

ZABBIX 2022 Conference

BRAZIL

02 a 05 de junho de 2022 | São Paulo - SP

Monitorando Dispositivos IoT com Zabbix, ESP8266 e sensores diversos

Apresentação

Quem Sou?

Marcilio Ramos

Tecnólogo em Telecomunicações

Administrador de Sistemas

Dev. de Hardware e Software

- **Analista de Monitoramento na Hostdime Brasil**
- **Empreendedor na MR Telecom.**
- **Entusiasta Linux desde 2006**



Sobre que falaremos?

- Como surgiu a ideia
- Como foi feito
- Casos de uso



Como surgiu o projeto?



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Como foi feito?

- Havia pouca documentação
- Poucos recursos \$\$

Solução

Hardware OpenSource:
Arduino, ESP8266

Software OpenSource:
Zabbix e Grafana!



ESP8266

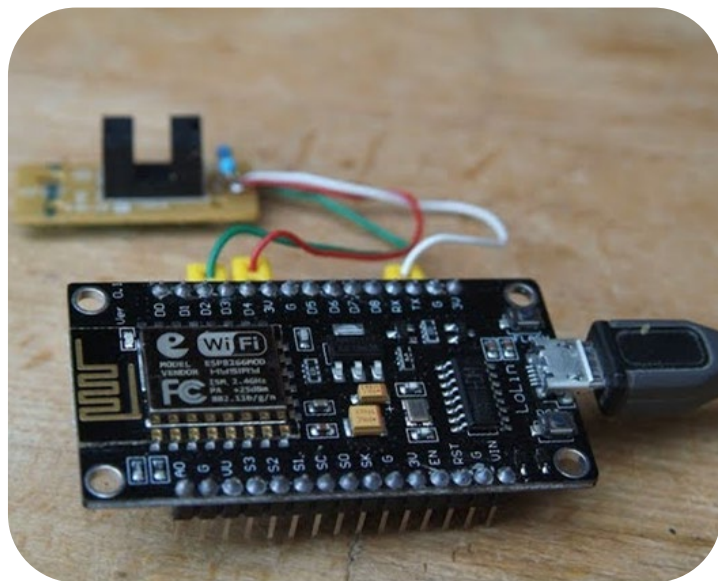
- Baixo custo
- Compatibilidade com framework Arduino
- MQTT
- Integração com Broker Mosquitto

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- Envio ao Zabbix via “Zabbix Sender”
- Possibilidade de inserir novos sensores
(energia elétrica, monóxido de carbono, detecção de cores, movimentos, ultrassom...)



Diagrama de funcionamento



Internet



Protótipo do sensor



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Câmaras frias

Postos de Saúde



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Monitoramento de vacinas contra Covid-19



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Oxímetro e batimentos cardíacos





79% 21:20



10.10.100.11:3000/d/lwPZheCWz/leitos-hospital?refresh=2s&orgId=1



Leitos Hospital

Last 5 minutes Refresh every 2s



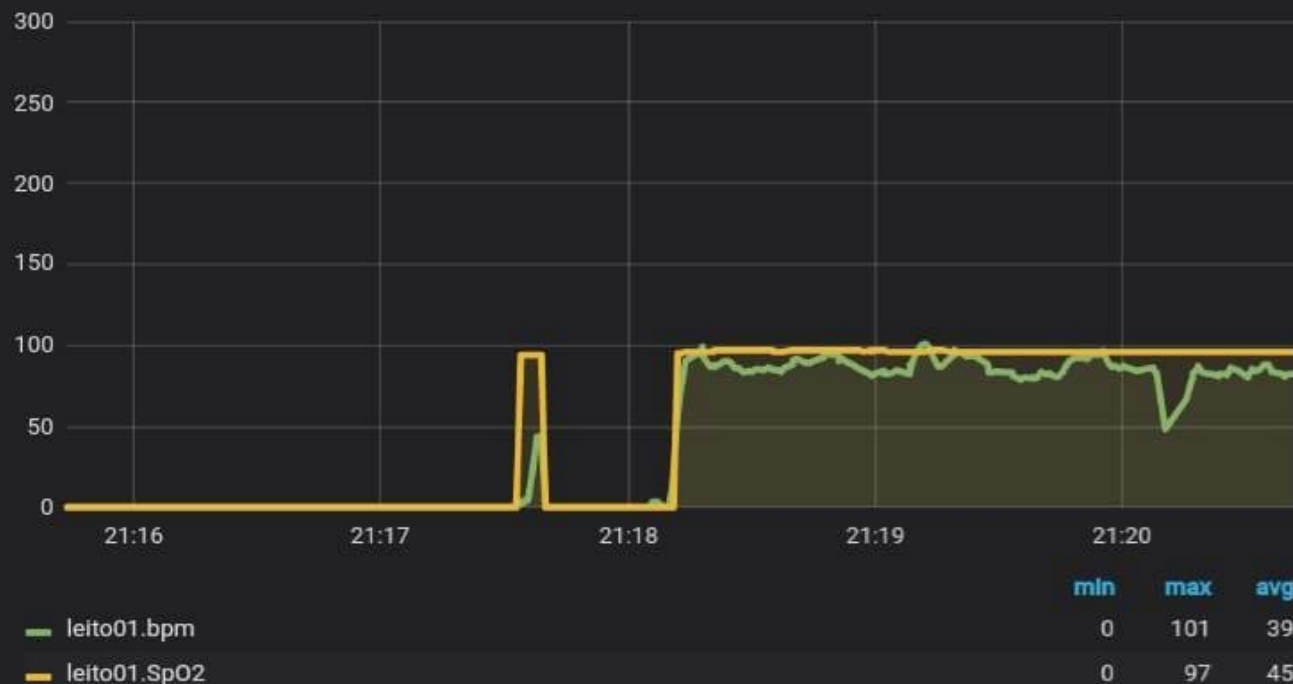
Leito 01 BPM



Leito 01 SpO2



Leito 01 BPM - SpO2

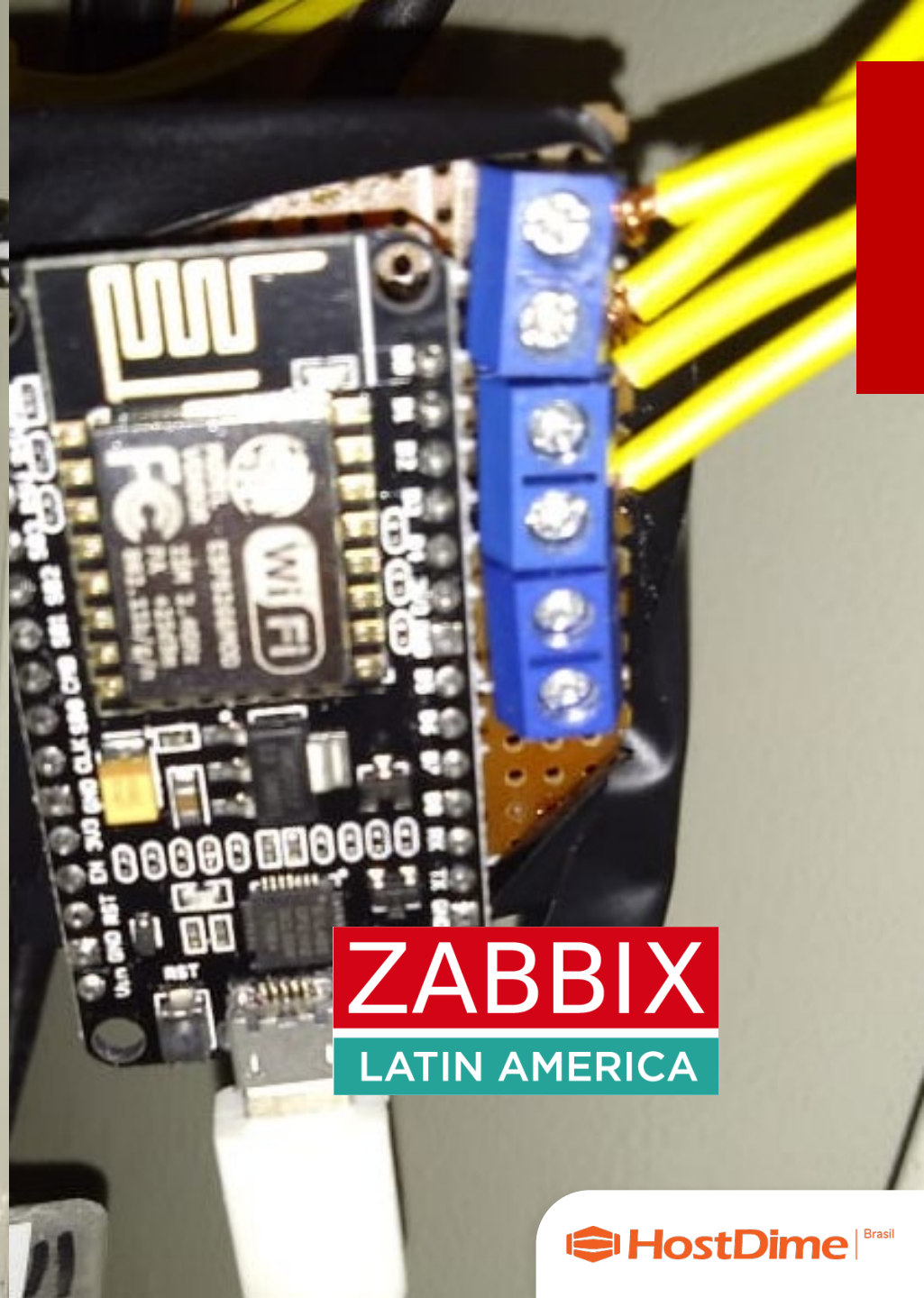


Oxímetro e batimentos cardíacos

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Boias anti-inundação do subsolo do Data Center



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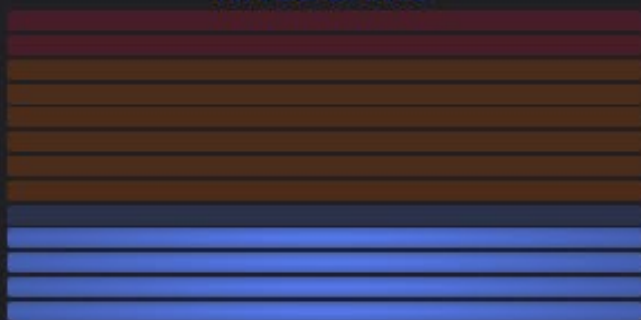


Protótipo monitoramento de vagas de estacionamento



Boias Deep Water

NIVEL BAIXO



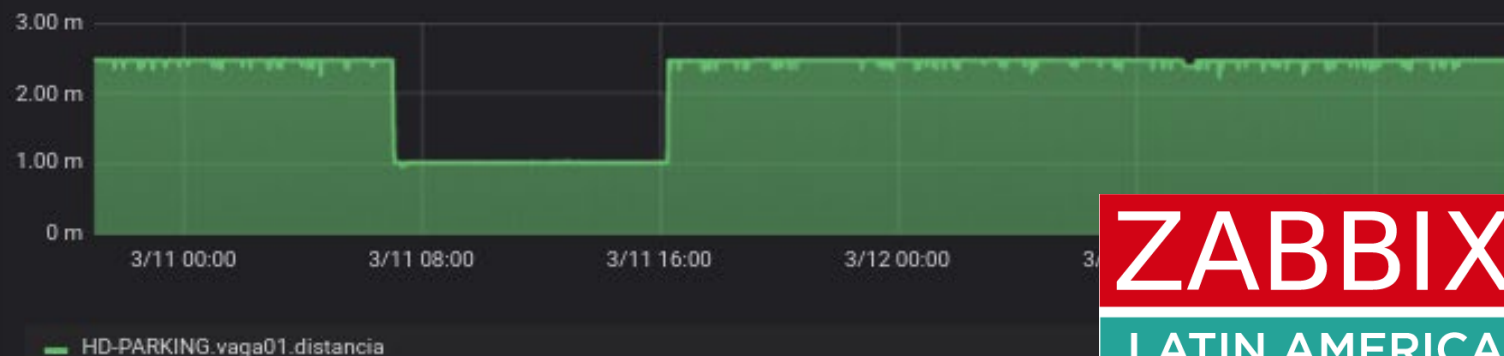
Boias Deep Water



ocupacao

VAGA 01 -
DESOCUPADA

distancia



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MONITORAMENTO IOGURTE ISIS

- MONITORAMENTO DE CAIXA D'ÁGUA E QUALIDADE DA ÁGUA



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Sonoff -TH 10

(Temperatura e Umidade)



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Sonoff -TH 10

(Temperatura e Umidade)

Sonoff TH Module

Sonoff

SI7021 Temperature 30.8°C
SI7021 Humidity 76.3%

ON

Toggle

Configuration

Information

Firmware Upgrade

Console

Restart

Sonoff TH Module

Sonoff

Module parameters

Module type (Sonoff Basic)

Sonoff TH (04)

GPIO1 Serial Out

None (00)

GPIO3 Serial In

None (00)

GPIO4

None (00)

GPIO14 Sensor

SI7021 (03)

Save

Configuration

MQTT parameters

Host ()

IP DO BROKER MQTT

Port (1883)

1883

Client (DVES_D7C383)

DVES_%06X

User (DVES_USER)

DVES_zabbix

Password

.....

Topic = %topic% (sonoff)

Zabbix_Conference/TH10

Full Topic (%prefix%/ %topic%/)

Zabbix_Conference/TH10

Save



```
Arquivo  Editar  Sketch  Ferramentas  Ajuda
[Icons]
deepwater2 $
/*=====
MR TELECOM - Eng. Marcilio Ramos - DEEP WATER - Monitoramento de Boias anti-inundação
=====*/
#include <ESP8266WebServer.h>
#include <PubSubClient.h>

char mqtt_server[30];
int mqtt_port=1883;
char id_monitor[20]="host_zabbix";
#define mqtt_server "IP_DO_BROKER"
#define mqtt_user "your_username"
#define mqtt_password "your_password"
WiFiClient espClient;
PubSubClient client(espClient);
const char* ssid = "SSID_DA_WIFI";
const char* password = "SENHA_da_WIFI";
int porta1 = D1;
int porta2 = D2;
int porta1status = 50;
int porta2status = 50;
```

```
//ENVIO DO DADO VIA MQTT
String porta2chave = "/enviar/" + id_monitor2 + "/" + id_monitor2 + ".porta2status/";
client.publish(String(porta2chave).c_str(), String(porta2status).c_str(), true);
Serial.println("=====");
Serial.println("Pub:" + porta2chave + porta2status);
Serial.println("=====");

}
delay (500);
```

Programando ESP8266 com framework Arduino



Script PAHO, em Python



```
import paho.mqtt.client as mqtt

# The callback for when the client receives a CONNACK response from the server.
def on_connect(client, userdata, flags, rc):
    print("Connected with result code "+str(rc))
    # Subscribing in on_connect() means that if we lose the connection and
    # reconnect then subscriptions will be renewed.
    client.subscribe("$SYS/#")

# The callback for when a PUBLISH message is received from the server.
def on_message(client, userdata, msg):
    print(msg.topic+" "+str(msg.payload))

client = mqtt.Client()
client.on_connect = on_connect
client.on_message = on_message

client.connect("mqtt.eclipseprojects.io", 1883, 60)

# Blocking call that processes network traffic, dispatches callbacks and
# handles reconnecting.
# Other loop*() functions are available that give a threaded interface and a
# manual interface.
client.loop_forever()
```

fonte:
eclipse.org/paho/



Dados Inserido via Script

"Tipo Trapper"



☐	Nome ▲	Triggers	Chave	Intervalo	Histórico	Estatísticas	Tipo	Status
☐	...	last.POWER	last.POWER	5s	1h	0	Calculado	Ativo
☐	...	TH10: Sonoff_Humidity	Triggers 1	Sonoff_Humidity	90d	365d	Item dependente	Ativo
☐	...	TH10: Sonoff_Temp	Triggers 1	Sonoff_Temp	90d	365d	Item dependente	Ativo
☐	...	TH10	TH10	TH10	1h		Zabbix trapper	Ativo
☐	...	TH10_POWER	POWER	POWER	90d	365d	Zabbix trapper	Ativo
Exibind								

Dados Inserido via Script "Tipo Trapper"



Grupos de hosts

informe aqui o argumento para pesquisa

Selecionar

Hosts

Zabbix_Conference X

informe aqui o argumento para pesquisa

Selecionar

Nome

Etiquetas

E/OU

Ou

etiqueta

Contêm

valor

Remover

Adicionar

Exibir etiquetas

Nenhum

1

2

3

Nome da etiqueta

Cheio

Encurtado

Nenhum

Prioridade de exibição de etiquetas

lista separada por pontos

Mostrar detalhes

Save as

Aplicar

Limpar

Subfiltro afeta somente a área com filtro

☐	Host	Nome ▲	Última checagem	Último valor	Modificar	Etiquetas	Info...
☐	Zabbix_Conference	last.POWER	5s	1			Gráfico
☐	Zabbix_Conference	Sonoff_Humidity	2m 25s	75.8 H	-0.1 H		Gráfico
☐	Zabbix_Conference	Sonoff_Temp	2m 25s	31 C			Gráfico
☒	Zabbix_Conference	TH10	2m 25s	{ "Time": "2022-05-21..."			Histórico
☐	Zabbix_Conference	TH10_POWER	2h 42m 33s	1			

{ "Time": "2022-05-21T19:51:43", "SI7021": { "Temperature": 31.0, "Humidity": 75.8, "TempUnit": "C" } }

Exibindo 5 de 5 encontrados

Dados coletados via Agent2

“Tipo Texto Json”



Sonoff TH Module

Sonoff

```
19:26:43 MQT: Zabbix_Conference/TH10/STATE = {"Time":"2022-05-21T19:26:43","Uptime":"0T02:19:14","SleepMode":"Dynamic","Sleep":50,"LoadAvg":19,"POWER":"ON","Wif
19:31:43 MQT: Zabbix_Conference/TH10/STATE = {"Time":"2022-05-21T19:31:43","Uptime":"0T02:20:14","SleepMode":"Dynamic","Sleep":50,"LoadAvg":19,"POWER":"ON","Wif
19:31:43 MQT: Zabbix_Conference/TH10/SENSOR = {"Time":"2022-05-21T19:31:43","SI7021":{"Temperature":31.0,"Humidity":76.1},"TempUnit":"C"}
19:36:43 MQT: Zabbix_Conference/TH10/STATE = {"Time":"2022-05-21T19:36:43","Uptime":"0T02:25:14","SleepMode":"Dynamic","Sleep":50,"LoadAvg":19,"POWER":"ON","Wif
19:36:43 MQT: Zabbix_Conference/TH10/SENSOR = {"Time":"2022-05-21T19:36:43","SI7021":{"Temperature":31.0,"Humidity":75.9},"TempUnit":"C"}
19:41:43 MQT: Zabbix_Conference/TH10/STATE = {"Time":"2022-05-21T19:41:43","Uptime":"0T02:30:14","SleepMode":"Dynamic","Sleep":50,"LoadAvg":19,"POWER":"ON","Wif
19:41:43 MQT: Zabbix_Conference/TH10/SENSOR = {"Time":"2022-05-21T19:41:43","SI7021":{"Temperature":31.0,"Humidity":76.0},"TempUnit":"C"}
19:46:43 MQT: Zabbix_Conference/TH10/STATE = {"Time":"2022-05-21T19:46:43","Uptime":"0T02:35:14","SleepMode":"Dynamic","Sleep":50,"LoadAvg":19,"POWER":"ON","Wif
19:46:43 MQT: Zabbix_Conference/TH10/SENSOR = {"Time":"2022-05-21T19:46:43","SI7021":{"Temperature":31.0,"Humidity":75.9},"TempUnit":"C"}
19:51:43 MQT: Zabbix_Conference/TH10/STATE = {"Time":"2022-05-21T19:51:43","Uptime":"0T02:40:14","SleepMode":"Dynamic","Sleep":50,"LoadAvg":19,"POWER":"ON","Wif
19:51:43 MQT: Zabbix_Conference/TH10/SENSOR = {"Time":"2022-05-21T19:51:43","SI7021":{"Temperature":31.0,"Humidity":75.8},"TempUnit":"C"}
19:56:43 MQT: Zabbix_Conference/TH10/STATE = {"Time":"2022-05-21T19:56:43","Uptime":"0T02:45:14","SleepMode":"Dynamic","Sleep":50,"LoadAvg":19,"POWER":"ON","Wif
19:56:43 MQT: Zabbix_Conference/TH10/SENSOR = {"Time":"2022-05-21T19:56:43","SI7021":{"Temperature":30.9,"Humidity":75.5},"TempUnit":"C"}
20:01:43 MQT: Zabbix_Conference/TH10/STATE = {"Time":"2022-05-21T20:01:43","Uptime":"0T02:50:14","SleepMode":"Dynamic","Sleep":50,"LoadAvg":19,"POWER":"ON","Wif
20:01:43 MQT: Zabbix_Conference/TH10/SENSOR = {"Time":"2022-05-21T20:01:43","SI7021":{"Temperature":30.9,"Humidity":75.9},"TempUnit":"C"}
20:02:00 MQT: Zabbix_Conference/TH10/UPTIME = {"Time":"2022-05-21T20:02:00","Uptime":"0T02:50:31"}
20:06:43 MQT: Zabbix_Conference/TH10/STATE = {"Time":"2022-05-21T20:06:43","Uptime":"0T02:55:14","SleepMode":"Dynamic","Sleep":50,"LoadAvg":19,"POWER":"ON","Wif
20:06:43 MQT: Zabbix_Conference/TH10/SENSOR = {"Time":"2022-05-21T20:06:43","SI7021":{"Temperature":30.9,"Humidity":76.1},"TempUnit":"C"}
20:11:43 MQT: Zabbix_Conference/TH10/STATE = {"Time":"2022-05-21T20:11:43","Uptime":"0T03:00:14","SleepMode":"Dynamic","Sleep":50,"LoadAvg":19,"POWER":"ON","Wif
20:11:43 MQT: Zabbix_Conference/TH10/SENSOR = {"Time":"2022-05-21T20:11:43","SI7021":{"Temperature":30.8,"Humidity":76.2},"TempUnit":"C"}
```

Enter command

Main Menu

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Dados coletados via Agent2

“Tipo Texto Json”



Item Etiquetas Pré-processamento

* Nome

Tipo

* Chave

Tipo de informação

* Período de retenção do histórico

* Período de retenção das estatísticas

Preencha o campo do inventário do host

Descrição

Ativo ☒

Dados recentes



Dados coletados via Agent2

“Tipo Texto Json”

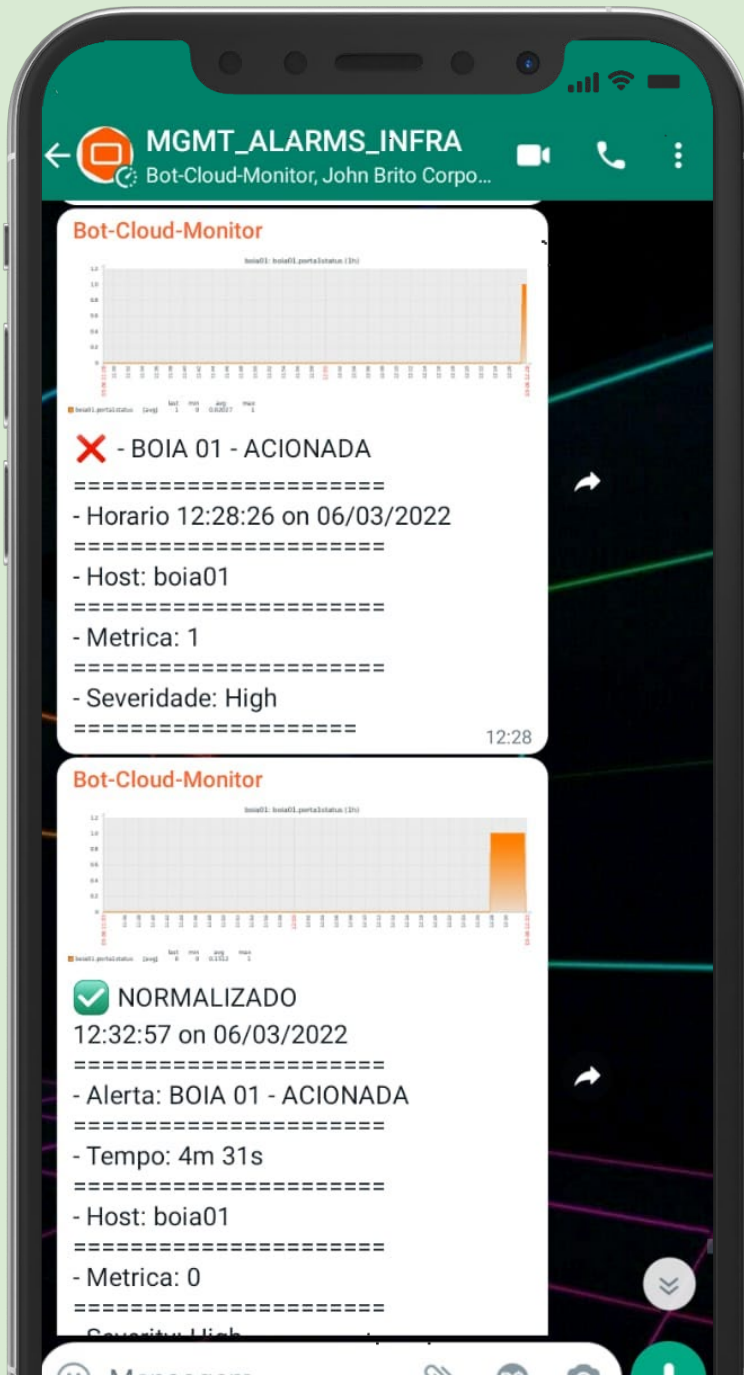


Hora	Valor
25-03-2022 22:30:52	{"Time": "2022-03-26T02:30:51", "SI7021": {"Temperature": 29.5, "Humidity": 80.6}, "TempUnit": "C"}
25-03-2022 22:30:52	{"Time": "2022-03-26T02:30:51", "Uptime": "2T13:25:35", "SleepMode": "Dynamic", "Sleep": 50, "LoadAvg": 19, "POWER": "ON", "Wifi": {"AP": 1, "SSId": "Sinal_Fraco", "BSSId": "58:D5:6E:8D:AD:30", "Channel": 3, "RSSI": 100}}
25-03-2022 22:25:52	{"Time": "2022-03-26T02:25:51", "SI7021": {"Temperature": 29.6, "Humidity": 80.1}, "TempUnit": "C"}
25-03-2022 22:25:52	{"Time": "2022-03-26T02:25:51", "Uptime": "2T13:20:35", "SleepMode": "Dynamic", "Sleep": 50, "LoadAvg": 19, "POWER": "ON", "Wifi": {"AP": 1, "SSId": "Sinal_Fraco", "BSSId": "58:D5:6E:8D:AD:30", "Channel": 3, "RSSI": 100}}
25-03-2022 22:20:52	{"Time": "2022-03-26T02:20:51", "SI7021": {"Temperature": 30.0, "Humidity": 79.5}, "TempUnit": "C"}
25-03-2022 22:20:52	{"Time": "2022-03-26T02:20:51", "Uptime": "2T13:15:35", "SleepMode": "Dynamic", "Sleep": 50, "LoadAvg": 19, "POWER": "ON", "Wifi": {"AP": 1, "SSId": "Sinal_Fraco", "BSSId": "58:D5:6E:8D:AD:30", "Channel": 3, "RSSI": 100}}
25-03-2022 22:15:52	{"Time": "2022-03-26T02:15:51", "SI7021": {"Temperature": 30.4, "Humidity": 79.1}, "TempUnit": "C"}
25-03-2022 22:15:52	{"Time": "2022-03-26T02:15:51", "Uptime": "2T13:10:35", "SleepMode": "Dynamic", "Sleep": 50, "LoadAvg": 19, "POWER": "ON", "Wifi": {"AP": 1, "SSId": "Sinal_Fraco", "BSSId": "58:D5:6E:8D:AD:30", "Channel": 3, "RSSI": 100}}
25-03-2022 22:10:52	{"Time": "2022-03-26T02:10:51", "SI7021": {"Temperature": 30.3, "Humidity": 79.2}, "TempUnit": "C"}

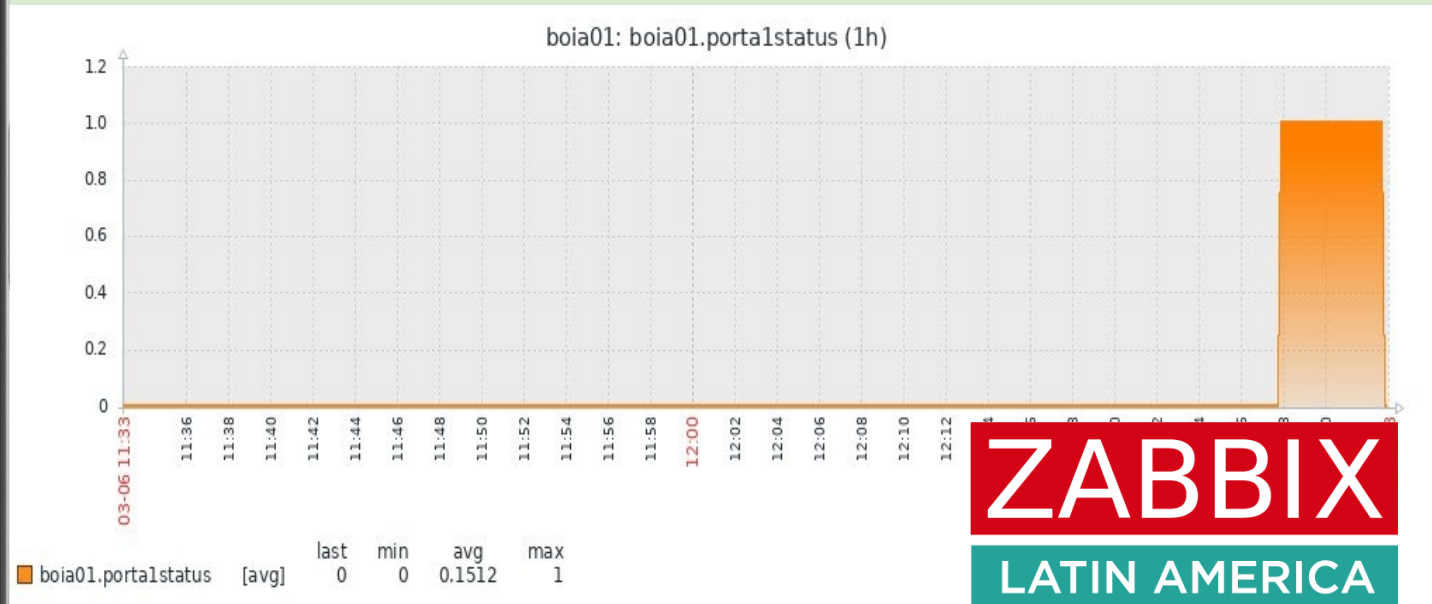


Integração com Telegram





Integração com Whatsapp



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OBRIGADO

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