Opdracht 5

Cloud Technology & Security

Qing Scholten

Opdracht 1: Function met mqtt publish

1.

```
const { app } = require('@azure/functions');

app.http('MQTTPublish', {
    methods: ['POST'],
    authLevel: 'anonymous',
    handler: async (request, context) => {
        const mqtt = require("mqtt");
        const client = mqtt.connect("mqtt:broker.mqttdashboard.com");
        var publishtopic = "Alarmlicht";

        context.log(`Http function processed request for url "${request.url}"`);

        let text = "Test";
        client.publish(publishtopic, text);

        return { body: `Publish is verzonden: ${text}!` };
    }
});
```

POST http://localhost:7071/a

http://localhost:7071/api/MQTTPublish

POST http://localhost:7071/api/MQTTPublish

Params Authorization Headers (8) Body Scripts Settings

Query Params

	Key
	Key

Body Cookies Headers (4) Test Results

Pretty Raw Preview Visualize Text

```
1  Publish is verzonden: Test!
```

Publish

Topic: testtopic/1

QoS: 0

Retain

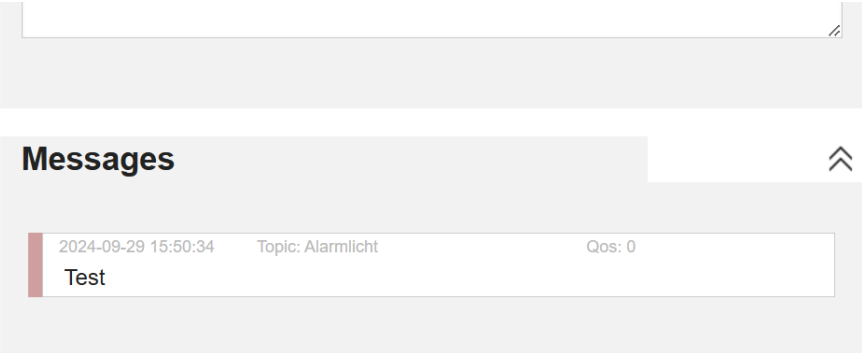
Publish

Message

Subscriptions

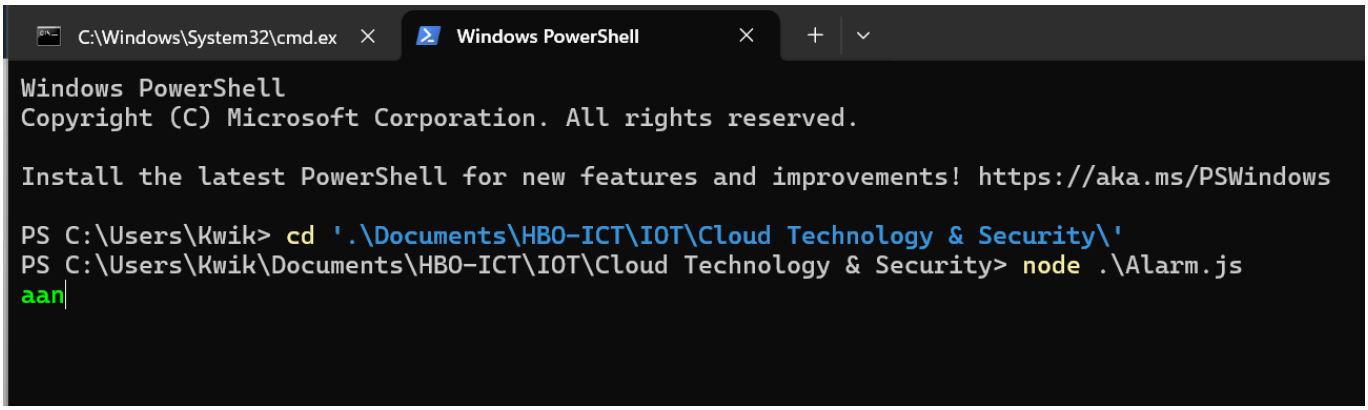
Add New Topic Subscription

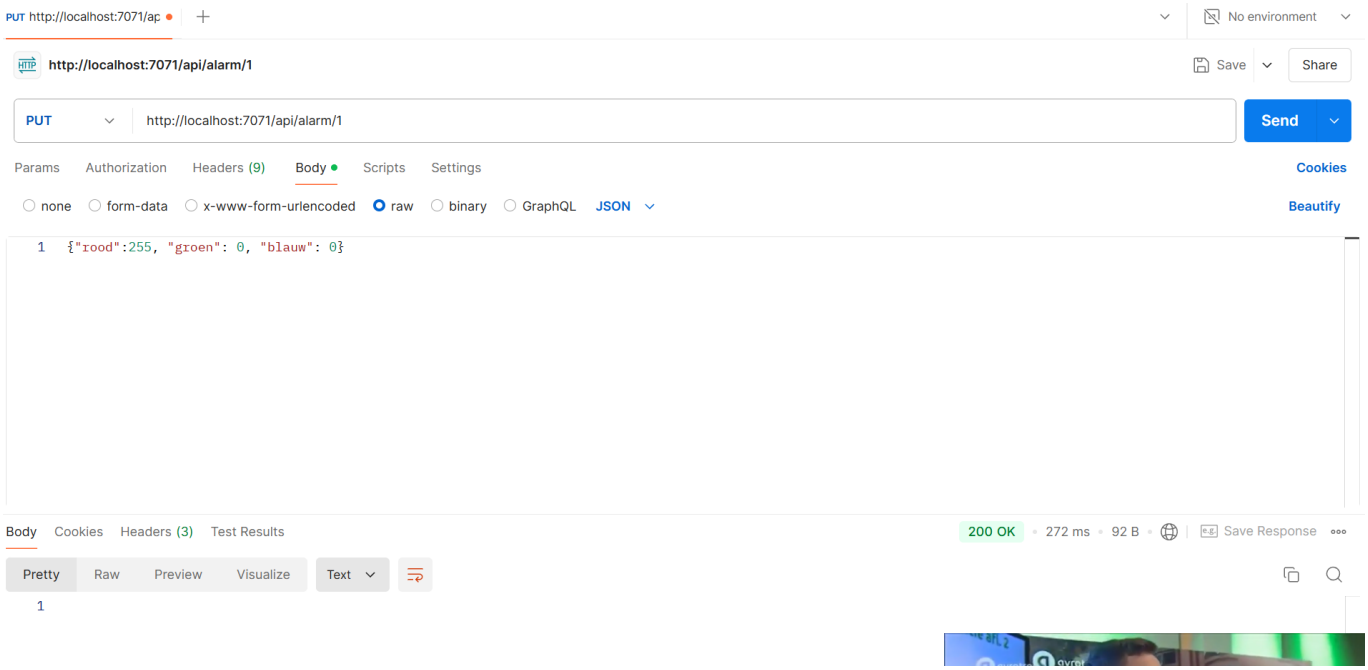
Qos: 2
Alarmlicht

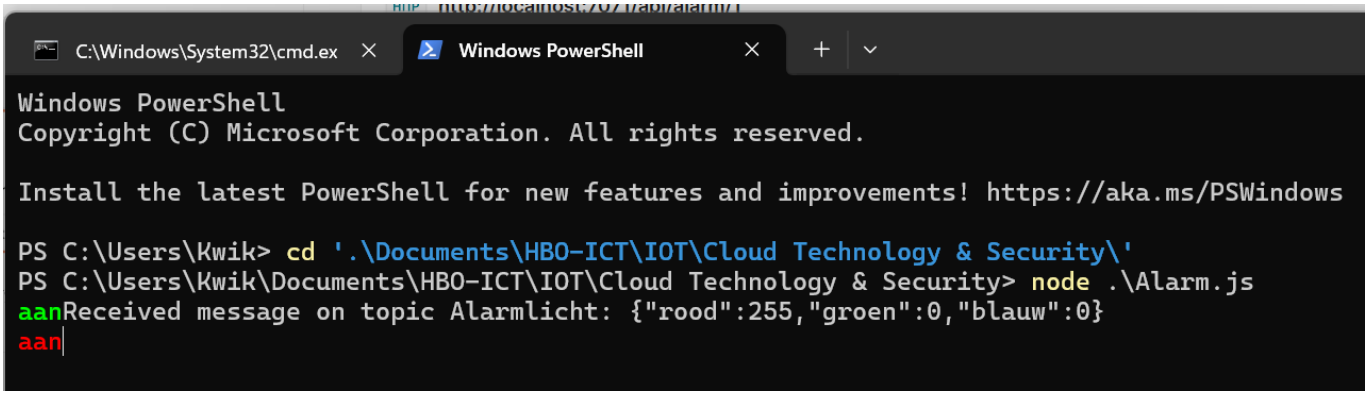


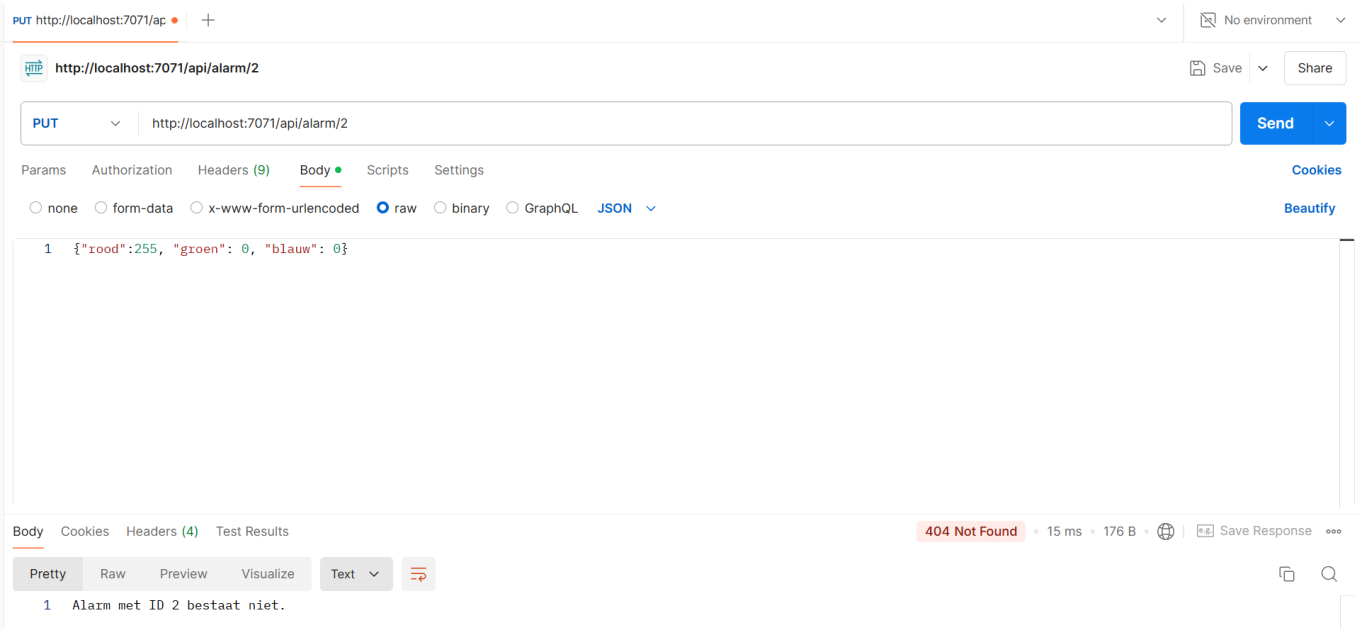
2.

```
app.http('AlarmAansturing', {
    methods: ['PUT'],
    authlevel: 'anonymous',
    route: 'alarm/{id:int?}',
    handler: async (request, context) => {
        const mqtt = require("mqtt");
        const client = mqtt.connect("mqtt:broker.mqttdashboard.com");
        var publishtopic = "Alarmlicht";

        context.log(`Http function processed request for url "${request.url}"`);

        try {
            var id = request.params.id;
            if (id == 1) {
                var bod = await request.json();
                var text = JSON.stringify(bod);
                client.publish(publishtopic, text);
                return {
                    status: 200
                }
            }
            else {
                return {
                    status: 404,
                    body: `Alarm met ID ${id} bestaat niet.`
                }
            }
        }
        catch (e) {
            context.log(`Fout bij het aansturen van het alarm`, e);
            return {
                status: 500,
                body: 'Interne serverfout bij aansturen van alarm.'
            }
        }
    }
});
```


C:\Windows\System32\cmd.ex
Windows PowerShell
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.
Install the latest PowerShell for new features and improvements! https://aka.ms/PSWindows
PS C:\Users\Kwik> cd '.\Documents\HBO-ICT\IOT\Cloud Technology & Security\'
PS C:\Users\Kwik\Documents\HBO-ICT\IOT\Cloud Technology & Security> node .\Alarm.js
aan


PUT http://localhost:7071/ap
No environment
http://localhost:7071/api/alarm/1
Save
Share
PUT
http://localhost:7071/api/alarm/1
Send
Params
Authorization
Headers (9)
Body
Scripts
Settings
Cookies
none
form-data
x-www-form-urlencoded
raw
binary
GraphQL
JSON
Beautify
1 {"rood":255, "groen": 0, "blauw": 0}
Body
Cookies
Headers (3)
Test Results
200 OK
272 ms
92 B
Save Response
Pretty
Raw
Preview
Visualize
Text
1

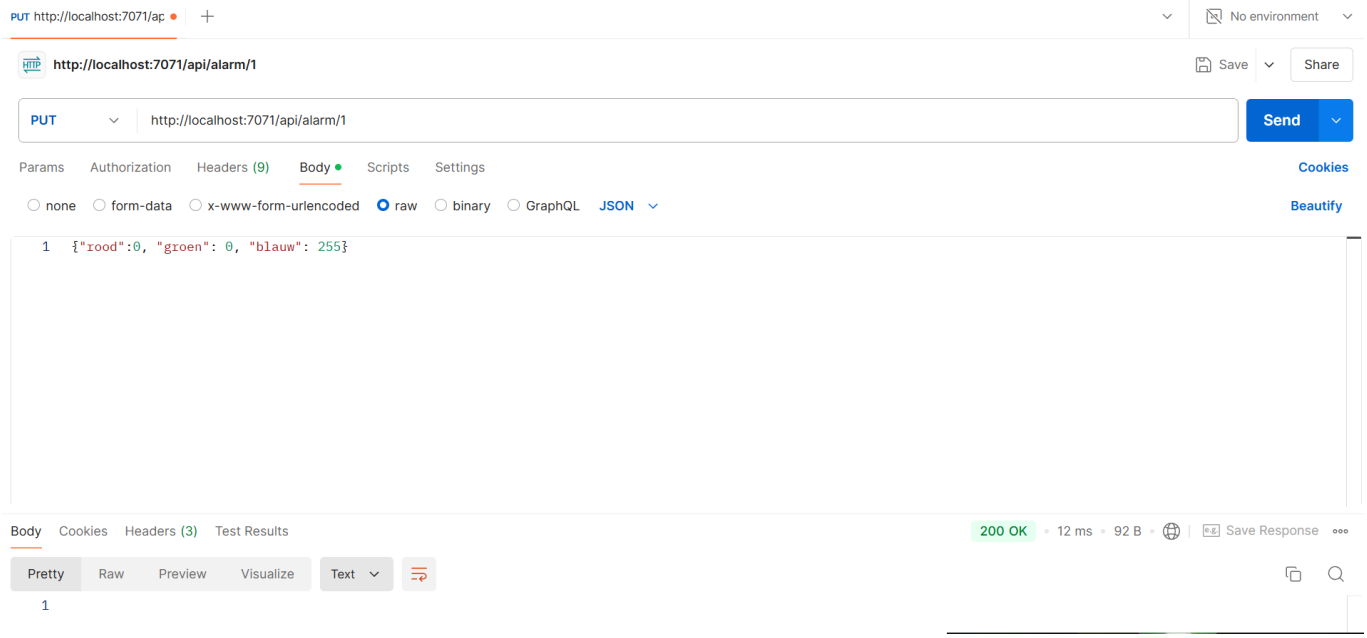


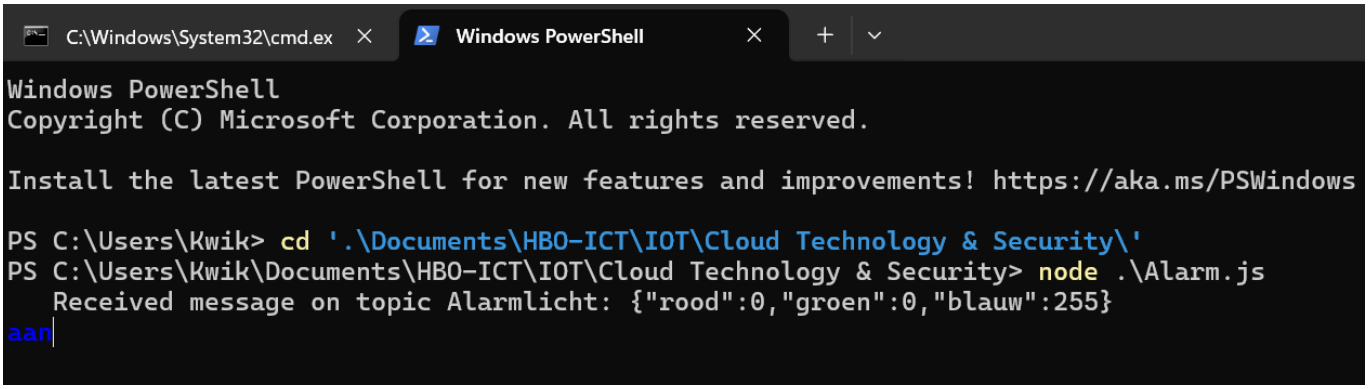


3.

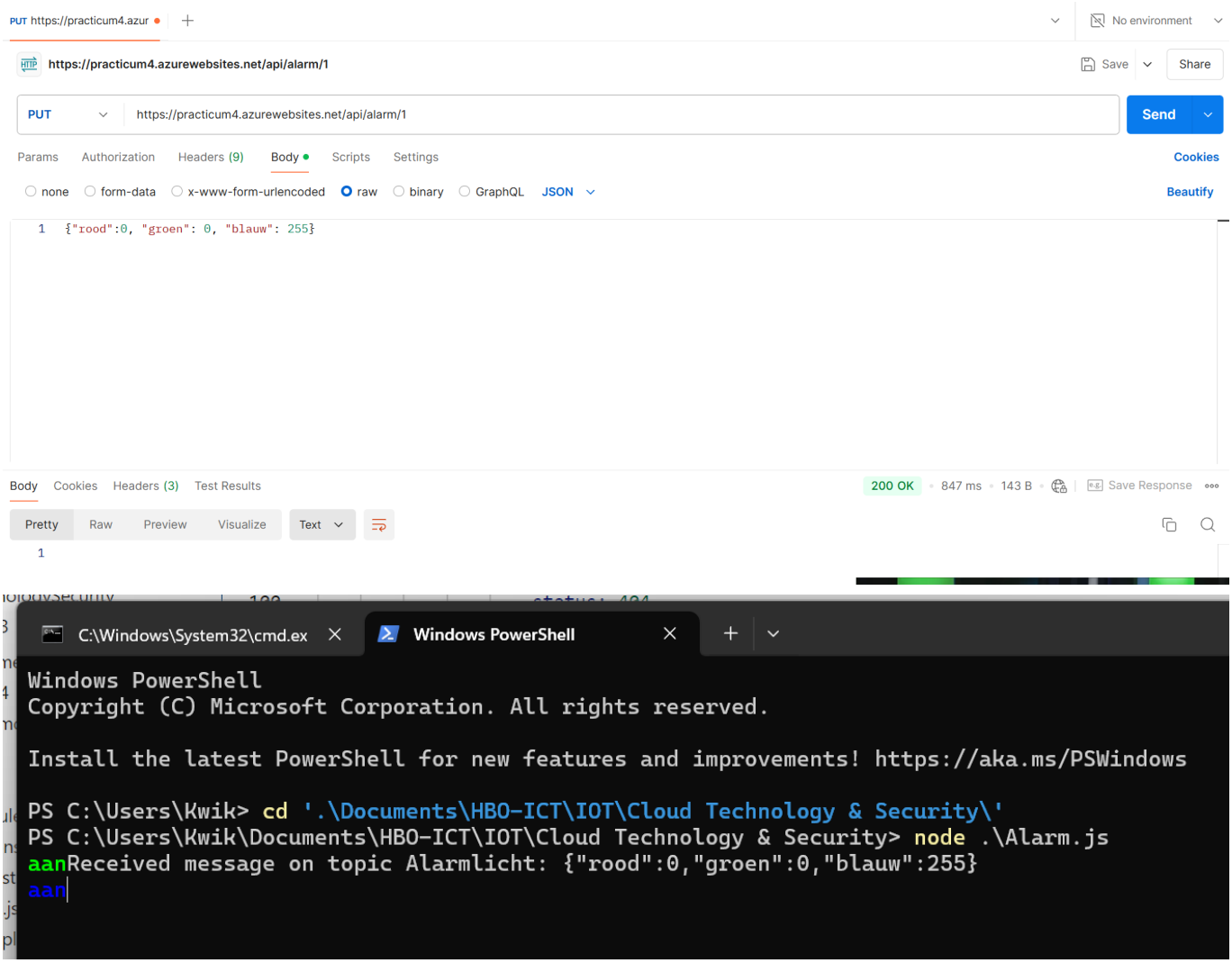
```
app.http('AlarmAansturing', {
    methods: ['PUT'],
    authlevel: 'anonymous',
    route: 'alarm/{id:int?}',
    handler: async (request, context) => {
        const mqtt = require("mqtt");
        const client = mqtt.connect("mqtt:broker.mqttdashboard.com");
        const alarmlichten = ["Alarmlicht", "Alarmlicht2"]
        var publishtopic = "Alarmlicht";

        context.log(`Http function processed request for url "${request.url}"`);

        try {
            var id = request.params.id - 1;
            if (id < alarmlichten.length) {
                var bod = await request.json();
                var text = JSON.stringify(bod);
                client.publish(alarmlichten[id], text);
                return {
                    status: 200
                }
            }
```

```
            else {
                return {
                    status: 404,
                    body: `Alarm met ID ${id} bestaat niet.`
                }
            }
        }
        catch (e) {
            context.log(`Fout bij het aansturen van het alarm`, e);
            return {
                status: 500,
                body: 'Interne serverfout bij aansturen van alarm.'
            }
        }
    }
});
```





4.



Opdracht 2: Await en Async in node.js

5.

```
var fs = require ('fs');
fs.readFile('file.txt', function(e, data) {
    if (e) {
        console.log(`Error bij het lezen van bestand: ${e}`);
        return;
    }
    else {
        console.log(`Bestandsinhoud: ${data}`);
        return;
    }
});
console.log("Hey Ho");
```

Opdracht5.md | file.js | file.txt

file.txt

```
1 Kwak
```

```
Windows PowerShell
Windows PowerShell
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PS C:\Users\Kwik> cd '.\Documents\HBO-ICT\IOT\Cloud Technology & Security\'
PS C:\Users\Kwik\Documents\HBO-ICT\IOT\Cloud Technology & Security> node .\file.js
Hey Ho
Bestandsinhoud: Kwak
PS C:\Users\Kwik\Documents\HBO-ICT\IOT\Cloud Technology & Security>
```

6.

```javascript
async function ReadFile() {
    var fs = require ('fs/promises');
    try {
        const data = await fs.readFile('file.txt');
        console.log(`Bestandsinhoud: ${data}`);
    }
    catch (e) {
        console.log(`Error bij het lezen van bestand: ${e}`);
    }
}

ReadFile();
console.log("Hey Ho")
```

```
Windows PowerShell
Windows PowerShell
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Install the latest PowerShell for new features and improvements! https://aka.ms/PSWindows

PS C:\Users\Kwik> cd '.\Documents\HBO-ICT\IOT\Cloud Technology & Security\'
PS C:\Users\Kwik\Documents\HBO-ICT\IOT\Cloud Technology & Security> node .\file.js
Hey Ho
Bestandsinhoud: Kwak
PS C:\Users\Kwik\Documents\HBO-ICT\IOT\Cloud Technology & Security>
```
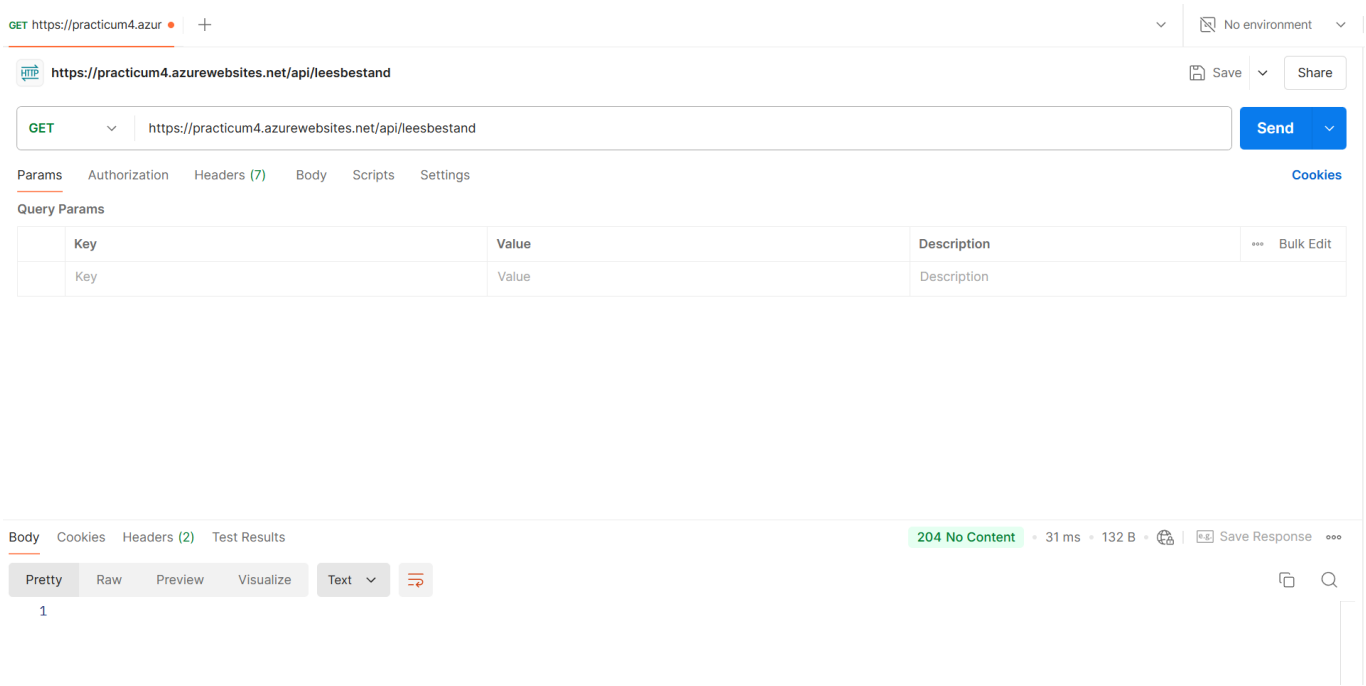

7.

```
app.http('LeesBestand', {
    methods: ['GET'],
    authlevel: 'anonymous',
    route: 'leesbestand',
    handler: async (request, context) => {
        async function ReadFile() {
            var fs = require ('fs/promises');
            try {
                const data = await fs.readFile('package.json');
                console.log(`Bestandsinhoud: ${data}`);
            }
            catch (e) {
                console.log(`Error bij het lezen van bestand: ${e}`);
            }
        }

        ReadFile();
        console.log("Hey Ho")
    }
})
```

```
2024-09-30T07:34:37.490 [Information] Hey Ho
2024-09-30T07:34:37.490 [Information] Executed 'Functions.LeesBestand' (Succeeded, Id=f54de6a4-7df2-4e0d-9732-bac39c218b
9d, Duration=3ms)
2024-09-30T07:34:37.491 [Information] Bestandsinhoud: {
2024-09-30T07:34:37.491 [Information] "name": "",
2024-09-30T07:34:37.491 [Information] "version": "1.0.0",
2024-09-30T07:34:37.491 [Information] "description": "",
2024-09-30T07:34:37.491 [Information] "main": "src/functions/*.js",
2024-09-30T07:34:37.491 [Information] "scripts": {
2024-09-30T07:34:37.491 [Information] "start": "func start",
2024-09-30T07:34:37.491 [Information] "test": "echo \"No tests yet...\""
2024-09-30T07:34:37.491 [Information] },
2024-09-30T07:34:37.491 [Information] "dependencies": {
2024-09-30T07:34:37.491 [Information] "@azure/functions": "^4.0.0",
2024-09-30T07:34:37.491 [Information] "chalk": "^4.1.2",
2024-09-30T07:34:37.491 [Information] "mqtt": "^5.10.1"
2024-09-30T07:34:37.491 [Information] },
2024-09-30T07:34:37.491 [Information] "devDependencies": {
2024-09-30T07:34:37.491 [Information] "azure-functions-core-tools": "^4.x"
2024-09-30T07:34:37.491 [Information] }
2024-09-30T07:34:37.491 [Information] }
2024-09-30T07:34:37.487 [Information] Executing 'Functions.LeesBestand' (Reason='This function was programmatically call
ed via the host APIs.', Id=f54de6a4-7df2-4e0d-9732-bac39c218b9d)
2024-09-30T07:34:37.490 [Information] Executed 'Functions.LeesBestand' (Succeeded, Id=f54de6a4-7df2-4e0d-9732-bac39c218b
9d, Duration=3ms)
```

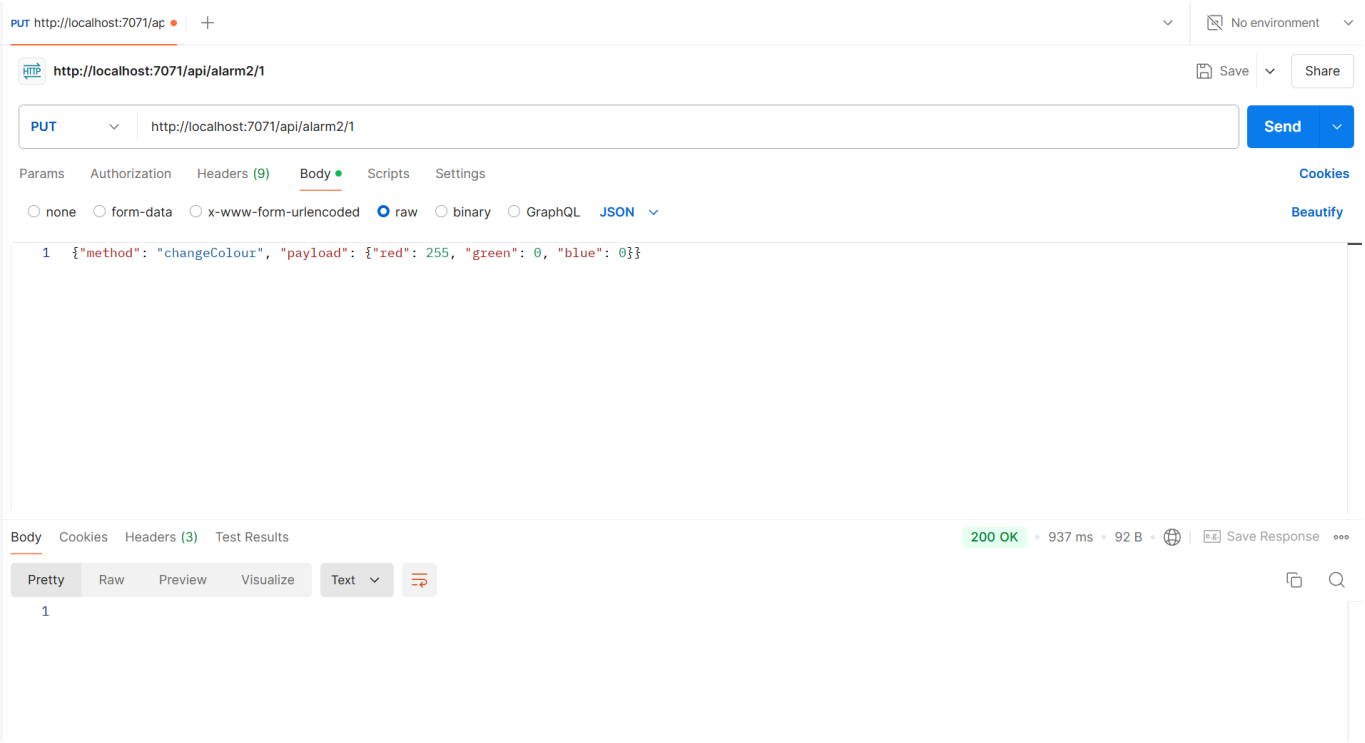


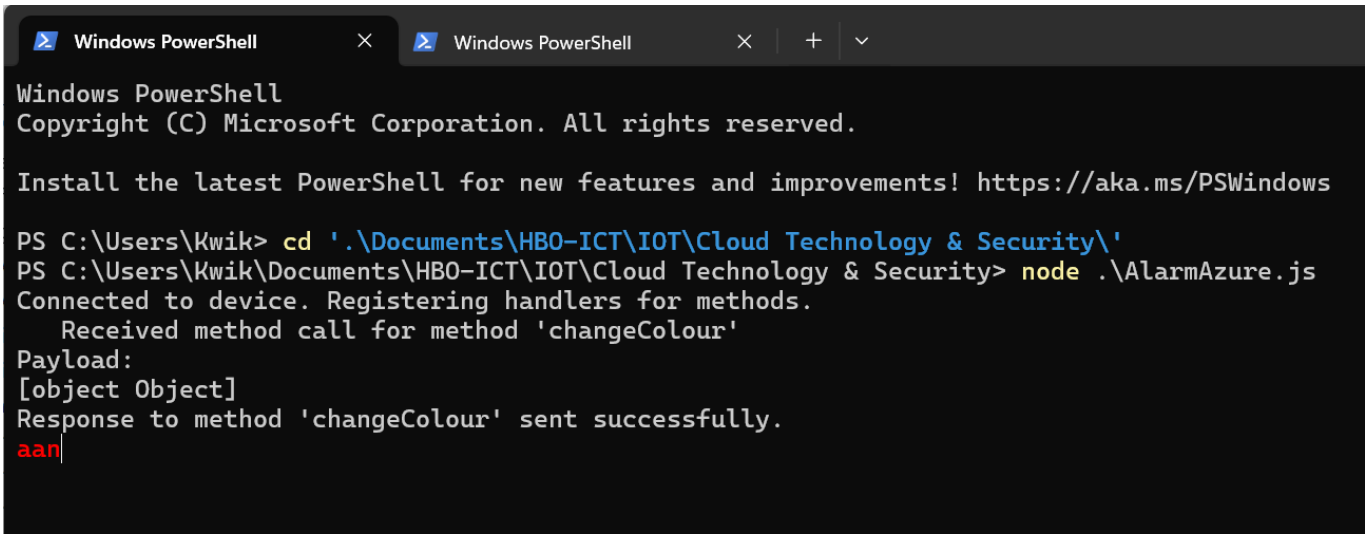
Opdracht 3: Azure Iot hub en functio

8.

```
app.http('AlarmIOT', {
    methods: ['PUT'],
    authLevel: 'anonymous',
    route: 'alarm2/{id:int?}',
    handler: async (request, context) => {
        var Client = require('azure-iothub').Client;
        var connectionString = process.env.IOTHUB_CONNECTION_STRING;
        var client = Client.fromConnectionString(connectionString);
        context.log(`Http function processed request for url "${request.url}"`);

        try {
            var id = request.params.id;
            if (id == 1) {
                var bod = await request.json();
```

```
                var text = JSON.stringify(bod);
                text = JSON.parse(text);
                var methodParams = {
                    methodName: text.method,
                    payload: text.payload,
                    responseTimeoutInSeconds: 15
                }
                var targetDevice = "NewAlarm";
                client.invokeDeviceMethod(targetDevice, methodParams, function
(err, result) {
                    if (err) {
                        console.error('Failed to invoke method \'' +
methodParams.methodName + '\': ' + err.message);
                    }
                    else {
                        console.log(methodParams.methodName + ' on ' +
targetDevice + ':');
                        console.log(JSON.stringify(result, null, 2));
                    }
                })
                return {
                    status: 200
                }
            }
            else {
                return {
                    status: 404,
                    body: `Alarm met ID ${id} bestaat niet.`
                }
            }
        }
        catch (e) {
            context.log(`Fout bij het aansturen van het alarm`, e);
            return {
                status: 500,
                body: 'Interne serverfout bij aansturen van alarm.'
            }
        }
    }
});
```



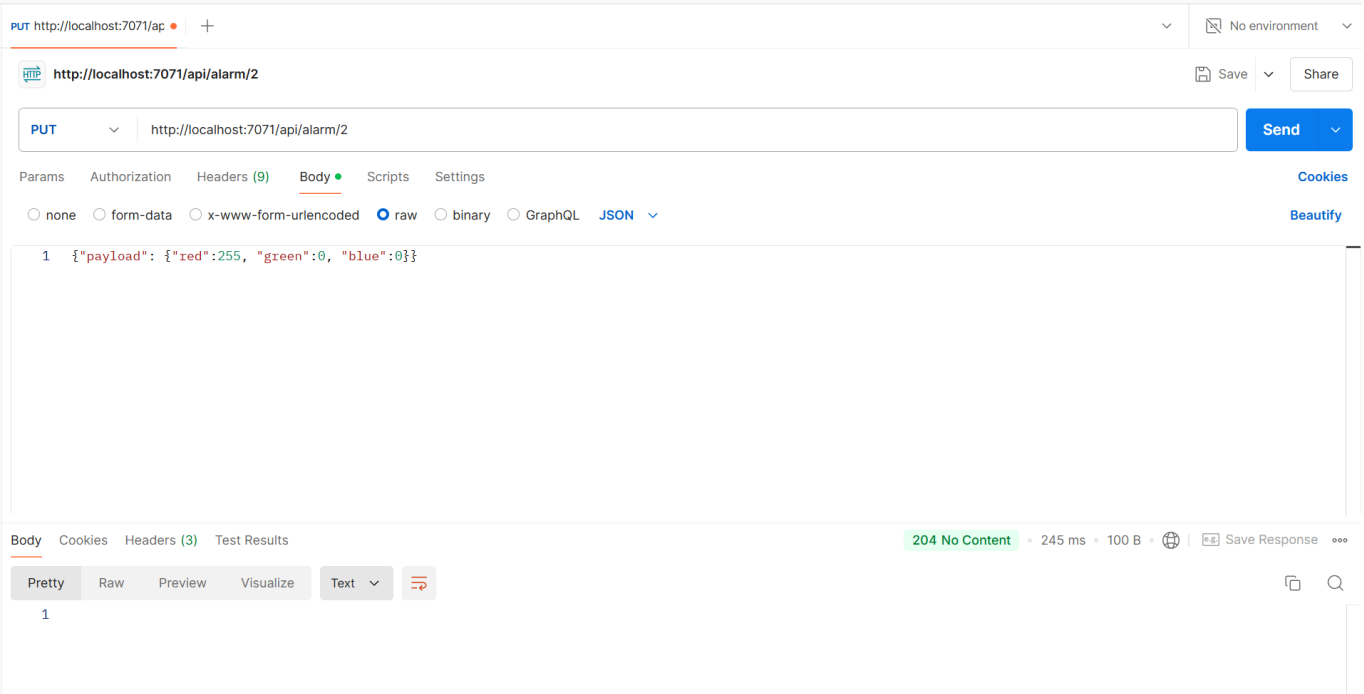


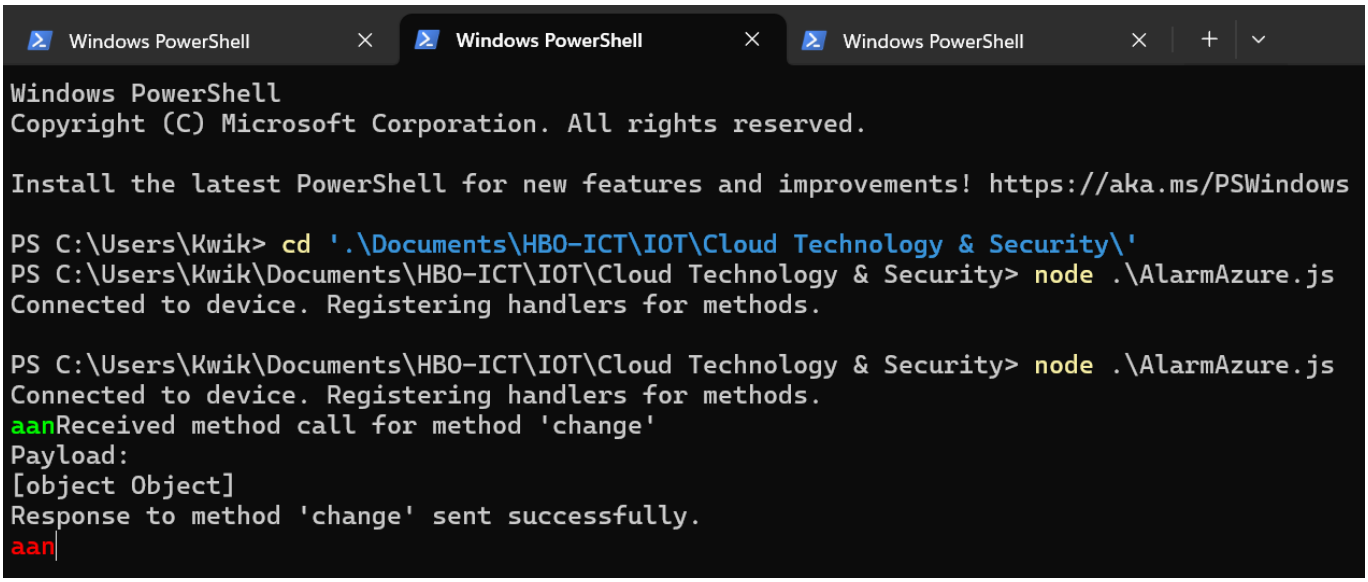
9.

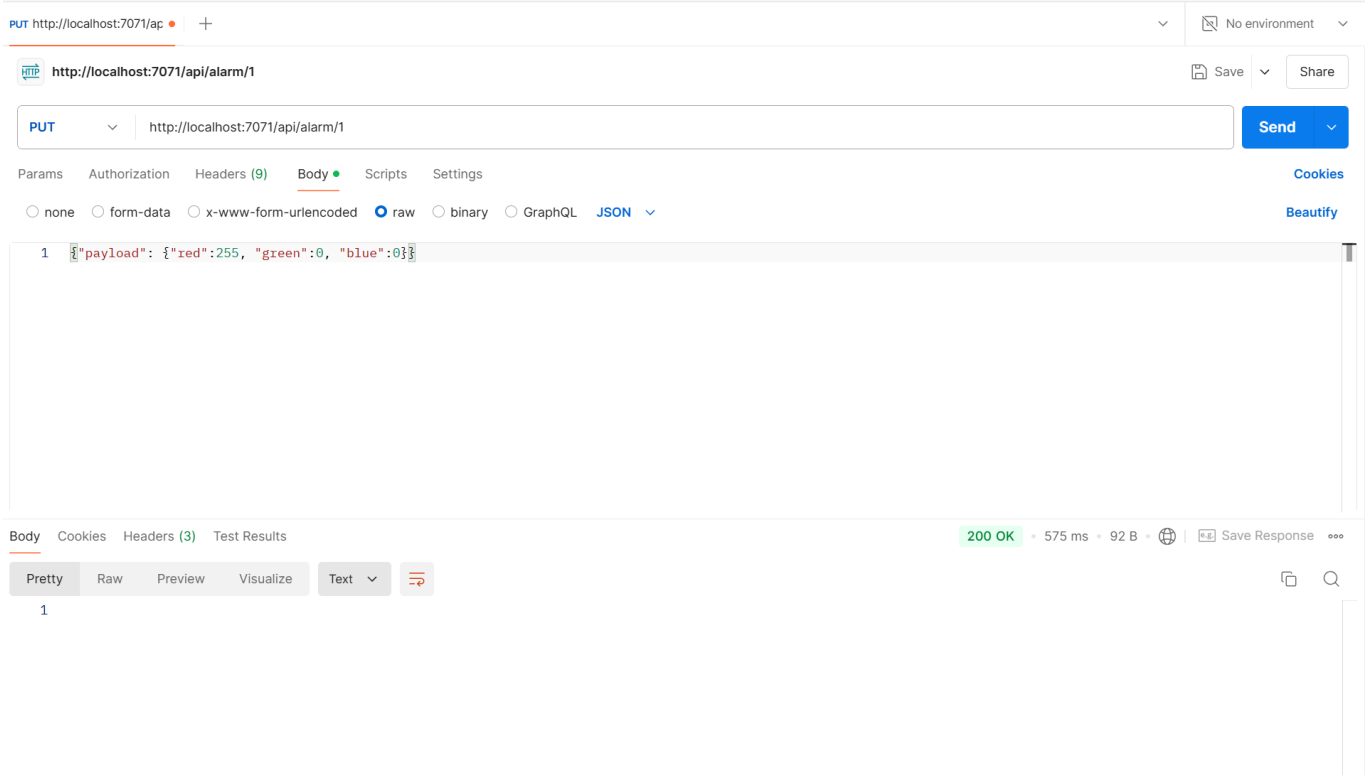
```
var alarms = {
    "Alarms": [
        {
            "Method": "MQTT",
            "Name": "Alarmlicht"
        },
        {
            "Method": "Azure",
            "Name": "NewAlarm"
        }
    ]
}

app.http('AlarmAzureIOT', {
    methods: ['PUT'],
    authLevel: 'anonymous',
```

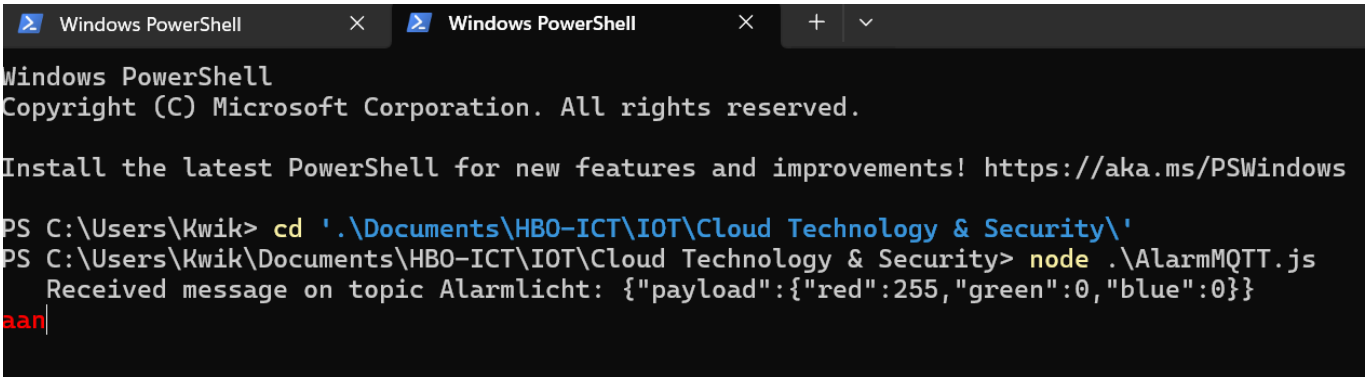
```
    route: 'alarm/{id:int?}',
    handler: async (request, context) => {
        var Client = require('azure-iothub').Client;
        var connectionString = process.env.IOTHUB_CONNECTION_STRING;
        var client = Client.fromConnectionString(connectionString);
        context.log(`Http function processed request for url "${request.url}"`);
        try {
            var id = request.params.id - 1;
            if (id < alarms.Alarms.length) {
                var bod = await request.json();
                var text = JSON.stringify(bod);
                text = JSON.parse(text);
                if (alarms.Alarms[id].Method === "MQTT"){
                    const mqtt = require("mqtt");
                    const clientmqtt =
mqtt.connect("mqtt:broker.mqttdashboard.com");
                    var temptext = JSON.stringify(bod);
                    clientmqtt.publish(alarms.Alarms[id].Name, temptext);
                    return {
                        status: 200
                    }
                }
                else if (alarms.Alarms[id].Method === "Azure") {
                var methodParams = {
                    methodName: "change",
                    payload: text.payload,
                    responseTimeoutInSeconds: 15
                }
                    client.invokeDeviceMethod(alarms.Alarms[id].Name,
methodParams, function (err, result) {
                        if (err) {
                            console.error('Failed to invoke method \'' +
methodParams.methodName + '\': ' + err.message);
                        }
                        else {
                            console.log(methodParams.methodName + ' on ' +
targetDevice + ':');
                            console.log(JSON.stringify(result, null, 2));
                        }
                    })
                }
                else {
                    return {
                        status: 500,
                        body: 'Interne serverfout bij aansturen van alarm.'
                    }
                }
            }
            else {
                return {
                    status: 404,
                    body: `Alarm met ID ${id} bestaat niet.`
                }
            }
```

```
        }
        catch (e) {
            context.log(`Fout bij het aansturen van het alarm`, e);
            return {
                status: 500,
                body: 'Interne serverfout bij aansturen van alarm.'
            }
        }
    }
});
```







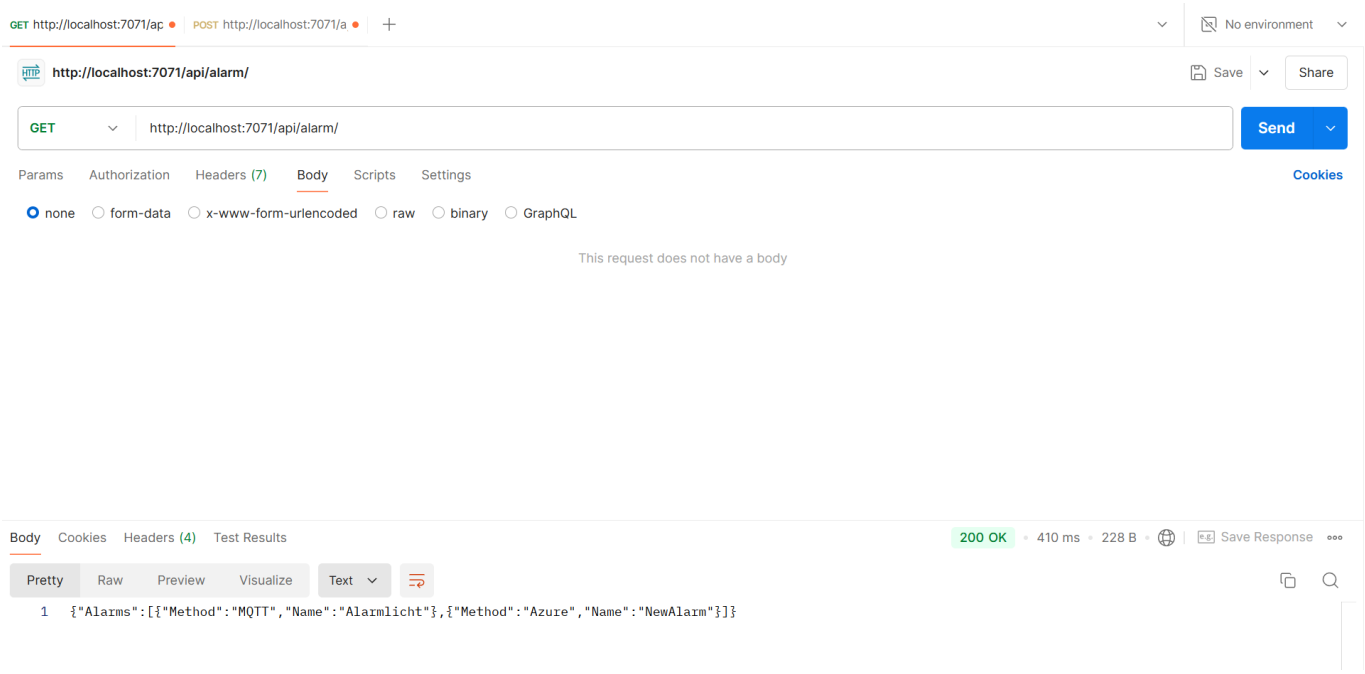


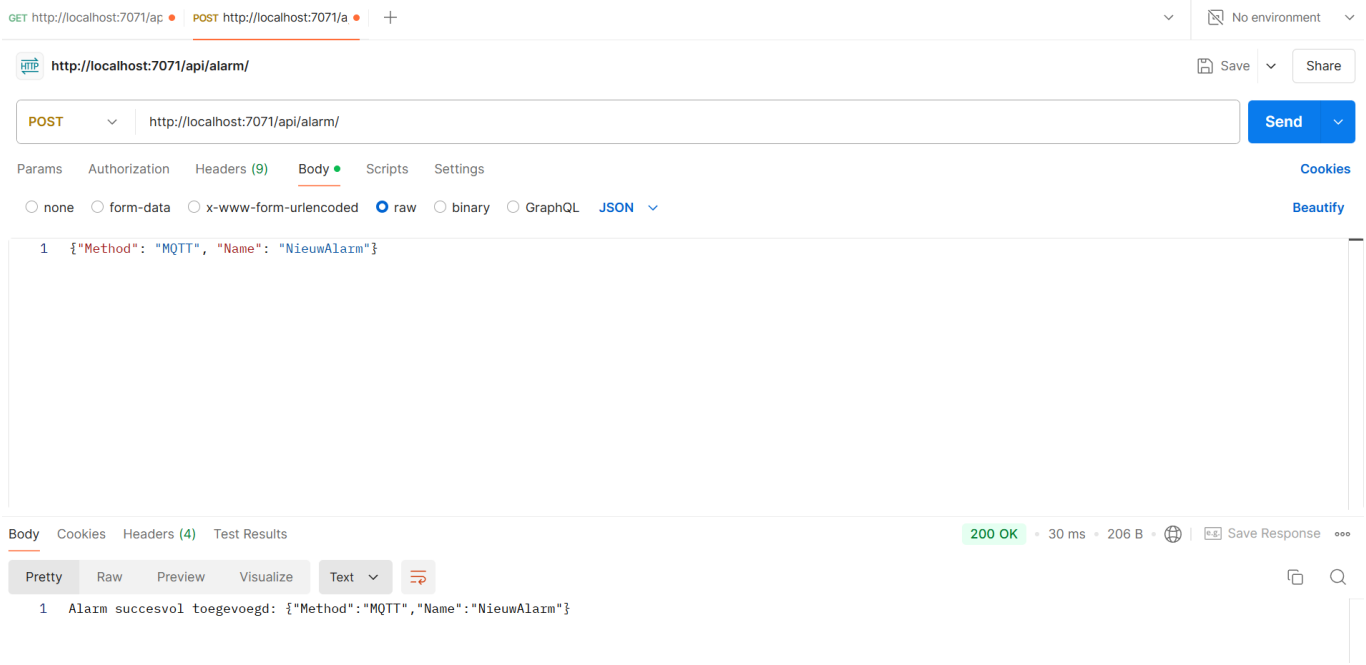
10. Omdat je nu een universele aansturing hebt voor verschillende soorten systemen, in dit geval Alarm systemen. Nu is de client niet meer afhankelijk van de implementatie van de verschillende alarm systemen (MQTT aangestuurd en Azure aangestuurd).
11.

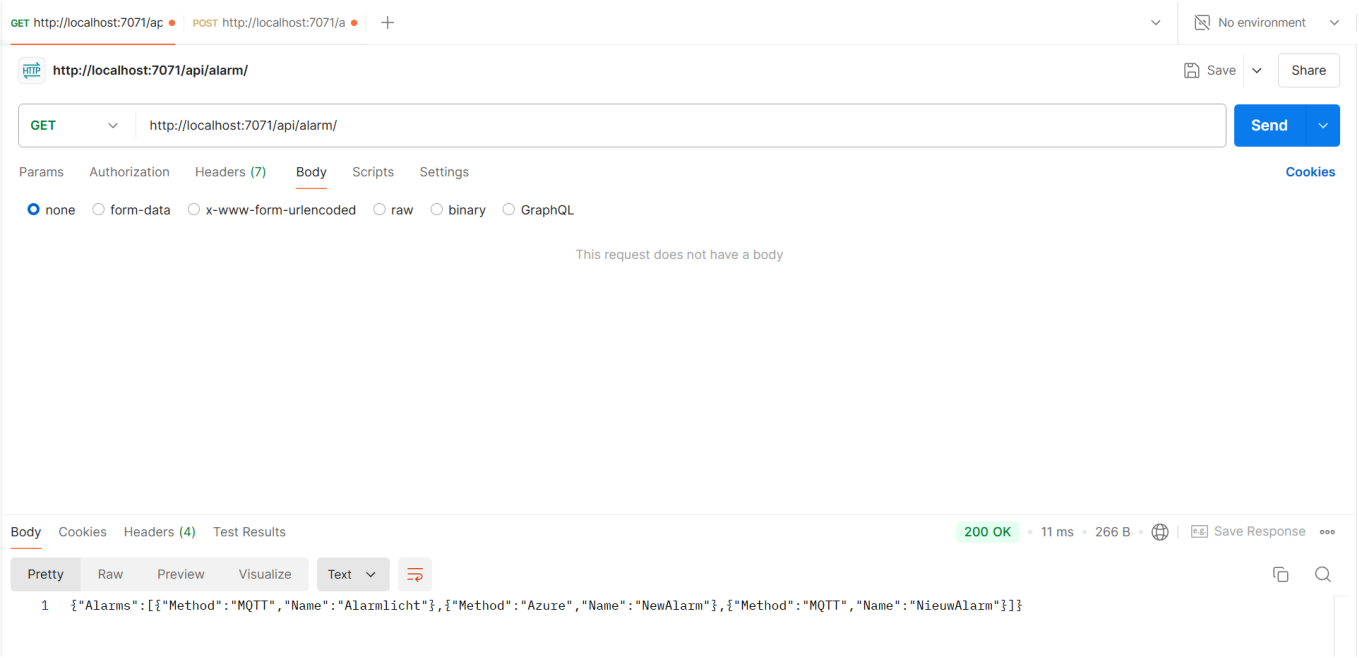
```
app.http('AlarmGET', {
    methods: ['GET'],
    authLevel: 'anonymous',
    route: 'alarm/{id:int?}',
    handler: async (request, context) => {
        context.log(`Http function processed request for url "${request.url}"`);

        var id = request.params.id - 1;
        var al = alarms.Alarms[id];
        if (isNaN(id)) {
            context.log(`Verzoek tot opvragen gehele alarmlijst.`);
            var textlist = JSON.stringify(alarms);
        }
        else if (id > alarms.Alarms.length || id < 0) {
            context.log(`Verzoek tot opvragen van niet bestaand alarm!`)
```

```
            return {
                status: 404,
                body: "404! Dit alarm bestaat niet!"
            }
        }
        else {
            context.log(`Verzoek tot opvragen van alarm ${id}.`)
            var textlist = JSON.stringify(al);
        }
        return {
            status: 200,
            body: `${textlist}` };
    }
})

app.http('AlarmToevoegen', {
    methods: ['Post'],
    authLevel: 'anonymous',
    route: 'alarm',
    handler: async (request, context) => {
        context.log(`Http function processed request for url "${request.url}"`);
        try {
            var bod = await request.text();
            var nieuwalarm = JSON.parse(bod);
            if (!nieuwalarm.hasOwnProperty("Method")) {
                context.log("Poging tot toevoeging alarm zonder methode van
communicatie.");
                return {
                    status: 404,
                    body: "Een alarm kan niet toegevoegd worden zonder methode van
communicatie."
                }
            }
            else if (!nieuwalarm.hasOwnProperty("Name")) {
                context.log("Poging tot toevoeging alarm zonder naam.");
                return {
                    status: 404,
                    body: "Een alarm kan niet toegevoegd worden zonder naam."
                }
            }
            else {
                alarms.Alarms.push(nieuwalarm);
                context.log(`Alarm toegevoegd: ${JSON.stringify(nieuwalarm)}`);
                return{
                    status: 200,
                    body: `Alarm succesvol toegevoegd:
${JSON.stringify(nieuwalarm)}`
                }
            }
        }
        catch (e) {
            context.log(`Fout bij het verwerken van het toevoegen van een alarm`,
e);
            return {
```

```
                    status: 500,
                    body: 'Interne serverfout bij toevoegen alarm.'
                }
            }
        }
    });
```



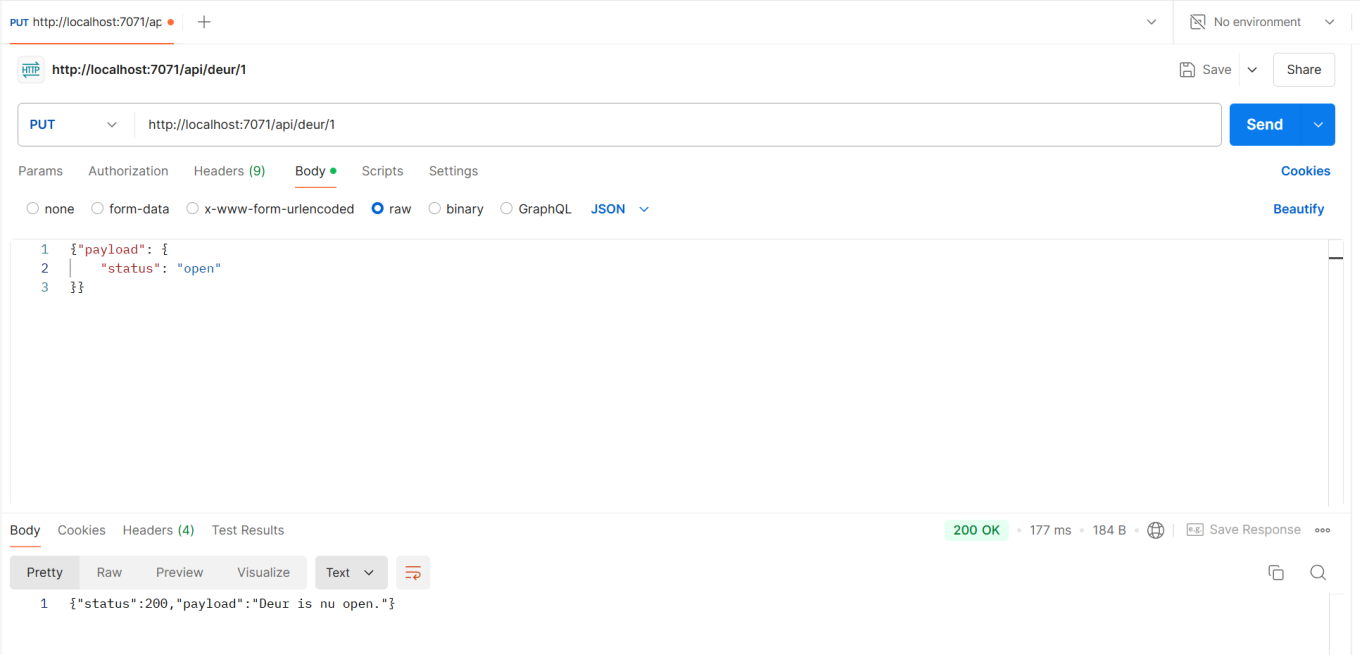


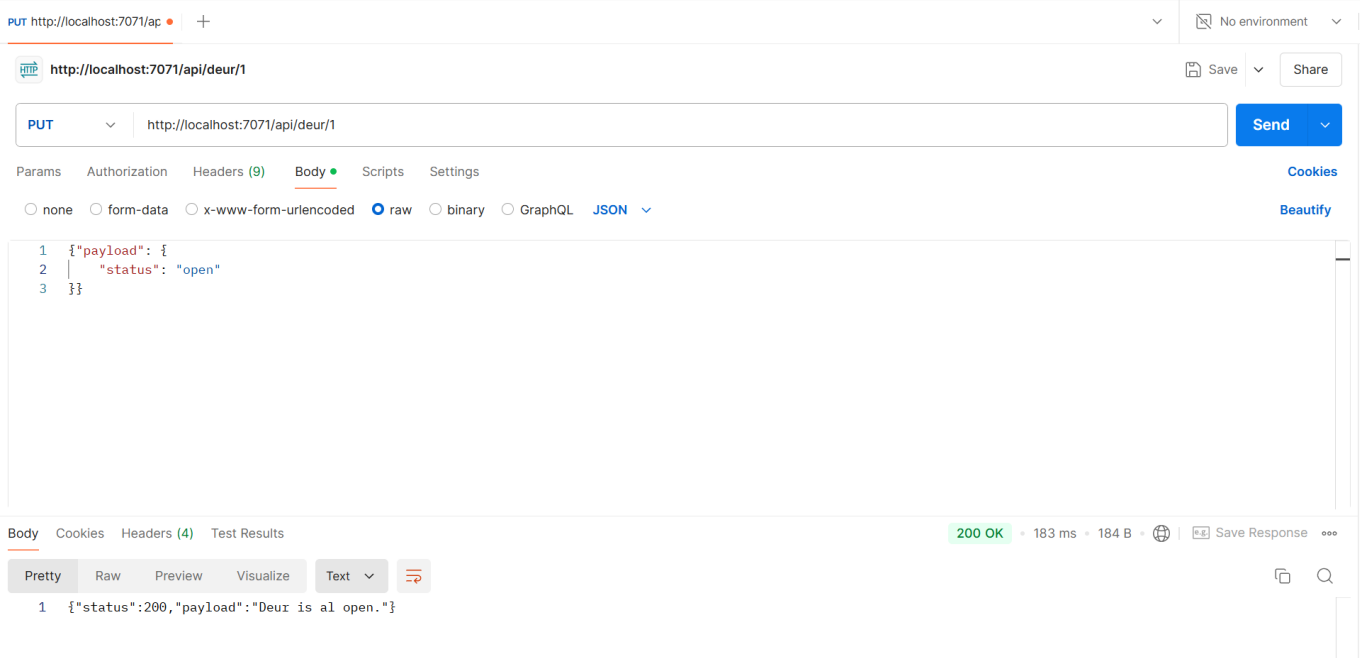


12.

```
app.http('DeurAansturing', {
    methods: ['PUT'],
    authLevel: 'anonymous',
    route: 'deur/{id:int?}',
    handler: async (request, context) => {
        var Client = require('azure-iothub').Client;
        var connectionString = process.env.IOTHUB_CONNECTION_STRING;
        var client = Client.fromConnectionString(connectionString);
        context.log(`Http function processed request for url "${request.url}"`);
        try {
            var id = request.params.id - 1;
            if (id < deuren.Deuren.length) {
                var bod = await request.json();
                var text = JSON.stringify(bod);
                text = JSON.parse(text);
                var methodParams = {
                    methodName: "changeStatus",
                    payload: text.payload,
                    responseTimeoutInSeconds: 15
                }
                console.log(deuren.Deuren[id].Name);
                var result = await
client.invokeDeviceMethod(deuren.Deuren[id].Name, methodParams);
                console.log(result.result);
                return {
                    status: 200,
                    body: JSON.stringify(result.result)
                }
            }
            else {
                return {
                    status: 404,
```

```
                    body: `Deur met ID ${id+1} bestaat niet.`
                }
            }
        }
        catch (e) {
            context.log(`Fout bij het aansturen van de deur`, e);
            return {
                status: 500,
                body: 'Interne serverfout bij aansturen van deur.'
            }
        }
    }
});
```





PUT http://localhost:7071/ap

No environment

http://localhost:7071/api/deur/1

Save Share

PUT http://localhost:7071/api/deur/1 Send

Params Authorization Headers (9) Body Scripts Settings Cookies

none form-data x-www-form-urlencoded raw binary GraphQL JSON Beautify

```
{"payload": {
    "status": "dicht"
}}
```

Body Cookies Headers (4) Test Results 200 OK 135 ms 185 B Save Response

Pretty Raw Preview Visualize Text

```
{"status":200,"payload":"Deur is nu dicht."}
```

PUT http://localhost:7071/ap

No environment

http://localhost:7071/api/deur/1

Save Share

PUT http://localhost:7071/api/deur/1 Send

Params Authorization Headers (9) Body Scripts Settings Cookies

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```
{"payload": {
    "status": "dicht"
}}
```

Body Cookies Headers (4) Test Results 200 OK 205 ms 185 B Save Response

Pretty Raw Preview Visualize Text

```
{"status":200,"payload":"Deur is al dicht."}
```