

# CSSE 477 – Milestone 3 – Application Server

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The pluggable architecture of your application server has made it more extensible in Milestone 2. In this milestone, you will improve a few more quality attributes of the server by applying different improvement tactics.

## Requirements

Please note that when software requirements are written in English (an informal language), there is a possibility of misunderstanding the requirements. It is always a good idea to talk with your client (in this case, your instructor) to clarify the confusion before committing to an implementation. In that spirit, your instructor has been asking you to verify your design/approach on or before the Friday's classes for every milestone so far. For this milestone as well, you must run your improvement tactics/design by your instructor on or before the Friday's class (May 8, 2015).

## Measuring the Server's Attributes

In this milestone, you will develop **two meaningful scenarios each** for **measuring** the following quality attributes of the application server:

1. Availability
2. Performance
3. Security

You will create test plans and carry out tests against the Milestone 2 code. The results (measurement of each scenario) serve as the baseline to compare the improvements discussed in the next section.

## Applying Improvement Tactics

You will implement **at least two tactics each** for improving the three quality attributes. Out of the **six** total tactics, **three must be unique** (one per quality attribute) and the **others can be overlaps**. As a result, you must implement **four unique tactics** at the bare minimum: one unique tactic for each the three quality attributes and one additional that applies to all three.

You will again run your test plans and measure the six scenarios after implementing the tactics. Please run the new experiments without changing the experimental condition (such as the test machine, OS, network settings, and so on).

**Note:** You can download a Java-based Denial-of-Service client from Moodle that you can use to stress test your server.

## Deliverables

### Report (pdf)

Your report must have the following sections:

1. Title Page
2. Change History

You will update the MS2 report. Please append the changes to the **Change History** section to reflect changes in this version.

### 3. Architecture and Design

3.1 Updated architecture diagram.

3.2 Updated detailed design and a brief explanation.

### 4. Tactics/Feature Listing

Show the cumulative work assignment so far in the project including the work for this milestone (who did what)

### 5. Architectural Evaluation and Improvements

#### 5.1 Availability

A1 – A short name for availability scenario 1

A1.1 The concrete scenario description showing Source, Stimulus, Environment, Artifact, Response, Reponse Measure

A1.2 The test plan for A1

A1.3 The baseline (result of the test). You must show a concrete, measurable number.

A1.4 Improvement tactics (describe your approach in clear and concise way; use UML class diagram to show your new design where applicable). Note that it is ok if the same tactics is applicable to both scenarios as long as you have two tactics for each quality attribute.

A1.5 Compare and contrast the result of applying the two tactics against the baseline. Provide a short conclusion interpreting the difference in measured values.

A2 – A short name for availability scenario 2

(Similar to A1)

#### 5.2 Performace (See 5.1)

#### 5.3 Security (See 5.1)

### 6. Future Improvements

Identify places where your project can be improved further and the tactics that can be used to do so.

### Code (zip)

Bundle the project and turn-it in on Moodle.

## Grading

You will be peer-reviewed by another team in class on Monday the 11<sup>th</sup>. You will swap your code and use the following rubrics to evaluate each other's work: 0 – No Try, 1 – Not Enough Thought or Implementation, 2 – Some Thought or Some Implementation, 3 – Developed Idea or Near Completion Implementation, 4 – Well-Developed Idea or Completely

Implemented, 5 – Elegant or Creative Work. During the evaluation, the evaluating team will ask you to replicate your results for one or two randomly selected scenarios (can be baseline result or after improvement results). You must have your test machine/laptop ready for the live experiment.

Feature Id	Description	Ratings
A-1	Availability Scenario 1	0-5
A-2	Availability Scenario 2	0-5
A-3	Tactics for improving availability	0-5
P-1	Performance Scenario 1	0-5
P-2	Performance Scenario 2	0-5
P-3	Tactics for improving performance	0-5
S-1	Security Scenario 1	0-5
S-2	Security Scenario 2	0-5
S-3	Tactics for improving security	0-5
Overall	Overall quality	0-5

## Timeline

**On or before Friday, May 8, 2015, 5:10 pm** – Please verify your scenarios/tactics with the instructor. You must bring a document that shows detailed scenarios in the meeting.

**Monday, May 11, 2015, 8:00 am** – Please turn in your report (pdf) and the source code (zip) files on Moodle. We will conduct project evaluations during the class.