Mihini

An open-source framework for M2M development

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Who I am

- **Benjamin Cabé**
- Open Source guy at Sierra Wireless
- Long-time Eclipse lover

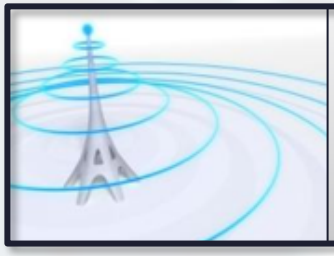
SIERRA WIRELESS™

Sierra Wireless

A leading provider of Mobile Computing and Machine-to-Machine cellular wireless solutions

Founded in 1993
Experienced leadership
Approximately 900 employees worldwide

Broad range of high performance hardware & software solutions



Proven innovator in new wireless technologies, embedded systems and end to end solutions

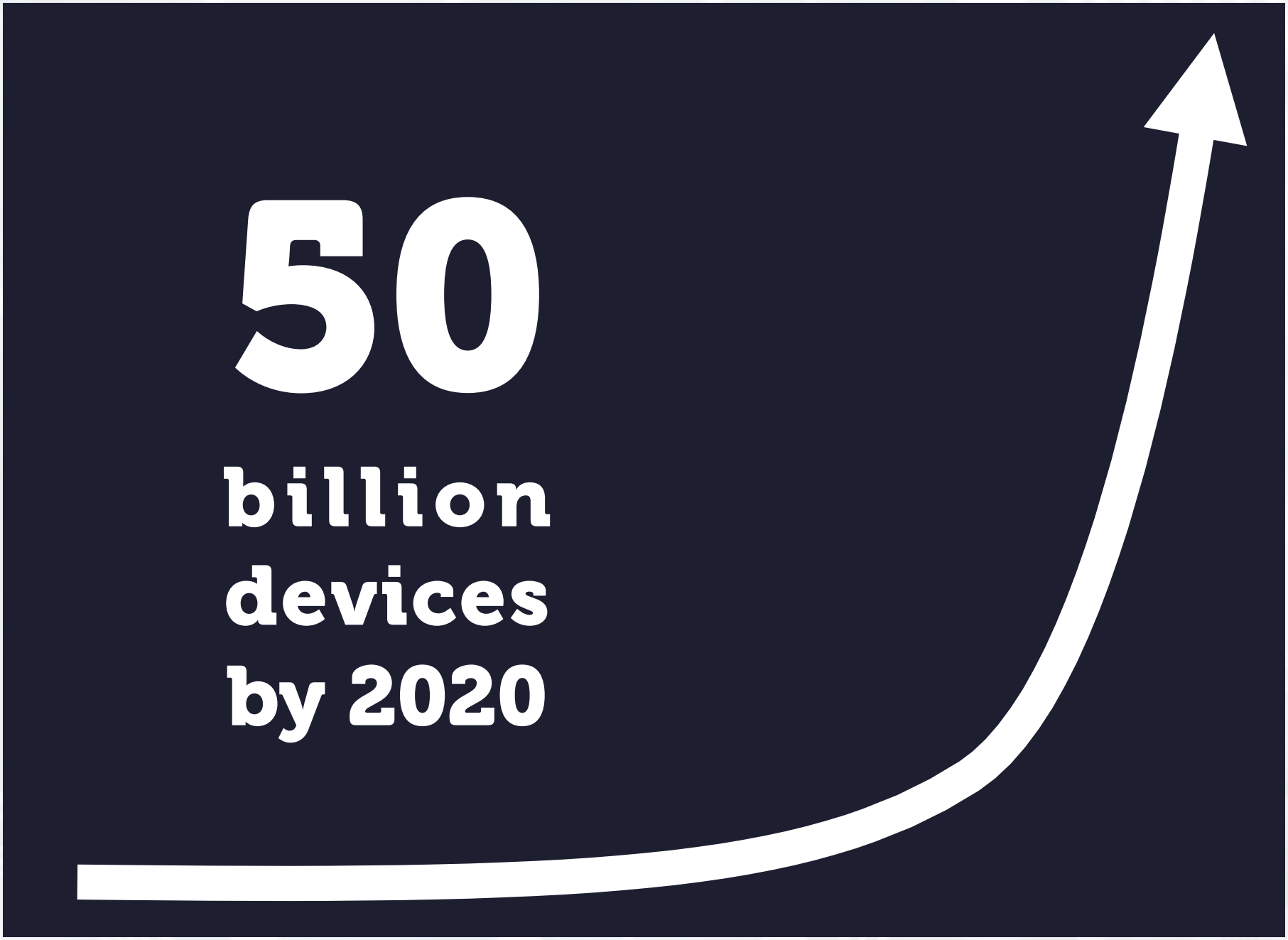
Annual Revenue
$650 million

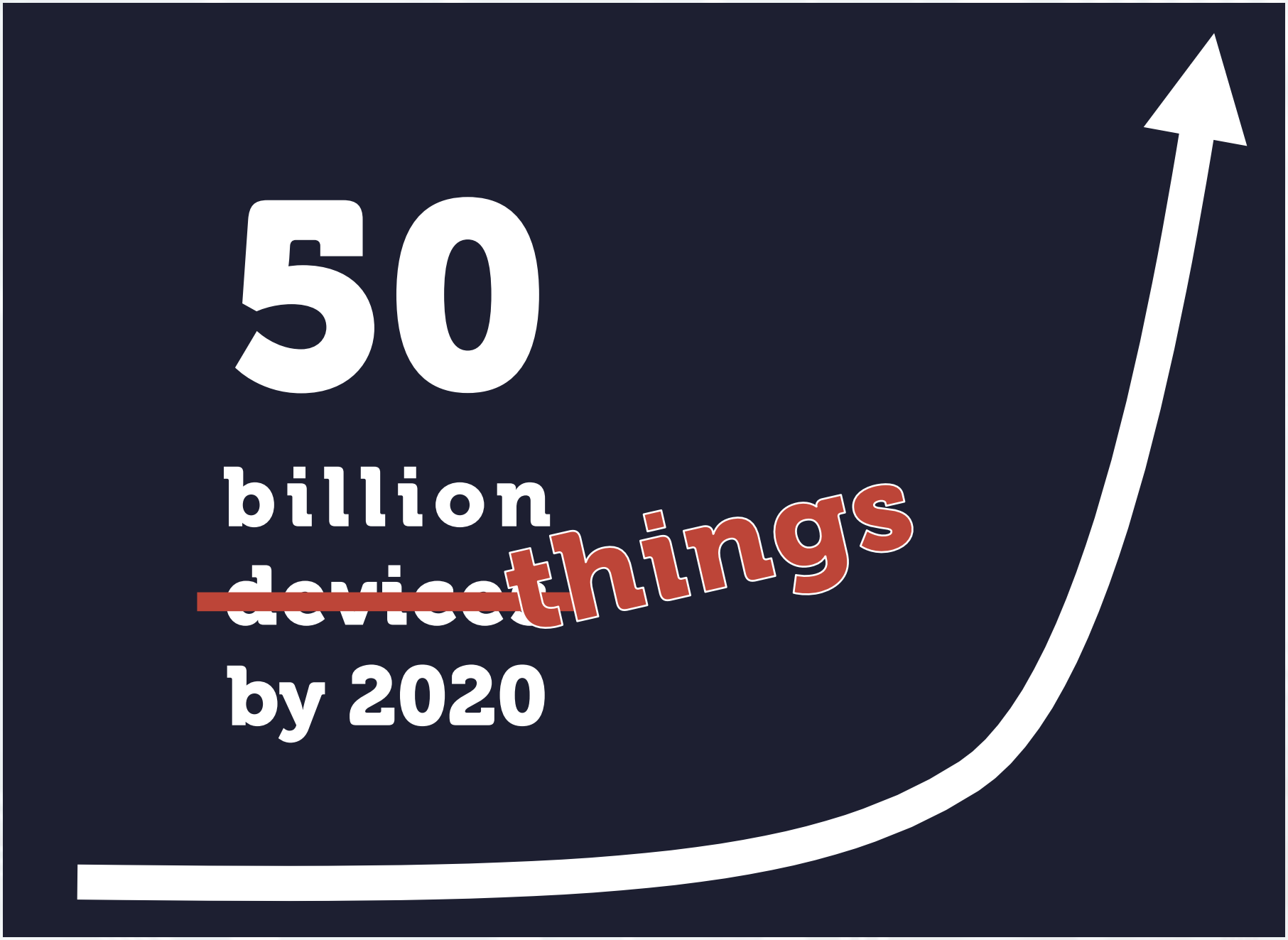
Strong global presence.
HQ in Vancouver, Canada
R&D on three continents

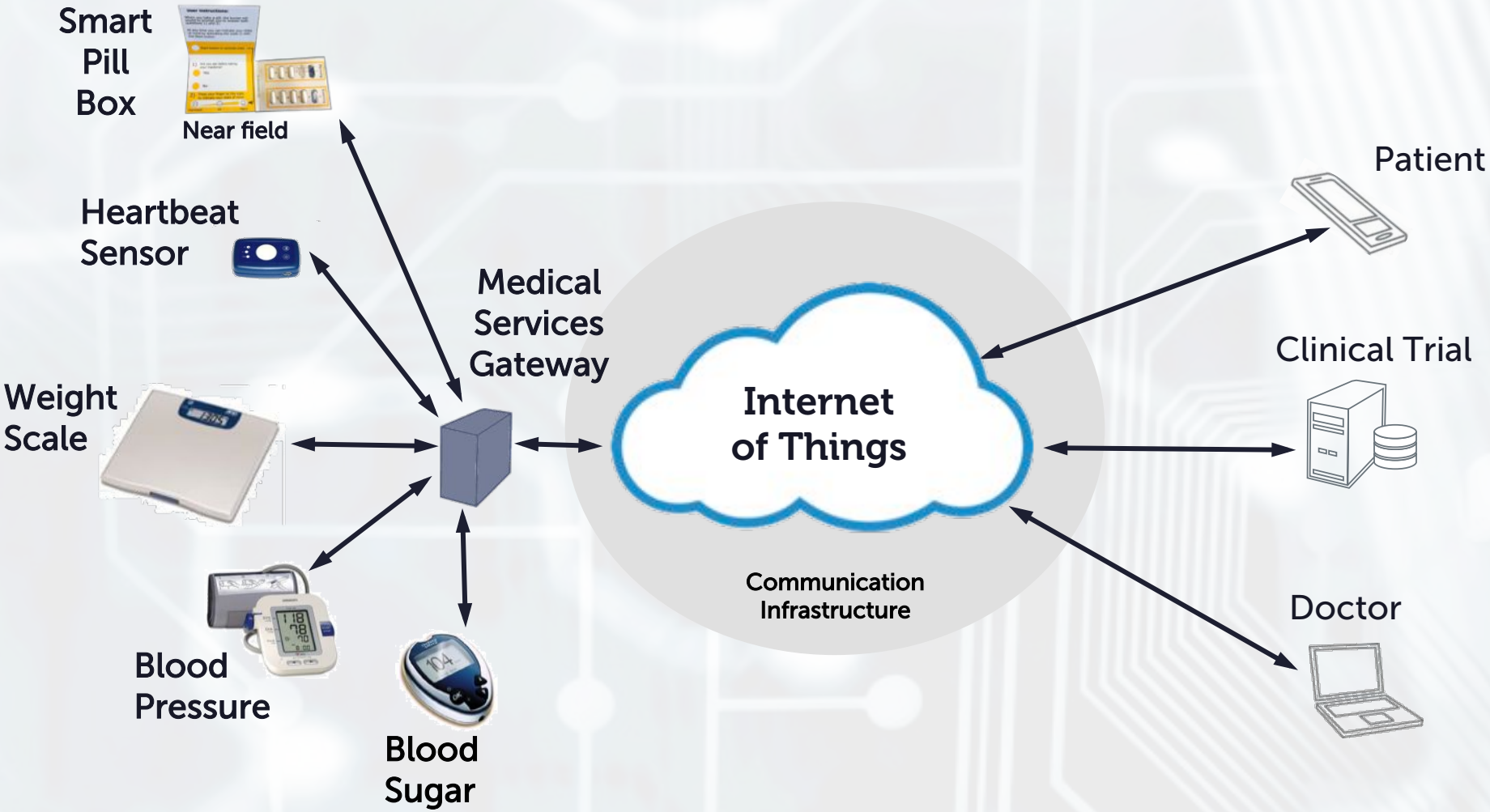
NASDAQ
TSX

What is M2M?

> Technology that supports wired or wireless communication between devices


50
billion
devices
by 2020

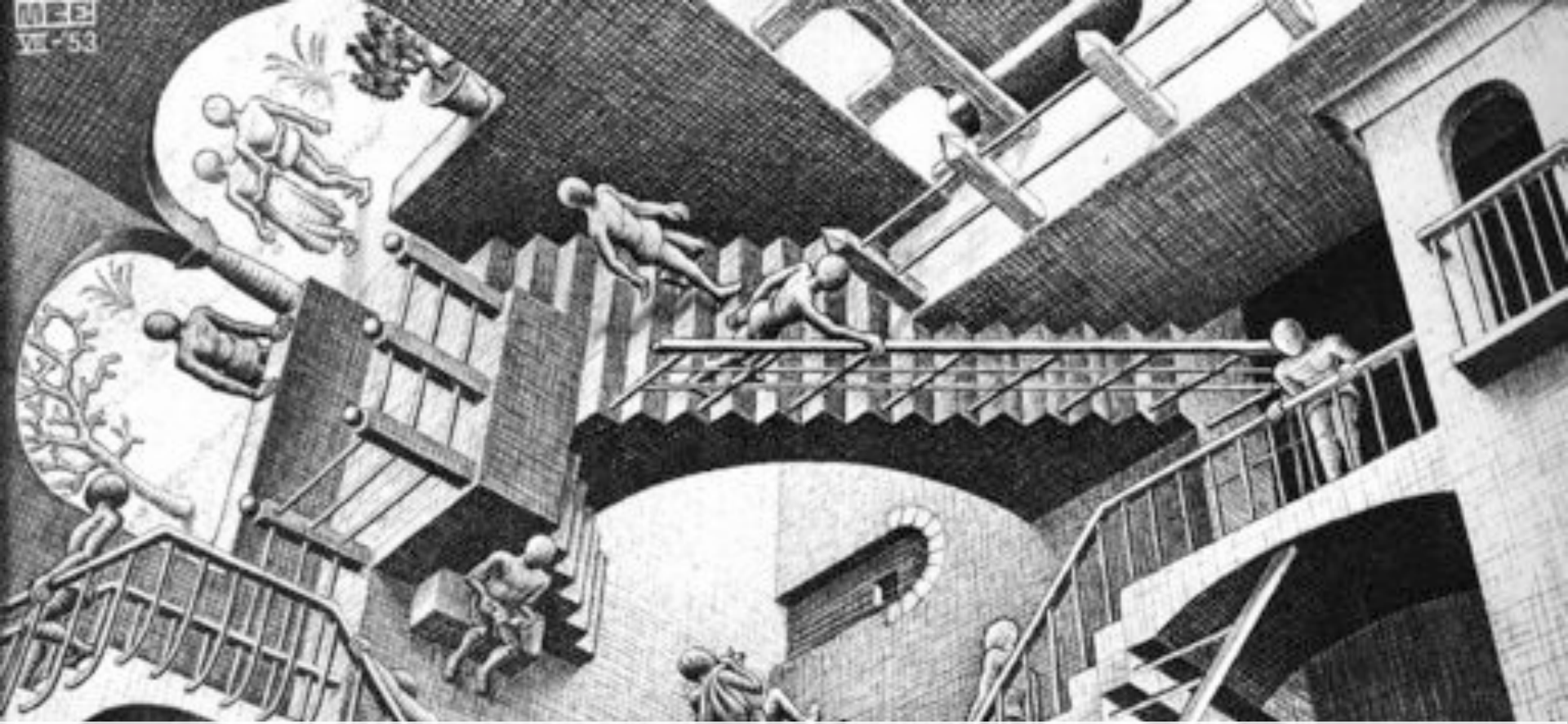

50
billion
~~devices~~ things
by 2020


Smart
Pill
Box
Near field
Heartbeat
Sensor
Weight
Scale
Medical
Services
Gateway
Internet
of Things
Communication
Infrastructure
Patient
Clinical Trial
Doctor
Blood
Pressure
Blood
Sugar

Ready then?


...Not quite!

M2M market = fragmented



M2M development = complex

M2M vendors
= lock-in

open source?

Axeda

BANDXI INTERNATIONAL

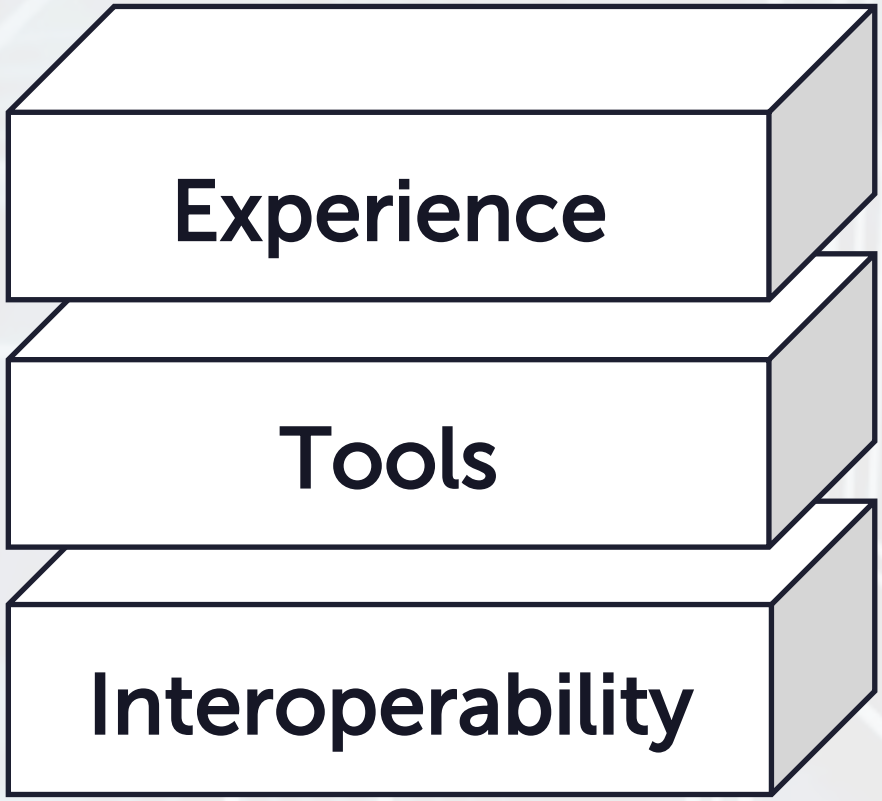
Cirrus Link SOLUTIONS

EUROTECH
Imagine. Build. Succeed.

IBM

SIERRA WIRELESS

3 pillars



3 projects

Framework	mihini
Protocols	paho
Tools	koneki

mihini

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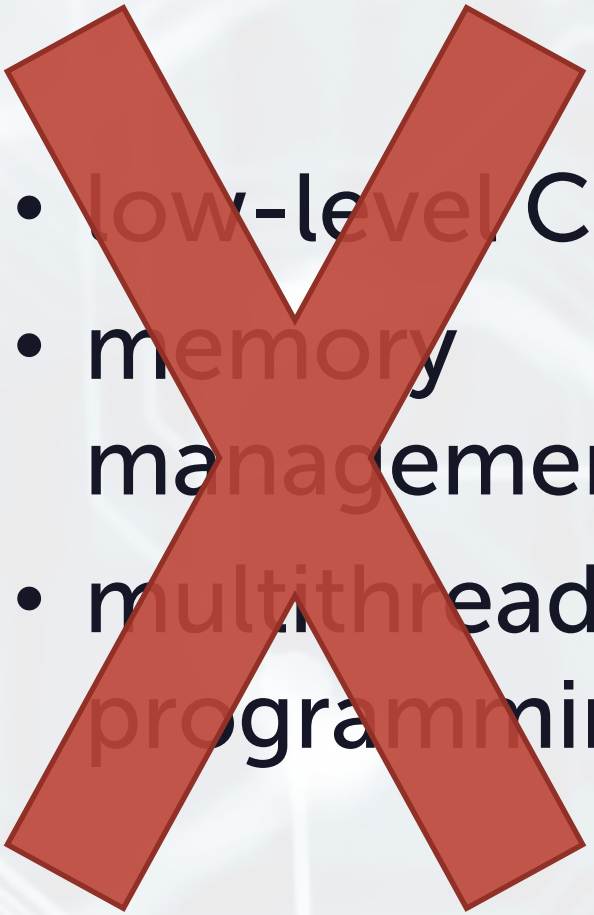
framework

I/O manipulation
data consolidation
application management
dev-friendly API

Before Mihini

- Proprietary “OS”
  - No consistent HW access layer across Sierra product line
  - No POSIX API
- Applications written in C
  - Learning curve
  - Compilation and debug are complex

M2M programming



- low-level C
- memory management
- multithreaded programming

- read sensor values
- control actuators
- consolidate data
- communicate

Example: Sending an SMS

```
int main()
{
    unsigned char char1[10];
    unsigned char char_buf[8]="AT+CSQ\n";
    // unsigned char sms_buf[20] = "AT+CMGS="xxxxxxxxx";

    int wc_fd;
    /******** Init of serial port **********/
    wc_fd = init_wc(wc_fd);
    sleep(3);
    //writing to serial port
    write(wc_fd,char_buf,sizeof(char_buf));
    usleep(40000);
    //reading from serial port
    read(wc_fd,char1,sizeof(char1));

    sleep(2);
    close(wc_fd);

    return 0;
} // end of main

// initialization of serial port

struct termios options;

ttys5_fd = open("/dev/ttyS5", O_RDWR );
if (ttys5_fd &lt; 0)
{
    printf("\nFail to open serial port 2\n");
    return 0;
}
```

```
sms.send(
    '+33612345678',
    'My SMS',
)
```

Simplify M2M programming

- powerful
- fast
- lightweight
- embeddable
- scripting
- C integration

Lua is also…

- A vibrant community
- A rich ecosystem of libraries
- A closed development model

koneki

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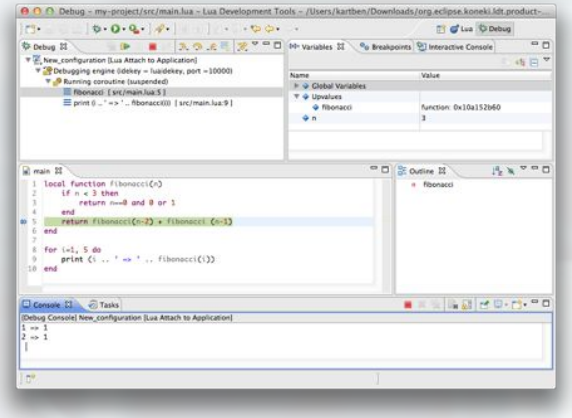
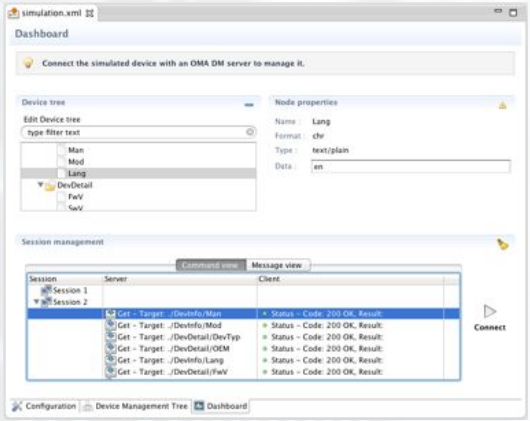
tools

develop
simulate
debug
deploy

koneki



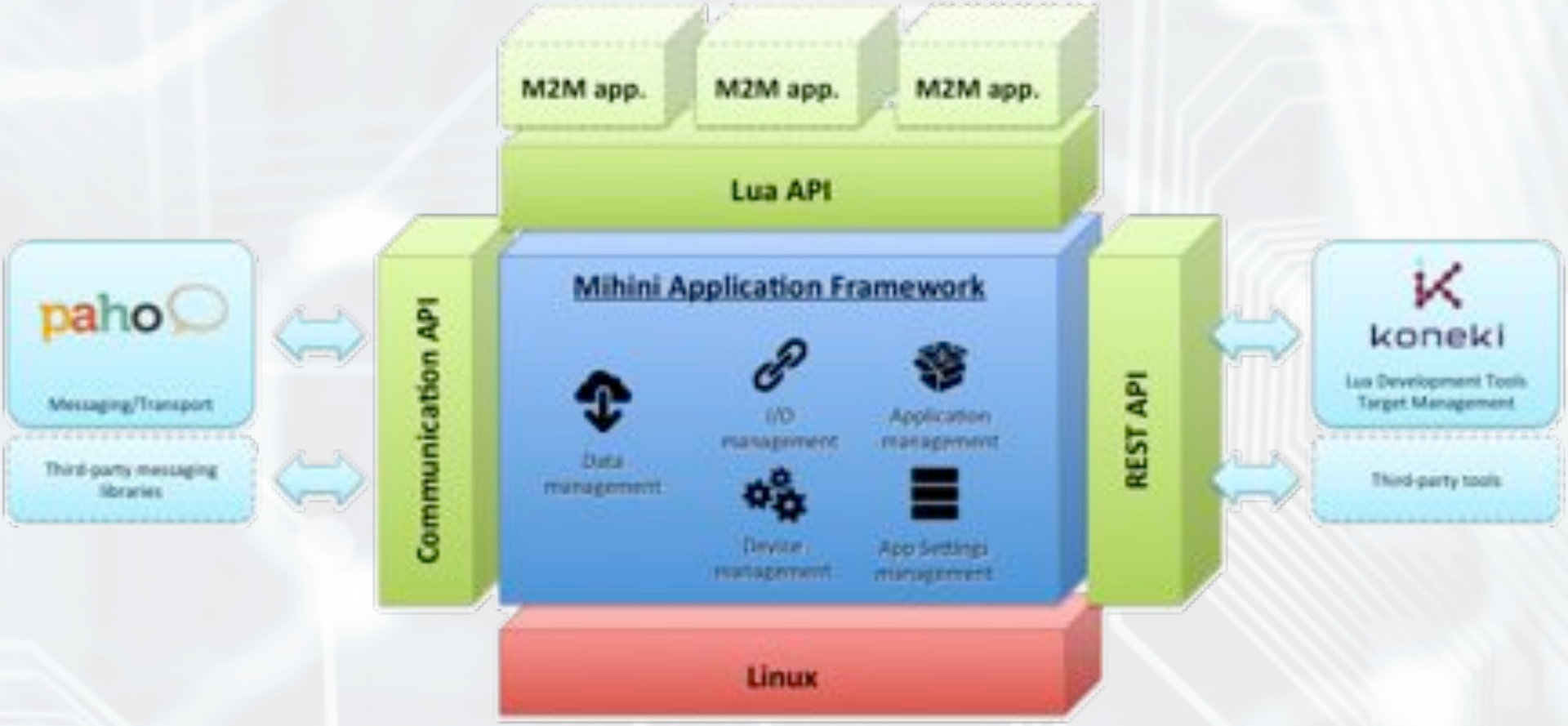
Lua Development Tools



OMA-DM Simulator

Next: Mihini tooling, M2M modeling

Mihini architecture overview



Moving to Eclipse Fdn?

- Community
  - users
  - contributors/committers
  - adopters
- Governance
- IP framework
- IT resources

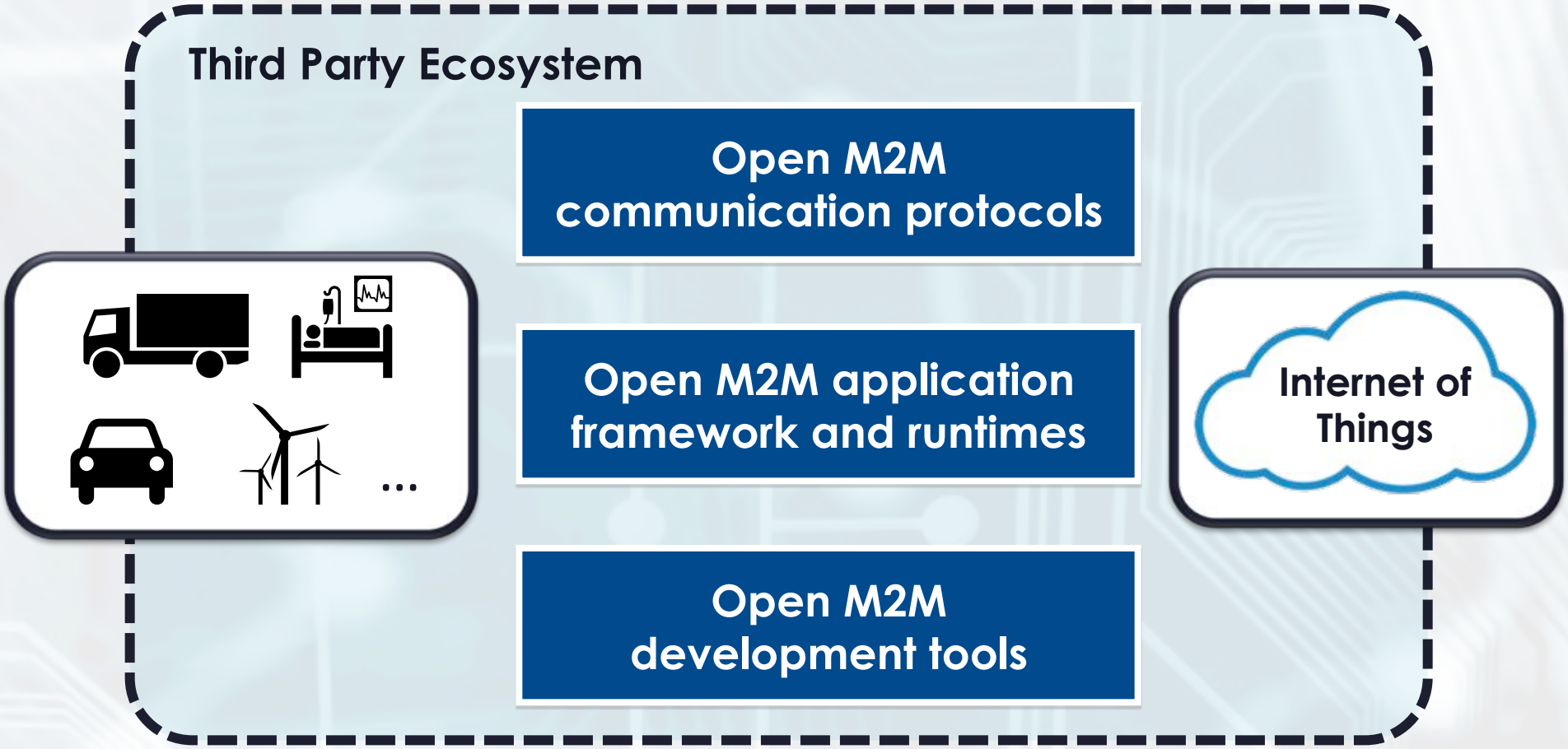
Building a community

- Going open source is also a way to
  - simplify developer experience
  - grow a community
  - enable innovation (see open H/W hobbyists)

M2M Developer Kit

M2M Developer Portal

New business models



H/W differentiation

- ruggedness
- radio certification
- add-ins
- services

S/W differentiation

embedded	server
industrial protocols	24/7
power optimization	3rd party services
development tools	security
vertical applications	billing
real-time	carrier integration
professional services	professional services
...	...

Wrap-up

- A complete M2M stack
  - embedded framework
  - comm. protocols (client and server)
  - tools
- An open collaboration model
- A de-facto standard M2M platform for enabling new businesses

Join us!

m2m

eclipse.org