
# When Serverless Met Security…
# Serverless Security & Functions-as-a-Service

Niels Tanis - CA Veracode

# About me

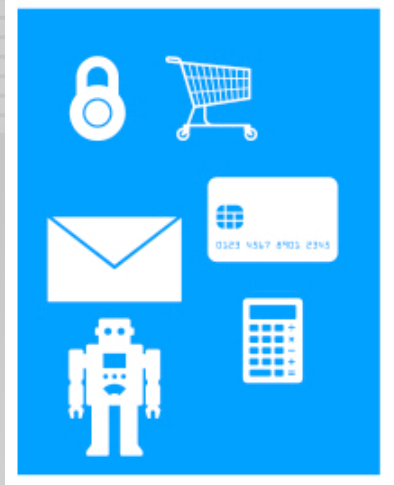
- Niels Tanis
  - Security Researcher
  - Background in:
    - .NET development
    - Pen tester
    - Security Consultancy
    - CSSLP


SERVERLESS ECONOMIC IMPACT
UNCTION AS
SERVICE IS
EVIL
Daniel Stori {turnoff.us}

# Agenda

- Serverless Security - Functions-as-a-Service (FaaS)
  - Overview
  - Benefits
  - Downsides
- Conclusion
- Q&A

# Monolith - MicroServices - FaaS



https://dzone.com/articles/introduction-to-serverless-computing

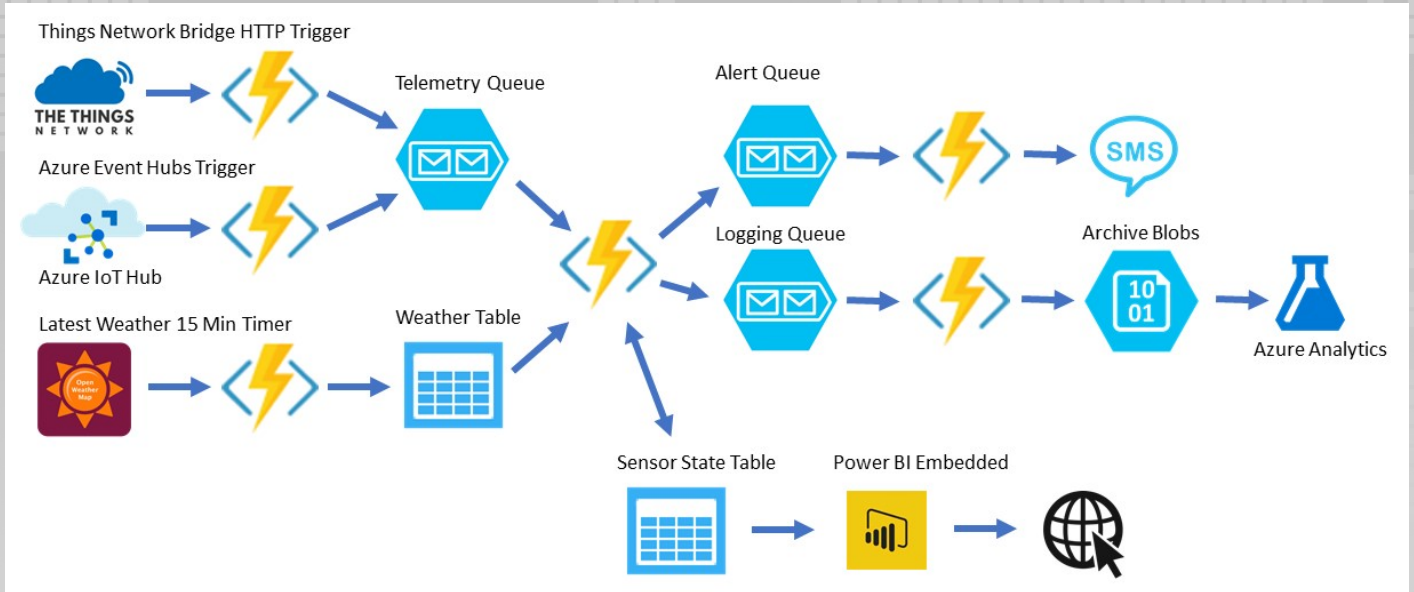
# What is Serverless?

- Full abstraction of servers
- Instant, scalable and event-driven
- Pay-per-use
- ‘Cloud is an operating system Serverless is its native code!’ (Erik Peterson, QCON)

# Functions-as-a-Service (FaaS)

- FaaS != Serverless
- FaaS is key building block
- Stateless & Ephemeral
- Single Responsibility
- Scalable & Event driven

# Example Waste Management System




https://github.com/gloveboxes/Waste-Management-Azure-Function-Based

# Security benefits of Serverless

- Servers are maintained by vendor
- No server to be compromised?
  - ‘Gone in 60 Milliseconds’ - Rich Jones
- Denial of Service is mitigated?

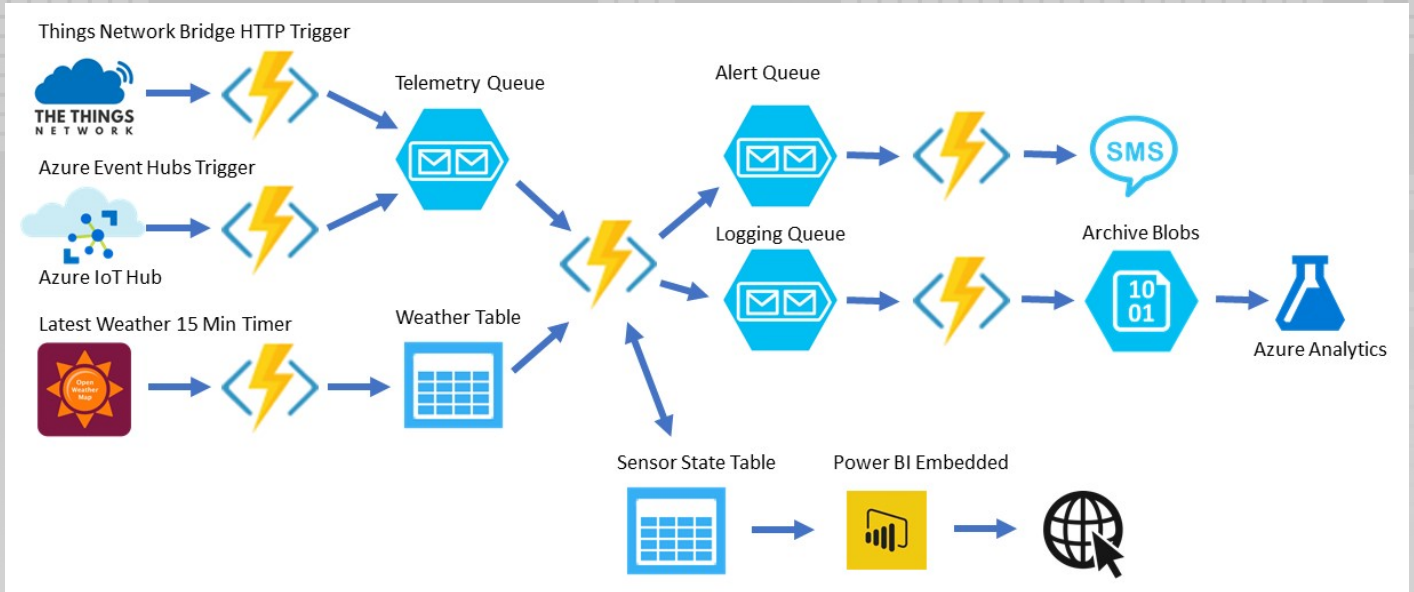
# Denial-of-Service

- Network DoS mitigated
- What get's executed? Let's limit it!
- Denial-of-~~Service~~ Wallet

# Attack Surface

- App shattered across platform
- Lot of complexity
- Inner- and outer attack surface

# Waste Management System

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# Monitoring

- What has happened?
- Logging and correlation
- What are you monitoring/logging

# Developed Code == Vulnerabilities

- Developed in various languages/technologies
- Old ‘fashioned’ vulnerabilities
  - SQL Injection
  - Remote Code Execution
  - Log Injection

# Third Party Libraries

- Simple Azure Function in C# - 10 lines
  - 50k lines for Azure Functions Host
  - 120k lines for NewtonSoft.JSON
- Vulnerability found/published
- Malicious/compromised package

# Storing Secrets

- Environment variables
- Use platform vendor service
- ‘Secrets at Scale’ - Ian Haken of Netflix

# Encryption of data

- Protecting data in transit and at rest
- Most vendors do ‘transparent’ encryption for data at rest.
- Consider ‘Client-Side Encryption’ in transit

# Least Privilege

- Fit for purpose privileges
- Review or audit them over time

# Software Supply Chain

- Automation is king!
- Deployment as code
- Separate different environments
  - Development
  - Staging
  - Production

# Conclusion

- Easy to create! Hard to keep track!
- Threat modelling
- Compartmentalise
- Monitoring and logging
- Automate delivery and configuration

# Thanks! Questions?

- ntanis at veracode.com
- https://twitter.com/nielstanis

# Links

- Serverless Security and Things That Go Bump the Night - https://www.infoq.com/presentations/serverless-security
- Storing Secrets at Scale - https://www.youtube.com/watch?v=15H5uCj1hlE
- Gone in 60ms - https://www.youtube.com/watch?v=YZ058hmLuv0