

Device Management in Internet of Things using OMA-LWM2M



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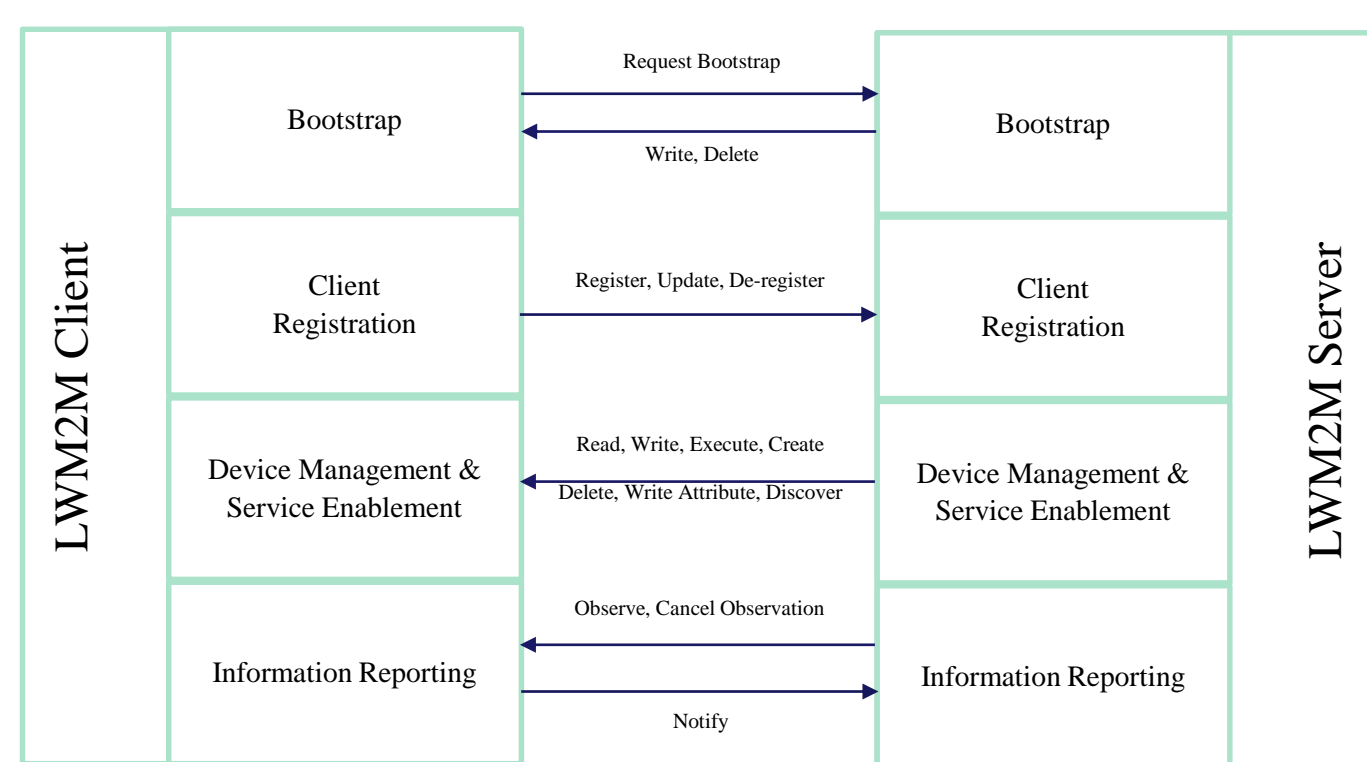
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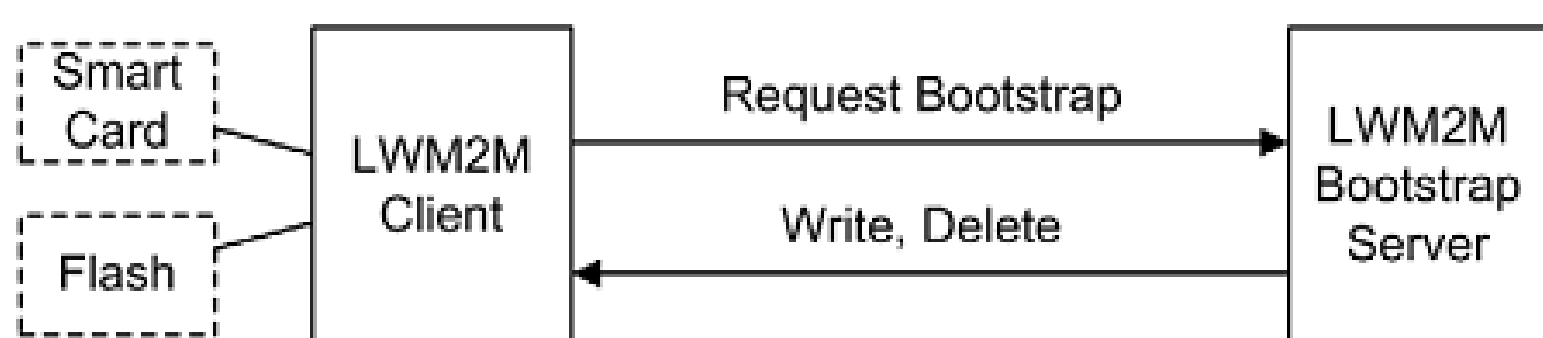
1. Abstract

Lightweight M2M (LWM2M) is an Open Mobile Alliance (OMA) standard that provides a fast deployable client-server specification to provide machine to machine services. It provides efficient device management as well as security workflow for CoAP applications using the same protocol, making it suitable for use in Internet of Things. In this poster we explore the LWM2M client-side implementation framework carried out over Contiki-based IoT nodes. It includes automatic device registration, de-registration, registration update, factory bootstrapping and firmware update functionalities. It provides resource management through interfaces such as READ, WRITE, OBSERVE and NOTIFY. Our implementation is compliant to OMA LWM2M v1.0 specification, supports OMA mandatory objects, IPSO objects as well as 3rd party objects and enables low memory-footprint implementation.

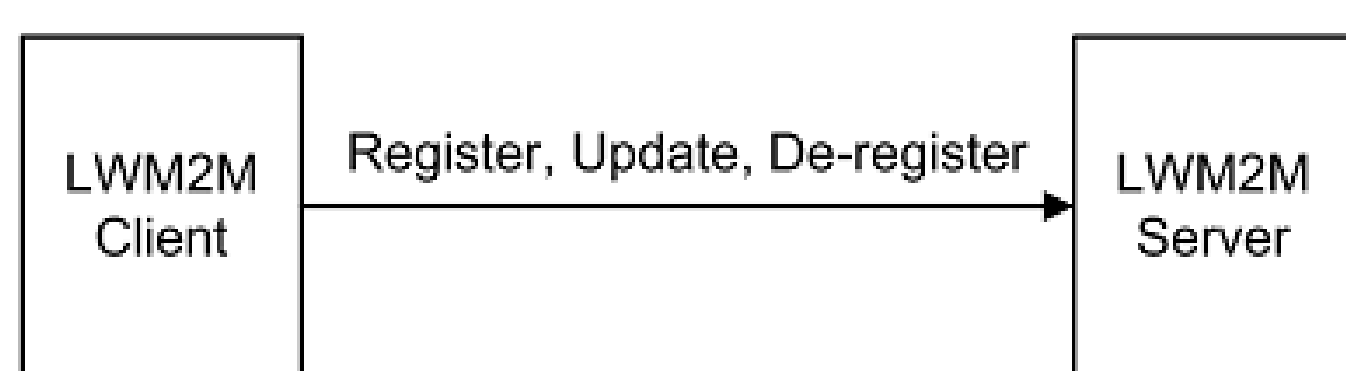
4. LWM2M communication interfaces



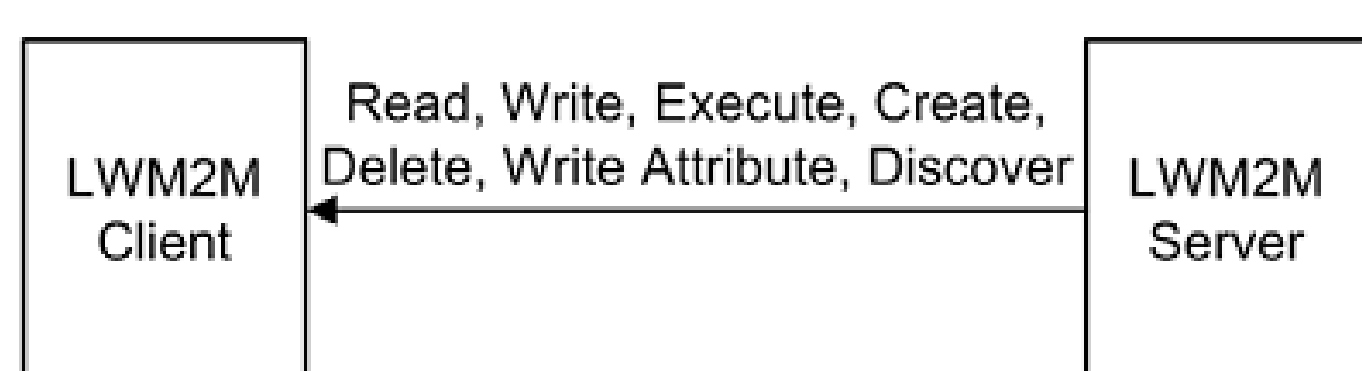
LWM2M Interfaces and Workflow



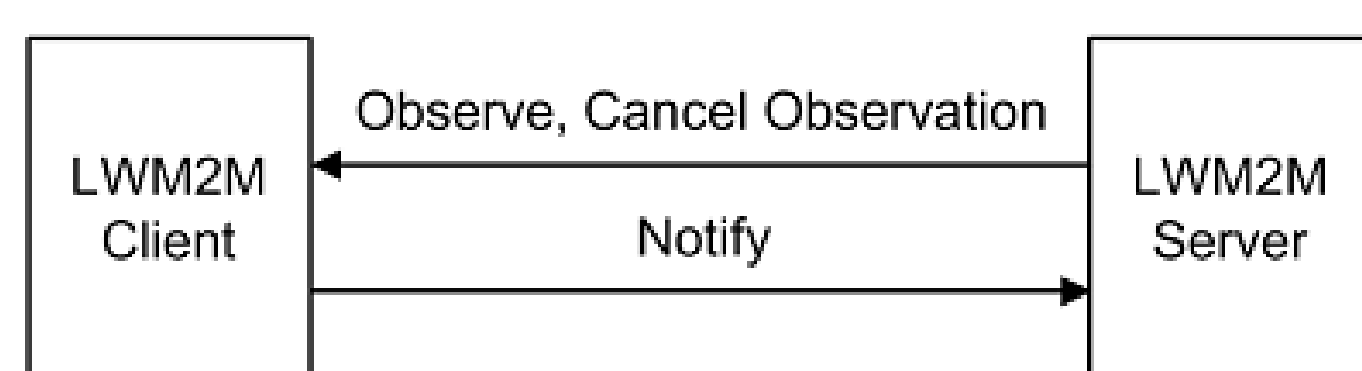
LWM2M Bootstrap



LWM2M Client Registration

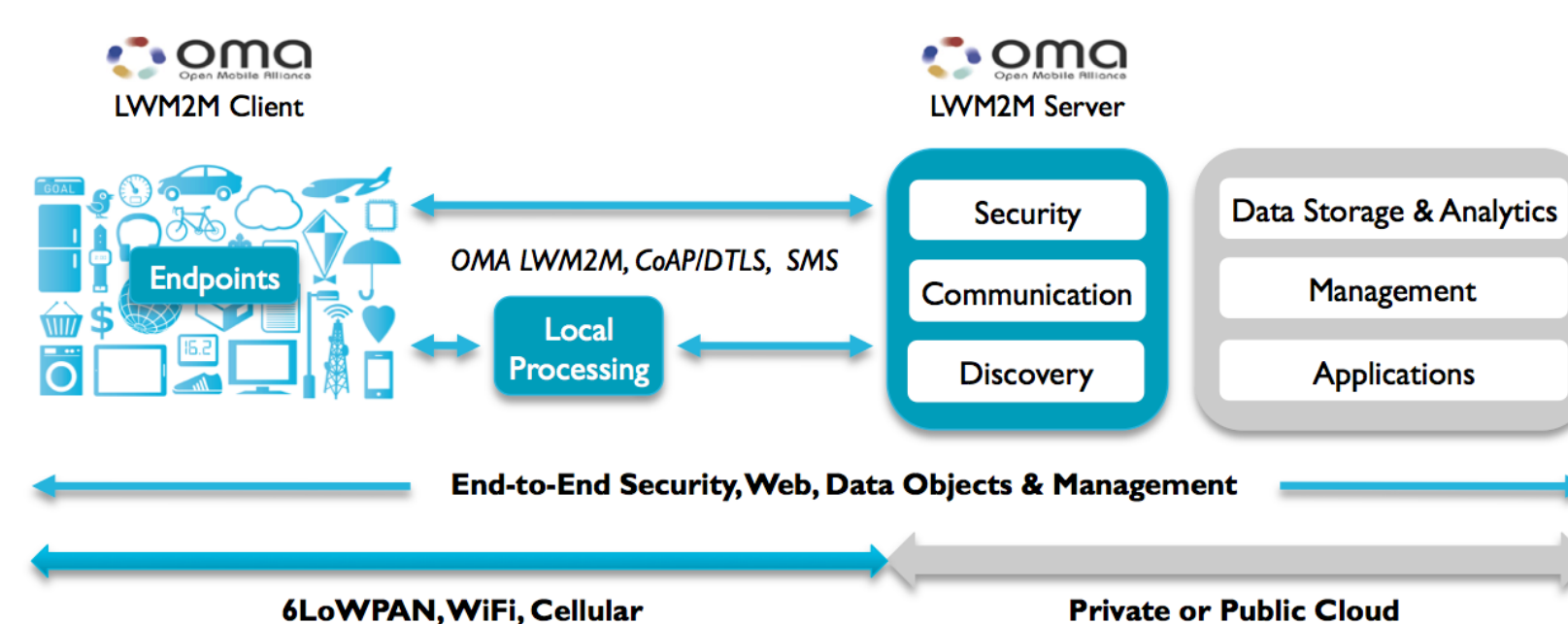


LWM2M Device Management and Service Enablement

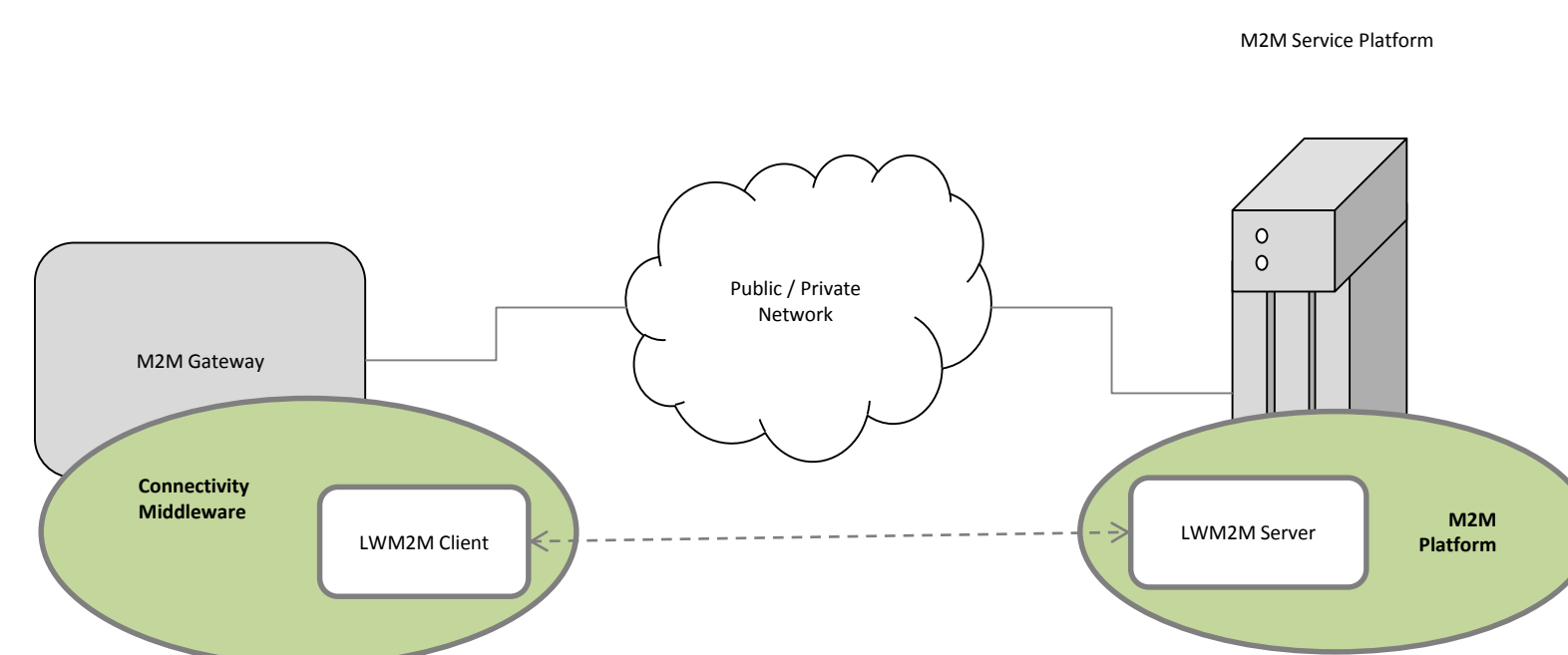


LWM2M Information Reporting

2. Device Management in IoT

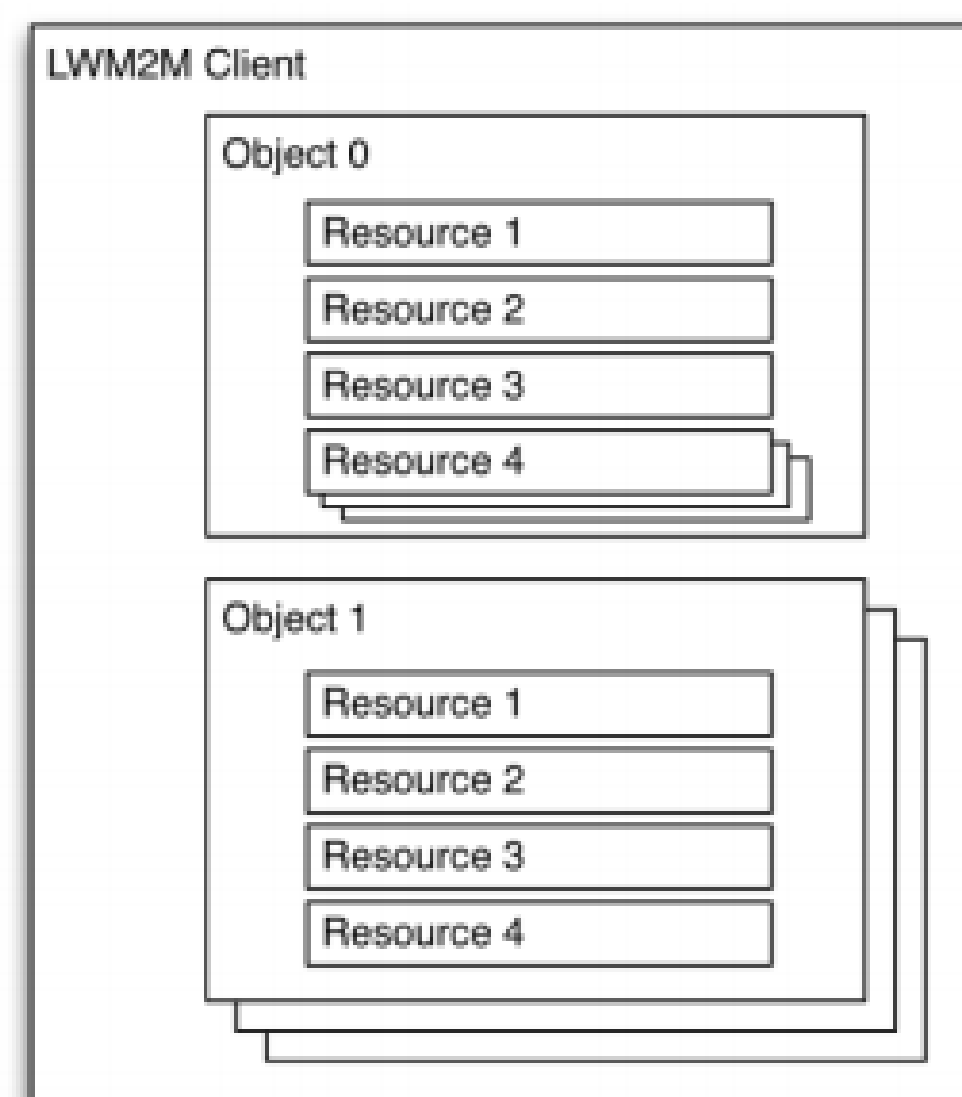


LWM2M Deployment Scenario [1]



LWM2M Components in M2M Products

5. Lightweight DTLS



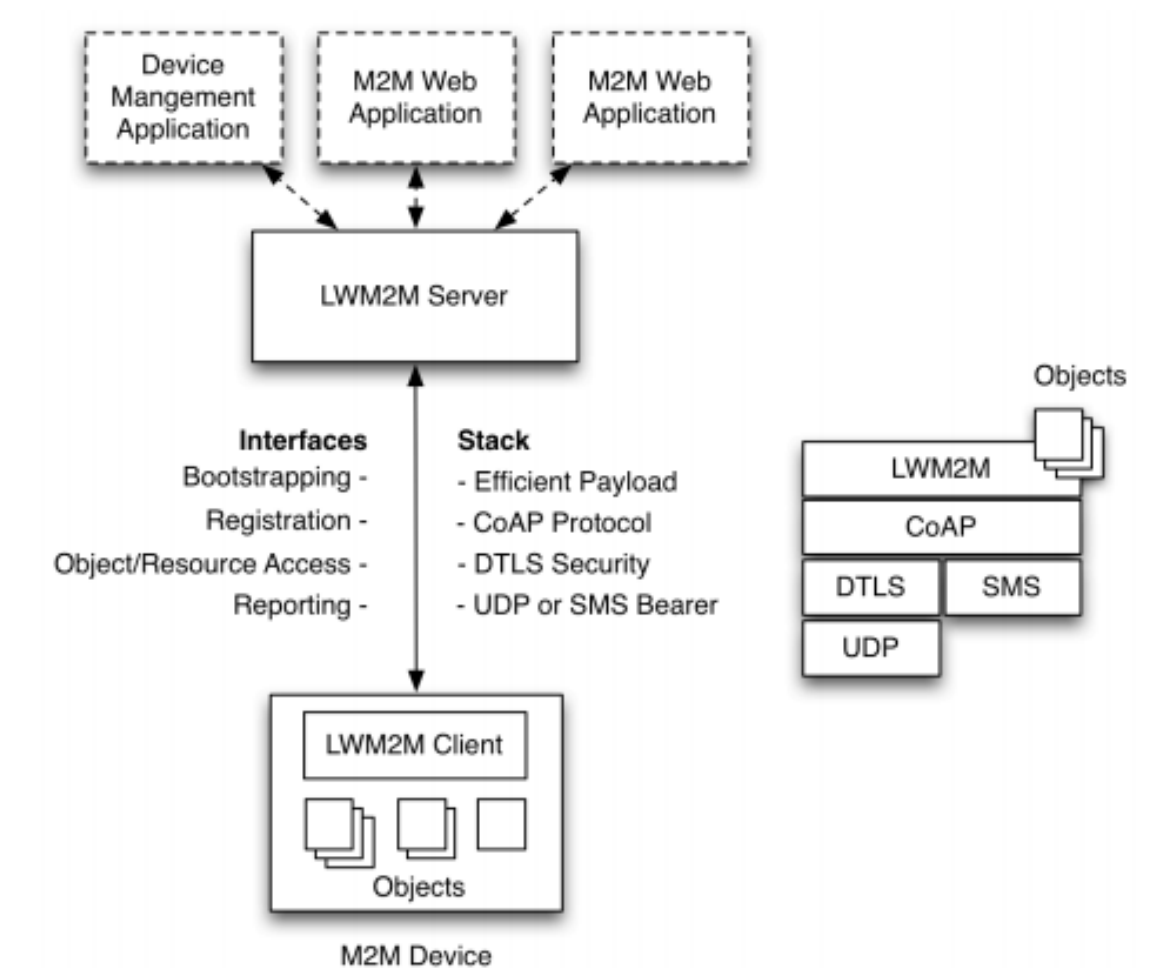
LWM2M Object/Resource Model [2]

7. Application Scenario

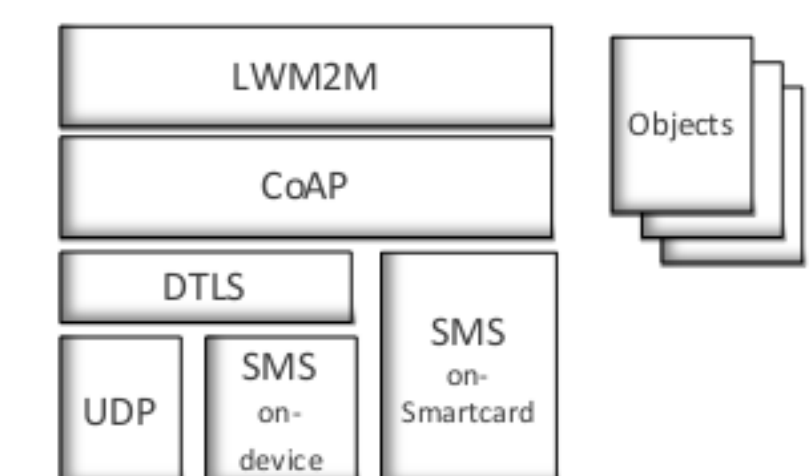
Device	LWM2M Client		
	Resource ID	Value	Instance ID
Lightbulb 1	5850	Off	0
	5851	0%	
Lightbulb 2	5850	On	1
	5851	50%	
Lightbulb 3	5850	On	2
	5851	100%	

LWM2M Device Instances for Dimmers [3]

3. LWM2M Architecture

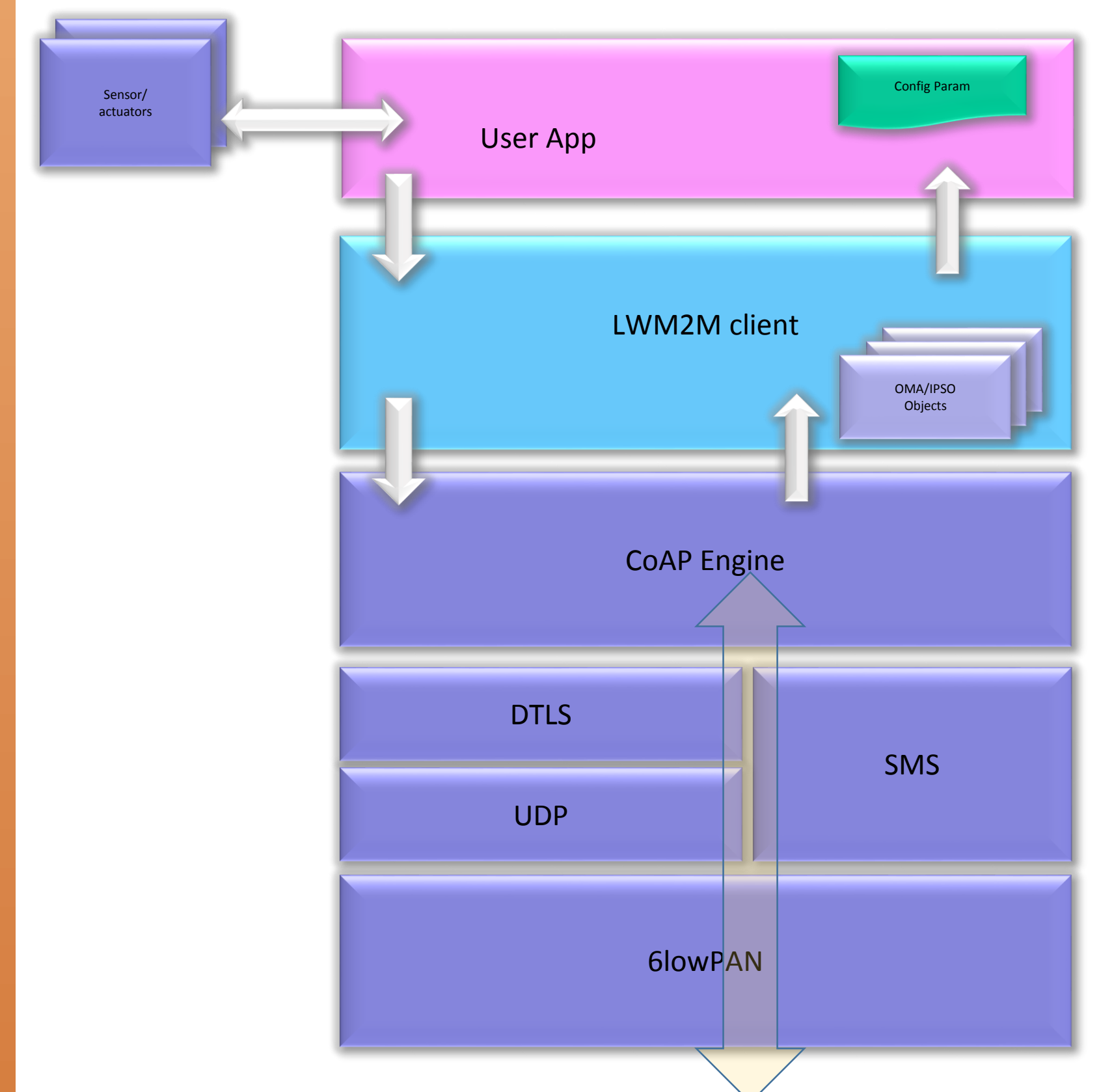


LWM2M Architecture [2]



LWM2M Enabler [2]

6. LWM2M Implementation



Altiux Connectivity Stack for LWM2M Client

References

1. Lightweight M2M: Enabling Device Management and Applications for the Internet of Things, ARM White Paper.
2. OMA LWM2M technical specification v.1.0.
3. LWM2M for IOT – Opportunities and challenges, Embien – Technology Blog