

National College of Ireland

**Distributed Systems (BSHCSDE4)**

Project Proposal

BSc (Honours) in Computing

Software Development

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## Introduction

In this paper, I will present in a short description how I will design and developed a web application that is going to use a collection of independent services located on different devices that share resources with each other over the network to be able to achieve a common goal.

All these services are called distributed systems and they will appear to the end-user like he is interacting with only one device. This will simulate the operations of a smart automated cloud management environment where a user can log in and get authenticate on a server, on another server his profile is going to be held and on the third server is from where he can access his files to be able to do his job.

## Technical Approach

This project is going to be built and saved locally on my personal laptop that is running Windows 10, and a backup copy of my project progress is available online on GitHub [here](https://github.com/DanielCostelNeagu/Distributed-Systems).

To design and develop the User Interface I will use Visual Studio Code to edit my code, Visual Studio Code is a free text editor created and maintained by Microsoft. The Graphical User Interface is going to be displayed in any web browser, as it will be coded in HTML 5 and I will use CSS for styling.

The main maven artefacts of the project code are going to be developed using the Eclipse Java Integrated Development Environment desktop version.

To allow my devices to talk to each other I will be using a Java implementation called jmDNS library to send and receive packets over the network using the multicasting protocol that uses the service registration and discovery of the devices on the local area network (Laurent Doguin, 2015).

Another way to allow my devices to efficiently connect is by making them directly call methods on each other to synchronise easily, in this way it will give the end-user an appearance of interacting with only one device. For this to be achieved I will use the gRPC, which is an open-source remote procedure call and was developed in 2015 by Google at the beginning to be able to connect their microservices in their Datacentres (gRPC, 2021).

One of the three services used in my project is a login service reside on an authentication server on the network, this service will allow a user to login and get authenticated against the active directory.

The second service that is going to be enabled on the simulated smart automated cloud environment is a database that will stock the user profile on it and is going to be connected over the same network to the rest of the server in the project.

The last service provided to the user thru the User Interface is going to be the ability to access and modify files located on the same network with the other two servers. The machine responsible for the central storage and management of data files so that other devices on the same network can access the files is called the file server (TechTarget Contributor, 2005).

## Conclusion

Building the reference implementation with the correct behaviour that simulates the operation of a smart automated environment that consists of smart services and devices that inter-communicate with each other by messages and protocols is going to be a challenging activity to have ready for submission on time by the 26th of March, but I will try to do my best and review as much content to be able to have it on time.

## References

Laurent Doguin (2015) *Let your Devices talk to each other.* [Online] Available at: <https://blog.couchbase.com/let-your-devices-talk-to-each-other-p2p/> [Accessed 1 March 2021].

gRPC.io (2021) *A high performance, open source universal RPC framework.* [Online] Available at: <https://grpc.io/> [Accessed 1 March 2021].

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