Programming for IoT Applications

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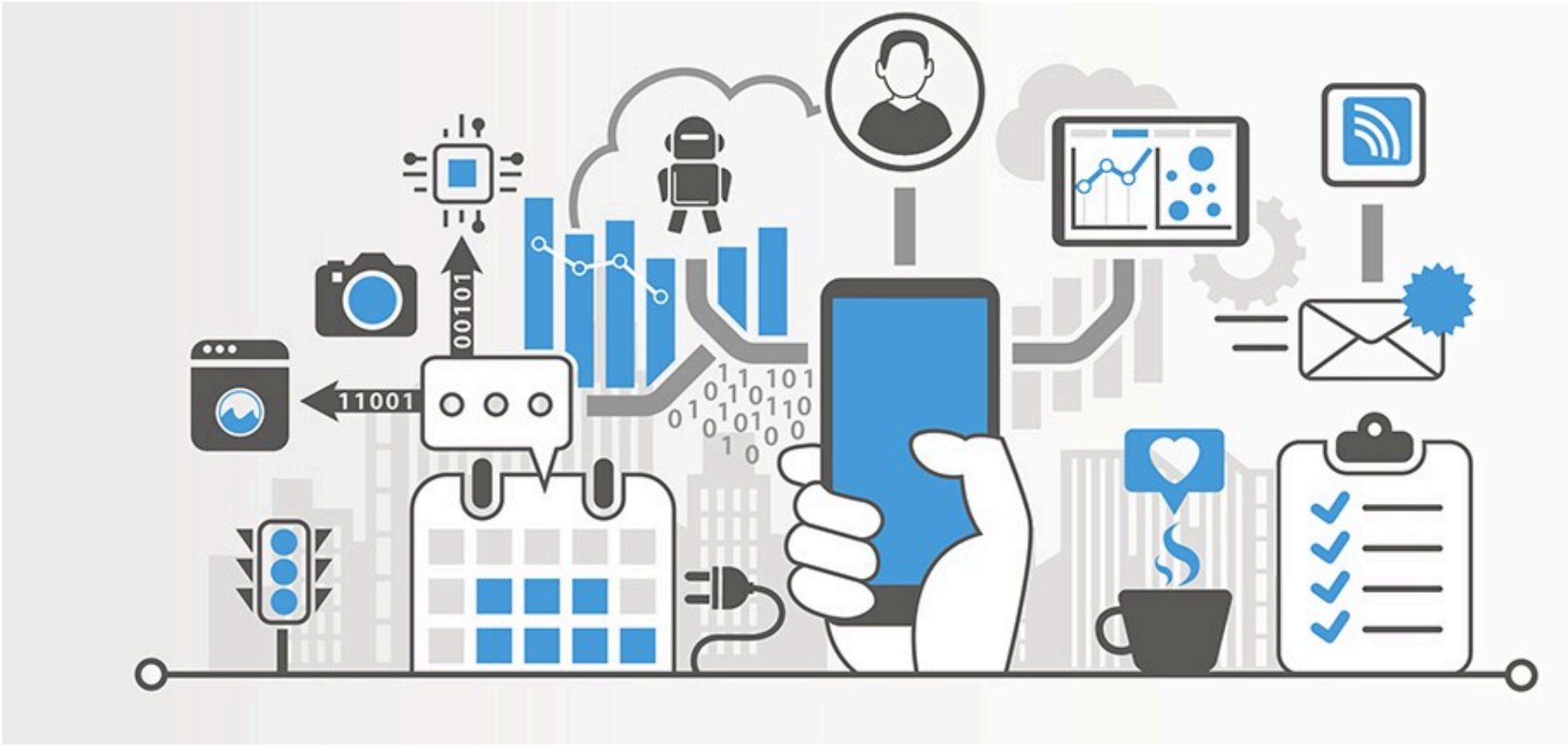
Lecture 9



SOFTWARE REQUIREMENTS FOR IOT PLATFORMS

Software Requirements

What are the main requirements to be addressed by an IoT platform?

- **Interoperability** among heterogeneous systems, technologies and devices (e.g. PLC, Wi-Fi, ZigBee, etc.)

Software Requirements

What are the main requirements to be addressed by an IoT platform?

- Interoperability
- **Scalability** to handle:
  - a large number of sensors and devices
  - a large number of users
  - a large volume of data stored (**Big Data** domain)
  - a large volume of information exchanged and processed

Software Requirements

What are the main requirements to be addressed by an IoT platform?

- Interoperability
- Scalability
- **Reliability** to avoid or prevent possible failures, inconsistencies, overloads, data missing, etc.

Software Requirements

What are the main requirements to be addressed by an IoT platform?

- Interoperability
- Scalability
- Reliability
- **Evolve over the time** by supporting rapid modification and enhancement with low cost and small architectural impacts.

Software Requirements

What are the main requirements to be addressed by an IoT platform?

- Interoperability
- Scalability
- Reliability
- Evolve over the time
- **Modularity** by designing the system as a collection of interoperable components that communicate through lightweight mechanisms.

Software Requirements

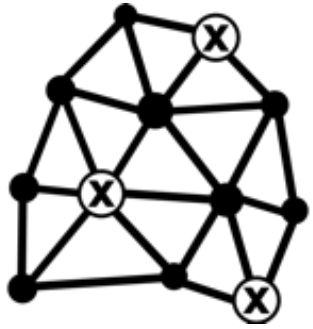
What are the main requirements to be addressed by an IoT platform?

- Interoperability
- Scalability
- Reliability
- Evolve over the time
- Modularity
- **Extendibility** to be capable of adding new functionality and supporting software updating, bugs correction, security policies and permissions updating.

Software Requirements

What are the main requirements to be addressed by an IoT platform?

- Interoperability
- Scalability
- Reliability
- Evolve over the time
- Modularity
- Extendibility
- **Decentralization** to ensure that each service may implement its functionalities using the most appropriate technology. Software components perform autonomously.



Software Requirements

What are the main requirements to be addressed by an IoT platform?

- Interoperability
- Scalability
- Reliability
- Evolve over the time
- Modularity
- Extendibility
- Decentralization
- **Flexibility** on supporting heterogeneous services with different characteristics and requirements.

Software Requirements

What are the main requirements to be addressed by an IoT platform?

- Interoperability
- Scalability
- Reliability
- Evolve over the time
- Modularity
- Extendibility
- Decentralization
- Flexibility
- **Synchronous Communication** to access historical data or devices' functionalities by exploiting request/response approach.

Software Requirements

What are the main requirements to be addressed by an IoT platform?

- Interoperability
- Scalability
- Reliability
- Evolve over the time
- Modularity
- Extendibility
- Decentralization
- Flexibility
- Synchronous Communication
- **Asynchronous Communication** to allow (Near-) Real-time data transmission by exploiting publish/subscribe approach and event-based communication to support low latency and scalability.

Software Requirements

What are the main requirements to be addressed by an IoT platform?

- Interoperability
- Scalability
- Reliability
- Evolve over the time
- Modularity
- Extendibility
- Decentralization
- Flexibility
- Synchronous Communication
- Asynchronous Communication
- **Standardization** to foster data exchange by exploiting *common interfaces* (Web services and API) *and open data-formats*.

Software Requirements

What are the main requirements to be addressed by an IoT platform?

- Interoperability
- Scalability
- Reliability
- Evolve over the time
- Modularity
- Extendibility
- Decentralization
- Flexibility
- Synchronous Communication
- Asynchronous Communication
- Standardization
- **Security** to guarantee authentication, data access, confidentially and privacy.