SDEV340-45 Home Automation Project

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A/C UNIT ← Connection

Heater ← Connection

Thermostat
- DayTemp Setting
- EveTemp Setting
- TemperatureSensor
- OnMsgHandler
- OffMsgHander
- HealthStatusDispatcher
- NodeName
- IPAddress
- SubnetMask
- GatewayAddress
- MACAddress

○ Provided Interface

◡ Required Interface

Requirements
- Application Requirements
  - Manual Control of Nodes
  - Automated Control of Nodes
  - Health Status Monitoring
- Implmentation Requirements
  - Industry Standard OOP Techniques
  - STL implementations
  - User Defined Templates
  - File I/O
  - Exception Handling
  - Pointers
  - Polymorphisms
  - Single Inheritance
  - Separate .cpp/.h per class
  - Main application driver main.cpp

Television
- OnMsgHandler
- OffMsgHandler
- ChannelUpHandler
- ChannelDownHandler
- ChannelDirectHandler
- VolumeUpHandler
- VolumeDownHandler
- HealthStatusDispatcher
- NodeName
- IPAddress
- SubnetMask
- GatewayAddress
- MACAddress

LightingZoneControllor
- OnMsgHandler
- OffMsgHandler
- HealthStatusDispatcher
- NodeName
- IPAddress
- SubnetMask
- GatewayAddress
- MACAddress

ControlBus

<<component>> SchedulerDatabase

<<component>> ActivityScheduler

<<component>> CentralController

<<component>> InventoryDatabase

ControlBus   ControlBus

VacuumBot
- OnMsgHandler
- OffMsgHandler
- MovementSensor
- HealthStatusDispatcher
- NodeName
- IPAddress
- SubnetMask
- GatewayAddress
- MACAddress

Alarm
- OnMsgHandler
- OffMsgHandler
- HealthStatusDispatcher
- FrontDoorSensor
- BackDoorSensor
- WindowSensor
- SoundSensor
- MotionSensor
- NodeName
- IPAddress
- SubnetMask
- GatewayAddress
- MACAddress

← Connection **FrontDoorAlarmContact**
← Connection **BackDoorAlarmContact**
← Connection **WindowAlarmContact**
← Connection **SoundPickups**
← Connection **MotionSensors**

Net::Network
- _deviceName : string
- _IPAddress : string
- _SubnetMask : string
- _GatewayAddress : string
- _MACAddress : string

+ Network()
+ Network(deviceName:string, macAddress:string, ipAddress:string, subnetMask:string, gatewayAddress:string)
+ setDeviceName (deviceName : string)
+ setIPAddress(ipAddress : string)
+ setSubnetMask(subnetMask : string)
+ setGatewayAddress(gatewayAddress : string)
+ setMacAddress(macAddress : string)
+ getDeviceName() : string
+ getIPAddress() : string
+ getSubnetMask() : string
+ getGatewayAddress() : string
+ getMacAddress() : string

ValidationLibrary::Network

+ <<static>> isMACValid(mac:string) : bool
+ <<static>> isIPv4AddressValid(ipv4Address) : bool
+ <<static>> isSubnetMaskValid(subnetMask:string) : bool
+ <<static>> isDeviceNameValid(deviceName:string) bool

Node::SmartNode
- _netConfig : Network*
- _deviceType : string
- _smartNode : SmartNode*
+ enum class Message : ENABLE_NODE, DISABLE_NODE,HEALTH_STATUS

+ SmartNode()
+ SmartNode(deviceName: string, deviceMac:string, deviceIPv4:string, deviceSubnetMask:string, deviceGatewayAddress:string)
+ virtual ~SmartNode()
+ getNetworkConfiguration() : Network*
+ getDeviceType():string
+ setDeviceType(string deviceType):void
+ getPtrToSmartNode() : SmartNode*
+ virtual messageHandler(message:Message) : bool
+ virtual enableNode() : bool
+ virtual disableNode() : bool
+ virtual getHealthStatus() : string
+ virtual void pollHealthStatus() : void
+ setHealthStatus(currentStatus) : void

Node::Thermostat : public

+ Thermostat()
+ Thermostat(deviceType:string, deviceName:string, deviceMAC:string, deviceIPv4Address:string, deviceSubnetMask:string, deviceGatewayAddress:string) : SmartNode(deviceType, deviceName, deviceMAC, deviceIPv4Address, deviceSubnetMask, deviceGatewayAddress)
+ virtual ~Thermostat()

Controller::CentralController
- _smartNodeInventory: vector<SmartNode>
- _tempNewSmartNodeContainer : map<string,string>
- _isTempNewSmartNodeContainerDeviceTypeSet = false : bool
- _isTempNewSmartNodeContainerDeviceNameSet = false : bool
- _isTempNewSmartNodeContainerDeviceMACSet = false : bool
- _isTempNewSmartNodeContainerDeviceIPv4AddressSet = false : bool
- _isTempNewSmartNodeContainerDeviceSubnetMaskSet = false : bool
- _isTempNewSmartNodeContaineDeviceGatewayAddressSet = false : bool

+ CentralController()
+ ~CentralController()
+ <<friend>>print_tempNewSmartNodeContainer(CentralController centralController) : void
+ <<friend>>print_smartNodeINventorhy(CentralController cnetralController) : void
+ **startController() : void**
- launchMainMenu() : void
- launchStatusMenu() : void
- launchInventoryMenu() : void
- launchSchedulerMenu() : void
- launchControllerMenu() : void
- launchPowerOffMenu(int &mainMenuChoice) : void
- launchInventorhyAddDeviceMenu() : void
- launchGetNetworkConfigDataMenu() : void
- launchCreateDeviceNameMenu() : void
- launchCreateDeviceMACMenu() : void
- launchCreateDeviceIPAddressMenu() : void
- launchCreateSubnetMaskMenu() : void
- launchCreateGatewayAddresssmenu() : void
- launchSaveNewDeviceMenu() : void
- resetTempNewSmartNodeContainerStateFlags() : void
- appendSmartNodeToInventoryFile(Node::SmartNode* newSmartNode) : void
- loadSmartNodeListFromInventoryFile() : void

HomeAutomationControllerTemplateLibary

template<typename SmartNodeType>**createNewSmartNode**(& smartNodeInventory : vector<Node::SmartNode*>, deviceType : string, deviceName : string, deviceMAC : string, deviceIP : string, deviceSubnetMask : string, deviceGatewayAddres : string)