

Assignment Report
Massive Multiplayer Online

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1. Introduction

- Massive multiplayer online is a application that developed run in distributed system. To play this game the user have to be a registered user. This game allows users to log in and select any server (and see friends playing in the server) and defeat the boss of the game by selecting the desired hero.

2. How to run MMO

- Please follow the instructions in following order to run the program

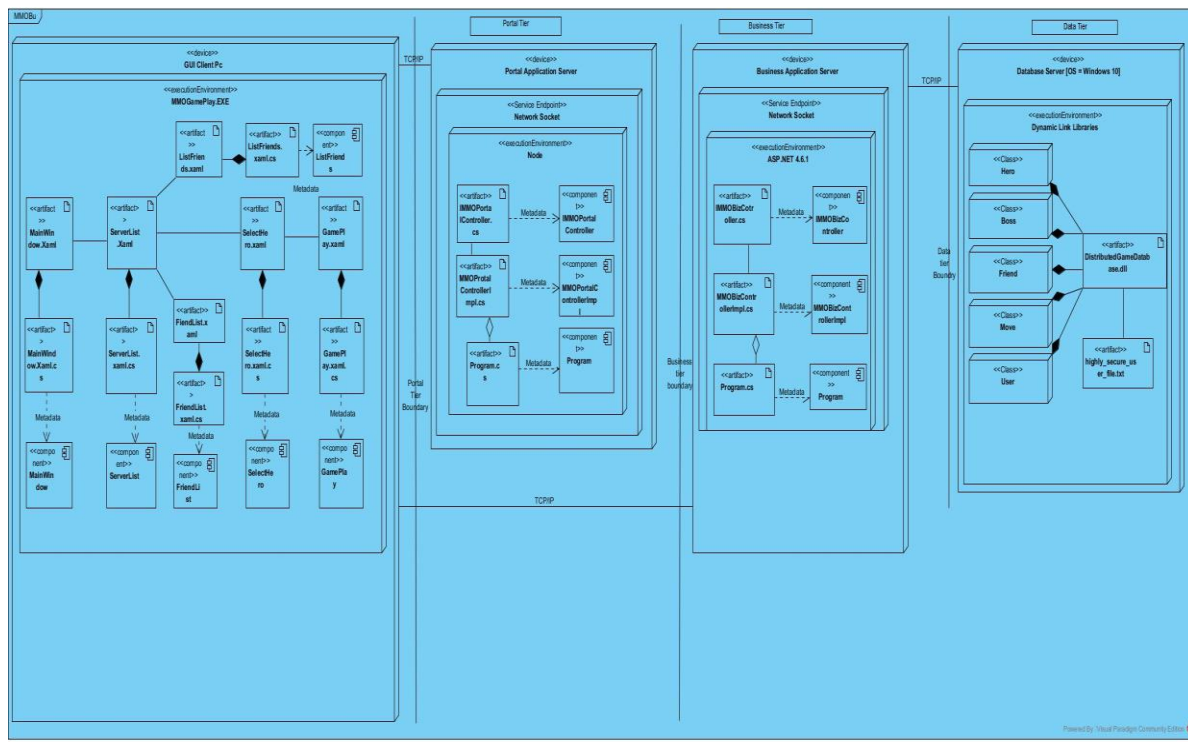
successfully.

1. Run the MMOData.exe in the following path,
“GameMMO\MMOData\bin\Debug”
 2. Then run the MMOPortal.exe in the following path,
“GameMMO\MMOPortal\bin\Debug”
 3. Then run the server, run the MMOBiz.exe in the following path
“GameMMO\MMOBiz\bin\Debug”. (To run multiple servers, run
MMOBiz.exe several times)
eg: If user needs five business servers user have to run
MMOBiz.exe five times
 4. Finally run MMOGamePlay.exe in the following path
“GameMMO\MMOGamePlay\bin\Debug”
- To run the program using visual studio run GameMMO.sln in the following
folder “GameMMO”

3. Known Issues

- New server addition is fully functional except when user has already logged in the user cannot see new server addition in the list.
- Data tier program does not crash under this circumstances
 - Cannot find user list file
 - Cannot find DistributedGameDatabase.DLL
- The design require at least one database server to run in order to execute function of user login.

4. Deployment Diagram

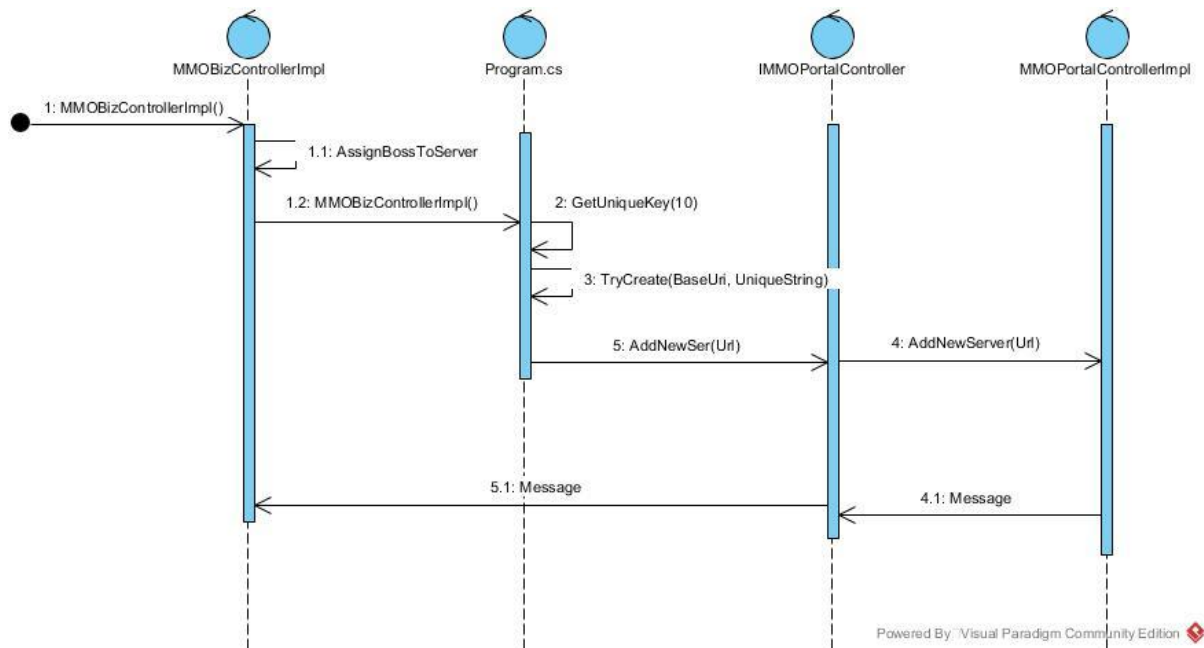


Figure

- The original jpg file of this figure is included in the submission folder.

6. Sequence Diagrams

A. Server Addition



Figure

- The original jpg file of this figure is included in the submission folder.

7. Implementation

A. GUI responsiveness

- The GUI doesn't freeze for any of function processing.

B. Design and implementation elegance

- A server can be added even after running the MMOGamePlay.exe but without logging in.
- As soon as a business server is run, it sends a message to the portal. Then the portal registers the new business server's address and sends back a message to the server. The message notifies the server that the server address is recorded in the portal and it will be displayed for clients to connect.
- The user can check their friend list at the server selection. Since the friend list is generated randomly from the database, when the user logs in the GUI stores the friend list and will be used further executions. Not only the friend list is being stored when the user logs in, user id and user name are also stored.
- The portal needs to connect to a business server in order to provide user validation and this is negative effect of implementation design of the program.

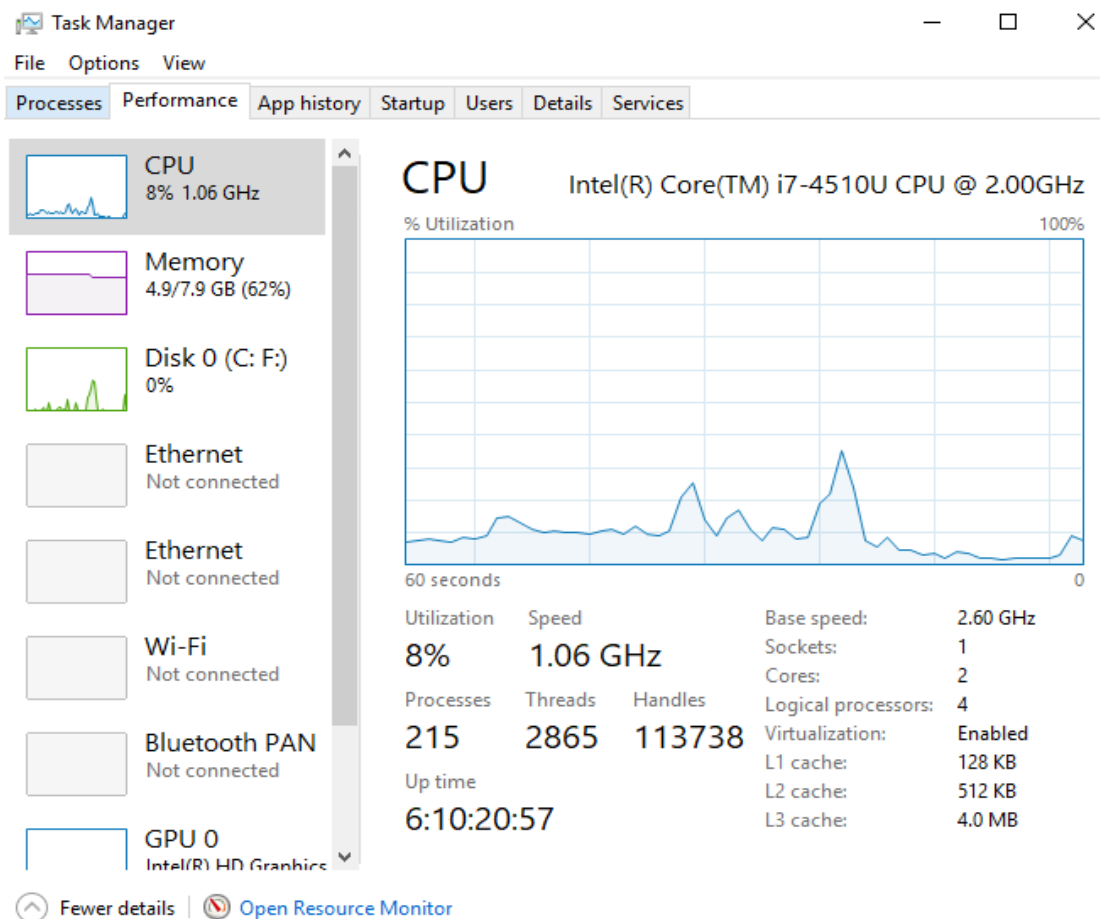
C. Design effects of having data classes without significant processing

- Having data classes without significant processing leads to better GUI responsiveness.

D. Effective use of distributed resources

- To use multiple business servers the user just have to run the MMOBiz.exe application several time.
- To use multiple GUIs the use just have to MMOGamePlay.exe Several times

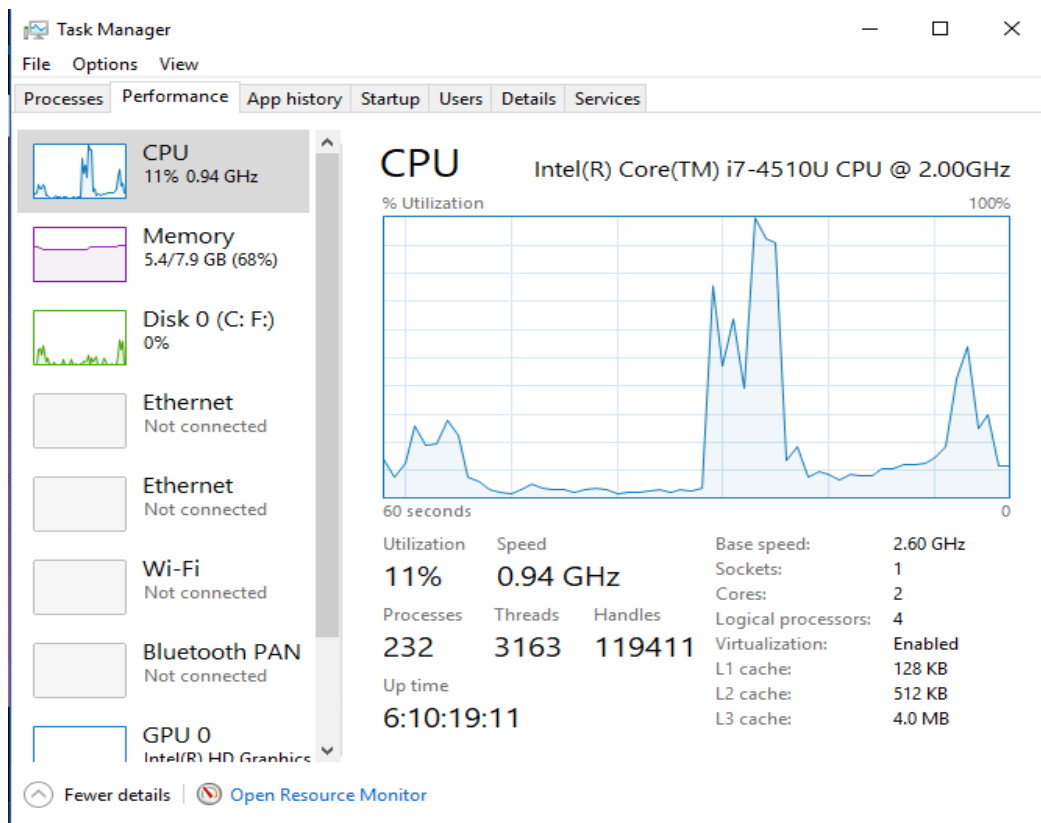
E. Memory usage of servers and clients



Figure

- In the above Figure it shows CPU statistics before running the program
 - CPU is at 8%
 - Memory is at 62%
 - Utilization is at 8%
 - Speed at 1.06Ghz
 - 215 Processes
 - 2865 Threads

- After running the program performance changes as showed in the following figure



Figure

- As in the above figure it shows a significant performance change
 - CPU is at 11%
 - Memory is 68%
 - Utilization 11%
 - Speed at 0.94Ghz
 - 232 Processes
 - 3163 Threads
- Running the several MMOGamePlay.exe does not slows down any other applications.

8. References

- [1] Visual Studio 2017. (2017). Microsoft.
- [2] Msdn.microsoft.com. (2018). *Uri.TryCreate Method (Uri, String, Uri) (System)*. [online] Available at: [https://msdn.microsoft.com/en-us/library/ms131573\(v=vs.110\).aspx](https://msdn.microsoft.com/en-us/library/ms131573(v=vs.110).aspx)
- [3] URI?, C. (2018). *Convert file path to a file URI?*. [online] Stack Overflow. Available at: <https://stackoverflow.com/questions/1546419/convert-file-path-to-a-file-uri> .
- [4] [closed], H. (2018). *How can I generate random alphanumeric strings in C#?*. [online] Stack Overflow. Available at: <https://stackoverflow.com/questions/1344221/how-can-i-generate-random-alphanumeric-strings-in-c> .
- [5] Msdn.microsoft.com. (2018). *Random.Next Method (System)*. [online] Available at: [https://msdn.microsoft.com/en-us/library/system.random.next\(v=vs.110\).aspx](https://msdn.microsoft.com/en-us/library/system.random.next(v=vs.110).aspx) .
- [6] lambda, F. (2018). *Fastest way to Remove Duplicate Value from a list<> by lambda*. [online] Stack Overflow. Available at: <https://stackoverflow.com/questions/10632776/fastest-way-to-remove-duplicate-value-from-a-list-by-lambda> .
- [7] Codeproject.com. (2018). *[Solved] How to remove duplicate strings of list string - CodeProject*. [online] Available at: <https://www.codeproject.com/Questions/725265/How-to-remove-duplicate-strings-of-list-string> .
- [8] list, H. (2018). *How to store a pair of strings in a non-unique list*. [online] Stack Overflow. Available at: <https://stackoverflow.com/questions/7120522/how-to-store-a-pair-of-strings-in-a-non-unique-list> .
- [9] C#, S. (2018). *Set background image on grid in WPF using C#*. [online] Stack Overflow. Available at: <https://stackoverflow.com/questions/3100837/set-background-image-on-grid-in-wpf-using-c-sharp/3100863> .
- [10] WPF?, H. (2018). *How to center a label text in WPF?*. [online] Stack Overflow. Available at: <https://stackoverflow.com/questions/5315497/how-to-center-a-label-text-in-wpf> .
- [11] reddit. (2018). *C# WPF, PasswordBox.Password() compared with Textbox.Text() • r/learnprogramming*. [online] Available at: https://www.reddit.com/r/learnprogramming/comments/2ylsdm/c_wpf_passwordboxpassword_compared_with/ .
- [12] Wpf-tutorial.com. (2018). *How-to: ListView with left aligned column names - The complete WPF tutorial*. [online] Available at: <http://www.wpf-tutorial.com/listview-control/listview-gridview-left-aligned-column-names/> .
- [13] WPF ListView, s. (2018). *WPF ListView, binding a SortedList containing <string,string>*. [online] Stack Overflow. Available at: <https://stackoverflow.com/questions/44641000/wpf-listview-binding-a-sortedlist-containing-string-string> .

[14] YouTube. (2018). *Button with Image in WPF ListView*. [online] Available at: <https://www.youtube.com/watch?v=1IU-4VQpdRg> .

[15] The Official Forums for Microsoft ASP.NET. (2018). *SortedList Get Item By Index*. [online] Available at: <https://forums.asp.net/t/1393697.aspx?SortedList+Get+Item+By+Index> .