

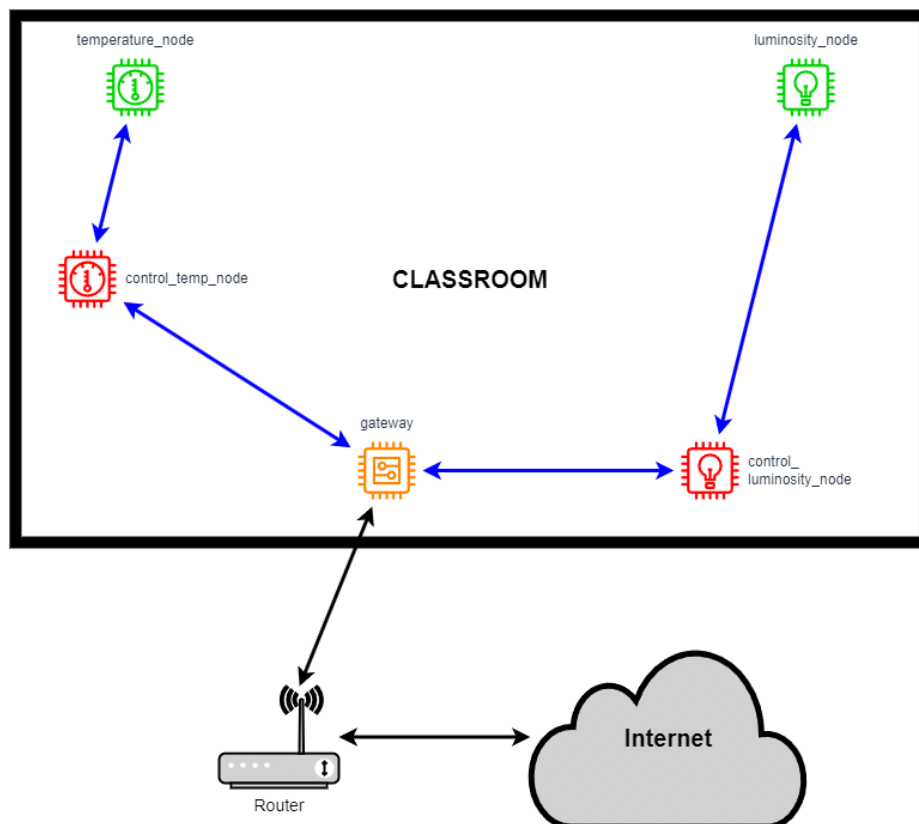
Projeto IoT 2023.2

Desenvolver um sistema IoT com capacidade para monitorar a temperatura ambiente em tempo real das salas de aula e laboratórios por meio de sensores de temperatura. As informações coletadas pelos sensores irão servir de referência para os atuadores que irão controlar os equipamentos de refrigeração para climatizar o ambiente em busca da melhoria do conforto térmico para os usuários da sala ou laboratório.

O sistema também irá monitorar a luminosidade da sala ou laboratório por meio de sensores de luminosidade e as informações coletadas pelo sensor servirá de referência para o controle automatizado dos sistemas de iluminação.

O objetivo do projeto é desenvolver um sistema IoT que implemente os conceitos de Smart Campus que proporcione ganhos na eficiência e na qualidade de vida no campus.

Monitorar e controlar a temperatura e a luminosidade ambiente da sala ou laboratório para reduzir consumo e aumentar o conforto dos usuários.



- **Nó sensor de luminosidade**

O nó sensor de luminosidade (luminosity_node) será responsável por coletar e enviar os dados sobre a luminosidade ambiente para o Middleware utilizando o protocolo MQTT para conexão com o gateway.

Esse nó utilizará o microcontrolador ESP32 e o sensor LDR (TSL2561, BH1750, VEML6030 ou LDR).

A figura 3 ilustra o diagrama em bloco do nó sensor de temperatura.

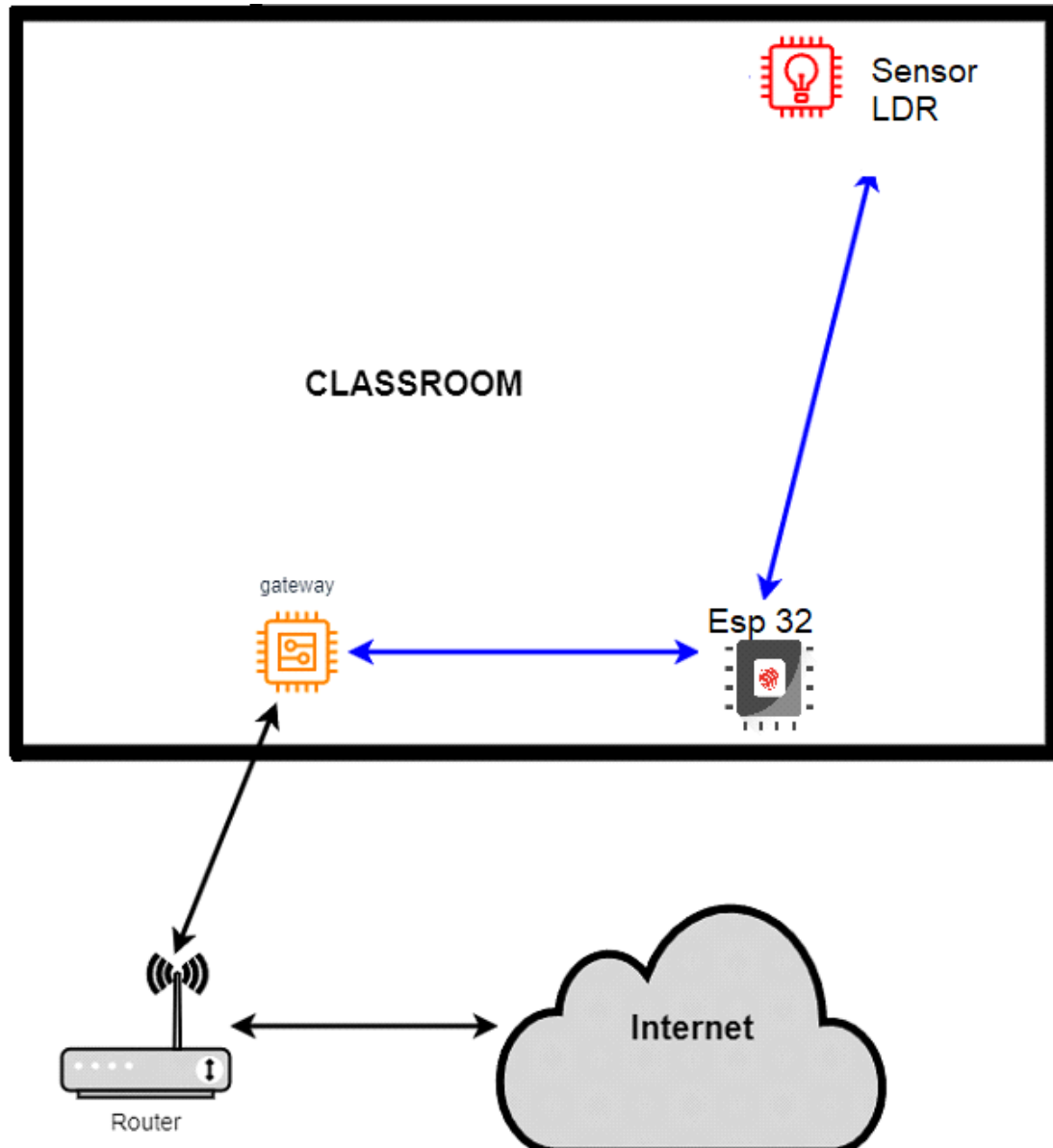


Figura 3: Diagrama em bloco do luminosity_node.

- **Controlador da iluminação**

O nó atuador (control_ luminosity_node) será responsável por controlar o ponto de iluminação da sala. Será implementado o protocolo MQTT entre o nó e o gateway para receber os comandos de controle do relé enviado a parti do Middleware.

Esse nó utilizará o microcontrolador ESP32 e o modulo Relé comum (Relé comum, SSR, Relé de pulso).

A figura 6 ilustra o diagrama em bloco do nó sensor de temperatura.

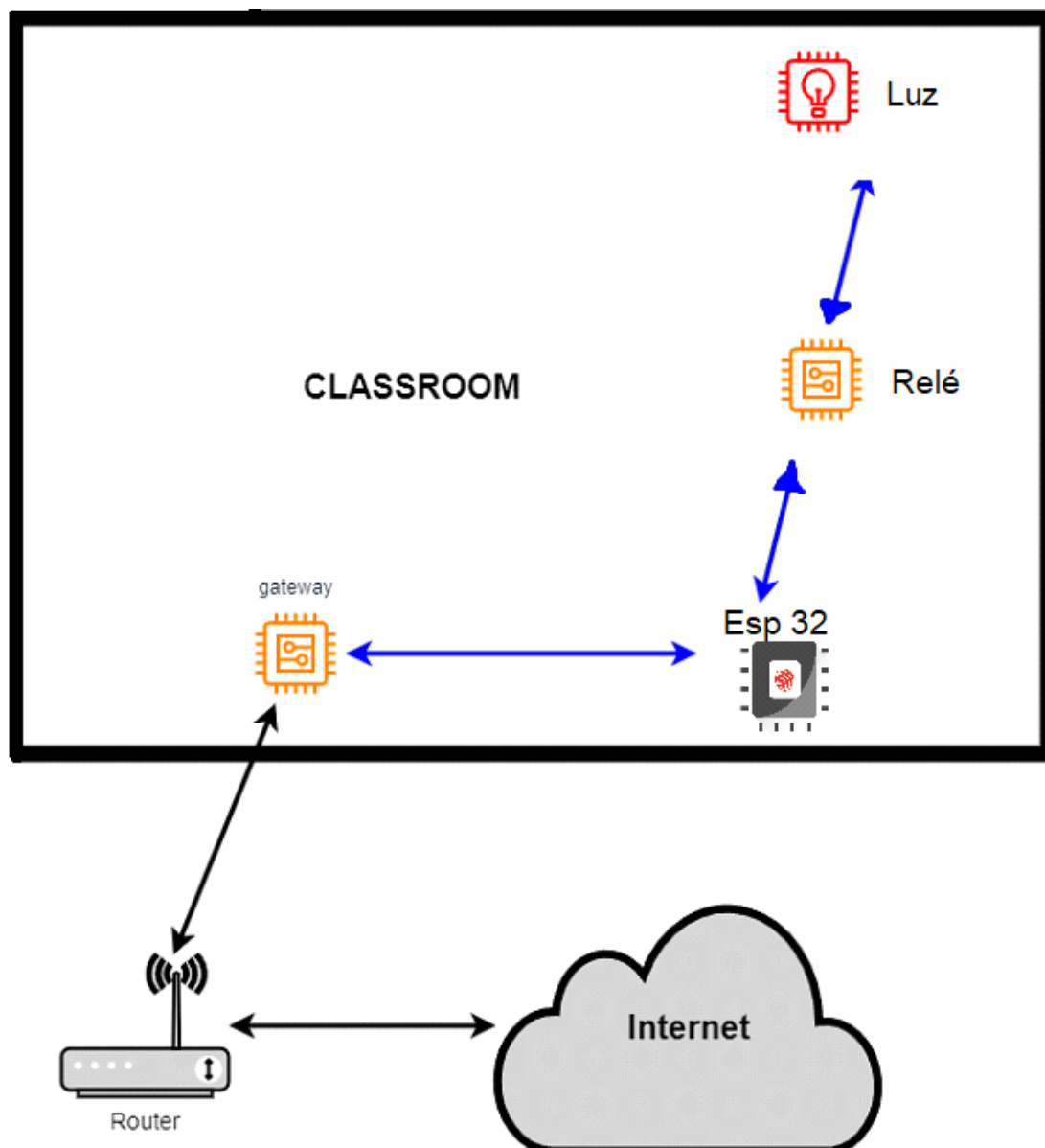


Figura 6: Diagrama em bloco do switch_node.

- **Gateway**

O gateway será responsável por implementar uma interface de comunicação entre os demais nós do sistema que estarão utilizando o protocolo MQTT com a rede internet por um Middleware.

Esse nó utilizará um computador rodando o sistema operacional Linux e o Middleware Dojot. A energia será fornecida por fonte de alimentação chaveada. A conexão com a

internet poderá ser por meio de rádio WiFi ou cabeada (Ethernet). Para a comunicação com os demais nós do sistema será utilizado um modulo Wifi .

A figura 7 ilustra o diagrama em bloco do nó sensor de temperatura.

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Figura 7: Diagrama em bloco do gateway

- **Roteador para acesso à internet**

Será utilizado a infraestrutura de rede WiFi ou cabeada do campus para conectar o nó gateway aos serviços (BD) e aplicativos Web e ou Apps de gestão do sistema que estão rodando na nuvem.

- **Nuvem**

Poderá ser utilizado serviço de computação em nuvem, tais como AWS, Azure, GCP, Digitalocean, para hospedar o banco de dados, aplicação web de gerenciamento ou implementado essa infraestrutura local.

Outro ponto importante que durante o desenvolvimento do projeto precisa estudado é com relação as boas práticas de segurança a serem implementadas em todos os nós para minimizar ataques ao serviço e sua segurança.

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