Microservices enabling IoT

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Traditional monolithic approach

• Single application
• All logic combined into single process
• Composed of classes, methods and packages
• Allows proper testing and use of deployment pipeline
• Every single change requires entire application to be re-deployed
Microservices

• A way of breaking down applications
• Instead of in-memory function calls, separate processes
• Small, highly decoupled and task specific
• Communicate with each other using lightweight mechanisms
• Model of software development popularized by Netflix, Amazon
Characteristics

• Componentization of service layer
• Well defined context boundaries
• Each service has separate “view” of the world and database
• Independently upgradable
• Inter-service communication using HTTP-REST APIs
Motivations/Advantages

• Technology heterogeneity
• Resilience
• Scaling
• Organizational alignment
Internet of Things

• A relevant approach for building the Middleware

• Three axis of scaling
  • Vertical: Increasing complexity of each end node (not so feasible)
  • Horizontal: Adding more devices to the network
  • Z-Axis: Functional which is promoted by micro-service design due to composability
• Smart meters
• 3 independent micro-services for:
  • Transfer
  • Processing
  • Transformation of data
References

• http://martinfowler.com/articles/microservices.html


• A. Krylovskiy et al., “Designing a Smart City Internet of Things Platform with Microservice Architecture”, International Conference on Future Internet of Things and Cloud 2015