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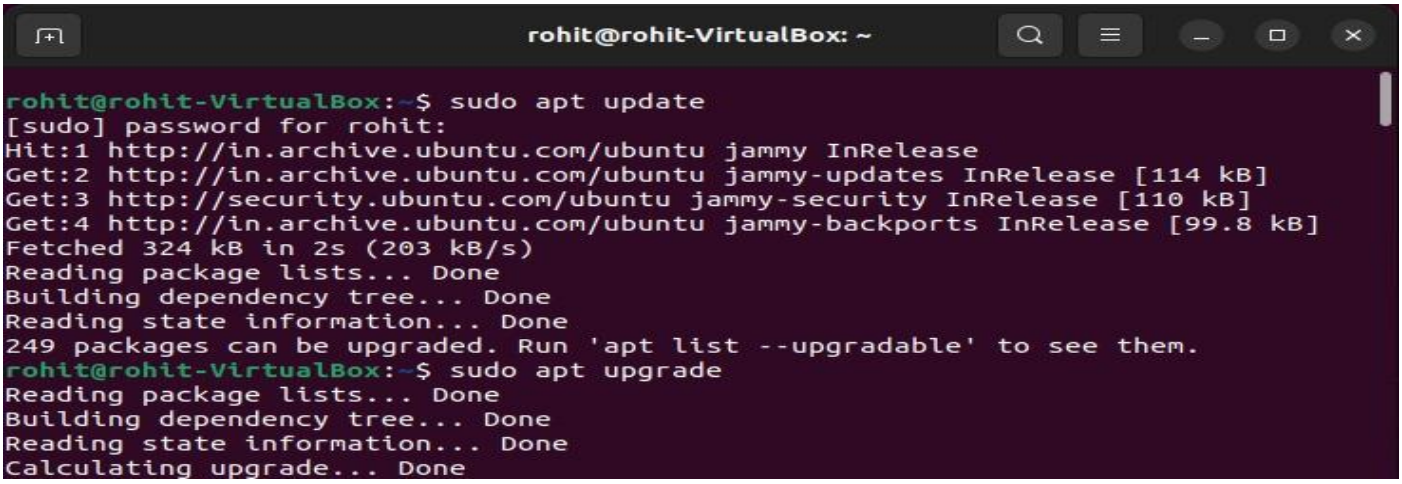
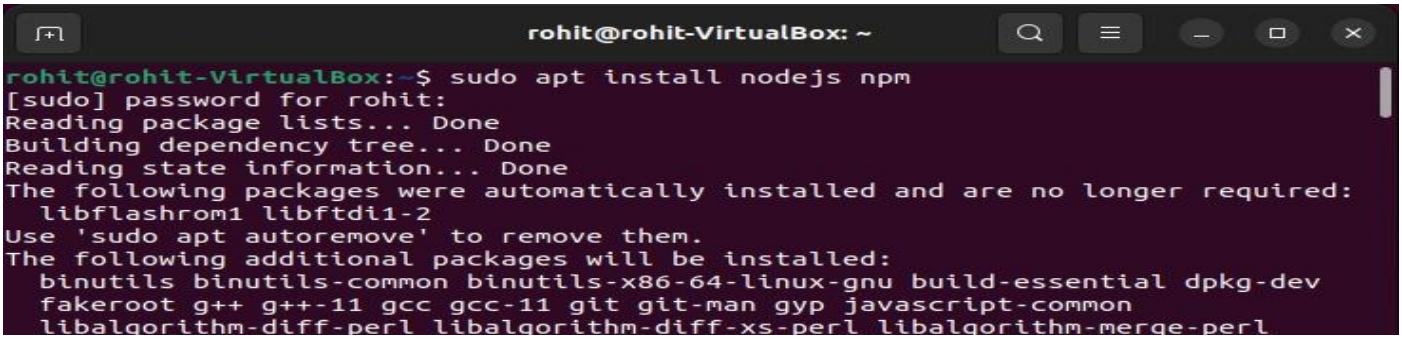
CPS System Design - CSE2034

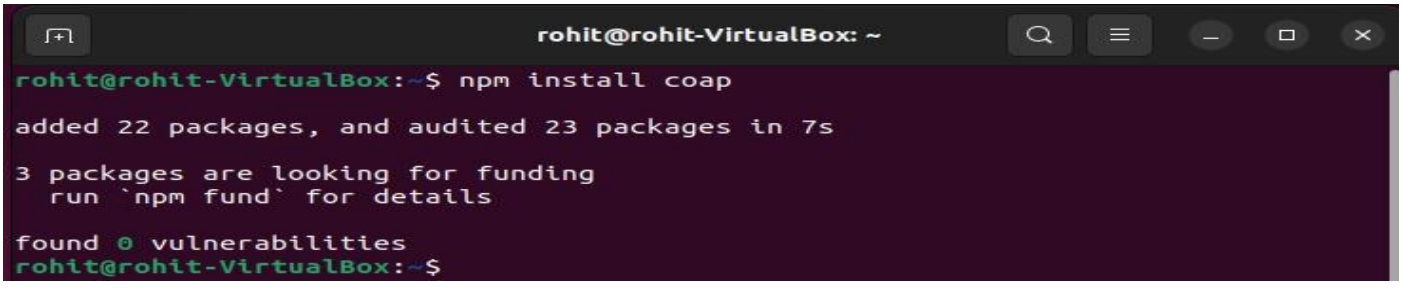
HTTP Server Creation

Experiment - 2

There is a chemical factory that do research and development in fertilisers. They deploy various sensors to monitor the air quality inside the factory premises and near to the plant. You as a CPS engineer, need to develop a CoAP Client device that fetches the values of the following sensors namely: Particle Matter, Hydro Carbons, Carbon Monoxide, Nitrous Oxide and Carbon Di oxide. You need to do the research on the permissible levels of all these sensors and device a NodeJS script and test the client using either Cu Plugin or any terminal based CoaP Client.





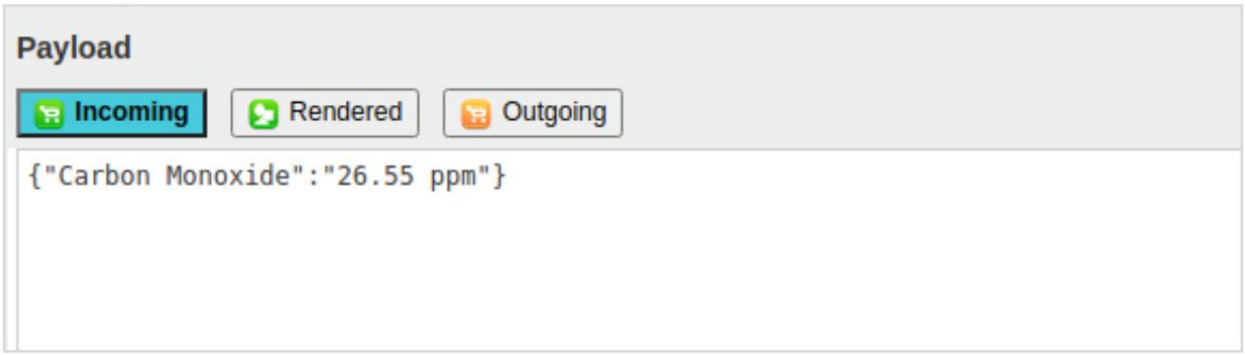


js file

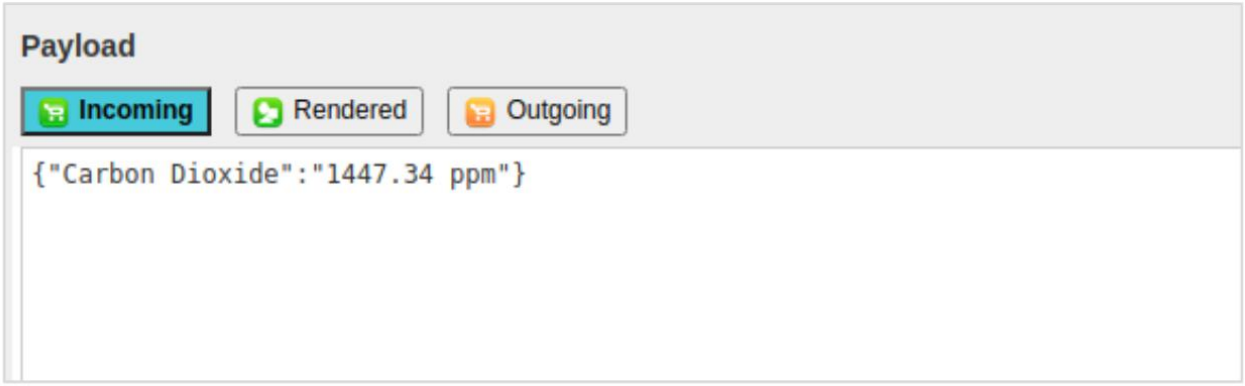
coap.js

```
var coap = require('coap'); //to include CoAP library
var portNum = 5683;

//define a random fucntion to send random int values
function randInt(min, max){
        return (Math.random()*(max-min)+min).toFixed(2);
}

coap.createServer(function (req, res){
        console.info("Client request is %s", req.url);

        switch(req.url){
                case "/co2":
                        displayOut(res, {'Carbon Dioxide':randInt(1000, 2000)+' ppm'})
                        break;

                case "/pm":
                        displayOut(res, {'Particulate Matter':randInt(0, 2.5)+' ppm'})
                        break;

                case "/hc":
                        displayOut(res, {'Hydrocarbons':randInt(0, 1500)+' ppm'})
                        break;

                case "/co":
                        displayOut(res, {'Carbon Monoxide':randInt(0, 50)+' ppm'})
                        break;

                case "/nox":
                        displayOut(res, {'Nitrous Oxide':randInt(0, 0.3)+' ppm'})
                        break;
        }
}).listen(portNum);

console.log("CoAP server started at port %s.", portNum);

function displayOut(res, content){
        if(content){
                res.setOption('Content-Format', 'application/json');
                res.code="2.05";
                res.end(JSON.stringify(content));
        }else{
                res.code="4.04";
                res.end();
        }
}
```

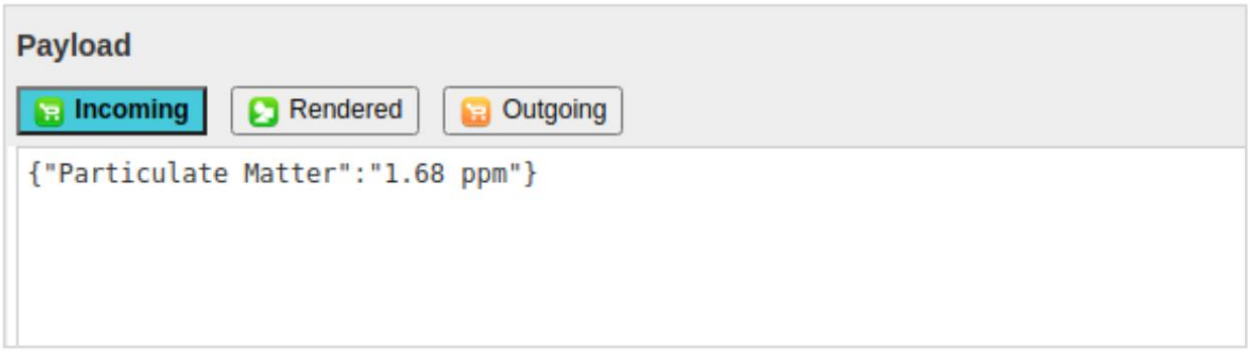
Using CU for Chrome



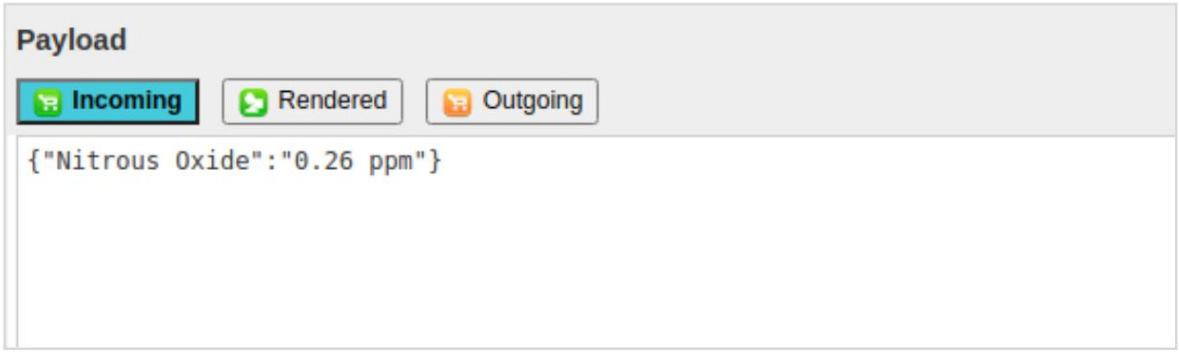
coap://localhost:5683/co



coap://localhost:5683/co2



coap://localhost:5683/pm

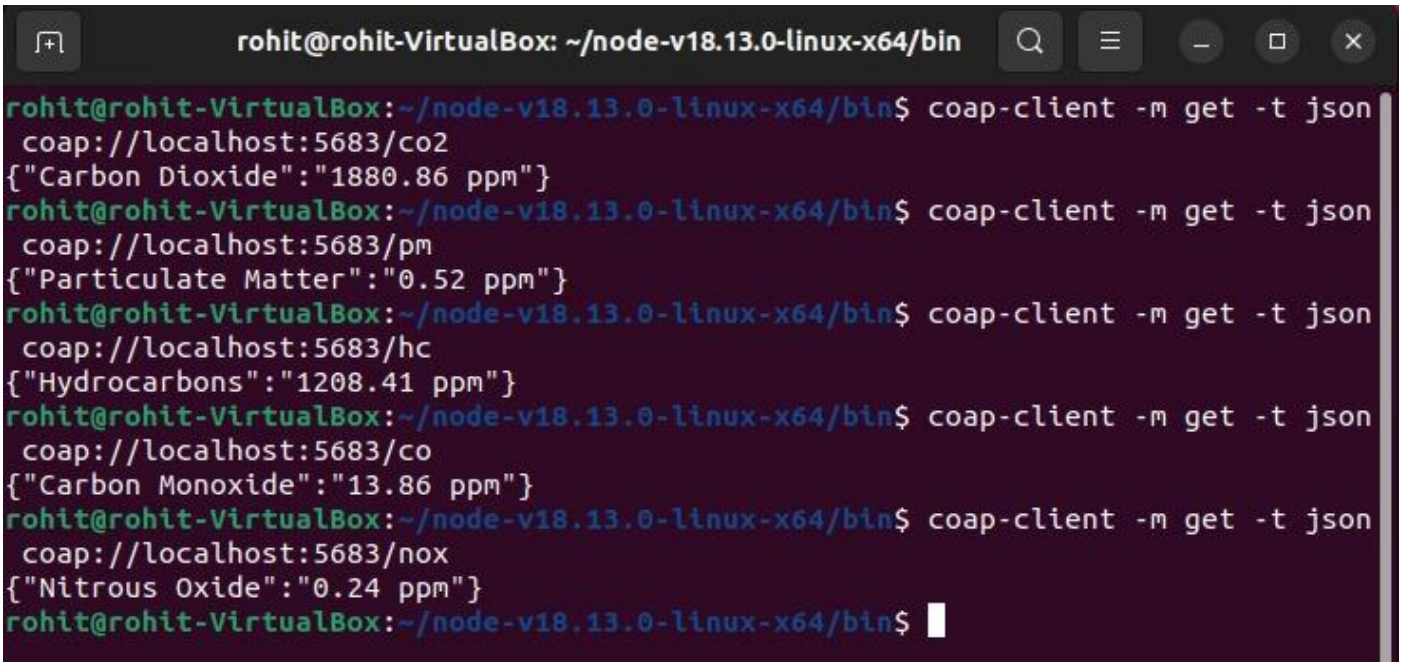


coap://localhost:5683/nox

coap://localhost:5683/hc

Using Terminal

Client Side



Server Side