as commenting and updating their profiles. |
| Admin Reporting | --- | Less than 1% of activities are administrative activities as a whole among concurrent site usage. The most common activity would be the generation of reports. |

Additional details on the breakdown can be found in the Approach section.

## Basic and Component Testing

The basic tests are used to understand the some of the baseline results of the server configuration as applied to the code at a certain instance. It acts as a comparison and focus for the composite tests, identifying what activity affects and skews the load of another activity. The tests are typically basic tests that performs single activities with as multiple factors removed. It may include some think time and pacing so that the server on load have a reasonable response time.

The component tests are the activities of the composite test broken down into single activities. Like the Basic test, it acts as a comparison and focus for the composite test. However because the single activities are the same as the composite test, the results align more close to the composite tests.

### Basic Tests

The basic sets of tests executed when needed are:
- On Site Load - See the load on just coming on the site
  - Load the homepage
- Login Only - See the load on coming to the site and logging in
  - Load the homepage
  - Log in
- Anonymous Single Page click - See the load on clicking a basic page anonymously
  - Load the homepage
  - Click on Terms of Service (most basic page)
- Authenticated Single Page click - See the load on clicking a basic page when authenticated (comparative result as affected by logging in)
  - Load the homepage
  - Log in
  - Click on Terms of Service (most basic page)
- Click Digital Resource Library - See load of typical action upon login (comparison as an intermediate step to reaching a resource)
  - Load the homepage
  - Log in
  - Click Digital Resource Library
- Click a Resource (empty PDF) - See load of a resource access while minimizing the pdf download factor from the results
  - Load the homepage
  - Log in
  - Click Digital Resource Library
  - Click empty pdf resource

## Load Size

For the performance test execution load, The site will be introduced to hundreds of thousands of users. However the expectation of the site is that the concurrent usage will be about 100 concurrent user activities at any moment. The performance test will focus on this as the initial driver. The results of testing may change some execution of testing as defined by the System Architect.

The execution will use an increasing progression of load size to evaluate the server support. The planned load size will be:

- 10 Concurrent Users
- 25 Concurrent Users
- 50 Concurrent Users
- 100 Concurrent Users

## Duration

For the purpose of this performance test, the size doesn't require a stress test to reasonably extrapolate the load on the server. In that regard, an approximate 1 hours length should reasonably illustrate the usage on the server. An increasing progression of duration will be used to evaluate the servers support. The planned duration will be:

- 15 min
- 30 min
- 60 min

## Technology

The performance test will utilize in combination, Apache JMeter, BlazeMeter, and New Relic to create, run, and collect the execution results.

Apache JMeter - http://jmeter.apache.org/ - Performance testing tool used to create the aforementioned tests
BlazeMeter - http://blazemeter.com/ - Performance testing service that provides the client-side simulation of users to execute the tests
New Relic - http://newrelic.com/ - Performance testing monitoring tool used to capture the server usage of the server while the tests are executed

# Environment and System Under Test

For the purpose of the performance testing, a dedicated server has been allocated for the execution. The server is comparable to production and will provide the safe environment for running the performance test and required changes to the environment.

BlazeMeter will be the system used to simulate the client users that will act on the performance test environment.

The following is a description of the configuration of each system that will serve in the performance testing before modification:

## Server Configuration

The original and current server configuration of server can be found as follows. It represents the current state and usage that the production would look like before server optimization.

### loadtest environment

| Server | Size | Service | State | Region | |
|---|---|---|---|---|---|
| bal-8878 | m1.medium | Varnish | active | us-east-1c | Dedicated |
| | | Elastic IP | 54.83.36.225 | | |
| bal-8879 | m1.medium | Varnish | hot spare | us-east-1e | Dedicated |
| fsdb-8876 | m1.xlarge | Database | primary | us-east-1c | |
| fsdb-8877 | m1.xlarge | Database | secondary | us-east-1e | |
| web-8874 | m1.large | Web | active | us-east-1c | Configure |
| | | Memcache | 64 MB | | |
| web-8875 | m1.large | Web | active | us-east-1e | Configure |
| | | Memcache | 64 MB | | |

**Client Configuration**

- BlazeMeter - This is cloud-based and will utilize a Virtual Server hosted in the United States. For the execution, it will be set to US West (Oregon) or US East (Virginia). All other configuration are left to BlazeMeter.
- There are three sizes of configuration of the servers:
  - Small - For tuning and small load of testing
  - Medium - Includes 1.7 GB of memory with dual core processing
  - Large - Includes 7 GB of memory with dual core processing and can sustain much higher throughput

## Metrics and Goals

As this is the initial use of the server, no previous details has been extrapolated as the formal expectation of metrics deliverable. The results in the execution of this performance test itself will provide the initial metrics and goals the server should meet. This can be further defined by the System Architect.

## Test Result

In combination, there are 1 execution of composite scripts and 3 execution of component scripts between the load size and duration. This will yield a progression result to extrapolate the growing load the server will need to handle. Through BlazeMeter and New Relic, the results will capture all typical results for analysis such as, but not limited to:

- Hits/s
- Response Time
- Latency
- CPU Usage
- Memory Usage
- Error Rate

# APPNOVATION
## TECHNOLOGIES

## Sample Test Results

| Active Users |
| Max Users |
| Response Time |
| Latency |
| Hits/s |
| KB/s |
| Errors |
| 200 |
| Embedded Resour… |
| 500 |

Active Users  ALL_Response Time



| Active Users |
| Max Users |
| Response Time |
| Latency |
| Hits/s |
| KB/s |
| Errors |
| 200 |
| Embedded Resour… |
| 500 |

| CPU |
| Memory |
| Network I/O |
| Connections |

console0_CPU  console0_Memory



| CPU |
| Memory |
| Network I/O |
| Connections |
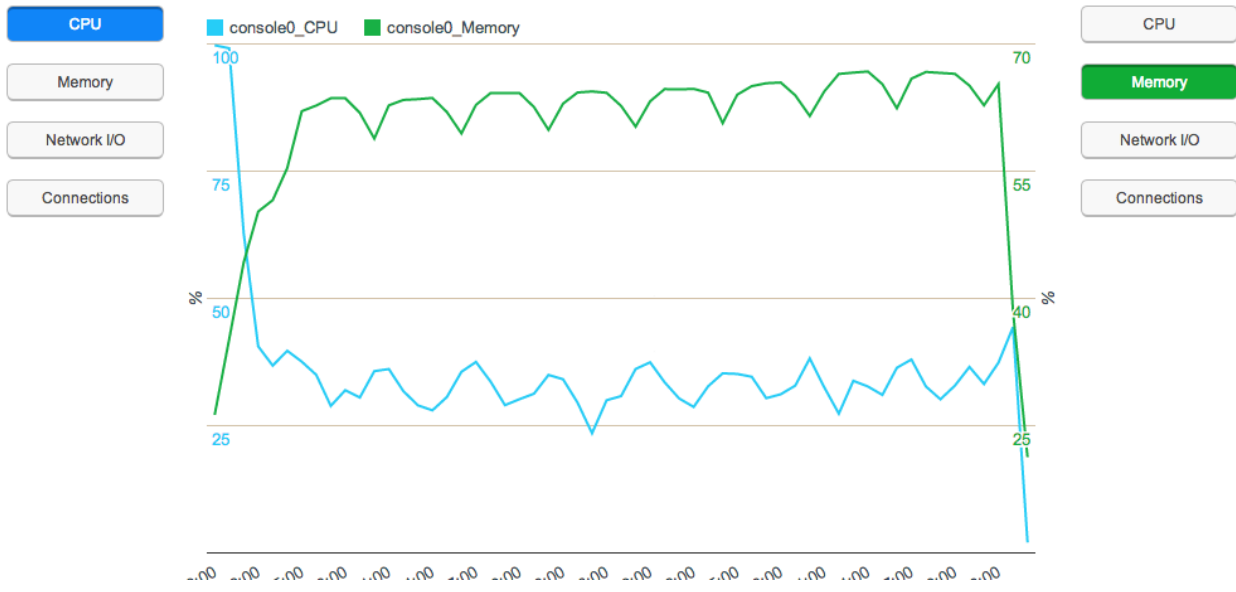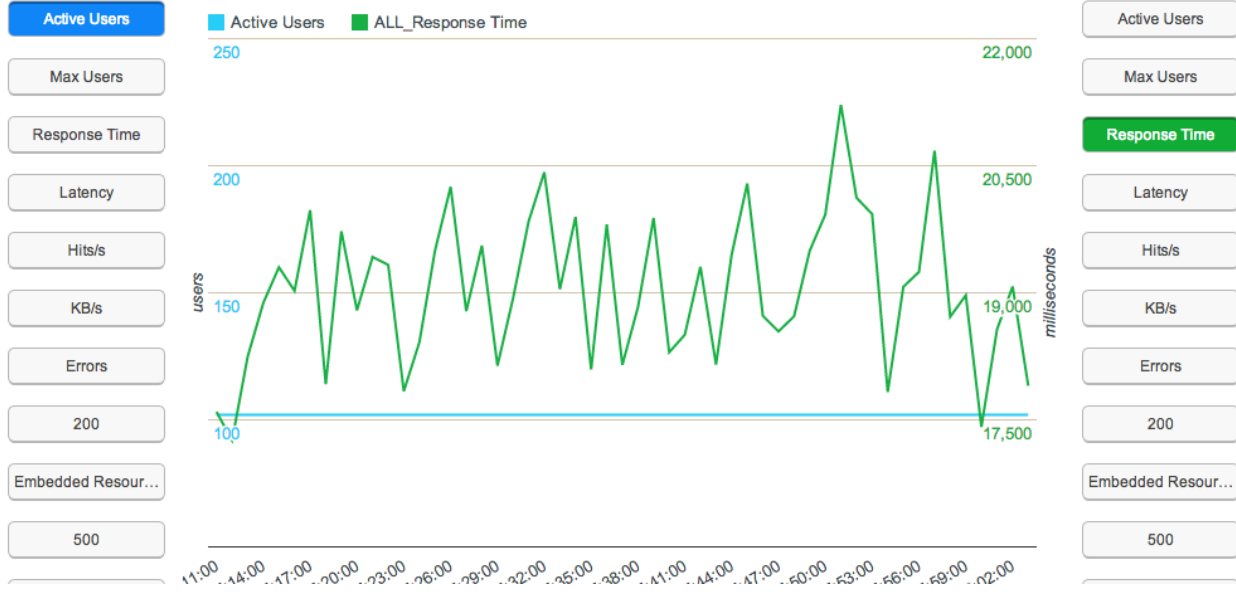
**Completion**

The scope provides a minimal yet a reasonable approach on the site usage at a given time. It also provide an initial perception of the ability of the server. This document will encompass the scope, approach, execution and results. Therefore this document is to act as a living document until the end of the initial performance testing exercise.

Further testing can be executed for a larger load and duration. As well, a more focussed or dedicated scenario can be executed. This is to the discretion of SBAC and System Architect. That will be encompassed in a new document to serve the new iteration.

# Approach

For the execution of the performance test, a set of composite and basic scripts are created to fulfill the criteria set in the Scope section. The scripts contain the activity and the load size as defined. Therefore minimal manual changes will need to be made to the script during execution. The scripts will be executed in succession with growing duration set in BlazeMeter. This allows the script to be run longer or shorter as needed by the previous test results.

Test users will need to be added into the system for simulation. A typical Drupal script will be used to pre-populate the users. It is not expected to create any more content on the test server. It will utilize the content as populated from Production. Content may be created for controlled load scenarios.

For the purpose of the test, a timer has not been set in the script so continuous execution of each iteration and every request will occur. There is a ramp up time for the user. At the end of each iteration, the simulated user will log out. Assertions are minimally set as any error on the server side is sufficient for the purpose for the purpose of the steps. The Admin Report are set to run in 5 minutes intervals.

# Execution

Execution will occur on BlazeMeter with the support of Quality Assurance Analyst (QA), Solution/System Architect (SA), Lead Developer (LD) and Information Technology Administrator (IT).

- QA will primarily execute the test scripts
- SA will support the execution
- IT will monitor the server usage using New Relic
- QA will document the results
- SA will review and analyse the results
- LD will optimize code, db and caching effort
- IT will make modification to the server as determined by the SA
- QA will rerun the test with the new server size as needed
- QA will document any new results

## Current Team Members and Responsibilities

| Role | Name | Responsibilities |
|---|---|---|
| Senior QA Lead | Darrel Dinh - darrel@appnovation.com | - Oversee QA performance test<br>- Performance planning and strategy<br>- Performance tuning assistance<br>- Prepare reports |
| Technical Scripter | Shaughn Leung - shaughn@appnovation.com | - Scripter<br>- Test Execution<br>- Data creation for Performance Test |
| Solutions Architect | Lee Faus - lee@appnovation.com | - Infrastructure and Solution Setup<br>- Performance Testing Guidance<br>- Results interpretation |
| System Architect / Performance Specialist | Steve Powers - steve@appnovation.com | - Performance Testing Expert<br>- Results interpretation<br>- Performance Tuning<br>- Server Recommendation |
| Lead Developer | Brandon Tate - brandont@appnovation.com | - Optimize code, db and caching for performance |
| Project Manager | Minh-Chau Prystupa - minhchau@appnovation.com | - Project overview |

# Test Scripts

The test scripts used for the performance testing execution can be found on Github at the following link: (Authentication and Permission is required to access the file)

https://github.com/AppnovationTechnologies/SBAC-Load-Testing

## Test Script Definition

The script definition outlines what is contained in the respective script. The script may be altered slightly as execution of the script progresses and identify the need for execution or tuning purposes.

All script will have users logging in as it is a requirement of the site. It also contains calls for navigation as to represent real users.

The versioning of the file may different than captured here.

### Action Definition

| Action | Description |
|---|---|
| View Resource 1 | <ul><li>Resource: Vocabulary Paint Chips</li><li>URL: content/vocabulary-paint-chips</li><li>Type: DOCX</li><li>Size: 32.09 KB</li></ul> |
| View Resource 2 | <ul><li>Resource: Reepobs Student Activity Genetics</li><li>URL: content/reepobs-student-activity-genetics</li><li>Type: PDF</li><li>Size:  3709.90 KB</li></ul> |
| View Resource 3 | <ul><li>Resource: Compare and Order Fractions</li><li>URL: content/compare-and-order-fractions</li><li>Type: PDF</li><li>Size: 2057.19 KB</li></ul> |
| View Empty Resource | <ul><li>Resource: Empty</li><li>URL: content/empty</li><li>Type: TXT</li><li>Size: 0 KB</li></ul> |
| Search (No Results) | <ul><li>Search term: SBAC</li><li>Filters:<ul><li>ELA - Reading Literature</li><li>ELA - Writing</li></ul></li></ul> |

| | |
|---|---|
| | ○ Parent<br>○ 9 - Ninth Grade<br>○ Document<br>● Number of Results: 0 |
| Search (One Result) | ● Search term: opinion<br>● Filters:<br>　○ 4 - Fourth Grade<br>　○ Combination of Instructional and Professional Learning Resource<br>● Number of Results: 1 |
| Search (Multiple Results) | ● Search term: lesson<br>● Filters:<br>　○ Image<br>　○ Student<br>● Number of Results: 8 |
| Update User Profile | ● Updated Fields:<br>　○ First Name<br>　○ Last Name<br>　○ About Me<br>　○ Subject<br>　○ Grade<br>　○ Student Population |
| Individual Contributor and Review Report | ● Report: Individual Contributor and Review Report<br>● Filters:<br>　○ State: All<br>　○ SNE: Gabe Kotter<br>　○ Custom Date:<br>　　■ From Date: 02/22/2014<br>　　■ To Date: 04/23/2014 |
| Detailed Resource Statistics Report | ● Report: Detailed Resource Statistics Report (CSV Report)<br>● Filters:<br>　○ Resource Type: All<br>　○ Resource Status: All<br>　○ Subject: All<br>　○ Grade: All<br>　○ Attribute: All |

## Composite Scripts

● Filename: sbac_pt001_composite_u10_ver1.jmx

| Activity | Action | Load Size | Number of Users |
|---|---|---|---|
| View | View Resource 1 | 30% | 3 |
| View | View Resource 2 | 20% | 2 |
| View | View Resource 3 | 20% | 2 |
| | **Total** | **70%** | **17** |
| Search | Exact single result from Search | 10% | 1 |
| Search | Multiple results from Search | 10% | 1 |
| | **Total** | **20%** | **2** |
| Write | Update user profile | **10%** | **1** |
| Admin Report | Individual Contributor and Review Report | + | 1 |
| Admin Report | Detailed Resource Statistics Report | + | 1 |

● Filename: sbac_pt001_composite_u25_ver1.jmx

| Activity | Action | Load Size | Number of Users |
|---|---|---|---|
| View | View Resource 1 | 24% | 6 |
| View | View Resource 2 | 24% | 6 |
| View | View Resource 3 | 20% | 5 |
| | **Total** | **68%** | **17** |
| Search | No results from Search | 8% | 2 |
| Search | Exact single result from Search | 8% | 2 |
| Search | Multiple results from Search | 4% | 1 |
| | **Total** | **20%** | **5** |
| Write | Update user profile | **12%** | **3** |
| Admin Report | Individual Contributor and Review Report | + | 1 |
| Admin Report | Detailed Resource Statistics Report | + | 1 |

● Filename: sbac_pt001_composite_u50_ver1.jmx

| Activity | Action | Load Size | Number of Users |
|---|---|---|---|
| View | View Resource 1 | 24% | 12 |
| View | View Resource 2 | 24% | 12 |
| View | View Resource 3 | 22% | 11 |
| | **Total** | **70%** | **35** |
| Search | No results from Search | 8% | 4 |
| Search | Exact single result from Search | 6% | 3 |
| Search | Multiple results from Search | 6% | 3 |
| | **Total** | **20%** | **10** |
| Write | Update user profile | **10%** | **5** |
| Admin Report | Individual Contributor and Review Report | + | 1 |

| Admin Report | Detailed Resource Statistics Report | + | 1 |
|---|---|---|---|

- Filename: sbac_pt001_composite_u100_ver1.jmx

| Activity | Action | Load Size | Number of Users |
|---|---|---|---|
| View | View Resource 1 | 24% | 24 |
| View | View Resource 2 | 23% | 23 |
| View | View Resource 3 | 23% | 23 |
| | **Total** | **70%** | **70** |
| Search | No results from Search | 7% | 7 |
| Search | Exact single result from Search | 7% | 7 |
| Search | Multiple results from Search | 6% | 6 |
| | **Total** | **20%** | **20** |
| Write | Update user profile | **10%** | **10** |
| Admin Report | Individual Contributor and Review Report | + | 1 |
| Admin Report | Detailed Resource Statistics Report | + | 1 |

- Filename: sbac_pt001_composite_no_admin_reports_u25_ver1

| Activity | Action | Load Size | Number of Users |
|---|---|---|---|
| View | View Resource 1 | 24% | 6 |
| View | View Resource 2 | 24% | 6 |
| View | View Resource 3 | 20% | 5 |
| | **Total** | **68%** | **17** |
| Search | No results from Search | 8% | 2 |
| Search | Exact single result from Search | 8% | 2 |
| Search | Multiple results from Search | 4% | 1 |
| | **Total** | **20%** | **5** |

| Write | Update user profile | **12%** | **3** |
|-------|---------------------|---------|-------|

**Component Scripts**

- Filename: sbac_pt001_Resource1_u12_ver1.jmx

| Activity | Action | Load Size | Number of Users |
|----------|--------|-----------|-----------------|
| View | View Resource 1 | 100% | 12 |

- Filename: sbac_pt001_Resource1_u10_ver1.jmx
- Filename: sbac_pt001_Resource1_u25_ver1.jmx
- Filename: sbac_pt001_Resource1_u50_ver1.jmx
- Filename: sbac_pt001_Resource1_u100_ver1.jmx

| Activity | Action | Load Size | Number of Users |
|----------|--------|-----------|-----------------|
| View | View Resource 1 | 100% | 10, 25, 50, 100 |

- Filename: sbac_pt001_search_u25_ver1.jmx

| Activity | Action | Load Size | Number of Users |
|----------|--------|-----------|-----------------|
| Search | No results from Search | 34% | 8 |
| Search | Oneresult from Search | 33% | 8 |
| Search | Multiple results from Search | 33% | 9 |

- Filename: sbac_pt001_search_u50_ver1.jmx

| Activity | Action | Load Size | Number of Users |
|----------|--------|-----------|-----------------|
| Search | No results from Search | 32% | 16 |
| Search | Oneresult from Search | 34% | 17 |
| Search | Multiple results from Search | 34% | 17 |

- Filename: sbac_pt001_write_u10_ver1.jmx
- Filename: sbac_pt001_write_u25_ver1.jmx

| Activity | Action | Load Size | Number of Users |
|----------|--------|-----------|-----------------|
| Write | Update User Profile | 100% | 10, 25 |

- Filename: sbac_pt001_admin_reports_u10_ver1.jmx

| Activity | Action | Load Size | Number of Users |
|----------|--------|-----------|-----------------|
| Admin Report | Individual Contributor and Review Report | 50% | 5 |
| Admin Report | Detailed Resource Statistics Report | 50% | 5 |

- Filename: sbac_pt001_login_u10_ver1.jmx
- Filename: sbac_pt001_login_u25_ver1.jmx
- Filename: sbac_pt001_login_u50_ver1.jmx
- Filename: sbac_pt001_login_u100_ver1.jmx

| Activity | Action | Load Size | Number of Users |
|----------|--------|-----------|-----------------|
| Login | Login and Redirect to Digital Library Resources Page | 100% | 10,25,50,100 |

## Basic Test

- sbac_pt001_basic_t1_load_homepage_u50_ver3.jmx

| Activity | Action | Think Time (Seconds) | Load Size | Number of Users |
|----------|--------|----------------------|-----------|-----------------|
| Read | ● View Login Page | 5-10 | 100% | 50 |

- sbac_pt001_basic_t2_anon_page_click_tos_u50_ver3.jmx

| Activity | Action | Think Time (Seconds) | Load Size | Number of Users |
|----------|--------|----------------------|-----------|-----------------|
| Read | ● View Login Page | 5-10 | 100% | 50 |
| Read | ● View Terms of | 5-10 | 100% | 50 |

| | Service | | | |
|---|---|---|---|---|

- sbac_pt001_basic_t3_login_only_u50_ver3.jmx

| Activity | Action | Think Time (Seconds) | Load Size | Number of Users |
|---|---|---|---|---|
| Login | ● Login | 5-10 | 100% | 50 |

- sbac_pt001_basic_t4_auth_page_click_tos_u50_ver3.jmx

| Activity | Action | Think Time (Seconds) | Load Size | Number of Users |
|---|---|---|---|---|
| Login | ● Login | 5-10 | 100% | 50 |
| Read | ● View Terms of Service | 5-10 | 100% | 50 |

- sbac_pt001_basic_t5_view_digital_library_resources_u50_ver3.jmx

| Activity | Action | Think Time (Seconds) | Load Size | Number of Users |
|---|---|---|---|---|
| Login | ● Login | 5-10 | 100% | 50 |
| Read | ● View Digital Library Resources | 5-10 | 100% | 50 |

- sbac_pt001_basic_t5_view_digital_library_resources_u50_ver3.jmx

| Activity | Action | Think Time (Seconds) | Load Size | Number of Users |
|---|---|---|---|---|
| Login | ● Login | 5-10 | 100% | 50 |
| Read | ● View Digital Library Resources | 5-10 | 100% | 50 |
| | ● View Empty Resource | 5-10 | + | |

# Updates to Script (Changelog)

| Date | Version | Filename(s) | Changes |
|---|---|---|---|
| 05/05/2014 | Version 3 | ● sbac_pt001_composite_u25_ver3<br>● sbac_pt001_composite_u50_ver3<br>● sbac_pt001_composite_u100_ver3 | ● **Use Cache-Control (ENABLED)** |
| 05/07/2014 | Version 4 | ● sbac_pt001_composite_u1_ver4<br>● sbac_pt001_composite_u25_ver4<br>● sbac_pt001_composite_u50_ver4 | ● **300 Second Ramp-up Time per Thread** |
| 05/27/2014 | Version 5 | ● sbac_pt001_composite_u25_ver5<br>● sbac_pt001_composite_u50_ver5<br>● sbac_pt001_composite_u100_ver5 | ● **Removed the failed Assertion after Logging in (Popup has been removed)** |
| 05/27/2014 | Version 2 | ● sbac_pt001_Resource1_u25_ver2<br>● sbac_pt001_Resource1_u50_ver2<br>● sbac_pt001_Resource1_u100_ver2<br>● sbac_pt001_search_u25_ver2<br>● sbac_pt001_search_u50_ver2<br>● sbac_pt001_write_u25_ver2<br>● sbac_pt001_login_u25_ver2 | ● **Removed the failed Assertion after Logging in (Popup has been removed)** |
| 06/06/2014 | Version 6 | ● sbac_pt001_composite_u25_ver6<br>● sbac_pt001_composite_u50_ver6<br>● sbac_pt001_composite_u100_ver6 | ● **Fixed all broken Assertions**<br>● **2 Second Delay Between Requests**<br>● **Fixed header managers** |
| 06/06/2014 | Version 3 | ● sbac_pt001_Resource1_u25_ | ● **Fixed all broken** |

| | | ver3<br>● sbac_pt001_Resource1_u50_ver3<br>● sbac_pt001_Resource1_u100_ver3<br>● sbac_pt001_search_u25_ver3<br>● sbac_pt001_search_u50_ver3<br>● sbac_pt001_write_u25_ver3 | **Assertions**<br>● **2 Second Delay Between Requests**<br>● **Fixed header managers** |
| --- | --- | --- | --- |

# Test Run

The files will be run in BlazeMeter with the following duration. The results will be captured.

| # | File Name | Duration | Status |
|---|-----------|----------|--------|
| 1 | • sbac_pt001_composite_u25_ver1.jmx | 15 min | Complete |
| 2 | • sbac_pt001_composite_u25_ver1.jmx<br>• sbac_pt001_composite_u25_ver3.jmx<br>• sbac_pt001_composite_u25_ver4.jmx<br>• sbac_pt001_composite_u25_ver5.jmx | 30 min | Complete |
| 3 | • sbac_pt001_composite_u25_ver1.jmx<br>• sbac_pt001_composite_u25_ver3.jmx | 60 min | Complete |
| 4 | • sbac_pt001_composite_u50_ver1.jmx | 15 min | Complete |
| 5 | • sbac_pt001_composite_u50_ver1.jmx<br>• sbac_pt001_composite_u50_ver3.jmx<br>• sbac_pt001_composite_u50_ver4.jmx<br>• sbac_pt001_composite_u50_ver4.jmx | 30 min | Complete |
| 6 | • sbac_pt001_composite_u50_ver1.jmx<br>• sbac_pt001_composite_u50_ver3.jmx | 60 min | Complete |
| 7 | • sbac_pt001_composite_u100_ver1.jmx | 15 min | Complete |
| 8 | • sbac_pt001_composite_u100_ver1.jmx<br>• sbac_pt001_composite_u100_ver3.jmx | 30 min | Complete |
| 9 | • sbac_pt001_composite_u100_ver1.jmx | 60 min | Complete |
| 10 | • sbac_pt001_view_resource_u1_ver3.jmx | 15 min | Complete |
| 11 | • sbac_pt001_composite_u10_ver4.jmx | 30 min | Complete |
| 12 | • sbac_pt001_Resource1_u12_ver1<br>• sbac_pt001_Resource1_u25_ver1<br>• sbac_pt001_Resource1_u50_ver1<br>• sbac_pt001_Resource1_u100_ver1<br>• sbac_pt001_Resource1_u50_ver2<br>• sbac_pt001_Resource1_u50_ver3 | 30 min | Complete |
| 13 | • sbac_pt001_Resource1_u10_ver1.jmx<br>• sbac_pt001_Resource1_u50_ver1 | 60 min | Complete |

| 14 | • sbac_pt001_composite_no_admin_reports_u25_ver1 | 60 min | Complete |
|----|----------------------------------------------------|--------|----------|
| 15 | • sbac_pt001_search_u25_ver1<br>• sbac_pt001_search_u50_ver1<br>• sbac_pt001_search_u50_ver3 | 30 min | Complete |
| 16 | • sbac_pt001_write_u10_ver1<br>• sbac_pt001_write_u25_ver1<br>• sbac_pt001_write_u25_ver3 | 30 min | Complete |
| 17 | • sbac_pt001_admin_reports_u10_ver1 | 30 min | Complete |
| 18 | • sbac_pt001_login_u10_ver1<br>• sbac_pt001_login_u25_ver1<br>• sbac_pt001_login_u50_ver1<br>• sbac_pt001_login_u100_ver1<br>• sbac_pt001_login_u50_ver2 | 30 min | Complete |
| 19 | • sbac_pt001_Resource1_u50_10s_ver3<br>• sbac_pt001_Search_u50_10s_ver3 | 30 min | Complete |

# Performance Results

## New Relic Results

New Relic results are found within Blazemeter in the New Relic. Direct access to New Relic (Similar to looking at results in Blazemeter) requires authentication.

## Tuning Changes

| # | Recommendation | Result |
|---|----------------|--------|
| 1 | Enable caching on views after #9 | No real significant change to performance. |
| 2 | Install AdvAgg Drupal Module after #9 | Has cut down on JS and CSS requests but no significant change to performance. |
| 3 | Removed user_save from hook_user_login | Decreased login time |
| 4 | Added index to legal_conditions table | Decreased time to query login table |
| 5 | Added fields to legal_conditions query | Decreased time to query the login table by adding fields to the generated query |
| 6 | Disabled Adv Agg Drupal Module. Enabled Core Drupal compression/aggregation methods | Less css and js files were being created once this module was disabled |
| 7 | Fixed Broken View Cache | Decreased load time of view |
| 8 | Refactor sbac_user_int() to not use variable_set | Decreased the amount of cache_set's. |
| 9 | Refactor SQL querying in sbac_resource_determine_feedback | Decreased the amount of callbacks to this function |
| 10 | Disabled Google Docs Viewer test functionality | Decreased time to load resource page |
| 11 | Poormans Cron Off | Cron not required, so turned off |
| 12 | Fixed Recursive Node Load | Decreased time to load resource page |
| 13 | Fixed SOLR Index Connection | Decreased time to search and increased reliability |
| 14 | Lazy Load the tabs | Decreased time to load resource page |

| 15 | Drop down list of materials was requesting signed URLs from Google for every material even though it is not displayed. Refactored to do on the fly | Decreased time to load resource page |
|----|---|---|
| 16 | Removed 3 views and 1 form from page tpl (loaded via AJAX now) | Decreased overall site performance as the page tpl is sitewide |
| 17 | Account Tabs are loaded via AJAX now | Decreased time to load account page |
| 18 | Removed registry check in sbac_core_init | Decreased amount of cache_sets. |
| 19 | Removed cache_clear_all from user_profile_form_submit() | Decreased amount of time to submit account page. |
| 20 | Elysia Cron module enabled and configured | https://www.drupal.org/project/elysia_cron |
| 21 | Fixed 403 and 500 errors | Reduced error rate and error impact on performance |
| 22 | Implemented 403 to 404 Module | Minimized the 403 Errors returned |
| 23 | Implemented appno_login module | Improve performance during mass login |

## Composite and Component Test Results

**BlazeMeter Results for Initial Run**

| # | File Name | Duration | Report Link |
|---|-----------|----------|-------------|
| 1 | sbac_pt001_composite_u25_ver1.jmx | 15 min | Report 25 User for 15 Minutes |
| 2 | sbac_pt001_composite_u25_ver1.jmx | 30 min | Report 25 User for 30 Minutes |
| 3 | sbac_pt001_composite_u25_ver1.jmx | 60 min | Report 25 User for 60 Minutes |
| 4 | sbac_pt001_composite_u50_ver1.jmx | 15 min | Report 50 User for 15 Minutes |
| 5 | sbac_pt001_composite_u50_ver1.jmx | 30 min | Report 50 User for 30 Minutes |
| 6 | sbac_pt001_composite_u50_ver1.jmx | 60 min | Report 50 User for 60 Minutes |
| 7 | sbac_pt001_composite_u100_ver1.jmx | 15 min | Report 100 User for 15 Minutes |
| 8 | sbac_pt001_composite_u100_ver1.jmx | 30 min | Report 100 User for 30 Minutes |

| 9 | sbac_pt001_composite_u100_ver1.jmx | 60 min | [Report 100 User for 60 Minutes](#) |
|---|---|---|---|

**BlazeMeter Results after Tuning Changes #1 and #2**

| # | File Name | Duration | Report Link |
|---|---|---|---|
| 10 | sbac_pt001_view_resource_u1_ver3.jmx | 15 mins | [Report 1 User for 15 Minutes with Cache Control Enabled](#) |
| 11 | sbac_pt001_composite_u25_ver3.jmx | 50 min | [Report 25 Users for 15 Minutes with Cache Control Enabled](#) |

**BlazeMeter Results with New Relic**

| # | File Name | Duration | Report Link | Filter in New Relic |
|---|---|---|---|---|
| 12 | sbac_pt001_composite_u25_ver3.jmx | 60 mins | [Report 25 Users with Cache Control Enabled, Advanced Aggregation On](#) | [60 Min. May 1st. Ending at 5:15pm](#) |
| 13 | sbac_pt001_composite_u25_ver3.jmx | 60 mins | [Report 25 Users with Cache Control Enabled, Advanced Aggregation Off](#) | [60 Min. May 2nd. Ending at 1:10pm](#) |
| 14 | sbac_pt001_composite_u50_ver3.jmx | 30 mins | [Report 50 Users with Cache Control Enabled, Advanced Aggregation On](#) | [30 Min. May 5th. Ending at 5:30pm](#) |
| 15 | sbac_pt001_composite_u50_ver3.jmx | 30 mins | [Report 50 Users with Cache Control Enabled, Advanced Aggregation Off](#) | [30 Min. May 5th. Ending at 3:15pm](#) |
| 16 | sbac_pt001_composite_u100_ver3.jmx | 30 mins | [Report 100 Users with Cache Control Enabled, Advanced Aggregation On](#) | [30 Min. May 5th. Ending at 6:15pm](#) |
| 17 | sbac_pt001_composite_u100_ver3.jmx | 30 mins | [Report 100 Users with Cache Control Enabled, Advanced Aggregation Off](#) | [30 Min. May 5th. Ending at 2:30pm](#) |

**BlazeMeter Results with New Relic after Tuning Changes #3-6**

| # | File Name | Duration | Report Link | Filter in New Relic |
|---|-----------|----------|-------------|---------------------|
| 18 | sbac_pt001_composite_u25_ver3.jmx | 30 mins | Report 25 Users with Cache Control Enabled, Core Drupal Compression_On | 30 Min. May 7th. Ending at 12:27pm |
| 19 | sbac_pt001_composite_u50_ver3.jmx | 30 mins | Report 50 Users with Cache Control Enabled, Core Drupal Compression_On | 30 Min May 7th. Ending at 11:42am |

**BlazeMeter Results with New Relic after Tuning Changes #7-9**

| # | File Name | Duration | Report Link | Filter in New Relic |
|---|-----------|----------|-------------|---------------------|
| 20 | sbac_pt001_composite_u10_ver4.jmx | 30 mins | Report 10 Users with 300 Second Ramp Up | 30 Min May 8th. Ending at 10:01am |
| 21 | sbac_pt001_composite_u25_ver4.jmx | 30 mins | Report 25 Users with 300 Second Ramp Up | 30 Min May 7th. Ending at 10:51pm |
| 22 | sbac_pt001_composite_u50_ver4.jmx | 30 mins | Report 50 Users with 300 Second Ramp Up | 30 Min May 8th. Ending at 10:54am |

**BlazeMeter Results with New Relic for Resource 1**

| # | File Name | Duration | Report Link | Filter in New Relic |
|---|-----------|----------|-------------|---------------------|
| 23 | sbac_pt001_Resource1_u12_ver1 | 30 mins | Report 12 Users for Resource 1 | 30 Min May 8th. Ending at 4:33pm |
| 24 | sbac_pt001_Resource1_u25_ver1 | 30 mins | Report 25 Users for Resource 1 | 30 Min May 8th. Ending at 5:17pm |

**BlazeMeter Results for Composite Tests without Admin Reports**

| # | File Name | Duration | Report Link | Filter in New Relic |
|---|-----------|----------|-------------|---------------------|
| 25 | sbac_pt001_composite_no_admin_report | 60 mins | Report 25 Users for Composite without | 60 Min May 8th. |

| s_u25_ver1 | | Admin Reports | Ending at 6:39pm |

## BlazeMeter Results for Resource 1 after Tuning Change #10

| # | File Name | Duration | Report Link | Filter in New Relic |
|---|-----------|----------|-------------|---------------------|
| 26 | sbac_pt001_Resource1_u25_ver1 | 30 mins | Report 25 Users for Resource 1 Google Docs Viewer Disabled | 30 Min May 12th. Ending at 11:57am |
| 27 | sbac_pt001_Resource1_u50_ver1 | 30 mins | Report 50 Users for Resource 1 Google Docs Viewer Disabled | 30 Min May 12th Ending at 12:53pm |
| 28 | sbac_pt001_Resource1_u100_ver1 | 30 mins | Report 100 Users for Resource 1 Google Docs Viewer Disabled | 30 Min May 12th Ending at 1:35pm |
| 29 | sbac_pt001_Resource1_u50_ver1 | 30 mins | Report 50 Users for Resource 1 Google Docs Viewer Disabled | 30 Min May 12th Ending at 2:23pm |

## BlazeMeter Results for Isolated Search

| # | File Name | Duration | Report Link | Filter in New Relic |
|---|-----------|----------|-------------|---------------------|
| 30 | sbac_pt001_search_u25_ver1 | 30 mins | Report 25 Users for Search | 30 Min May 12th Ending at 3:10pm |

## BlazeMeter Results for Isolated Write (Update User Profile)

| # | File Name | Duration | Report Link | Filter in New Relic |
|---|-----------|----------|-------------|---------------------|
| 31 | sbac_pt001_write_u10_ver1 | 30 mins | Report 10 Users for Write | 30 Min May 12th Ending at 3:52pm |

## BlazeMeter Results for Resource 1 after Tuning Change #11

| # | File Name | Duration | Report Link | Filter in New Relic |
|---|-----------|----------|-------------|---------------------|
| 32 | sbac_pt001_Resource1_u25_ver1 | 30 mins | Report 25 Users Resource 1 with Poorans CRON | 30 Min May 12th Ending at 4:02pm |

| | | disabled | |
|---|---|---|---|

**BlazeMeter Results after Tuning Change #12-13**

| # | File Name | Duration | Report Link | Filter in New Relic |
|---|---|---|---|---|
| 33 | sbac_pt001_Resource1_u25_ver1 | 30 mins | Report 25 Users Resource 1 after Tuning Changes #12-13 | 30 Min May 15th Ending at 10:10am |
| 34 | sbac_pt001_Resource1_u50_ver1 | 30 mins | Report 50 Users Resource 1 after Tuning Changes #12-13 | 30 Min May 15th Ending at 10:53am |
| 35 | sbac_pt001_Resource1_u100_ver1 | 30 mins | Report 100 Users Resource 1 after Tuning Changes #12-13 | 30 Min May 15th Ending at 11:38am |
| 36 | sbac_pt001_search_u25_ver1 | 60 mins | Report 25 Users Search after Tuning Changes #12-13 | 30 Min May 15th Ending at 12:53pm |
| 37 | sbac_pt001_search_u50_ver1 | 30 mins | Report 50 Users Search after Tuning Changes #12-13 | 30 Min May 15th Ending at 1:41pm |
| 38 | sbac_pt001_write_u25_ver1 | 30 mins | Report 25 Users Write after Tuning Changes #12-13 | 30 Min May 15th Ending at 2:25pm |
| 39 | sbac_pt001_admin_reports_u10_ver1 | 30 mins | Report 10 Users Admin Reports after Tuning Changes #12-13 | 30 Min May 15th Ending at 3:11pm |
| 40 | sbac_pt001_search_u50_ver1 | 30 mins | Report 50 Users Search after Tuning Changes #12-13 | 30 Min May 15th Ending at 3:54pm |
| 41 | sbac_pt001_Resource1_u10_ver1.jmx | 60 mins | Report 10 Users Resource 1 | 60 Mins May 20th Ending at 7:33pm |

## BlazeMeter Results after Tuning Change #14-15

| # | File Name | Duration | Report Link | Filter in New Relic |
|---|-----------|----------|-------------|---------------------|
| 42 | sbac_pt001_Resource1_u50_ver1 | 60 mins | Report 50 Users Resource 1 After Tuning Changes #14-15 | 60 Mins May 23rd Ending at 12:34pm |
| 43 | sbac_pt001_Resource1_u100_ver1 | 30 mins | Report 100 Users Resource 1 After Tuning Changes #14-15 | 30 Mins May 23rd Ending at 1:16pm |

## BlazeMeter Results after Tuning Change #16-17

| # | File Name | Duration | Report Link | Filter in New Relic |
|---|-----------|----------|-------------|---------------------|
| 42 | sbac_pt001_composite_u50_ver4 | 30 mins | Report 50 Users Composite After Tuning Changes #16-17 | 30 Mins May 27th Ending at 4:18pm |
| 43 | sbac_pt001_write_u25_ver1 | 30 mins | Report 25 Users Write After Tuning Changes #16-17 | 30 Mins May 27th Ending at  5:06pm |
| 44 | sbac_pt001_composite_u50_ver4 | 30 mins | Report 50 Users Composite After Tuning Changes #16-17 | 30 Mins June 2nd Ending at 12:38pm |
| 45 | sbac_pt001_composite_u25_ver5 | 30 mins | Report 25 Users Composite After Tuning Changes #16-17 | 30 Mins June 2nd Ending at 1:38pm |
| 46 | sbac_pt001_Resource1_u50_ver2 | 30 mins | Report 50 Users Resource 1 After Tuning Changes #16-17 | 30 Mins June 2nd Ending at 2:21pm |
| 47 | sbac_pt001_Resource1_u50_ver2 | 30 mins | Report 50 Users Resource 1 After Tuning Changes #16-17 | 30 Mins June 4th Ending at 2:18pm |

| 48 | sbac_pt001_composite_u50_ver4 | 60 mins | Report 50 Users Composite After Tuning Changes #16-17 | 30 Mins June 4th Ending at 3:34pm |

## BlazeMeter Results for isolated Login Tests

| # | File Name | Duration | Report Link | Filter in New Relic |
|---|-----------|----------|-------------|---------------------|
| 49 | sbac_pt001_login_u10_ver1 | 30 mins | Report 10 Users Login | 30 Mins June 5th Ending at 12:11pm |
| 50 | sbac_pt001_login_u25_ver1 | 30 mins | Report 25 Users Login | 30 Mins June 5th Ending at 12:58pm |
| 51 | sbac_pt001_login_u50_ver1 | 30 mins | Report 50 Users Login | 30 Mins June 5th Ending at 1:54pm |
| 52 | sbac_pt001_login_u100_ver1 | 30 mins | Report 100 Users Login | 30 Mins June 5th Ending at 2:41pm |

## BlazeMeter Results for Write Test

| # | File Name | Duration | Report Link | Filter in New Relic |
|---|-----------|----------|-------------|---------------------|
| 53 | sbac_pt001_write_u25_ver1 | 30 mins | Report 25 Users Write | 30 Mins June 5th Ending at 5:00pm |

## BlazeMeter Results with Assertion Fixes and 2 Second Delay per Request

| # | File Name | Duration | Report Link | Filter in New Relic |
|---|-----------|----------|-------------|---------------------|
| 54 | sbac_pt001_search_u50_ver3 | 30 mins | Report 50 Users Search with 2 Second Delay | 30 Mins June 9th Ending at 12:07pm |
| 55 | sbac_pt001_write_u25_ver3 | 30 mins | Report 25 Users Write with 2 Second Delay | 30 Mins June 9th Ending at 12:50pm |
| 56 | sbac_pt001_Resource1_u50_ver3 | 30 mins | Report 50 Users Resource 1 with 2 Second Delay | 30 Mins June 9th Ending at 1:33pm |

| 57 | sbac_pt001_login_u 50_ver2 | 30 mins | Report 50 Users Login with 2 Second Delay | 30 Mins June 9th Ending at 2:16pm |

## BlazeMeter Results with Tuning Changes #18-21

| # | File Name | Duration | Report Link | Filter in New Relic |
|---|-----------|----------|-------------|---------------------|
| 58 | sbac_pt001_Resource1_u50_ver3 | 30 mins | Report 50 Users Resource 1 after Tuning Changes #18-19 | 30 Mins June 11th Ending at  12:17pm |
| 59 | sbac_pt001_Resource1_u100_ver3 | 30 mins | Report 100 Users Resource 1 after Tuning Changes #18-19 | 30 Mins June 11th Ending at 3:50pm |
| 60 | sbac_pt001_write_u 25_ver3 | 30 mins | Report 25 Users Write after Tuning Changes #18-19 | 30 Mins June 11th Ending at  4:45pm |
| 61 | sbac_pt001_search _u50_ver3 | 30 mins | Report 50 Users Search after Tuning Changes #18-19 | 30 Mins June 11th Ending at 5:45pm |
| 62 | sbac_pt001_Resource_u25_ver3 | 30 mins | Report 25 Users Resource 1 after Tuning Changes #18-19 | 30 Mins June 11th Ending at 6:31pm |
| 63 | sbac_pt001_search _u25_ver3 | 30 mins | Report 25 Users Search after Tuning Changes #18-19 | 30 Mins June 11th Ending at 7:12pm |
| 64 | sbac_pt001_login_u 50_ver2 | 30 mins | Report 50 Users Login after Tuning Changes #18-19 | 30 Mins June 11th Ending at 7:53pm |

## BlazeMeter Results with 10 Second Delay per Request

| # | File Name | Duration | Report Link | Filter in New Relic |
|---|-----------|----------|-------------|---------------------|
| 65 | sbac_pt001_Resource1_u50_10s_ver3 | 30 mins | Report 50 Users Resource 1 with 10 Second Delay | 30 Mins June 19th Ending at 5:17pm |
| 66 | sbac_pt001_Search _u50_10s_ver3 | 30 mins | Report 50 Users Search with 10 | 30 Mins June 19th |

| | | | Second Delay | Ending at 6:20pm |
|---|---|---|---|---|

## Basic and Additional Test Results

**BlazeMeter Results for Basic Tests (30 Minutes)**

| # | File Name | Duration | Report Link | New Relic Link (PDT) |
|---|---|---|---|---|
| 1 | sbac_pt001_basic_t1_load_homepage_u50_ver3 | 30 mins | Report 50 Users Anonymous View Login Page | N/A |
| 2 | sbac_pt001_basic_t2_anon_page_click_tos_u50_ver3 | 30 mins | Report 50 Users Anonymous View Terms of Service | 06/17/2014 - 19:22:00 |
| 3 | sbac_pt001_basic_t3_login_only_u50_ver3 | 30 mins | Report 50 Users Login Only | 06/17/2014 - 21:04:00 |
| 4 | sbac_pt001_basic_t4_auth_page_click_tos_u50_ver3 | 30 mins | Report 50 Users Authenticated View Terms of Service | 06/17/2014 - 21:45:00 |
| 5 | sbac_pt001_basic_t5_view_digital_library_resources_u50_ver3 | 30 mins | Report 50 Users Authenticated View Digital Library Resources | |
| 6 | sbac_pt001_basic_t6_view_empty_resource_u50_ver3 | 30 mins | Report 50 Users Authenticated View Empty Resource | 06/17/2014 - 23:37:00 |

## BlazeMeter Results for Additional/Custom Load Test

| # | File Name | Duration | Report Link | New Relic Link (PDT) |
|---|-----------|----------|-------------|----------------------|
| 7 | sbac_pt001_normall oad_t12_normal_site _usage_u50_ver1 | 60 mins | Report 50 Users Composite Test | 06/19/2014 - 3:11:00 |
| 8 | sbac_pt001_normall oad_t12_normal_site _usage_u100_ver1 | 60 mins | Report 100 Users Composite Test | 06/19/2014 - 4:25:00 |

## BlazeMeter Results for Basic Tests (60 Minutes)

| # | File Name | Duration | Report Link | New Relic Link (PDT) |
|---|-----------|----------|-------------|----------------------|
| 9 | sbac_pt001_basic_t1 _load_homepage_u5 0_ver3 | 53 mins | Report 50 Users Anonymous View Login Page | N/A |
| 10 | sbac_pt001_basic_t2 _anon_page_click_to s_u50_ver3 | 60 mins | Report 50 Users Anonymous View Terms of Service | 06/19/2014 - 11:38:00 |
| 11 | sbac_pt001_basic_t3 _login_only_u50_ver 3 | 60 mins | Report 50 Users Login | 06/19/2014 - 12:56:00 |
| 12 | sbac_pt001_basic_t4 _auth_page_click_to s_u50_ver3 | 60 mins | Report 50 Users Authenticated View Terms of Service | 06/19/2014 -21:32:00 |
| 13 | sbac_pt001_basic_t5 _view_digital_library _resources_u50_ver 3 | 60 mins | Report 50 Users Authenticated View Digital Library Resources | 06/20/2014 - 09:21:00 |
| 14 | sbac_pt001_basic_t6 _view_empty_resour ce_u50_ver3 | 60 mins | Report 50 Users Authenticated View Empty Resource | 06/20/2014 - 10:32:00 |

## BlazeMeter Results for Additional/Custom Load Test Set 2

| # | File Name | Duration | Report Link | New Relic Link (PDT) |
|---|-----------|----------|-------------|----------------------|
| 15 | sbac_pt001_normall | 60 mins | Report 25 Users | 06/19/2014 - 14:22:00 |

| | | | | |
|---|---|---|---|---|
| | oad_t12_normal_site _usage_u25_ver2 | | Composite Test Ver2 | |
| 16 | sbac_pt001_normall oad_t12_normal_site _usage_u50_ver2 | 60 mins | Report 50 Users Composite Test Ver2 | 06/19/2014 - 18:58:00 |
| 17 | sbac_pt001_normall oad_t12_normal_site _usage_u100_ver2 | 60 mins | Report 100 Users Composite Test Ver2 | 06/19/2014 - 21:32:00 |

## New Environment Test Results

### BlazeMeter Results for Component Tests in New Environment

| # | File Name | Duration | Report Link | Filter in New Relic |
|---|---|---|---|---|
| 18 | sbac_pt001_Resour ce1_u50_ver3 | 30 mins | Report 50 Users Resource 1 with 2 Second Delay | 30 Mins June 25th Ending at 2pm |
| 19 | sbac_pt001_Search _u50_ver3 | 30 mins | Report 50 Users Search with 2 Second Delay | 30 Mins June 25th Ending at 2:49pm |
| 20 | sbac_pt001_Resour ce1_u50_ver3 | 60 mins | Report 50 Users Resource 1 with 2 Second Delay | 60 Mins June 30th Ending at 8:54am |
| 21 | sbac_pt001_Search _u50_ver3 | 60 mins | Report 50 Users Search with 2 Second Delay | 60 Mins June 30th Ending at 11:20am |

### BlazeMeter Results for Basic Tests in New Environment

| # | File Name | Duration | Report Link | New Relic Link (PDT) |
|---|---|---|---|---|
| 22 | sbac_pt001_basic_t3 _login_only_u50_ver 3 | 30 mins | Report 50 Users Login New Environment | 06/25/2014 - 19:55:00 |
| 23 | sbac_pt001_basic_t4 _auth_page_click_to s_u50_ver3 | 30 mins | Report 50 Users View Terms of Service New Environment | 06/26/2014 - 21:07:00 |

| 24 | sbac_pt001_basic_t5 _view_digital_library _resources_u50_ver 3 | 60 mins | Report 50 Users View Digital Library Resources New Environment | 06/26/2014 - 23:58:00 |
| 25 | sbac_pt001_basic_t6 _view_empty_resour ce_u50_ver3 | 60 mins | Report 50 Users View Empty Resource New Enviromment | 06/25/2014 - 16:12:00 |

**BlazeMeter Results for Basic Tests Rerun**

| # | File Name | Duration | Report Link | New Relic Link (PDT) |
|---|-----------|----------|-------------|----------------------|
| 26 | sbac_pt001_basic_t3 _login_only_u50_ver 3 | 30 mins | Report 50 Users Login | 06/27/2014 - 14:36:00 |
| 27 | sbac_pt001_basic_t4 _auth_page_click_to s_u50_ver3 | 30 mins | Report 50 Users View Terms of Service | 06/27/2014 - 3:29:00 |
| 28 | sbac_pt001_basic_t6 _view_empty_resour ce_u50_ver3 | 30 mins | Report 50 Users View Empty Resource | 06/27/2014 - 4:18:00 |
| 29 | sbac_pt001_basic_t3 _login_only_u50_ver 3 | 60 mins | Report 50 Users Login | 06/27/2014 - 17:31:00 |
| 30 | sbac_pt001_basic_t4 _auth_page_click_to s_u50_ver3 | 60 mins | Report 50 Users View Terms of Service | 06/27/2014 - 18:38:00 |
| 31 | sbac_pt001_basic_t6 _view_empty_resour ce_u50_ver3 | 60 mins | Report 50 Users View Empty Resource | 06/27/2014 - 20:12:00 |
| 32 | sbac_pt001_basic_t3 _login_only_u50_ver 3 | 60 mins | Report 50 Users Login | 6/27/2014 -22:20:00 |
| 33 | sbac_pt001_basic_t4 _auth_page_click_to s_u50_ver3 | 60 mins | Report 50 Users View Terms of Service | 6/28/2014 - 00:57:00 |
| 34 | sbac_pt001_basic_t6 _view_empty_resour ce_u50_ver3 | 60 mins | Report 50 Users View Empty Resource | 6/28/2014 - 10:03:00 |

| 35 | sbac_pt001_basic_t5 _view_digital_library _resources_u50_ver 3 | 60 mins | Report 50 Users View Digital Library Resource | 6/28/2014 - 11:10:00 |

## BlazeMeter Results for 403 to 404 Module

| # | File Name | Duration | Report Link | New Relic Link (PDT) |
|---|---|---|---|---|
| 36 | sbac_pt001_basic_t5 _view_digital_library _resources_u50_ver 3 | 60 | Report 50 Users View Digital Library Resource | 6/30/2014 - 12:32:00 |

## BlazeMeter Results for Additional Test Reruns

| # | File Name | Duration | Report Link | New Relic Link (PDT) |
|---|---|---|---|---|
| 37 | sbac_pt001_Resourc e1_u50_ver3 | 30 mins | Report 50 Users Resource 1 | 7/2/2014 -  14:00:00 |
| 38 | sbac_pt001_composi te_u50_ver6 | 60 mins | Report 50 Users Composite Test | 7/2/2014 - 19:08:00 |

## BlazeMeter Results after appno_login Module enabled

| # | File Name | Duration | Report Link | New Relic Link (PDT) |
|---|---|---|---|---|
| 39 | sbac_pt001_composi te_u50_ver6 | 60 mins | Report 50 Users Composite Test | 7/4/2014 - 11:30:00 |
| 40 | sbac_pt001_Resourc e1_u100_ver3 | 60 mins | Report 100 Users Resource 1 | 7/4/2014 - 12:41:00 |
| 41 | sbac_pt001_normall oad_t12_normal_site _usage_u50_ver3 | 60 mins | Report 50 Users Normal Load Test | 7/4/2014 - 14:06:00 |

## BlazeMeter Results with Blazemeter Large Server type

| # | File Name | Duration | Report Link | New Relic Link (PDT) |
|---|---|---|---|---|
| 42 | sbac_pt001_Resourc e1_u100_ver3 | 60 mins | Report 100 Users Resource 1 | 7/4/2014 - 15:16:00 |
| 43 | sbac_pt001_composi te_u50_ver6 | 60 mins | Report 50 users Composite Test | 7/4/2014 - 16:31:00 |
| 44 | sbac_pt001_composi | 60 mins | Report 100 users | 7/4/2014 - 17:44:00 |

| | te_u100_ver6 | | Composite Test | |
|---|---|---|---|---|

# Server Analysis

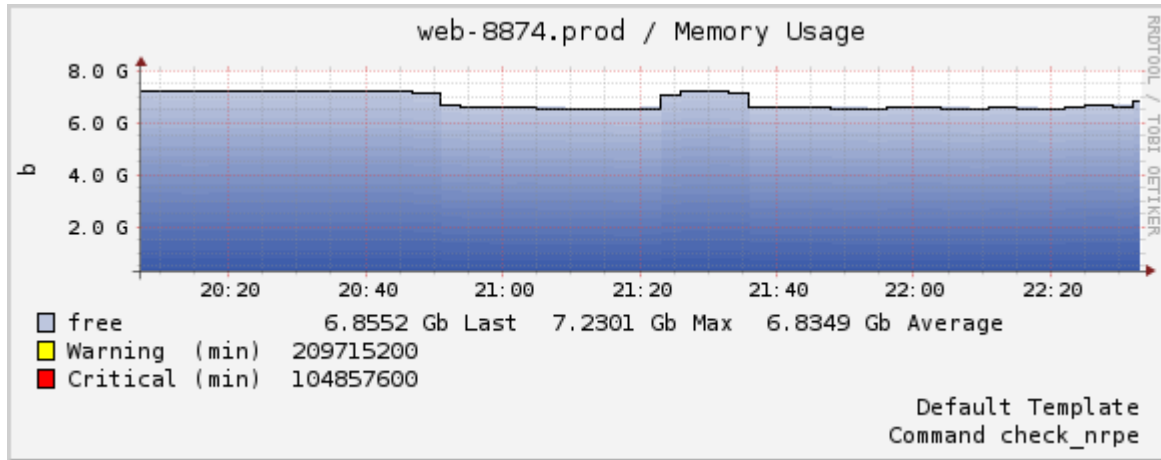## Initial Review and Analysis (June 5, 2014)

Looking of the recent hardware graphs, its quite clear that CPU on the web servers is the key issue:
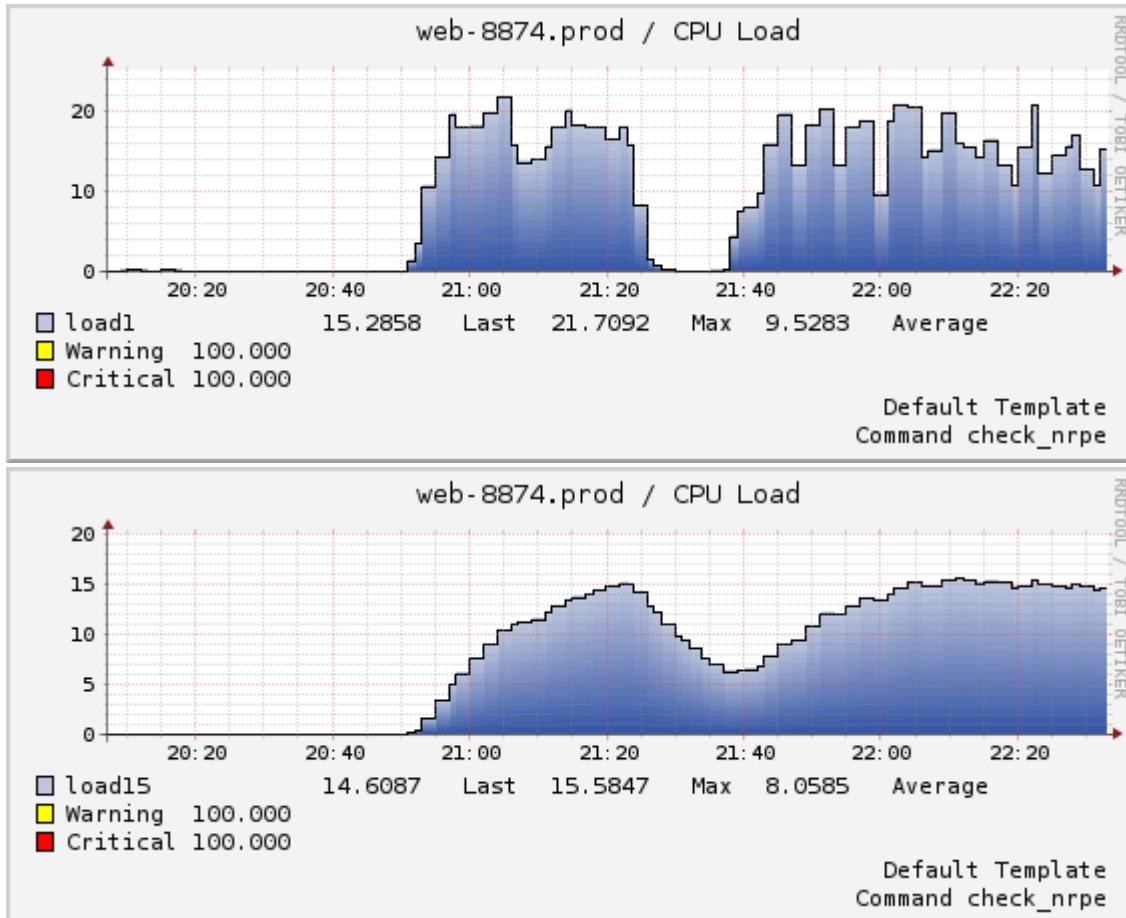




These graphs show that during our performance tests of 50 users, this webserver spiked to a load average of 15-20.

Meanwhile the RAM usage on this server was fine:



This is typical of the m1.large instances that we're using. They contain high amounts of RAM but only 2 compute units per server. So with high numbers of requests coming through in high concurrency, their CPU load spikes quickly. Not only is the CPU being used across 28 PHP processes but its also having to process memcache requests.

## Recommendation

**Initial Review - New Server Configuration (June 5, 2014)**

Initial Recommendation for hardware changes:

- Move the memcache servers off to their own dedicated servers on a pair of m1.small instances.
- Upgrade the web servers to cl.xlarge instances.
    - This provides 20 compute units per server, however we'll only be able to configure the servers with a maximum of 24 php process (unless we can reduce the memory limit down from 256MB).
    - This will delegate 0.83 compute units to each PHP process which will give them much more compute power (opposed to less than 0.07 currently)

# Final Results

After the final server tuning has been implemented, the final performance test runs are captured here to easily view the final results that illustrates the server meeting the final metrics defined and agreed upon.

## BlazeMeter Results from Final Performance Tuning

| # | File Name | Duration | Average Response Time (Blazemer) | Report Link | New Relic Link (PDT) |
|---|---|---|---|---|---|
| 45 | sbac_pt001_composite_u100_ver6 | 60 mins | 1984 ms | Report 102 Users Composite Test w/ Admin Reports | 7/4/2014 - 14:55:00 |
| 46 | sbac_pt001_composite_u100_ver6 | 60 mins | 1299 ms | Report 102 Users Composite Test w/ Admin Reports | 7/8/2014 - 12:35:00 |
| 47 | sbac_pt001_composite_u100_ver6 | 60 mins | 1308 ms | Report 102 Users Composite Test w/ Admin Reports | 7/8/2014 - 14:04:00 |

# Completion Signoff

<Amplify>