

National College of Ireland

**Distributed Systems (BSHCSDE4)**

Project Report

BSc (Honours) in Computing

Software Development

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# Overview

In this report, I present the scenario and services I have chosen to design and developed a Java Maven application that is using 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.

# Service Definition, Implementation and Naming

For my Smart Automated Cloud Management Environment system to be able to work properly it needs to locate and communicate with other components within my system. In this matter, I will make use of 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).

The first service used and implemented in my Smart Automated Cloud Management Environment project is the User service. This service is allowing the user that is interacting with the system to be authenticated and get logged in by providing a username and a password, by performing the Login action. The user can be logged out of the system too by performing the Logout action on the server.

The second service provided to the user on my Smart Automated Cloud Management Environment is a Database Service where the user can retrieve a file and analyse how many words that selected file contains.

The last service provided by my Smart Automated Cloud Management Environment is a VM service where the user can choose to see the Compute, Storage and General Purpose services available to him.

The user can access all these services via the Graphical User Interface (GUI). The GUI for this project was made using WinowBuilder, which is a plug-in tool for Eclipse IDE.

My project is located on GitHub and the link for it is <https://github.com/DanielCostelNeagu/Distributed-Systems>.

# 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 25 March 2021].

gRPC.io (2021) *A high performance, open source universal RPC framework*. [Online] Available at: https://grpc.io/ [Accessed 25 March 2021].