**NATIONAL COLLEGE OF IRELAND**

Higher Diploma in Science in Computing Information

**DISTRIBUTED SYSTEMS**

FINAL REPORT – CA1

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## **Alpha Smart Building Solutions**

**Service Definitions**

The domain for this project is Smart Building . The three services chosen are: Utility, Light and Climate.

**RPC invocations**

Utility Service:

* Switch Devices: Simple RPC;
* Switch Camera: Simple RPC;
* Print List: Bidirectional streaming RPC.

Light Service:

* Lights On Off: Simple RPC;
* Light Intensity: Client-side streaming RPC.

Climate Service:

* Hvac On Off: Simple RPC;
* Hvac Temperature: Server-side streaming RPC;
* Check CO: Simple RPC.

**Service Implementations**

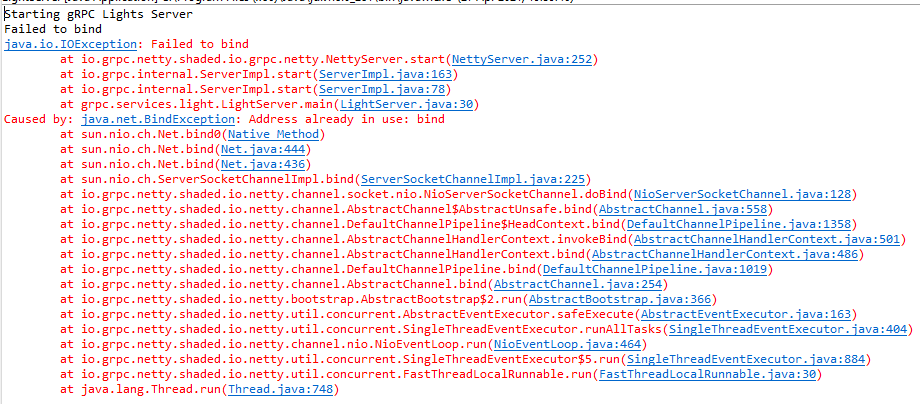
Climate: controls the heating, ventilation, and air conditioning system. This service allows the user to turn on and off the system, change temperature and turn on the extractors according to the CO level in the company, if it is over 40, the extractors are turned on.

Utility: with this service, the user can turn on and off devices and cameras to save energy and print the list of visitors in the company.

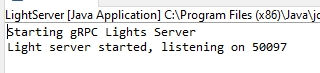
Light: in this functionality, the user is able to turn lights on and off and also control the light’s intensity.

**Remote Error Handling**

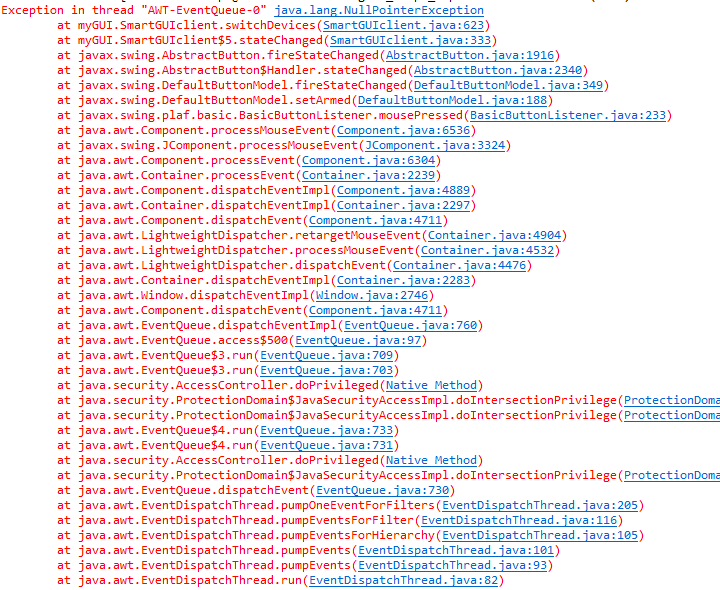
1. Error on running lights server, address already in use.



Solution: Two servers had the same address port 50097, changed climate port to 50099.



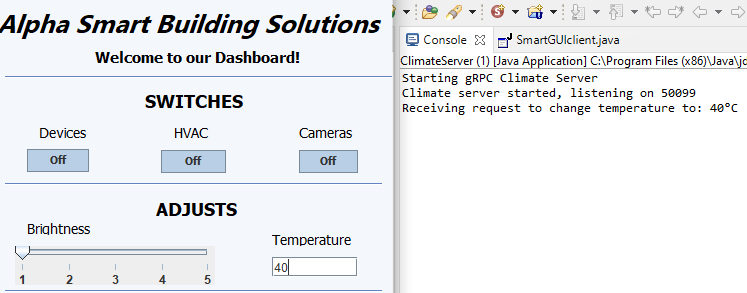
1. Null pointer exception clicking On/Off buttons



Solution: Added channels on GUI application for discovery, channels were only on the GRPC clients before.



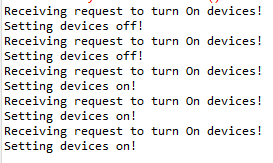
1. Temperature accepting any input



Solution: Changed input form from Text field to spinner with minimum 15 and maximum 35.



1. Several messages from server when clicking Toggle buttons



Solution: Could not find a solution for this problem.

**Client - Graphical User Interface (GUI)**

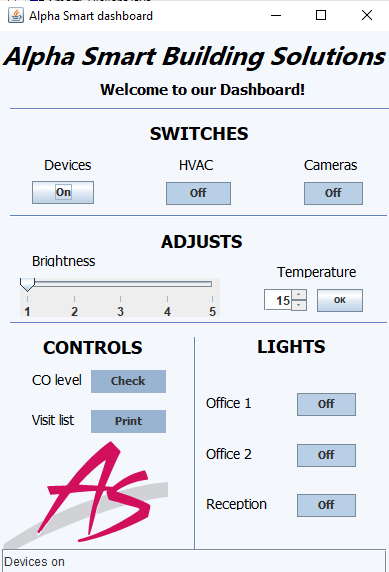
The GUI was developed in Eclipse using window builder. Toggle buttons were used to control the switches, their message changes from On the Off according to the devices status.

The lights intensity is controlled by a slider, the temperature input is done through a spinner.

All messages are displayed to the user at the bottom of the interface.

The level of CO is checked by clicking the button.

The visitors list is presented in a JOption Pane by clicking the “Print” button.



**GitHub Repo**

https://github.com/vanelyra/ALPHA-SMART-BUILDING-SOLUTIONS