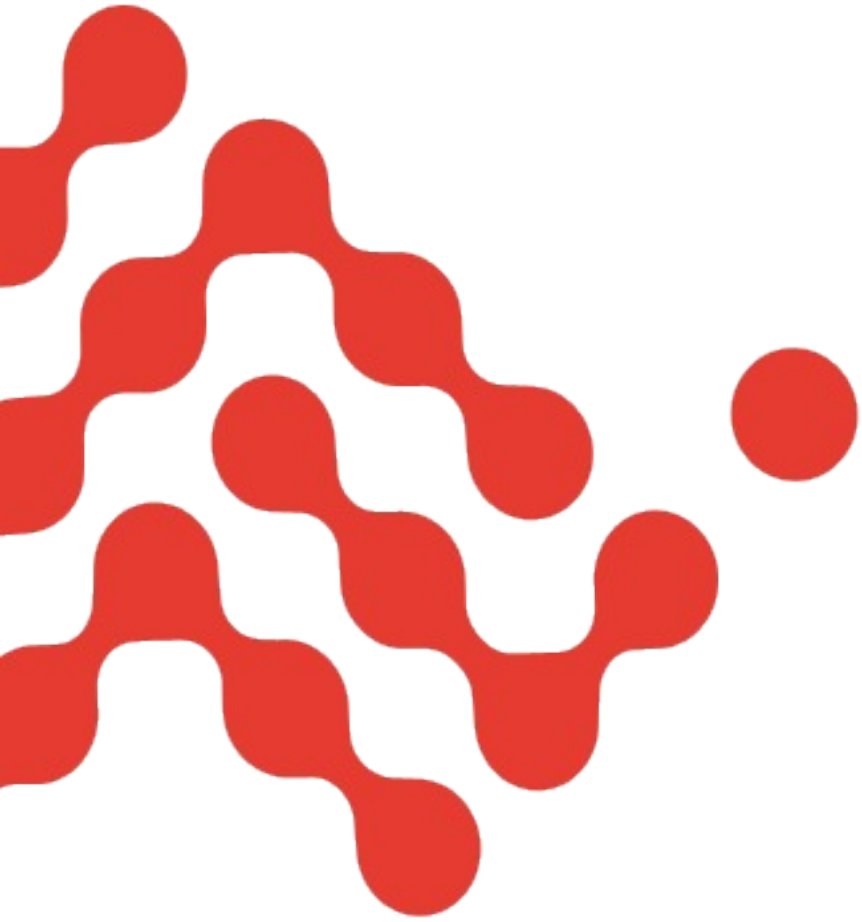
Open Source M2M at Eclipse
The Koneki Project

Eclipse Party Toulouse – June, 23rd 2011

Benjamin Cabé



Agenda

M2M?

M2M engineering… state of the union

M2M at Eclipse: Koneki

- What it is about
- What is available
- What you can expect
- **Demo!**

What's next / Get involved

Machine-to-Machine (M2M)

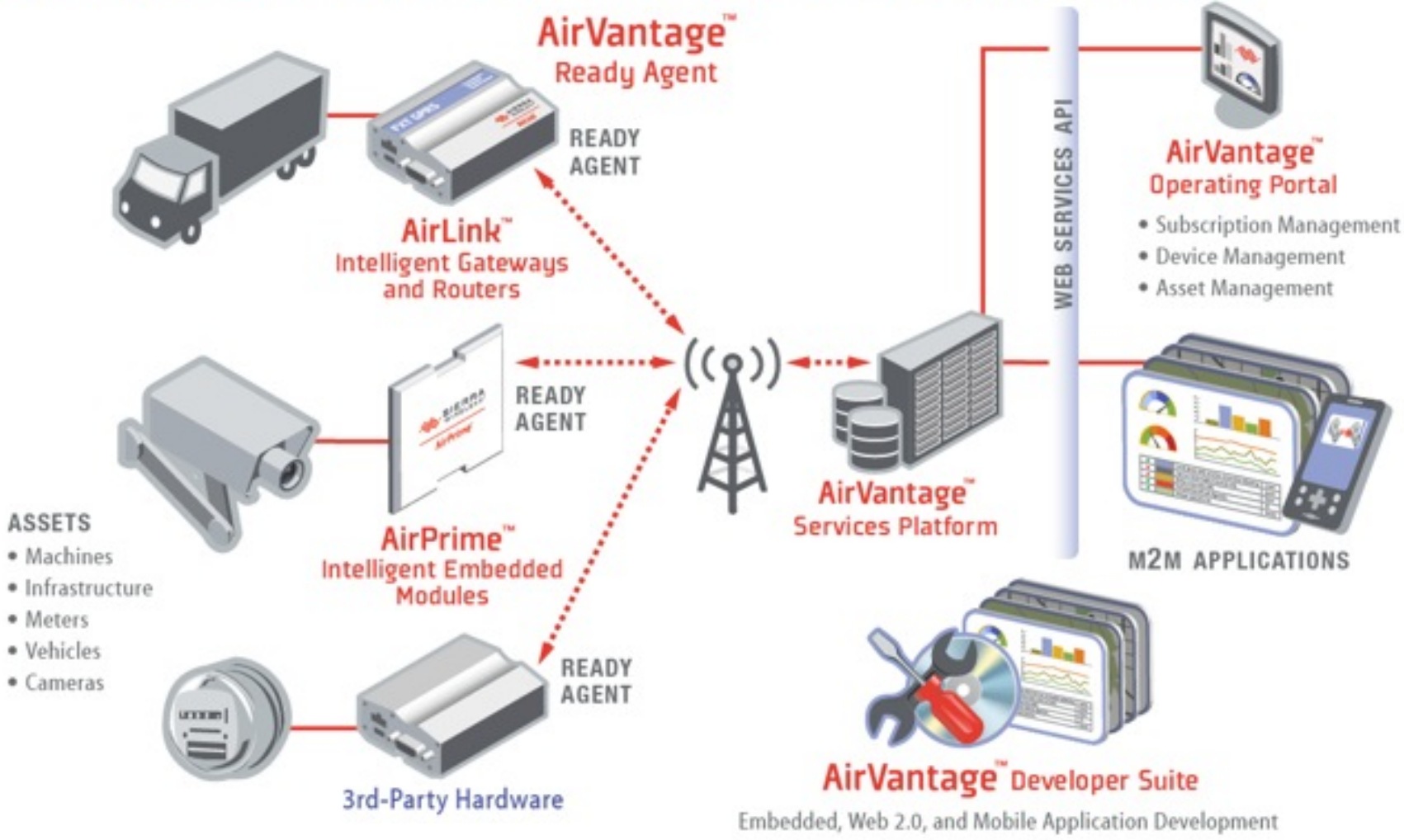
Wikipedia says:

> *[…] technologies that allow both wireless and wired systems to communicate with other devices of the same ability.*

M2M is everywhere!

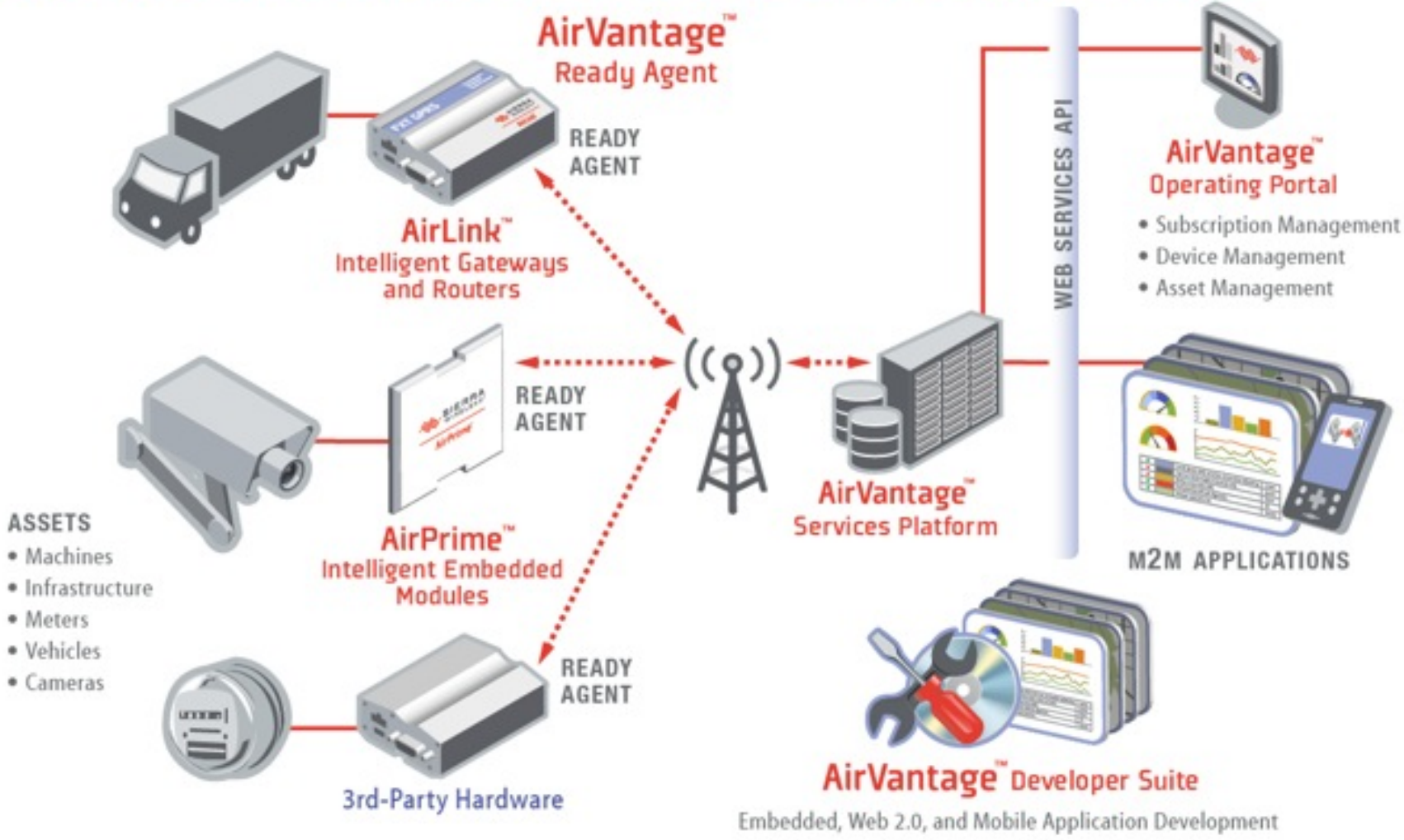
AirVantage Cloud Platform

Complete Solution to Build and Operate M2M Applications



AirVantage Cloud Platform

Complete Solution to Build and Operate M2M Applications




Fragmentation!

Heterogeneous hardware

And also…


TIME
DCF
SEC DATE ALARM ON
10:04
59
MON
11.28.05
IN
HUMIDITY
TEMP
68
%
RH
16.3
°C
HI AL
SENSOR:
MAX
OUT
TEMP
69
%
RH
18.3
°C
HI AL
PRESSURE HISTORY
PRESSURE
HI AL
1013.3
hPa
WIND
RAIN
TOTAL
HI AL
18.2
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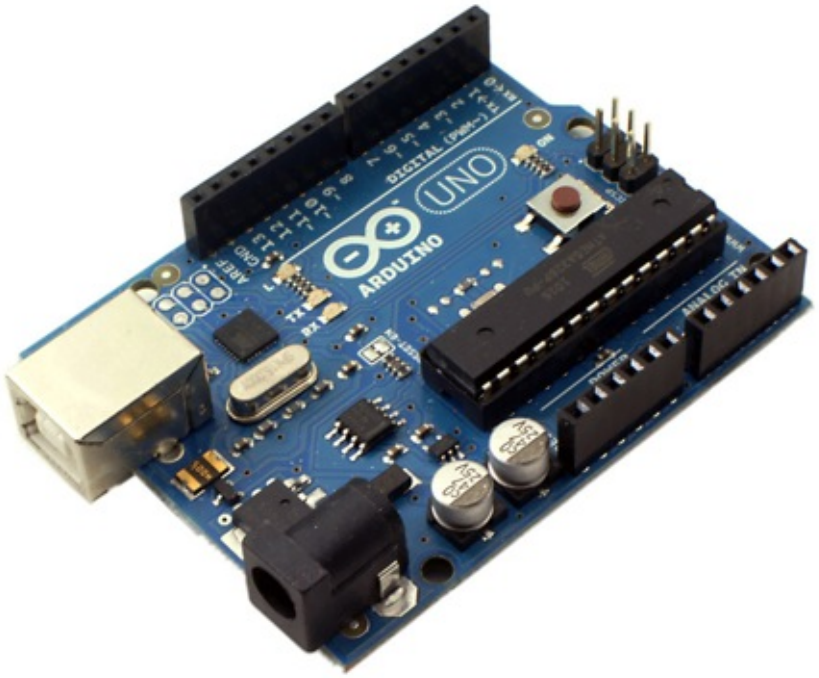
1038
mm
SET
+
HISTORY
ALARM
MIN/MAX


UNO
ARDUINO
DIGITAL (PWM~)

etc…

Heterogeneous OSes

iOS

SYMBIAN

WIND RIVER

montavista

OpenAT

NUCLEUS

android

MeeGo

QNX

Heterogeneous programming languages

C / C++

Shell script

Heterogeneous protocols

TCP
UDP
ICMP
SNMP
SMS
FTP
HTTP
…

Modbus
CAN-bus
Zigbee
X10
1 wire
…

XML & its derivatives
- (SOAP, binary XML, …)
- OMA-DM
- TR-069

JSON
MQTT
AWT-DA
Protocol buffers
…

Let's just top reinventing the wheel…

Every M2M solution provider ships its own « SDK »

Every M2M solution provider exposes its own APIs

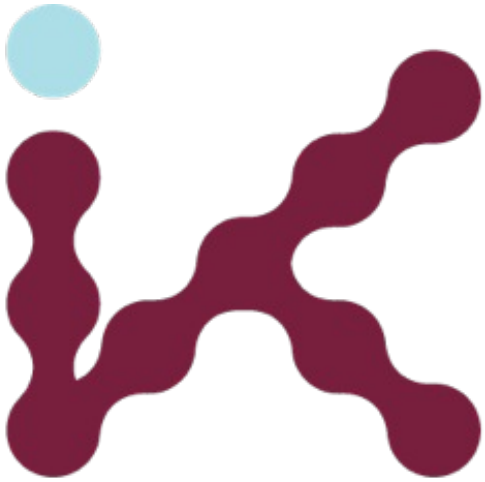
Every M2M solution provider relies on its own protocol(s)

… and create an Open Source initiative at Eclipse

Eclipse Foundation… why?

*— Eclipse is an open source community, whose projects are focused on building an **open development platform** comprised of **extensible frameworks**, **tools** and **runtimes** for building, deploying and managing software across the lifecycle —*

- All the infrastructure to « work in the open » (Wiki, source control, bug tracker, …)
- Governance
- IP management
- Strong ecosystem of industrial partners



koneki

Koneki project

Eclipse Technology project aiming at:

> *providing Machine-to-Machine solutions developers with tools easing the development, simulation, testing/debugging and deployment of such solutions*

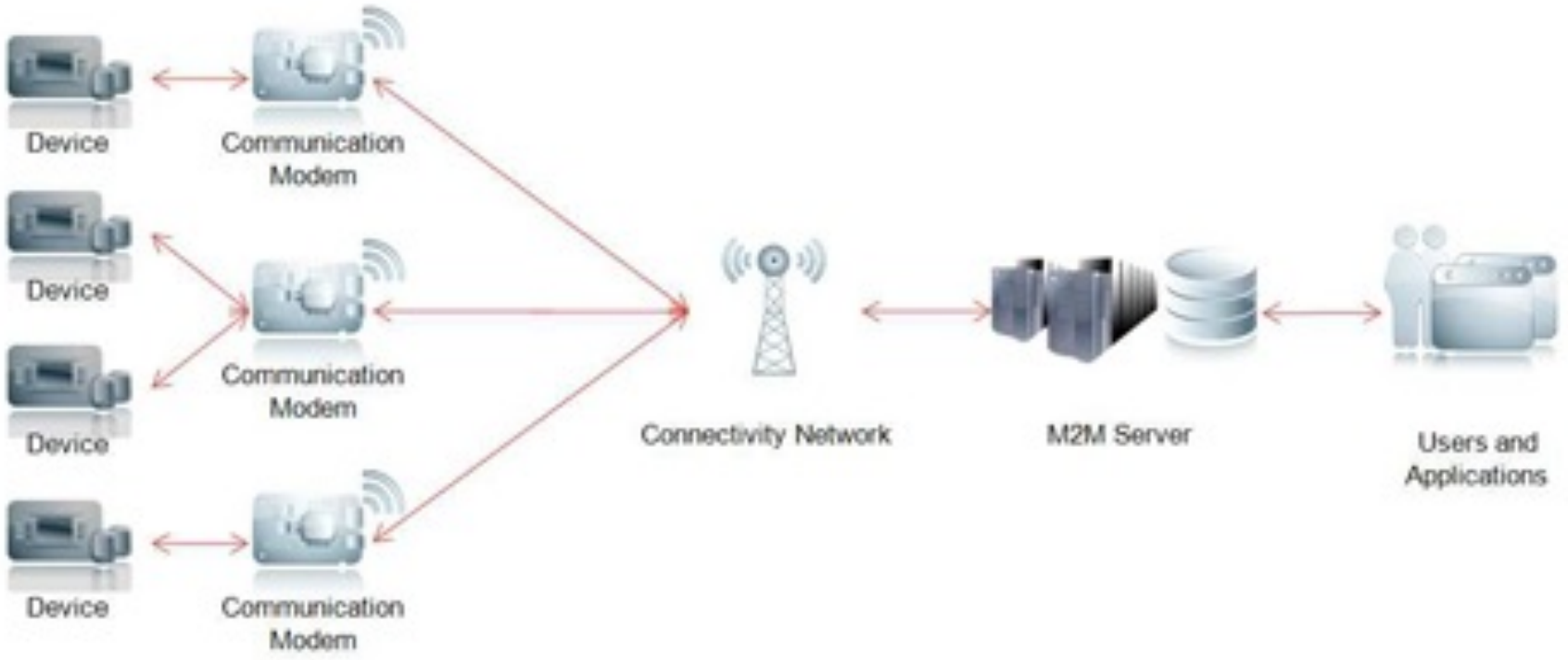
Koneki purpose

Provide extensible tooling for M2M developers

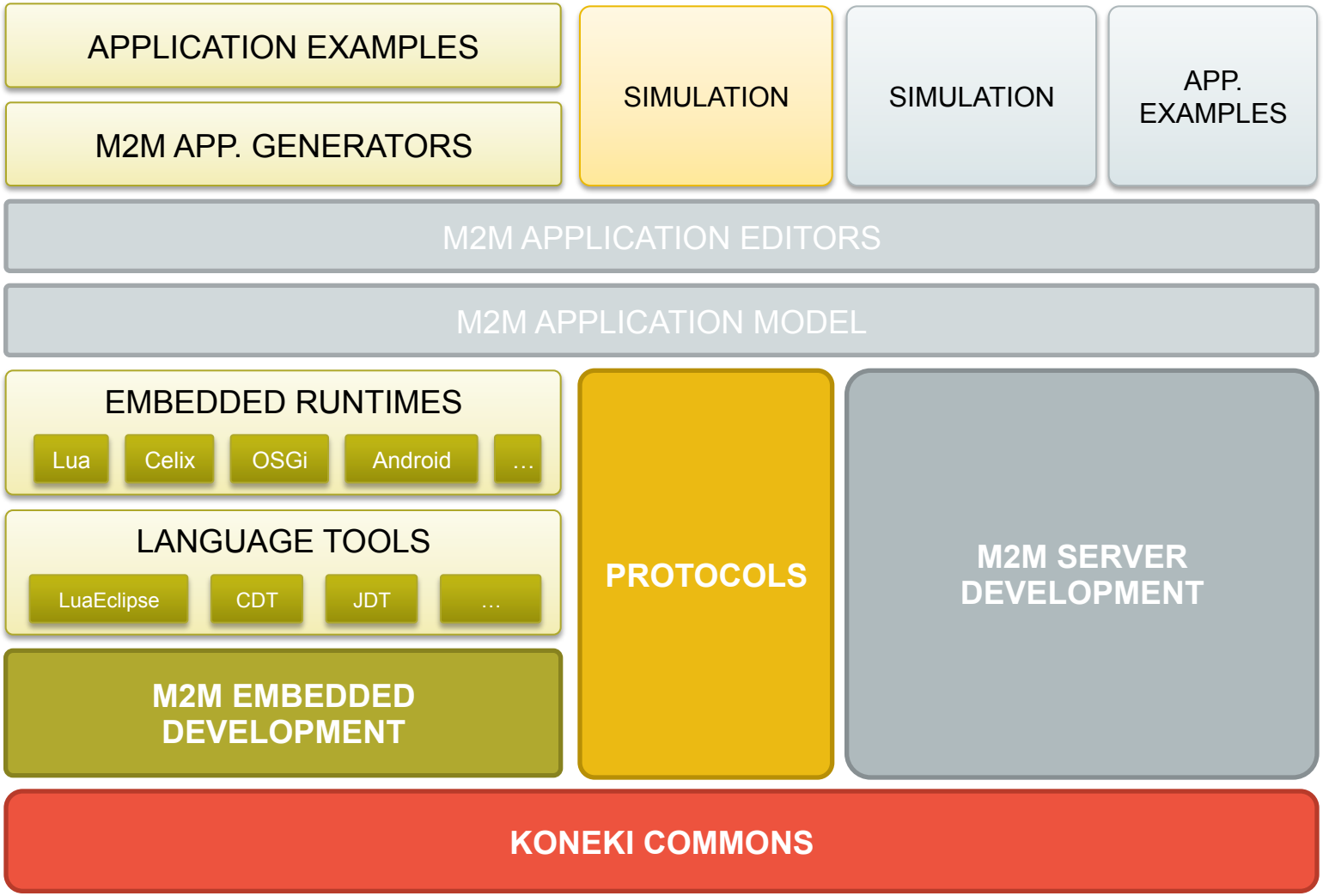
- M2M application model
- « Embedded » languages support
- M2M and industrial protocols support
- M2M Server simulation (OMA-DM, Asset Mgt, …)
- User assistance, examples

Provide an M2M embedded framework for Linux based devices

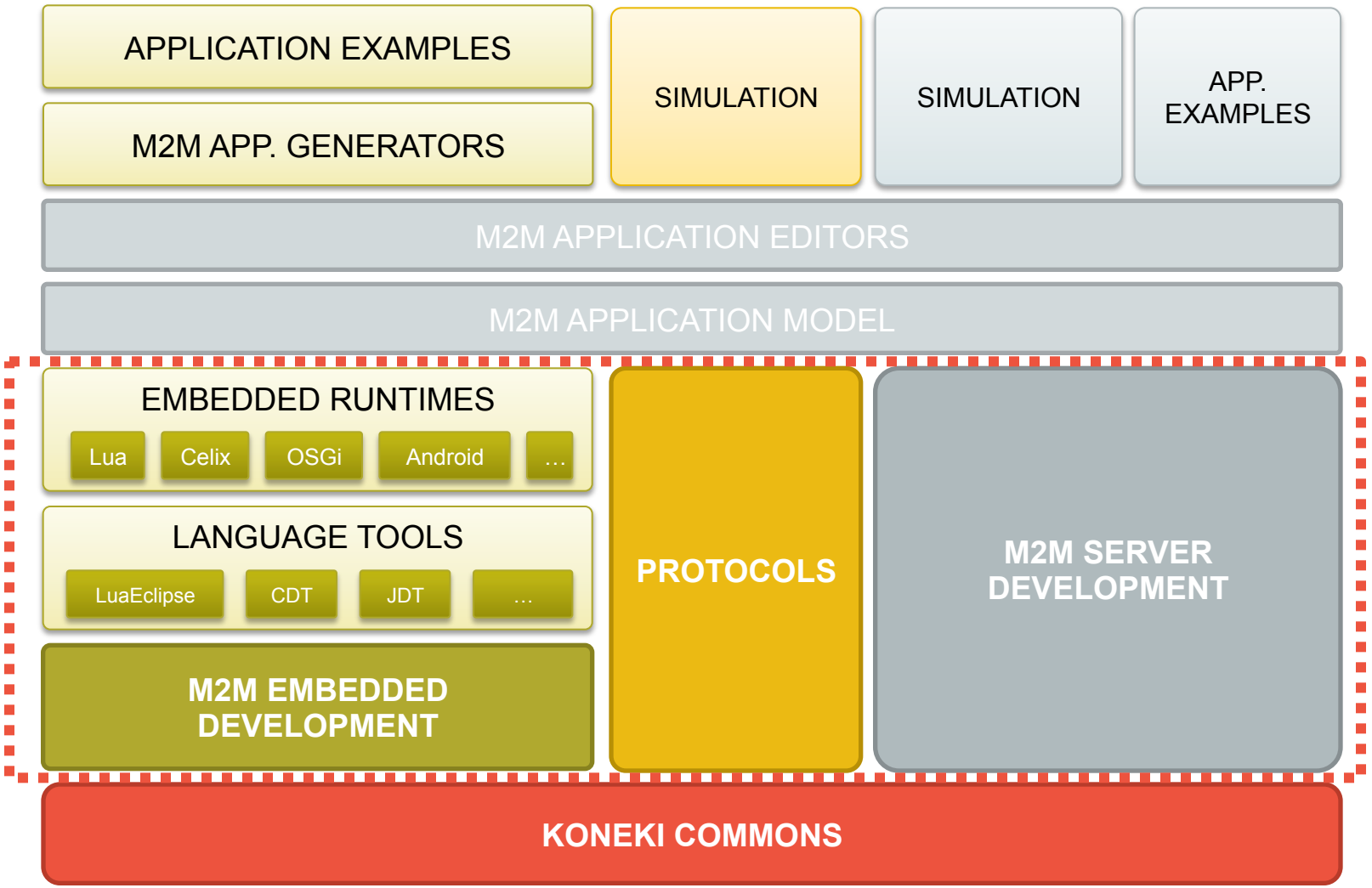
M2M end-to-end chain (simplified)



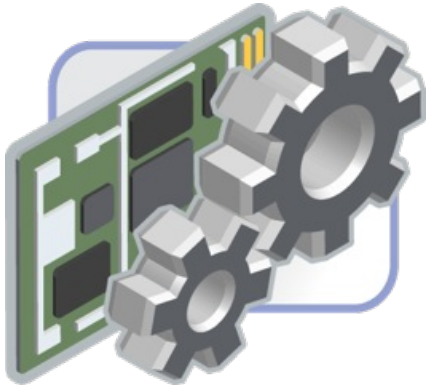
Koneki Overview



Koneki Enablers



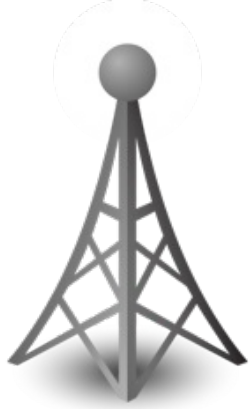
Embedded development



Eclipse already provides support great support for embedded development but Koneki will provide M2M specificities

- M2M runtimes/frameworks
  - Lua
  - OSGi
  - Android
- Target communication
- Application examples

Protocols manipulation



Koneki will provide common UI elements to:

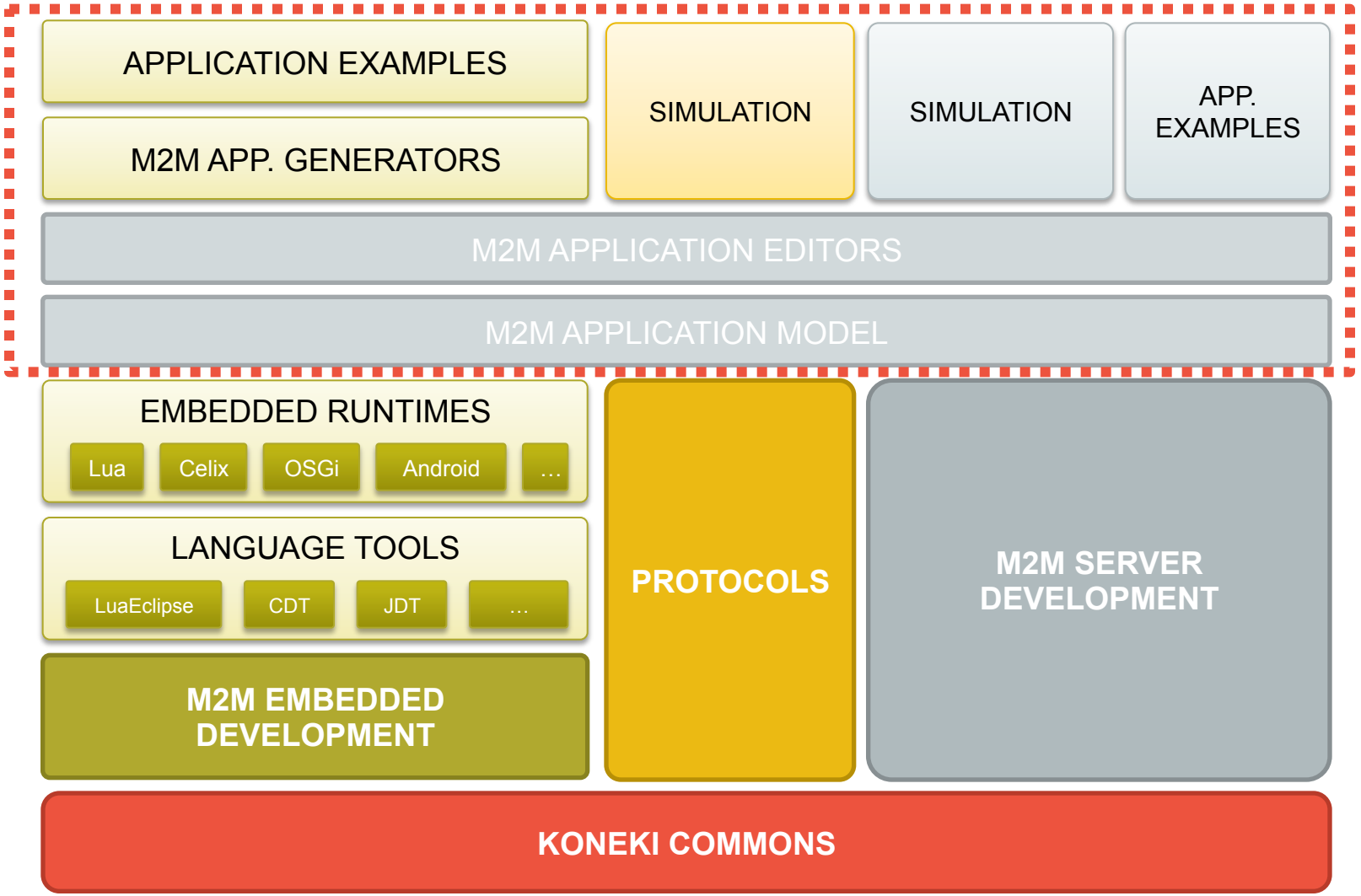
- Capture data frames and display them in a human-readable form
- Simulate complex communication scenarios
- Estimate bandwidth consumption

M2M Server Development

Smoothly integrate M2M servers into the IDE

- Perform administration tasks
- Discover server capabilities
- Simulate server behaviour

Koneki M2M application model



A model to rule them all?

Describe the **interfaces** of an M2M application:

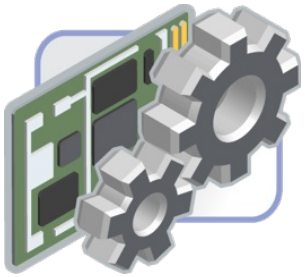
- Communication capabilities
  - Protocol, connection interval
- Manipulated data / events
  - Name, unit, description, archiving policy
- Configuration parameters
- Application packaging / Software update capabilities

Optionally

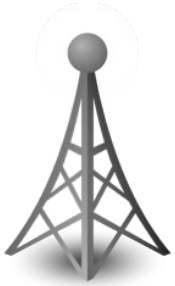
- Describe the **behaviour** of the M2M application

Code generation rules!

APPLICATION MODEL



Embedded application
Unit tests
Documentation



Communication simulation
Bandwidth use estimation

Web application
Smartphone widget
Gadget
…


Demo!

Roadmap overview

Q3 2011

- Call for community participation to define an M2M application model
- Improve Lua Tooling: LuaRocks, Luadoc, debugging/tracing

Q4 2011

- M2M server simulation infrastructure
- OMA-DM simulator (based on OSGi spec)
- Lua Tooling component to be moved to its own Technology project

Q2 2012

- First release of an usable « end-to-end » M2M IDE

Community feedback

Great interest at EclipseCon US

Eclipse tooling vendors interested in having a common programming model for embedded

M2M actors interested in establishing a reference IDE

How about you?!

Thank you!

http://www.eclipse.org/koneki

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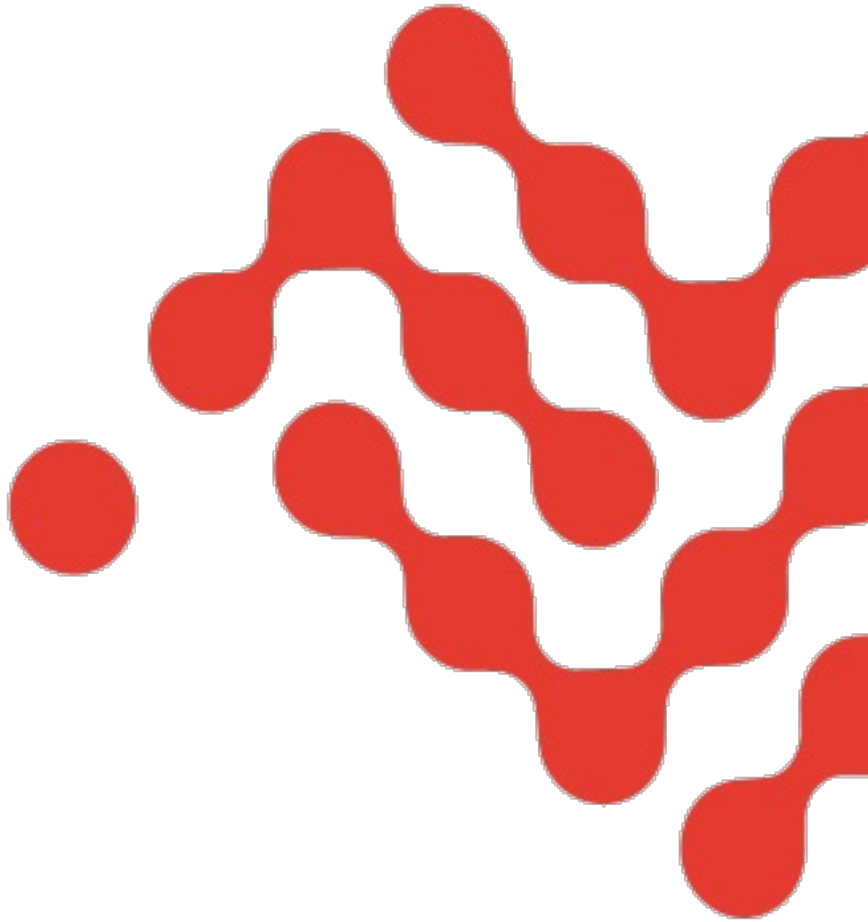
@kartben



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