NEXT GENERATION WIRELESS PRODUCTS AND SOLUTIONS

OpenSource IoT Middleware Frameworks

Siji Sunny

MOBILE EMBEDDED LABS PVT.LTD

USE CASE-1

Humidity and Temperature Monitoring using Arduino

(Ref: Electronics For You, Feb, 2017)

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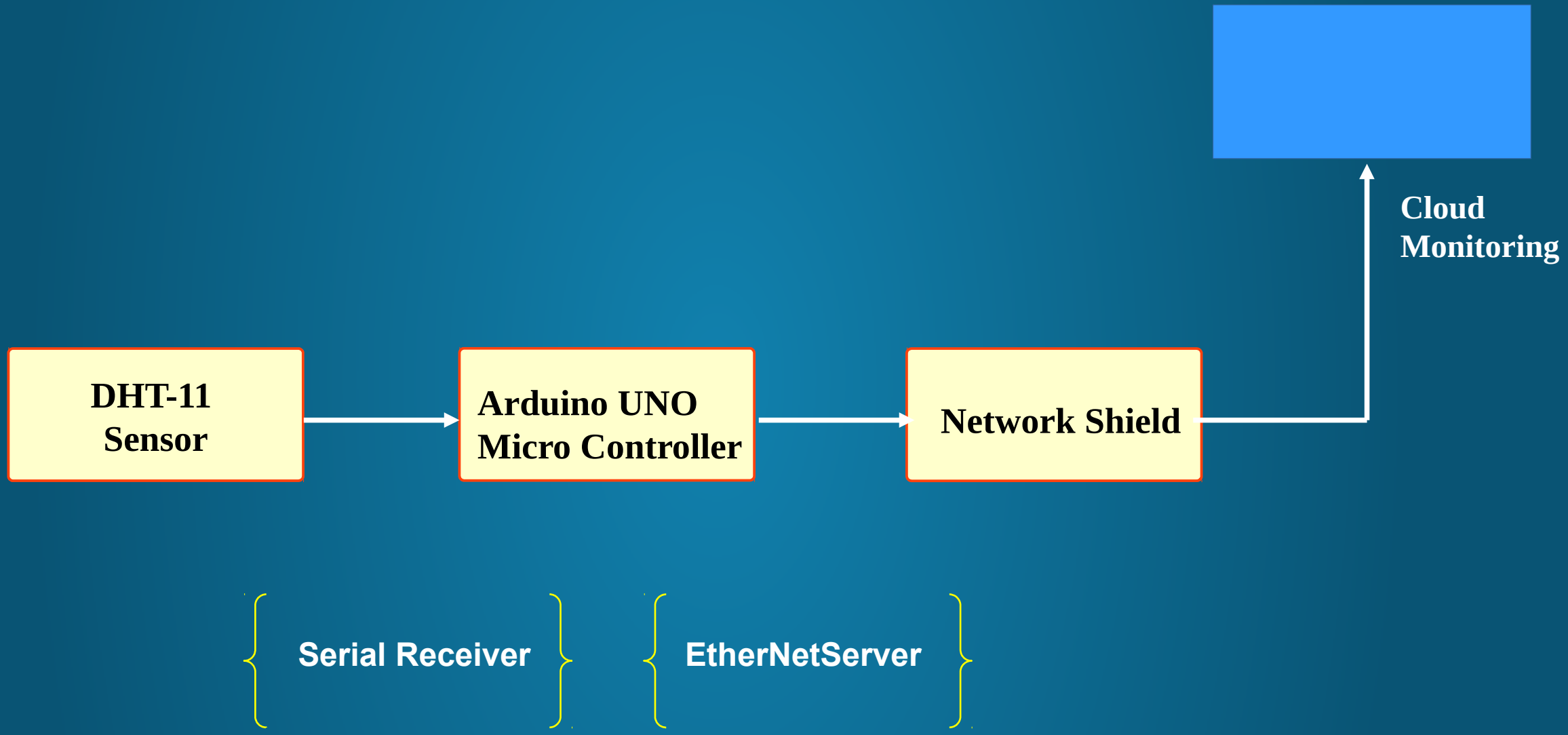
WORK FLOW



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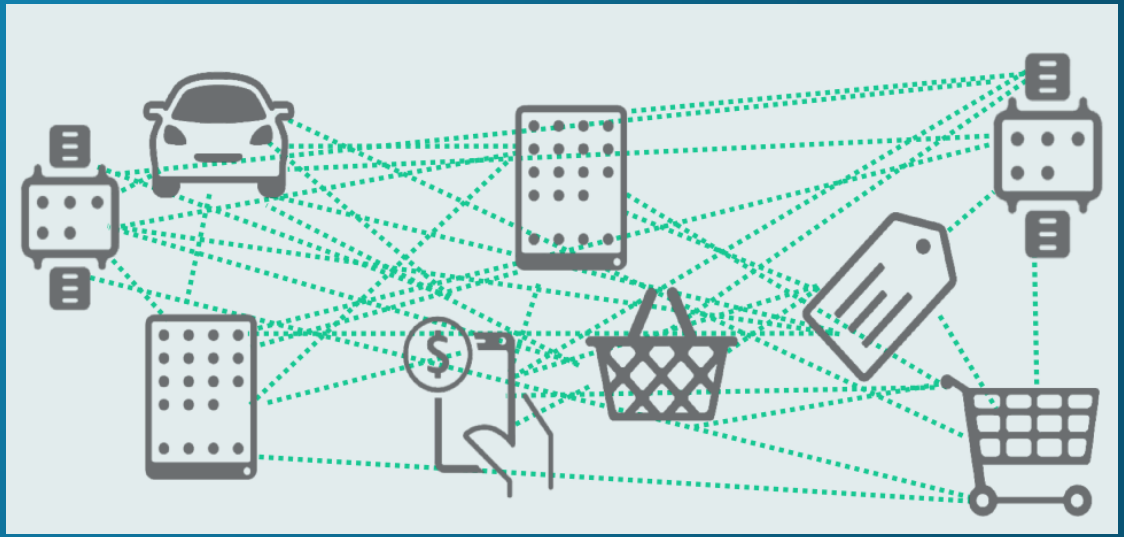
WHY OPENSOURCE MIDDLEWARE ?

To avoid – “Isolated Internet Of Things”

To build interoperability between various devices/protocols, regardless of vendor, OS, hardware, etc.



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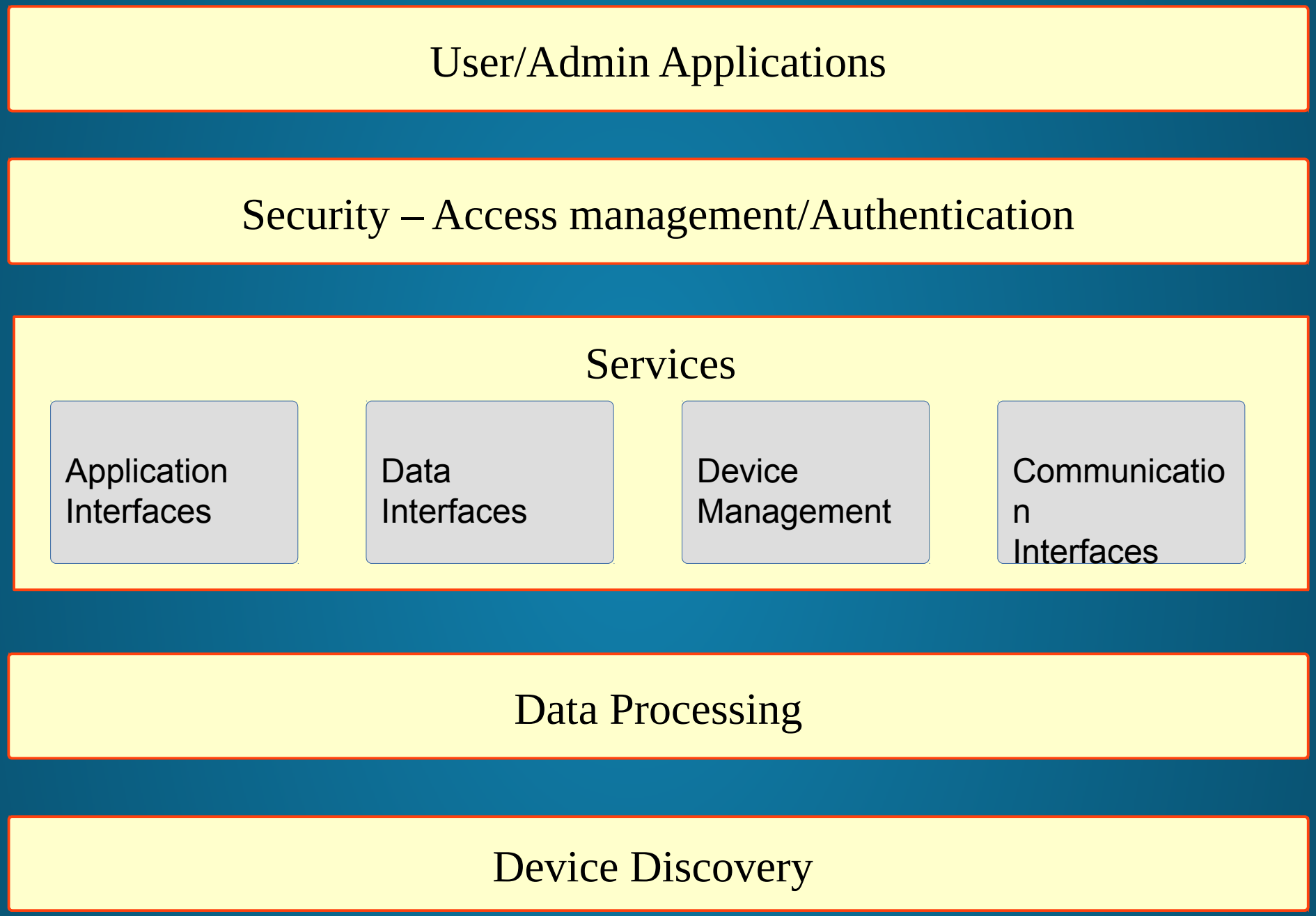

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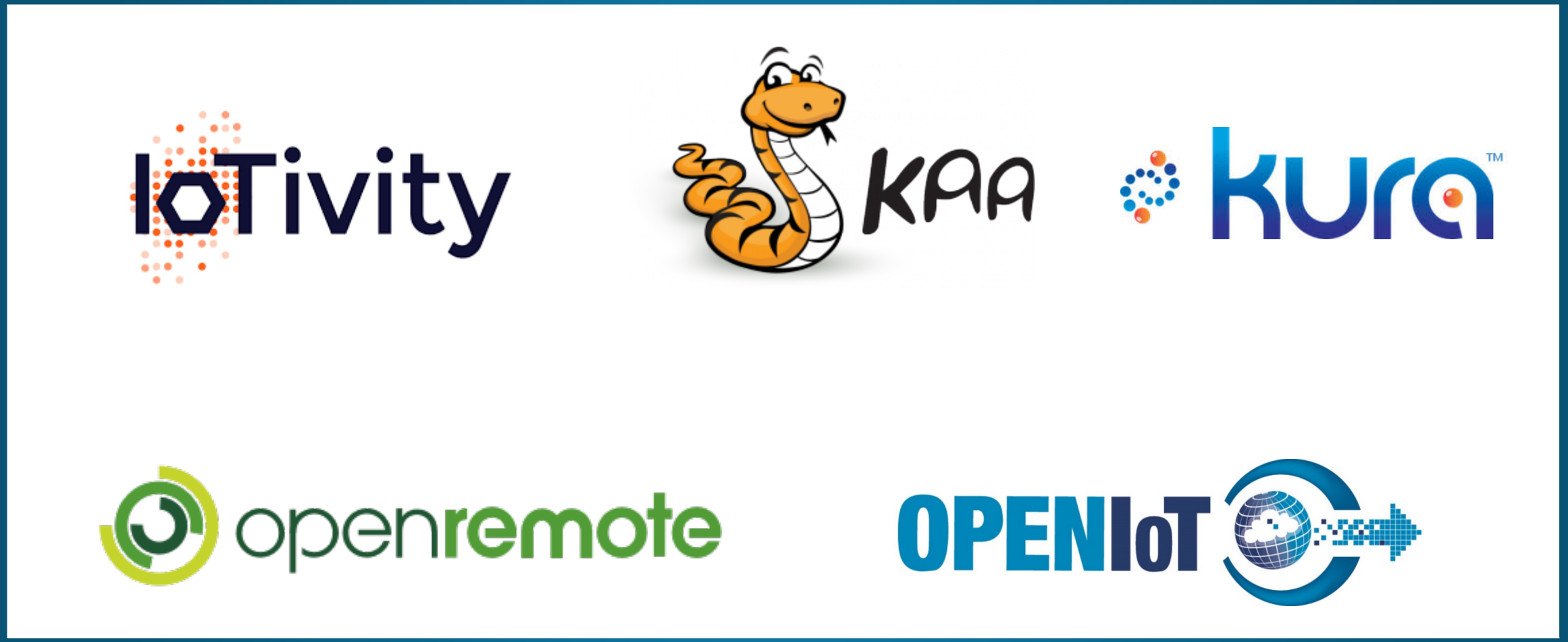
OpenSource IoT Middleware frameworks



IOTVITY

- Open source framework and SDK for building IoT Applications
- Hosted by LIUNX FOUNDATION & FUNDED by Open Connectivty Foundation (OCF)
- Apche 2.0 License
- In 2016 Alljoyn merged with Iotvity

Protocol Support

- Constrained Application Protocol (CoAP)
- Wi-Fi Direct
- Bluetooth low energy
- Bluetooth
- ANT+
- Zigbee & Z-Wave

OS Support

- Linux - Debian, Ubunttu, Fedora, Centos
- Debian ARM
- Android & IoS
- Windows
- Tizen
- Yocto
- Openwrt

OCF SPECIFICATION

Defiens core architecture, core features, and protocols to enable OCF profiles implementation for Internet of Things (IoT) usages and ecosystems.

The OCF architecture is based on the Resource Orientated REST architectural style

Bridging specification specifies a framework for translation between devices in OCF and non-OCF ecosystems.

The OCF offers Resource to AllJoyn Interface Mapping specification provides detailed mapping information to provide equivalency between AllJoyn defined Interfaces and OCF defined Resources

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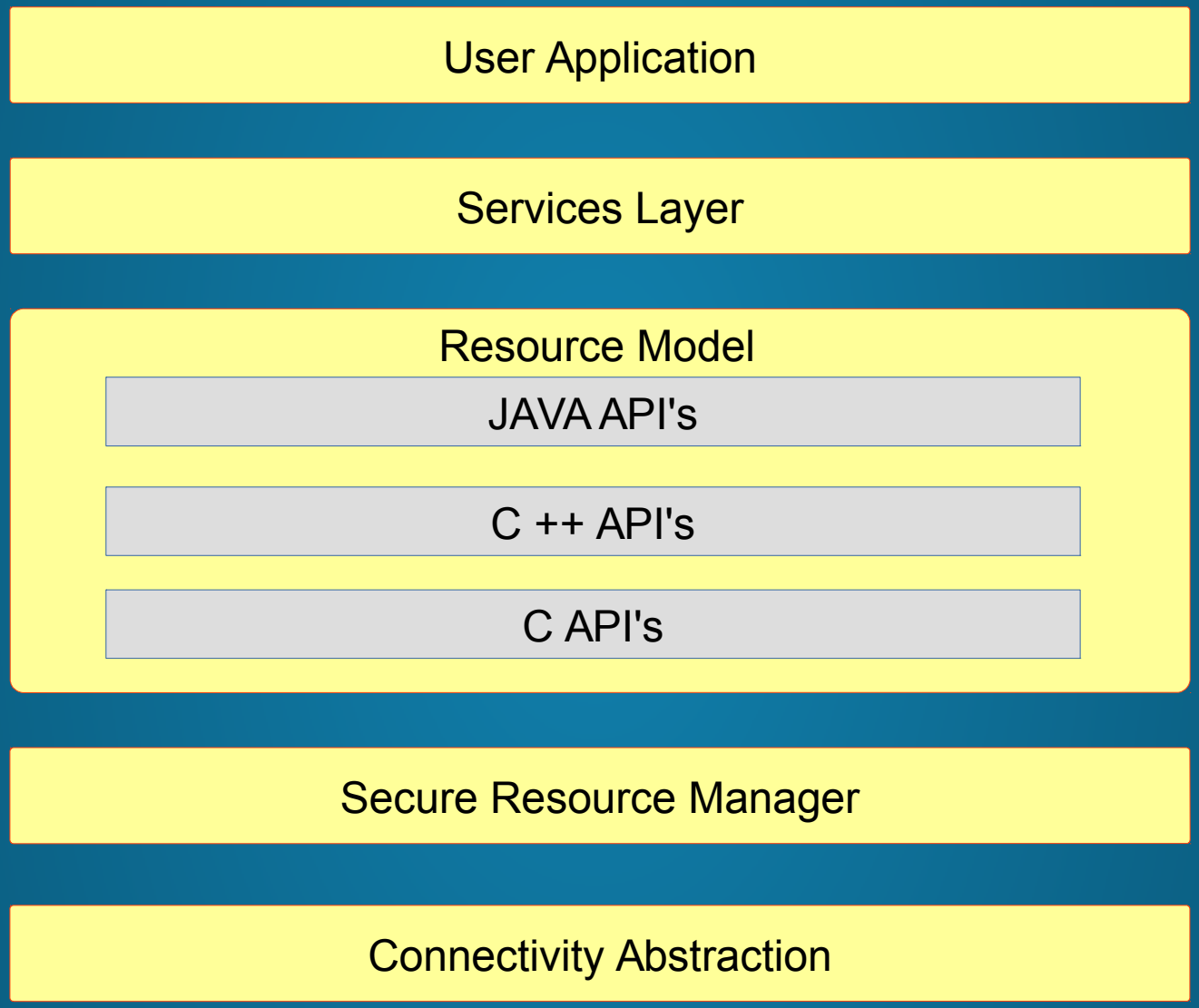
IOTVITY FUNCTIONAL ARCHITECTURE



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OCF RESOURCES

Functionality	Fixed URI
Discovery	/oic/res
Device	/oic/d
Platform	/oic/p
Security	/oic/sec/*

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OCF RESOURCES -COLLECTION URI

rt: Resource Type
if: Resource Interface
p: Resource Properties
n: Resource Name
links: [Other resource URI]

OCF PROTOCOLS

- Messaging protocol: CoAP (RFC 7252)
- Data model: CBOR (RFC 7049) encoding of OCF payloads
- Security model: DTLS-based authentication, encryption and access control
- Transport: UDP/IP; being adapted to Bluetooth

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USE CASE-2

LIGHT CONTROL -IoTVity(OCF)

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RESOURCE DISCOVERY

Multicast GET coap://224.0.1.187:5683/oic/res

Unicast response

[URI: /a/light; rt = [“oic.r.light”], if = [“oic.if.rw”],
p= discoverable, observable]

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GET / PUT REQUEST

Unicast GET coap://192.168.1.1:9000/a/light

Unicast response

[URI: /a/light; state = 0, dim = 0]

Unicast PUT coap://192.168.1.1:9000/a/light
PayLoad: [state=1;dim=50]

Unicast response

Status = Success

OBSERVER / NOTIFY

Unicast GET coap://192.168.1.1:9000/a/light; Observe_option= 0

Unicast response

[URI: /a/light; state = 1, dim = 50]

Notify Observers

[URI: /a/light; state = 0, dim = 0, sequence #: 1]

KAA PROJECT

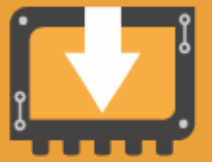
Manage an unlimited number of connected devices

Set up cross-device interoperability

Perform A/B service testing

Perform remote device provisioning and configuration

Perform real-time device monitoring



Distribute over-the-air firmware updates

Create cloud services for smart products

Collect and analyze sensor data

Analyze user behaviour, deliver targeted notifications

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KURA ECLIPSE

open source Java and Application Framework for M2M Service Gateways in the Eclipse IOT Working Group.

It provides

- Cohesive and integrated app environment
- Modular software components
- HW abstraction layer
- Field protocol libraries
- Cloud connectivity
- Remote app and device management
- Local app and device management
- Built-in Security
- Development tools

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THANK YOU

Contact- siji@melabs.in

Twitter - siji_sunny

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