Delivery 1 of AADL Model of The Smart Home System

Milestone of our project

| Delivery Date	Milestones
Mar 13, 2017	Project proposal
Mar 20, 2017	Accomplishing the subcomponents and connections of implementation of the smart home system
Apr 03, 2017	Accomplishing the definition and implementation of the main control router model
Apr 10, 2017	Accomplishing the definition and implementation of the remote server and clients model
Apr 17, 2017	Accomplishing the definition and implementation of the zigbee controller and devices module
Apr 24, 2017	Identifying and Adding related modes and flows, which include nominal and error flows
May 01, 2017	Adding error and nominal behavior for error model

The overview of our project
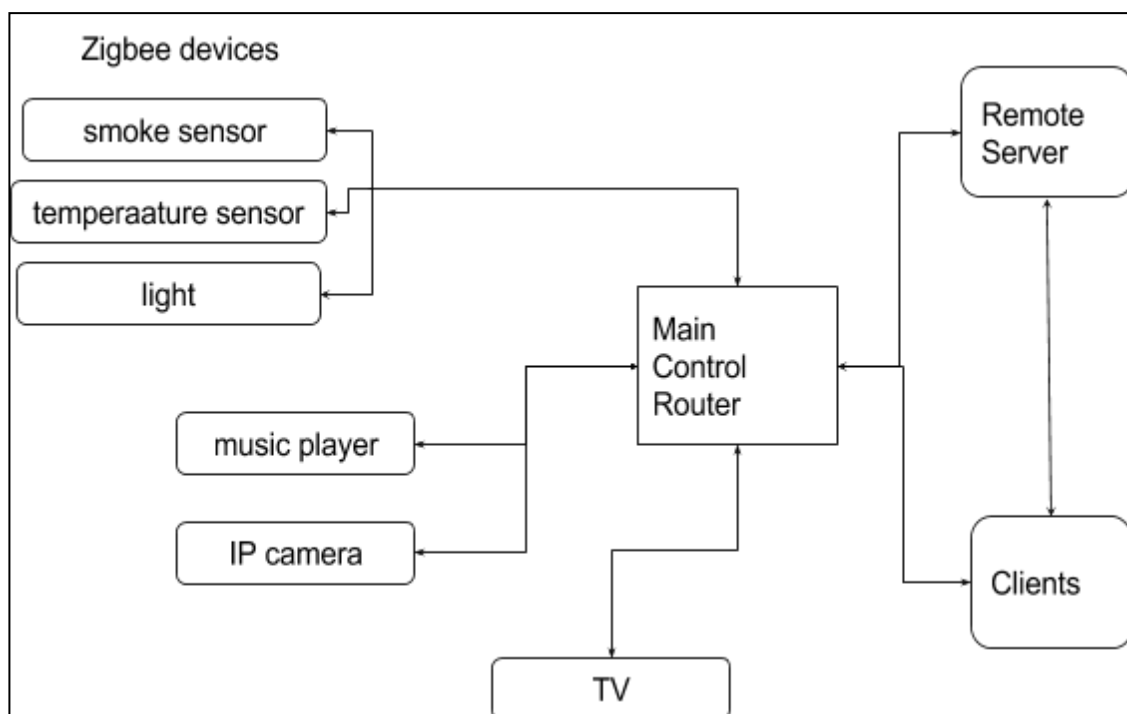
Figure 1. The Overview of Smart Home System

Overview

In this delivery, according to our milestone, we accomplished the implementation, which consists of features and connections, of the smart home system and the definitions of subcomponents. In the next work, we will give the error model, flow, and details of each components.
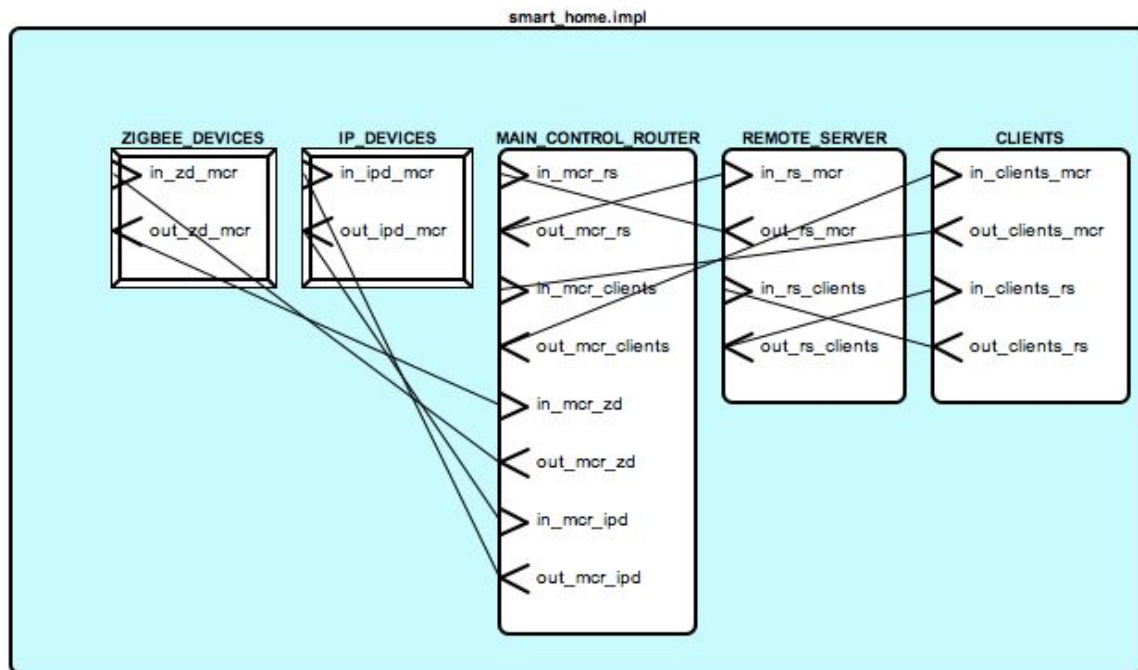
The AADL Models

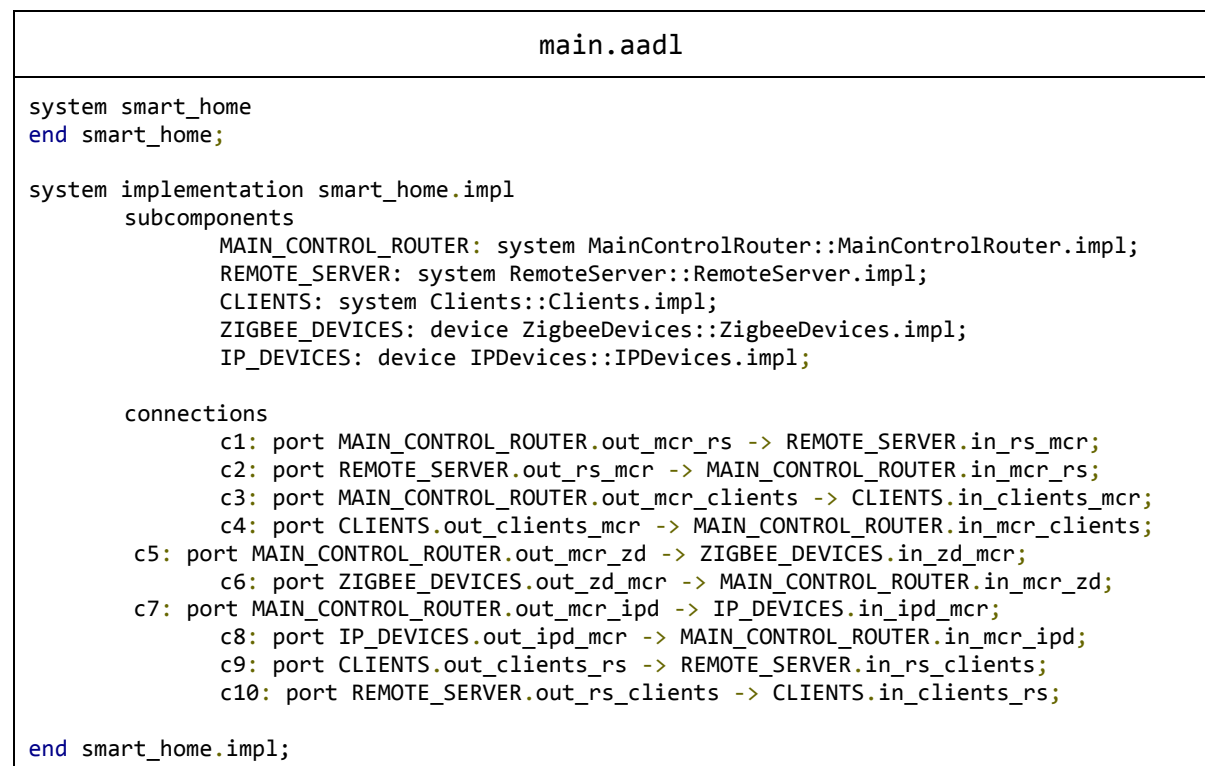Figure 2. Smart Home System implementations

```
                                     main.aadl

system smart_home
end smart_home;

system implementation smart_home.impl
        subcomponents
                MAIN_CONTROL_ROUTER: system MainControlRouter::MainControlRouter.impl;
                REMOTE_SERVER: system RemoteServer::RemoteServer.impl;
                CLIENTS: system Clients::Clients.impl;
                ZIGBEE_DEVICES: device ZigbeeDevices::ZigbeeDevices.impl;
                IP_DEVICES: device IPDevices::IPDevices.impl;

        connections
                c1: port MAIN_CONTROL_ROUTER.out_mcr_rs -> REMOTE_SERVER.in_rs_mcr;
                c2: port REMOTE_SERVER.out_rs_mcr -> MAIN_CONTROL_ROUTER.in_mcr_rs;
                c3: port MAIN_CONTROL_ROUTER.out_mcr_clients -> CLIENTS.in_clients_mcr;
                c4: port CLIENTS.out_clients_mcr -> MAIN_CONTROL_ROUTER.in_mcr_clients;
        c5: port MAIN_CONTROL_ROUTER.out_mcr_zd -> ZIGBEE_DEVICES.in_zd_mcr;
                c6: port ZIGBEE_DEVICES.out_zd_mcr -> MAIN_CONTROL_ROUTER.in_mcr_zd;
        c7: port MAIN_CONTROL_ROUTER.out_mcr_ipd -> IP_DEVICES.in_ipd_mcr;
                c8: port IP_DEVICES.out_ipd_mcr -> MAIN_CONTROL_ROUTER.in_mcr_ipd;
                c9: port CLIENTS.out_clients_rs -> REMOTE_SERVER.in_rs_clients;
                c10: port REMOTE_SERVER.out_rs_clients -> CLIENTS.in_clients_rs;

end smart_home.impl;
```

Figure 3. The component of Main Control Router

MainControlRouter.aadl
| ```
system MainControlRouter
        features
                in_mcr_rs:       in event port;
                out_mcr_rs:      out event port;
                in_mcr_clients:  in event port;
                out_mcr_clients: out event port;
                in_mcr_zd:       in event port;
                out_mcr_zd:      out event port;
                in_mcr_ipd:      in event port;
                out_mcr_ipd:     out event port;
end MainControlRouter;

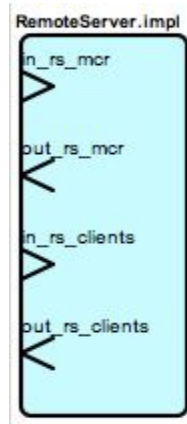system implementation MainControlRouter.impl
end MainControlRouter.impl;
``` |

Figure 4. The Component of Remote Server

RemoteServer.aadl
| ```
system RemoteServer
        features
                in_rs_mcr:      in event port;
                out_rs_mcr:     out event port;
                in_rs_clients:  in event port;
                out_rs_clients: out event port;
end RemoteServer;

system implementation RemoteServer.impl
end RemoteServer.impl;
``` |
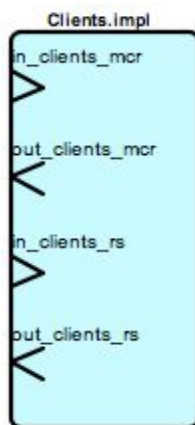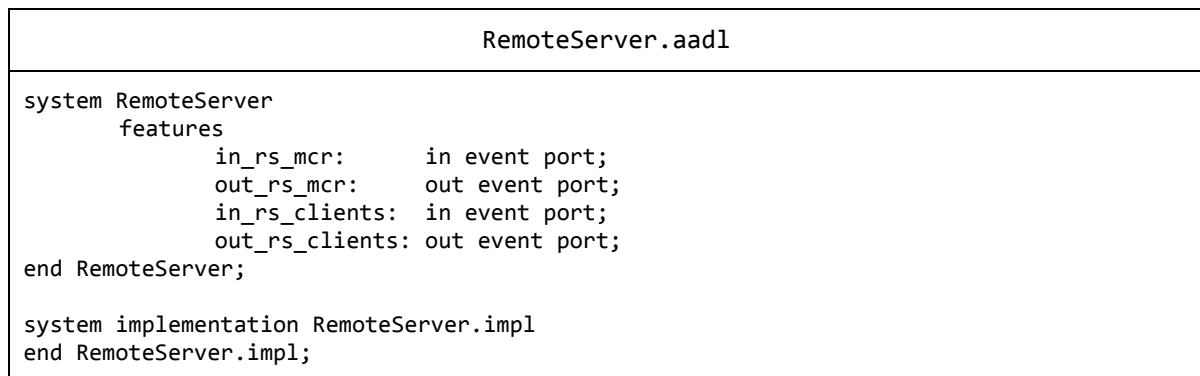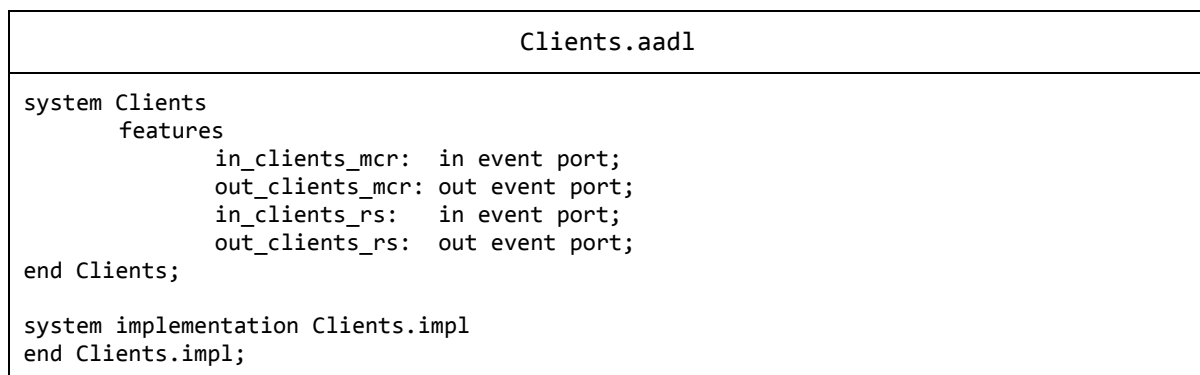

Figure 5. The component of Clients

Clients.aadl
| ```
system Clients
        features
                in_clients_mcr:  in event port;
                out_clients_mcr: out event port;
                in_clients_rs:   in event port;
                out_clients_rs:  out event port;
end Clients;

system implementation Clients.impl
end Clients.impl;
``` |

Figure 6. The component of Zigbee Devices

ZigbeeDevices.aadl
| ```
device ZigbeeDevices
        features
                in_zd_mcr:  in event port;
                out_zd_mcr: out event port;
end ZigbeeDevices;

device implementation ZigbeeDevices.impl
end ZigbeeDevices.impl;
``` |
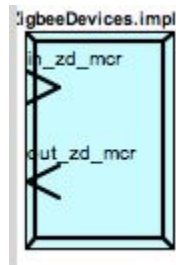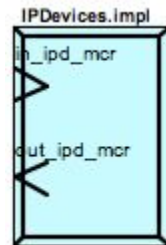

Figure 7. The component of IP Devices

IPDevices.aadl
| ```
device IPDevices
        features
                in_ipd_mcr:  in event port;
                out_ipd_mcr: out event port;
end IPDevices;

device implementation IPDevices.impl
end IPDevices.impl;
``` |