This prototype is aim to explore the feasibility of some key requirements of CPIS Backend of XTech project.

Requirements

1. The System should be able to receive Mobile App uploaded its geolocation data and display on CPIS browser near real-time.
2. The desired interval is 5 sec to handle 5000 concurrent user upload data. It means that the process time of 5000 record should within 5sec.
3. The system could have the scalability of handling 10000 concurrent by adding in more machine. It means that the process time of 10000 record should within 5sec.

Problem:

1. To handle the load of that data volume, need to identify possible bottleneck of the system.
2. When multiple machines have been added to the system, how to maintain data consistency?
3. Can it prevent single point of failure?

Possible solution:

1. Use SQL database to store latest uploaded geolocation data.
2. Use NoSQL DB Redis to store latest uploaded geolocation data.
3. Set up WCF interface to enable servers that receive mobile app uploaded data to transfer to CPIS server

Prototype:

To verify the feasibility, few prototypes are built using C# console application which might not reflect the real process time of system that built in multiple layers.

Prototype environment is Dell desktops with i7-4770 3.4GHz 8 CPUs, 16G RAM, Win7 64bit, LAN.

For the 1st solution, MySQL database is used and the table is in memory model to avoid low speed of hard disk I/O.

The prototype is ran 10 times for each volume to get an average process time. The observation is that when the volume is up to 9000, it cost 5 sec in average, and some of the maximum value has exceeds 5 sec.