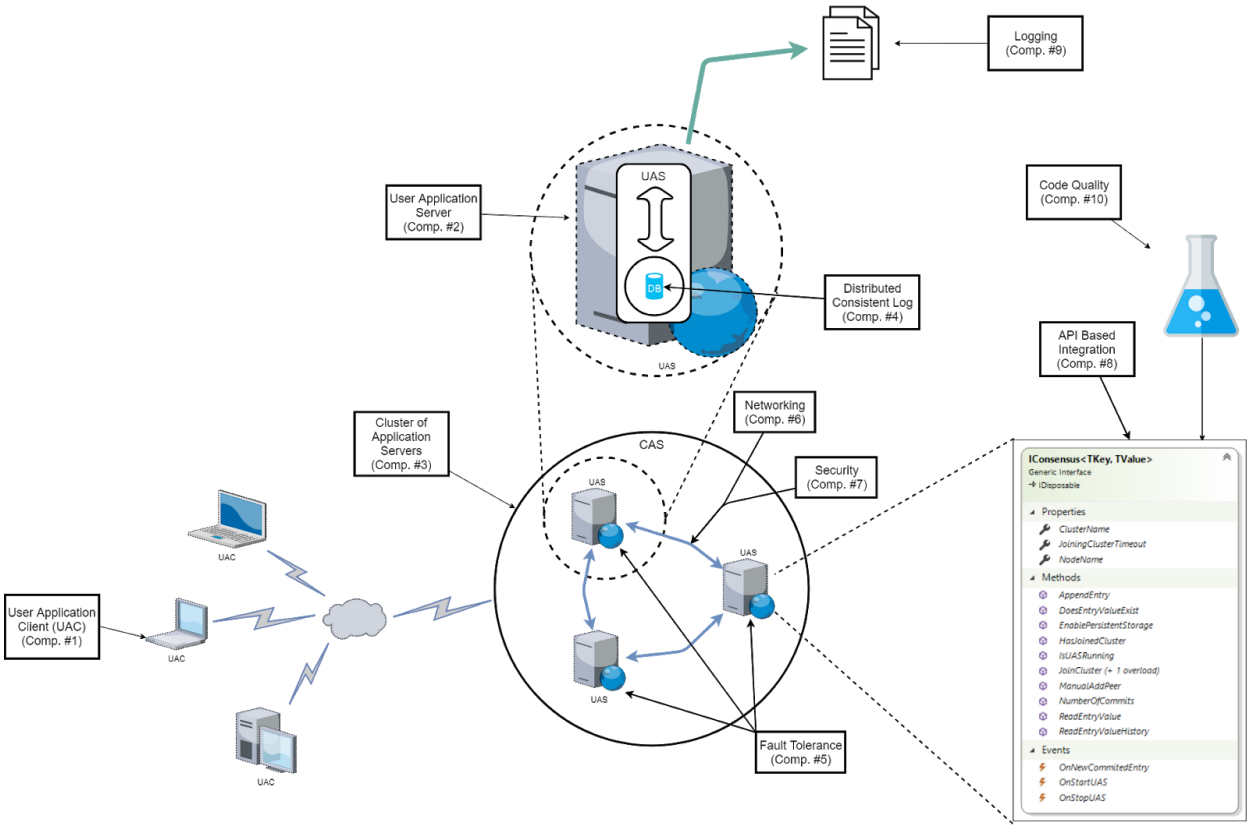
System Architecture

Architectural Components

1. **UAC - User application client -> Knows nothing about consensus, they know IP failover**
2. **UAS - User application server -> Running “active”/not running**
3. **CAS - Cluster of application servers -> 1 running UAS**
4. **Distributed consistent log/Consensus**
5. **Fault tolerance/failover**
6. **Networking - Code is hidden behind the API**
7. **Security - Code is hidden by implementing a different INetworking class**
8. **Library/API/Nuget**
9. **Logging**
10. **Code quality (Unit/integration tests)**



Architectural Component 1 - Distributed Consistent Log

This is the component used by the User Application Service (UAS) to commit their running service's data into a distributed log amongst the consensus nodes. This is the foundational feature which allows other UAS's to start up in the event of a running UAS failure.

Architectural Component 2 - Fault Tolerance

This is the features which allows an increase in availability of a given service, it does this though enabling the failing over of a User Application Service to another available node in the cluster.

Architectural Component 3 - Network Communication

This is the functionality which allows the distributed consensus nodes to communicate with each other. It will based on the "fire-and-forget"/"connectionless" UDP protocol to reduce latency, while leaving the overhead of handling packet loss to the consensus algorithm.

Architectural Component 4 - Security

This feature provides network security through message encryption and message authentication. The security of the system is based on zero knowledge password proofs (conducted in a two way challenge/response mechanism) which are conducted during key exchange phase, and before further communication, to create a secure channel.

Architectural Component 5 - API Based Integration

The User Application Server (UAS) communicates with it's consensus node through the use of a .NET class library. This single interface focused on usability is how the UAS communicates to the consensus algorithm.

Architectural Component 6 - High Quality Code

There will be a dedicated and focused effort on ensuring the highest possible quality of code as part of this project. As this code is to be ideally used in ensuring UAS high availability, it's focus on quality must be paramount.