HOLOGRAM

NICO MAAS

PI AND MORE 10 1/2
WHO AM I?

• Nico Maas
• Master of Science
• IT Systemelektroniker
• mail@nico-maas.de
• www.nico-maas.de
• @nmaas87
OVERVIEW

- Introduction
- Hologram
- Example project
INTRODUCTION

IoT Devices - how to connect to the net?
OPTIONS

- Ethernet
- WiFi
- GSM/UMTS
- LoRa
- Sigfox
PROBLEMS?

- Ethernet: (mostly) not available
- WiFi: (mostly) not available & high energy consumption
- LoRa, Sigfox: slow & not very widely available
ADDITIONAL PROBLEMS?

- Sigfox: Uplink only 3 times a day
- LoRa, Sigfox: Security?
- Ethernet & WiFi: What about handling the data easily?
WHAT ABOUT GSM/UMTS?

- Very widely available in the world
- High bandwidth (compared to LoRa / Sigfox)
DOWNSIDES?

- High energy consumption
- Too many network providers (global scale)
- Sometimes roaming restrictions
- Data handling: same problem as Ethernet & WiFi
- Security
ENTER HOLOGRAM

- DOES NOT solve energy issue - sorry :((!
- DOES solve the provider issue
- DOES solve the data handling / routing issue
- DOES solve the security issue
The Connectivity Platform for the Internet of Things

Connect devices, capture data, and manage your fleet with our complete IoT platform.

Get Started

Have a large deployment? Contact sales →
WHAT IS HOLOGRAM?

- NOT a worldwide acting provider, BUT a "resaler"
RESALER?

- 550+ carriers
- 180+ countries
- 2G/3G/4G/LTE/CAT-M
# PRICING OPTIONS

- **Pay as you go / Prepaid plans**

<table>
<thead>
<tr>
<th></th>
<th><strong>ZONE 1</strong></th>
<th><strong>ZONE 2 (INCLUDES ZONE 1 COVERAGE)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Platform Fee</strong></td>
<td>$0.40</td>
<td>$0.40</td>
</tr>
<tr>
<td><strong>Cost (billed per kb)</strong></td>
<td>$0.60 / MB</td>
<td>$0.85 / MB</td>
</tr>
</tbody>
</table>

- **SMS**

<table>
<thead>
<tr>
<th></th>
<th><strong>ZONE 1</strong></th>
<th><strong>ZONE 2 (INCLUDES ZONE 1 COVERAGE)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Inbound SMS</strong> (sent to device)</td>
<td>FREE</td>
<td>FREE</td>
</tr>
<tr>
<td><strong>Outbound SMS</strong> (sent from device)</td>
<td>$0.19 / Message</td>
<td>$0.30 / Message</td>
</tr>
</tbody>
</table>
PRICING OPTIONS

- Monthly plans
- High bandwidth plans [US-only]
- Free Developer Tier

Developer

$0

1MB / MONTH INCLUDED
ADDITIONAL DATA $0.60 / MB (BILLED BY KB)

Try it FREE

*Just cover shipping
WHAT IS HOLOGRAM?

- Data aggregator / router
- Similar to a Message Queue
ROUTING WITH TOPICS

Create new route

ROUTE NICKNAME

STATUS

Select topics

Search by topic name

SELECT TOPICS FROM RECENT MESSAGES

PAM  _JSONSTRING_  Unnamed Device  _SOCKETAPI_
MODIFY INCOMING DATA

Select an operation

- **Modifier (BETA)**
  Use variables to translate your messages into a different format.

- **Heartbeat (BETA)**
  Monitor for devices to go down

Insert operation (optional)
OUTPUT: IFTTT, S3, SLACK,...
WHAT IS HOLOGRAM?

- Security provider
- Uses the SIM Card as HW Security Device
WHAT YOU CAN DO WITH THAT?

1. Establish Trust
   Initial key storage at time of secure SIM manufacturing establishes trust without loading and coordinating certificates.

2. Embed Physical Hardware Security in IoT Devices
   Hologram secure IoT SIMs provide a hardware-based ‘something you must have’ security element for multi-factor authentication (MFA).

3. Build developer tools to enable unique one-time-passwords for machines (OTP-M)
   Enable MFA in only a few lines of code with Hologram developer tools.

4. Develop nonce and challenge-response scheme
   All Hologram secure IoT SIMs have an encoded nonce and challenge response scheme to generate OTP-Ms.

5. Validate Device Authentication/Identity
   Hologram validates OTP-Ms for message authentication and device identification.

6. Automatic continuous key rotation
   Hologram secure IoT SIMs rotate new keys to prevent forward and backward secrecy vulnerabilities.

7. Reestablish Trust Remotely
   When an incident occurs, Hologram remotely updates new keys for authentication.
INTEGRATION?

• (Using CLI and Nova Hardware)
OTHER SECURITY MEASURES?

- Secure Tunnels with Spacebridge
- Uploading own SSH Keys
- Authentication using Device API
- ...

24/02/2018
BONUS: EASE OF USE

- Hardware
- Software
- Services
- Tutorials
NOVA & DASH
SOFTWARE?

- CLI (use with i.e. Nova)
- Python SDK
- pppd with nc works too ;}
SERVICES?

- REST API
- TCP "API"
- Routing
- Spacebridge
- MFA
EXAMPLE PROJECT

GlassAware

(for a Hackster contest)
HARDWARE
WHAT DOES IT DO?

- Uses promiscuous mode with WiFi of RPi Zero W
- Scans for WiFi Clients in the area with certain MAC
- Sends warning to Hologram if found
- Hologram routes warning to IFTTT
- IFTTT sends a Tweet
- Alarm on Twitter
- Yes, can be solved easily++, but fun-- :'

24/02/2018
if 'f8:8f:ca:24' in p.addr2:
    print "WARNING! GOOGLE GLASS DETECTED!"
    os.system("sudo hologram send -t twitter dangerousDeviceN"
ROUTE?

Configure route

ROUTE NICKNAME
Twitter

STATUS
on

Insert operation (optional)

IFTTT Maker Webhook

Configure action

WEBHOOK KEY
Key portion of the IFTTT webhook URL

EVENT
Event portion of the IFTTT webhook URL

glassWarning

Data to send to IFTTT. Supports our advanced webhook variables. Leave as <<decoats>> to pass through all data

<<decoats>>

Update route  Cancel  Delete
TWITTER?

GlassAware

@GlassAware

hackster.io/nico-maas/glas

Beigetreten Januar 2018

Tweet an GlassAware

Tweets

1

Tweets

Tweets & Antworten

GlassAware @GlassAware · 4. Jan.
A problematic device entered the protected area.

Original (Englisch) übersetzen

Tweet tauchen
SOURCE CODE

https://github.com/nmaas87/GlassAware
CONCLUSION

• For non-battery constrained projects interesting
• Cool take on security (SIM Card)
• ... but not yet proven!
• For projects with high data volume too expensive
• For "switch" projects very cool (SMS receive = free!)
• Use with an old GPRS/UMTS modem & pppd :)

24/02/2018
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QUESTIONS?
Thank you for your attention :)
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