

Device architecture and technologies for the Web of Objects

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INFORMATION TECHNOLOGY FOR EUROPEAN ADVANCEMENT

Goals and requirements

- ◆ Role of devices and gateways in the WoO architecture
- ◆ Device requirements



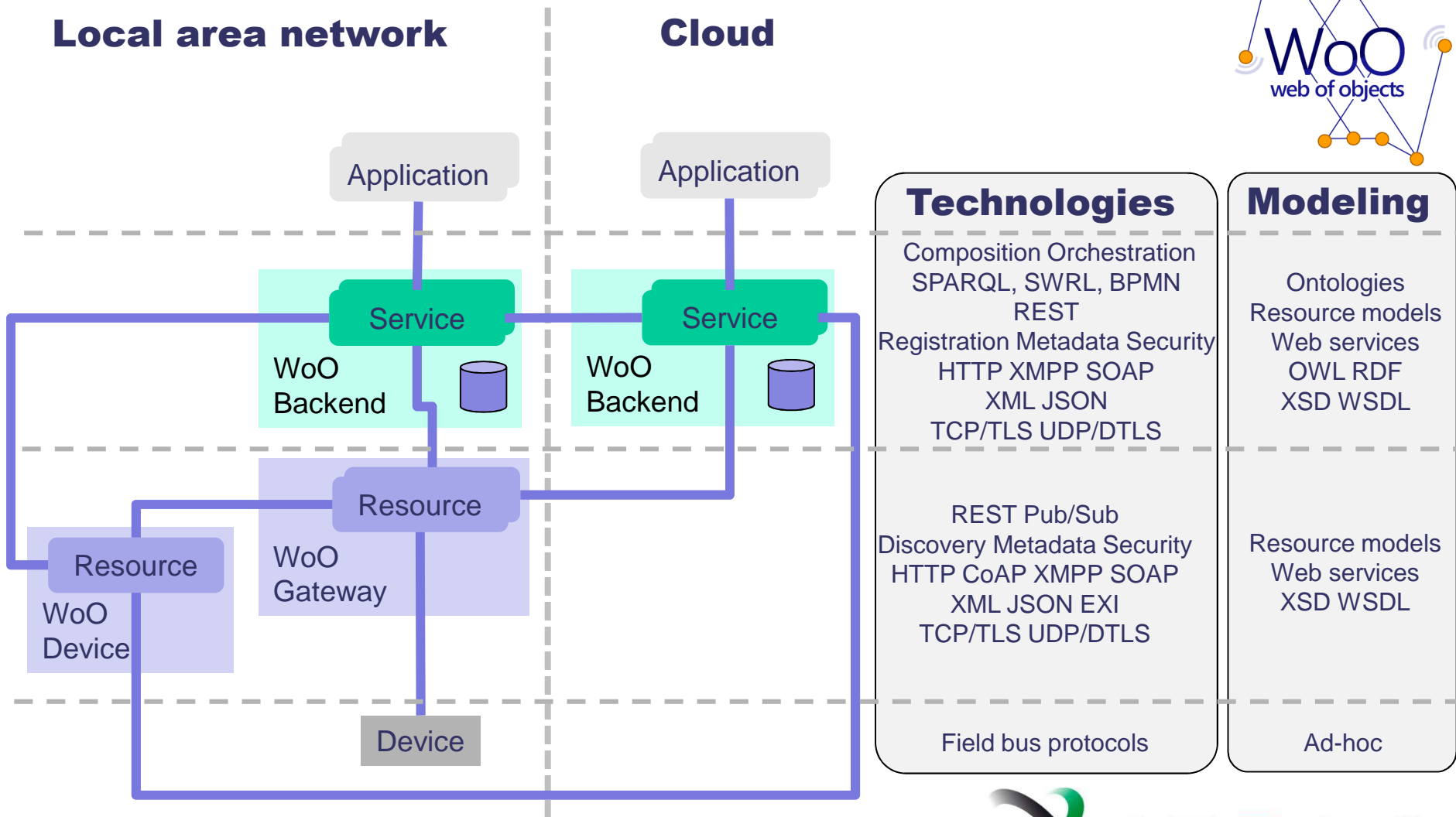
Results

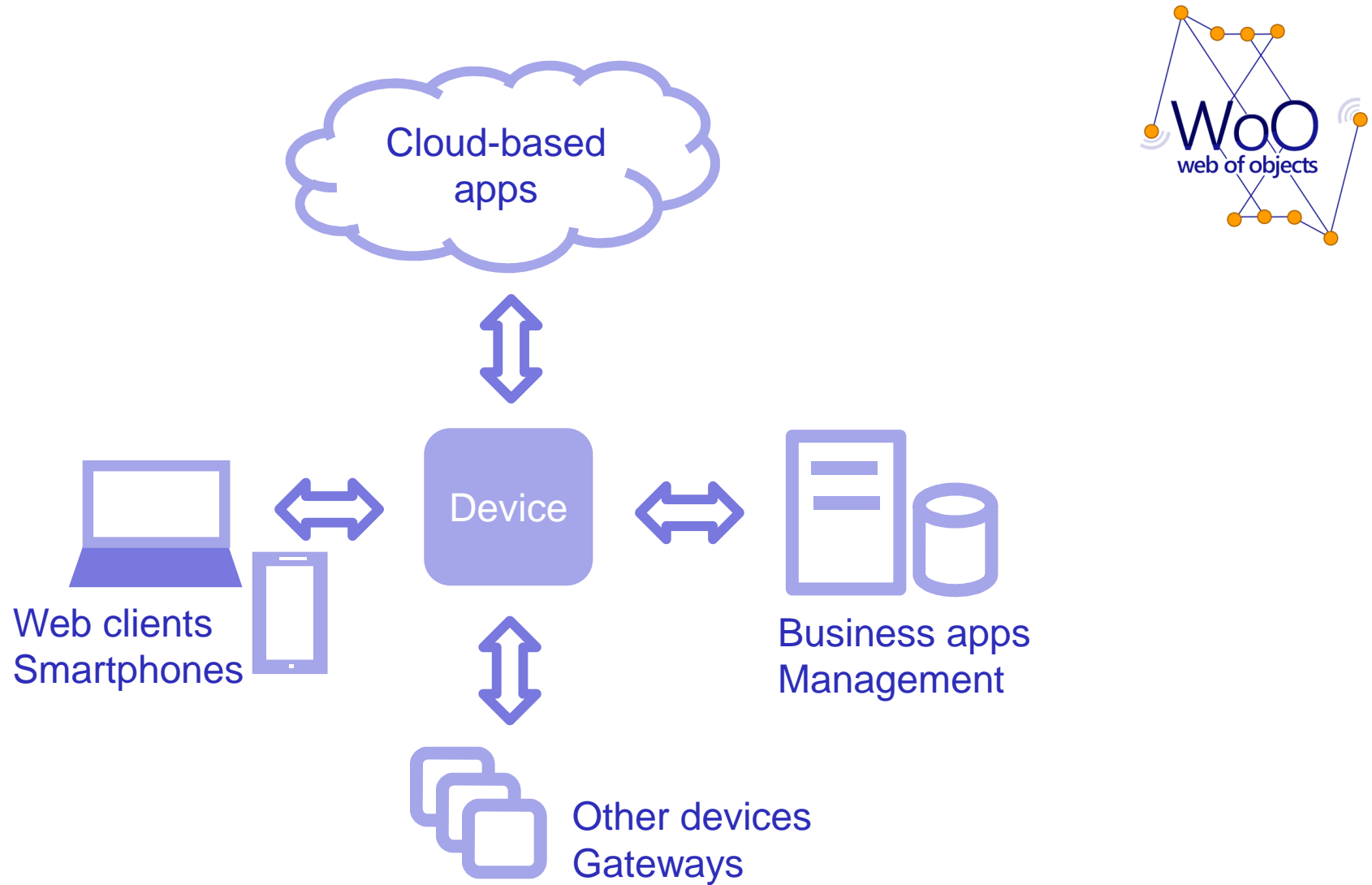
- ◆ Layered component architecture
- ◆ Examples of application layers:
 - Resource and service SDK
 - Dynamic deployment of choreography

The LwM2M profile

- ◆ A new standard for cloud-based, large-scale device management

Role of devices and gateways in the WoO architecture





Multi-tenancy: devices are dynamically involved in several applications

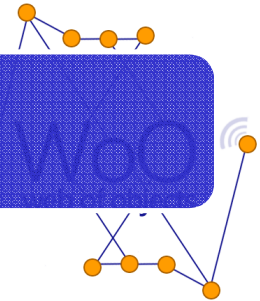
- **Dynamic discovery and adaptation**
 - **Device discovery and registration**
 - **Metadata information for semantic reasoning support**
- **Multiple architecture support**
 - **REST- and service-oriented architectures**
 - **Publish/subscribe architectures**

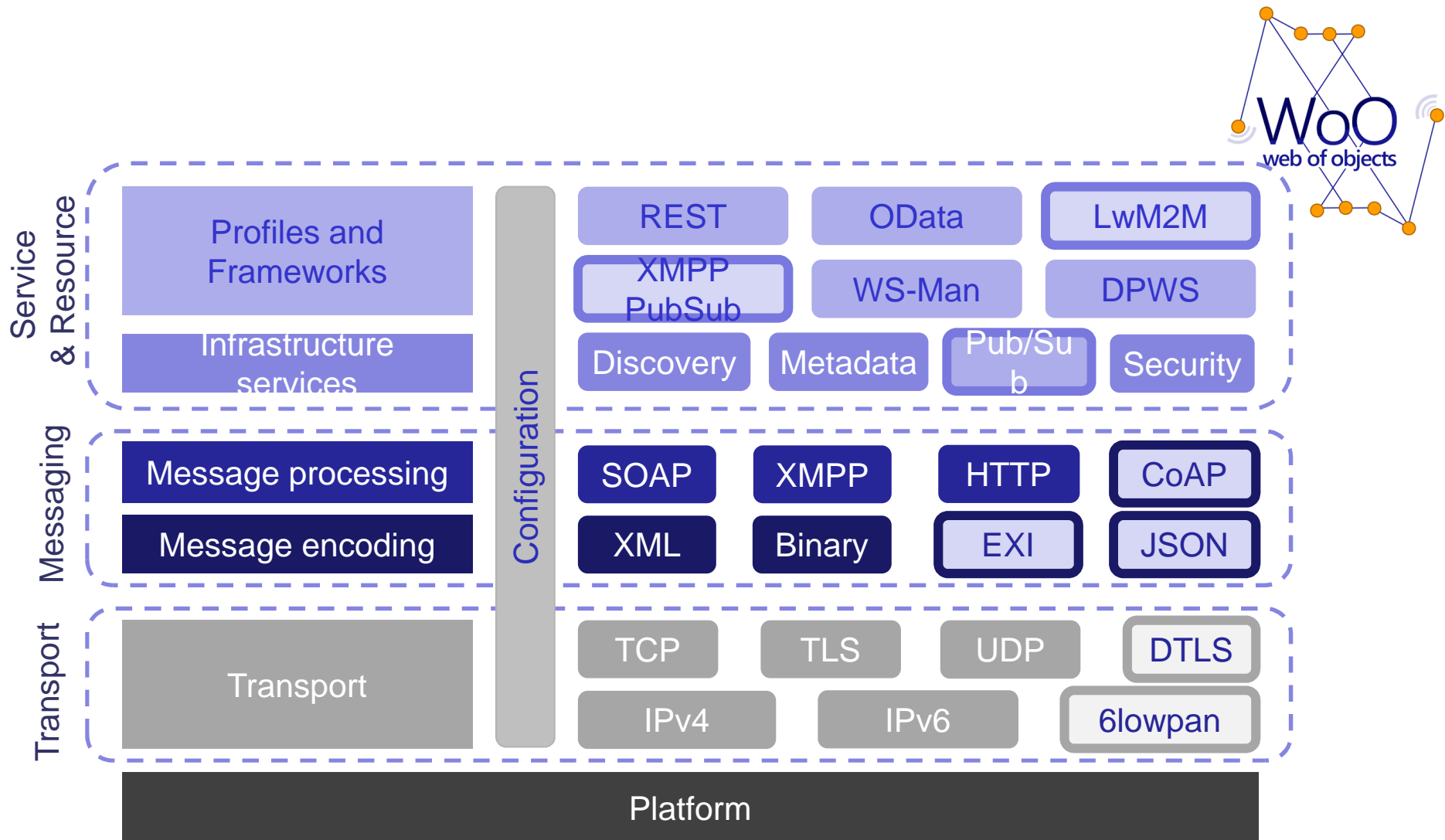
Small targets, e.g. wireless sensors

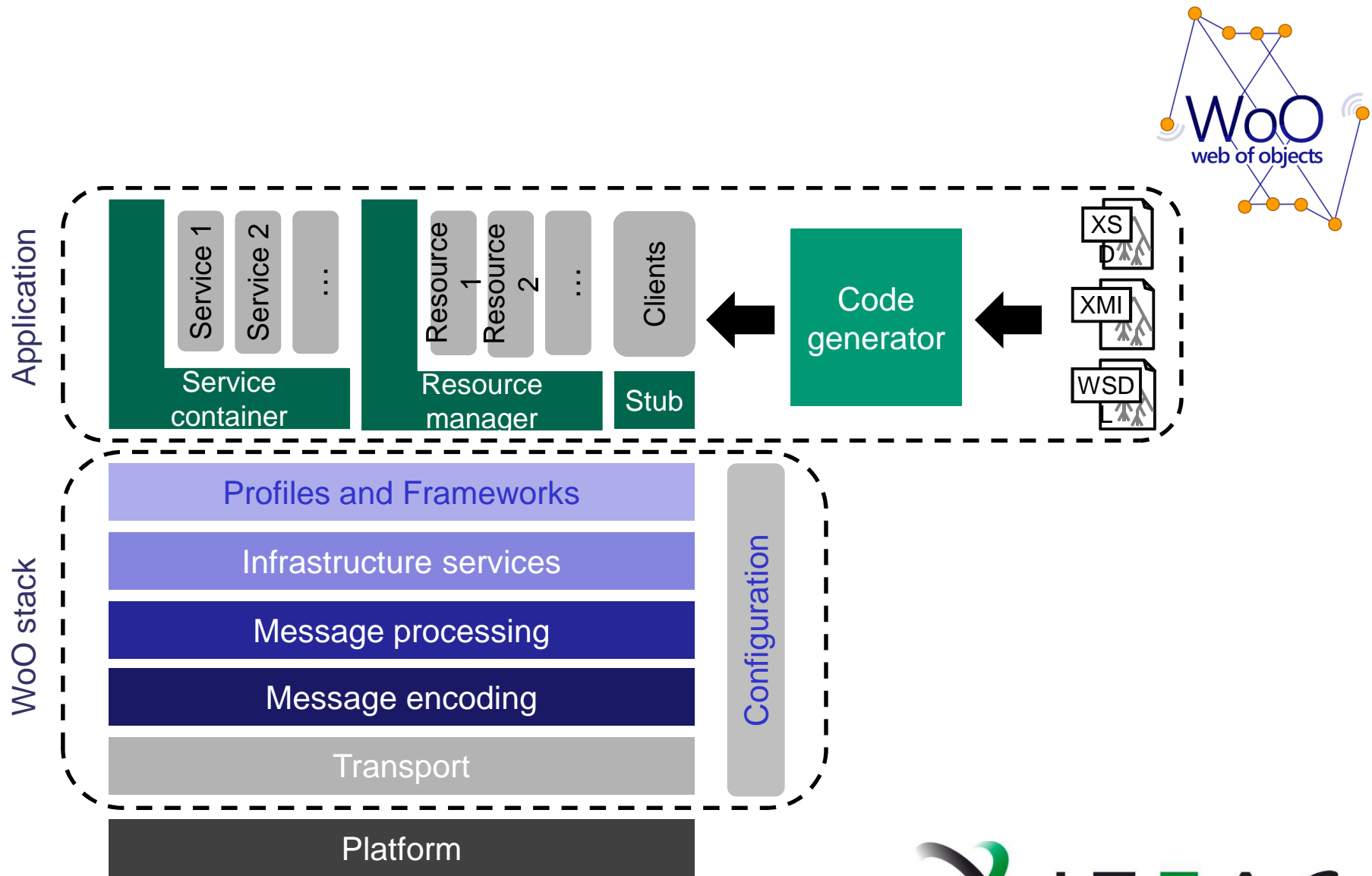
- **Flash memory: 50-100 kbytes**
- **RAM: 8-16 kbytes**

Security

- **Authentication**
- **Encryption**
- **Authorization**







Full object modeling capabilities

- ◆ Classes, instances, properties and methods
- ◆ Inheritance and associations
- ◆ Semantically equivalent to models found in Odata, DMTF CIM, LwM2M...

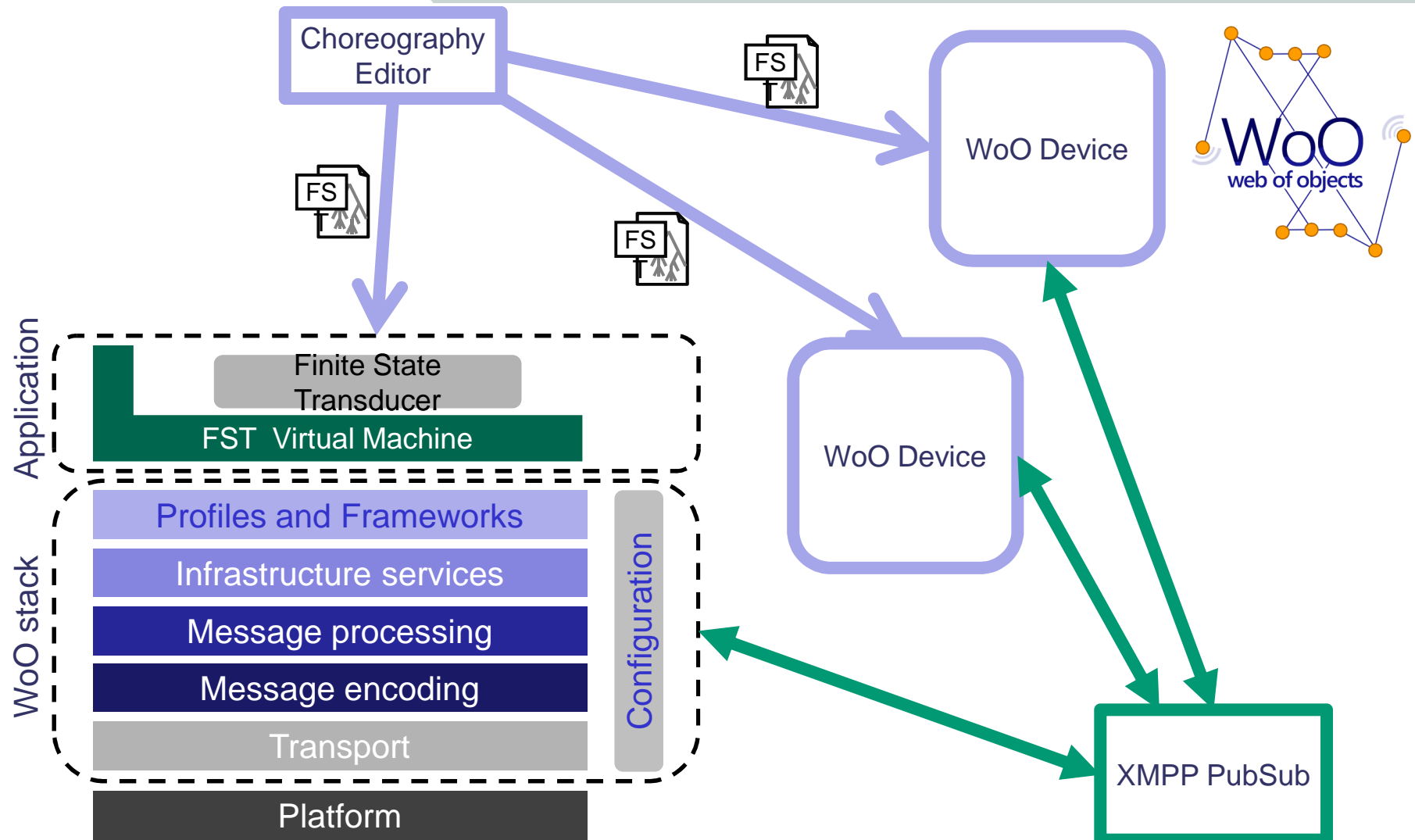


Code generation speeds up development and hide complexity

- ◆ Data binding: automatic conversion between C structures and wire representation: XML, JSON, EXI, various binary formats
- ◆ Stubs and skeletons for remote method invocation

The same resource implementations can be accessed from different protocols: Odata, Ws-Man, LwM2M

DLite: dynamic deployment of choreography



LwM2M: OMA draft standard

◆ Scope: device management

- DM resources for provisioning, configuration, software upgrade
- Secured communications and access control lists
- Extensible to support application resources (business data)

◆ Lightweight

- Based on CoAP and DTLS
- REST paradigm
- More scalable and easier to embed than existing DM standards (OMA-DM, BBF TR-69)

◆ First real-life application of the WoO device architecture

- Deployment in Q2 2015

