CIS 526/726 – Spring 2013

Assignment 5 – Performance

Assignment Due: April 28th, by midnight

Requirements:

This is a team assignment. For this assignment you will need to create a (or update your assignment 4) MVC 4.0 Web Application displaying k-state course offerings, which can be found here: http://catalog.k-state.edu. You should follow the MVC conventions throughout this assignment. A series of straightforward tutorials on this can be found here: http://www.asp.net/mvc/tutorials/mvc-4/getting-started-with-aspnet-mvc4/intro-to-aspnet-mvc-4. You will be using the IIS framework to implement a higher-performing (hopefully!) system, and 726 teams are expected to implement round-robin as well.

1. **Prior Work** (10 points) – Your program should implement the full set of requirements from assignments 1-4.

2. **Enhance the performance of the system** (30 points) – You will be expanding your previous work on the degree programs by implementing the techniques discussed in the lecture on performance.

    a. *CIS526* – Implement at least 3 of the 5 techniques (caching, parallelism, redundancy, asynchrony, resource pooling), or argue that your system already substantively uses these and how. Discuss the rationale for where you are using these techniques.

    b. *CIS726* – Same as CIS526 but use 4 of 5. You are also to implement parallelism at the business logic layer across multiple VMs – either through round-robin (see http://technet.microsoft.com/en-us/library/jj129543.aspx) or using the ESB to distribute requests across multiple distributed instantiations. (***10% extra credit*** if you do this dynamically by measuring load or response times and adding resources as needed.)

3. **Performance Analysis & Writeup** (60 points) – Using JMeter and other tools, analyze the performance of your system.

    a. *Analysis* (30 points) – Perform a systematic study of your system's performance. Use a variety of queries to stress different aspects of the system, a range of request timing (burst vs sustained), and simultaneous clients. Note the effects (by doing tests with/without) of the techniques used in Part 2. For ideas, you can look at the performance analysis in http://people.cis.ksu.edu/~dan/papers/hsweb.pdf or http://people.cis.ksu.edu/~dan/despot/pdpta04.pdf .

b. *Writeup* (30 points) – You should write up a short document describing your configuration(s), queries, test results, and an analysis of where the bottlenecks are in the system, its degree of scalability over a wide range of loads, and bottlenecks.

Teams with CIS726 students are expected to spread their services connected by MSMQ across at least two VMs (more if desired). Teams with 526 students only are not required to distribute their services.

Your production version of the application should be hosted on a virtual machine(s) on your OpenStack. You will need to submit the name of your virtual machine running the application on K-State Online.