CSE687 - Object Oriented Design Spring 2014

Project #4 – Remote Performance Assessment due Tuesday, April 29

version 1.5 – just changed points allocation to requirements

Purpose:

This project requires you to design and implement a Remote Performance Assessment facility. The assessment will use the communication software you built in Project #3 to start tasks on a remote server, query its performance while serving multiple concurrent clients, and measure its latency in serving task results.

Your communication channel is required to provide, on the receiving end, a dispatcher that posts the message to one of a collection of registered communicators. Each communicator has an input queue and a child thread that processes messages from its queue.

Requirements:

Your Message-Passing Communication project:

1. **shall** use standard C++ and the standard library, compile and link from the command line, using Visual Studio 2013, as provided in the ECS clusters and operate in the environment provided there[1].

2. **shall** use services of the C++ std::iostream library for all input and output to and from the user's console and C++ operator new and delete for all dynamic memory management.

3. **(2) shall** provide a server application that supports uploading and downloading source code files[2] and performing string searches[3] within source code files or similarity analyses between specified files.

4. **(3) shall** support concurrent processing of text searches or similarity analyses, including the capability to specify the number of threads that will participate in that processing.

5. **(3) Shall** enable the measurement of time required to carry out a processing request and also the end-to-end time to request a processing task and receive the corresponding reply. Please display the results in milliseconds.

6. **(1) shall** use the high resolution timer provided in the course directory or an equivalent resolution timer.

7. **(4) Shall** provide a client process that uses Windows Presentation Foundation (WPF) to build a Graphical User Interface (GUI) that supports the file and processing requests and displays performance information. **Shall** support choosing the number of threads to run from the GUI[4].

8. **(3) Shall** provide a console request application that can request of the server any of the processing tasks of which it is capable. The console application **shall** accept command line arguments to make any of these requests. One of its arguments is an integer number specifying the number of times to make its command line programmed request. Please use the console tester to demonstrate you meet all the requirements.

9. **(4) Shall** provide a test application that spawns a specified number of request applications[5] that each make a specified number of requests[6]. The test application uses the high resolution timer to display execution time for all processing it has spawned and the average processing time per request client.

10. The GUI client, request client, test application, and server **shall** display information to demonstrate clearly and succinctly that all requirements of this project have been met[7].

11. **shall** provide one compile.bat and one run.bat file that build and then execute your demonstrations Please package your project code, projects, solution, and batch files in a single zip archive. Please do not submit archives that are not zips.

[1] VC++ 2013 is available in all the ECS clusters.

[2] Note that no check-in, check-out, versioning, or dependency processing is required for this project, although those capabilities make sense for code servers.

[3] A 5 point bonus will be awarded for correctly implementing both search and scope analyses with concurrent processing.

[4] The GUI's emphasis should be performance measurement. It is acceptable to demonstrate file operations using the command line interface of a console client.

[5] You will find the .Net Process class useful for this requirement.

[6] This lets you demonstrate concurrent operation of your channels and server.

[7] No points are associated with this requirement since it is telling you that you won't get points for requirements you don't clearly show you have met.