Extending the reach of business agility - connecting people, places and things

Industry Challenge: leverage expanding connectivity for smarter business processes

We now have the ability to measure, sense and monitor nearly anything in the physical world

People, systems and objects can communicate and interact with each other in entirely new ways

Exponential growth of smart devices and wireless connectivity presents an opportunity

1 billion

In 2010, it is estimated there will be one billion transistors for each person on the planet.[1]

30 billion

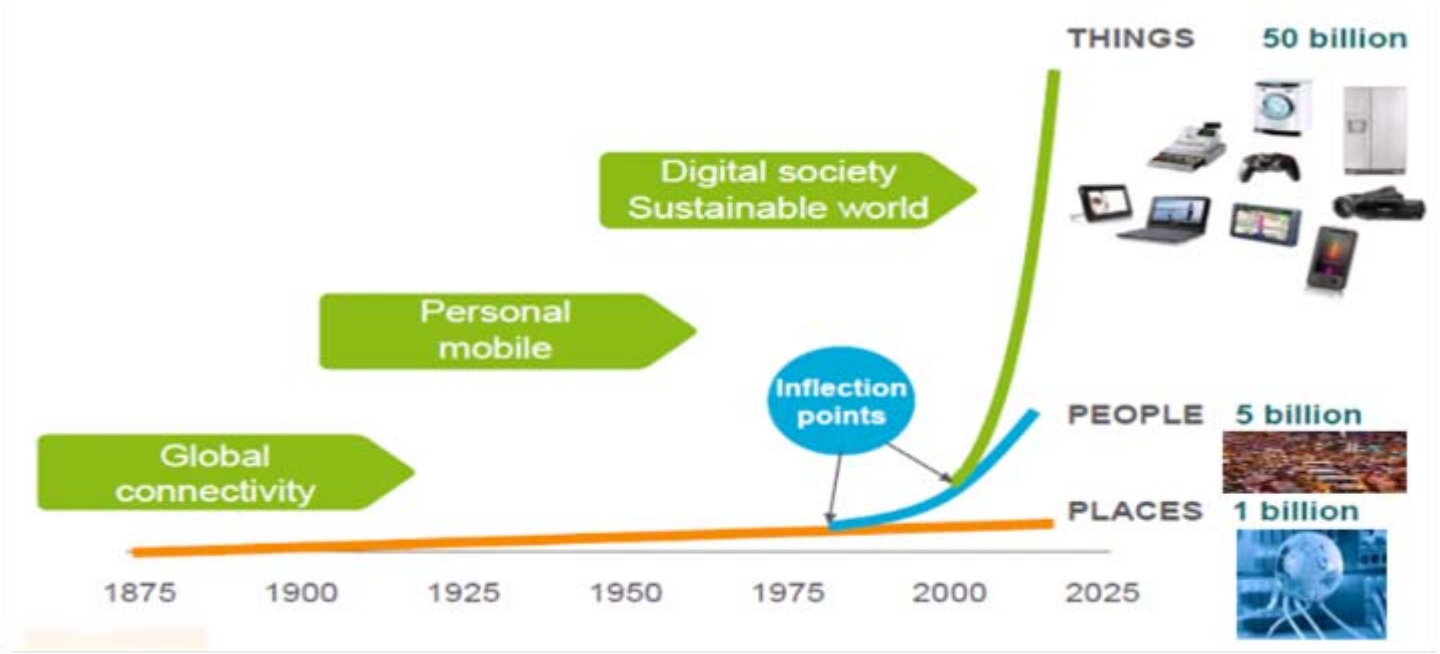
In 2010, the number of RFID tags embedded into our world and across entire ecosystems is estimated to reach 30 billion.[2]

3.4 million

In 2012, 3.4 million senior citizens will be using sensor-based healthcare monitoring solutions at home in the U.S.[3]

50 billion

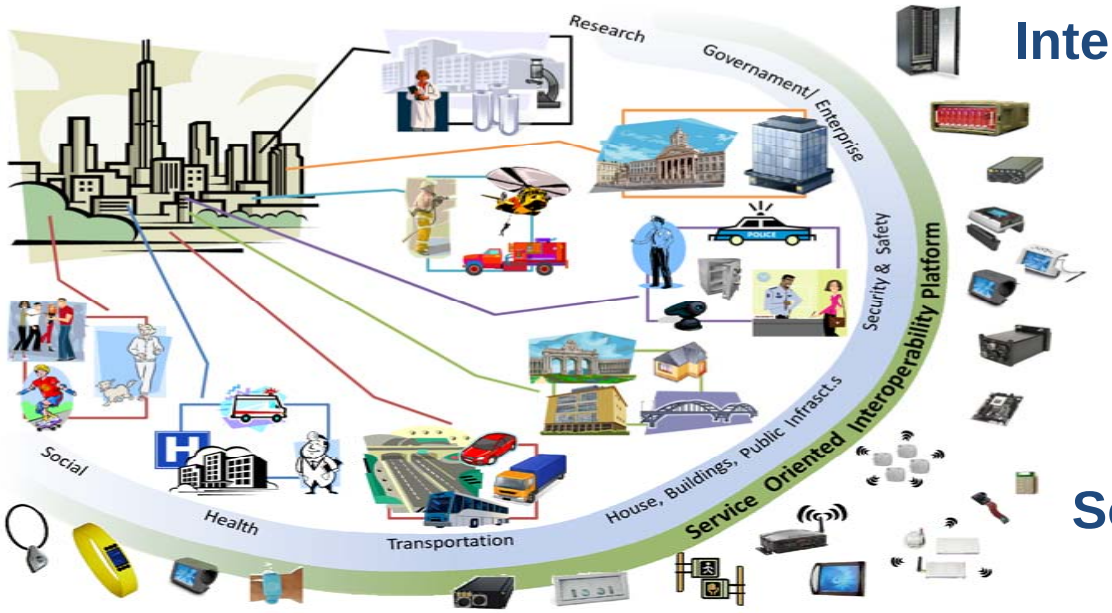
In 2020, the number of connected physical world devices, fueled by a 1000x increase in wireless broadband traffic.[4]



Source: Ericsson AB, "Infrastructure Innovation - Can the Challenge be met?," Sept 2010

[1] Smart Planet Op-Ad, 2008
[2] Sam Palmisano speech, November 12, 2008
[3] Parks Associates "Connected Medical Devices: Analysis and Forecast," 1Q08
[4] Ericsson AB "Infrastructure Innovation - Can the Challenge be met?," Sept 2010

Enabling new solutions



Internet of Things

Smarter Planet

Social business

- **Connectivity challenges**
  - **Lightweight protocols able to bridge to real world settings and deal with lossy constrained networks**
  - **Integration across domains and with existing business solutions**

- **MQTT reliable scalable messaging for constrained networks**
  - **Developed by IBM and Eurotech in 1999, refined and proven since then**

A Smarter Approach… expanding the community

...What's new?

M2M industry working group at Eclipse Foundation

- Industry group to broaden awareness for solution capabilities
  - Growing and scaling device connectivity solutions with open source tools, frameworks and runtimes
- November 2 announcement by Eclipse and Sierra Wireless
- IBM and Eurotech founding members

M2M open source project seeded with messaging technology

- Enable next generation of M2M connected solutions for web, embedded and business developers
- Promote creation of highly scalable messaging technology
- IBM MQTT client contribution
- Eurotech framework contribution

MQTT solution examples

Home pace-maker monitoring solution

Home monitoring appliance publishes diagnostics to health care provider through patient home connection

- ***Enabled*** *higher level of patient care, early diagnosis of problems, peace of mind*
- ***Improved*** *administrative efficiency and maintenance*
- ***Helped*** *conform to standards and eased integration of data*

Intelligent Utility Network offering

Smart home meters monitor and control usage from central location through mobile network

- ***Enabled*** *daily energy savings of 15-20%*
- ***Improved*** *peak usage and avoided over charges*
- ***Helped*** *optimize energy grid use*

Personal messaging for mobile subscribers from Facebook

https://www.facebook.com/notes/facebook-engineering/building-facebook-messenger/10150259350998920

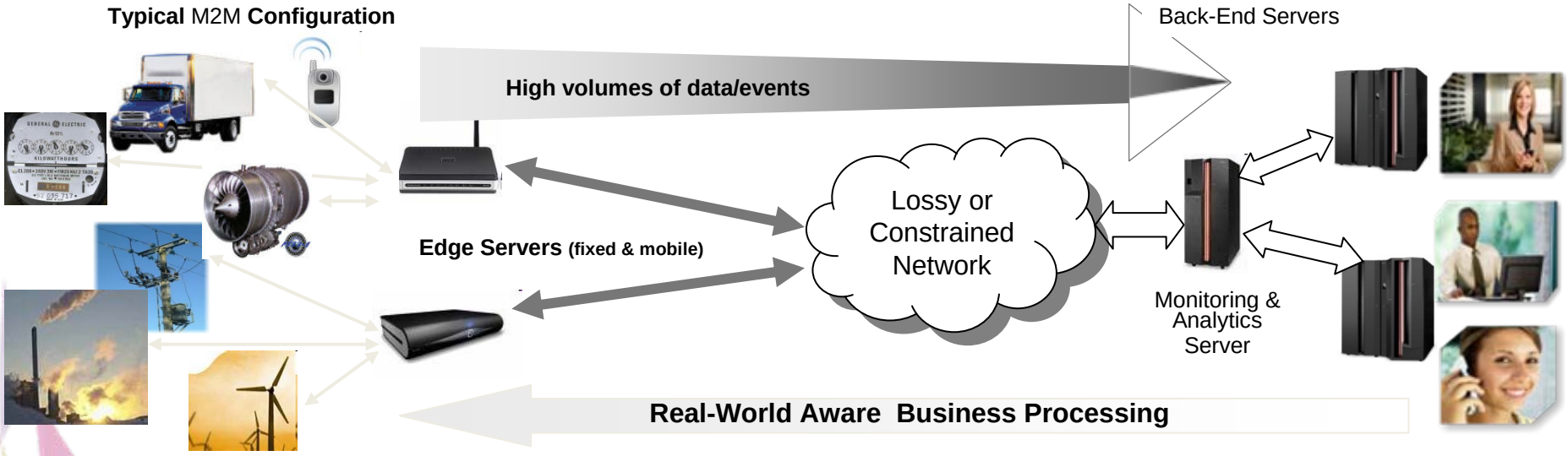
- ***Enabled*** *reliable communications between individuals*
- ***Improved*** *delivery times over low latency connections*
- ***Helped*** *improve mobile battery life*

MQTT: Technology To Address the Challenge

Designed for intermittent/inconstant connectivity, bandwidth constraints.

Scalable messaging model for high volume, distributed web applications

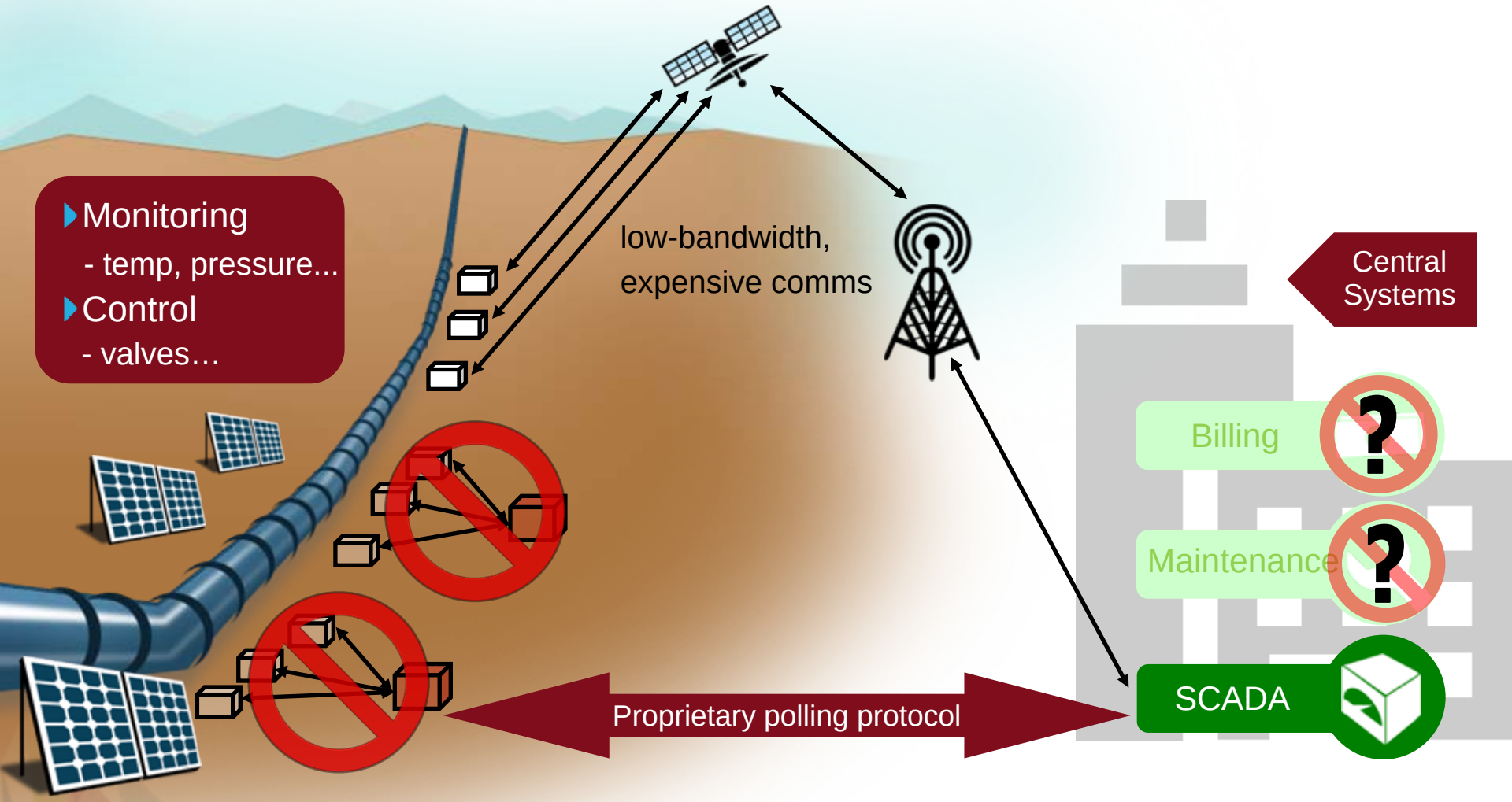
Bi-directional messaging supports “closed loop” business processing



Bridge reliable networks over disparate wireless networks

Extending the reach of application, service and information delivery

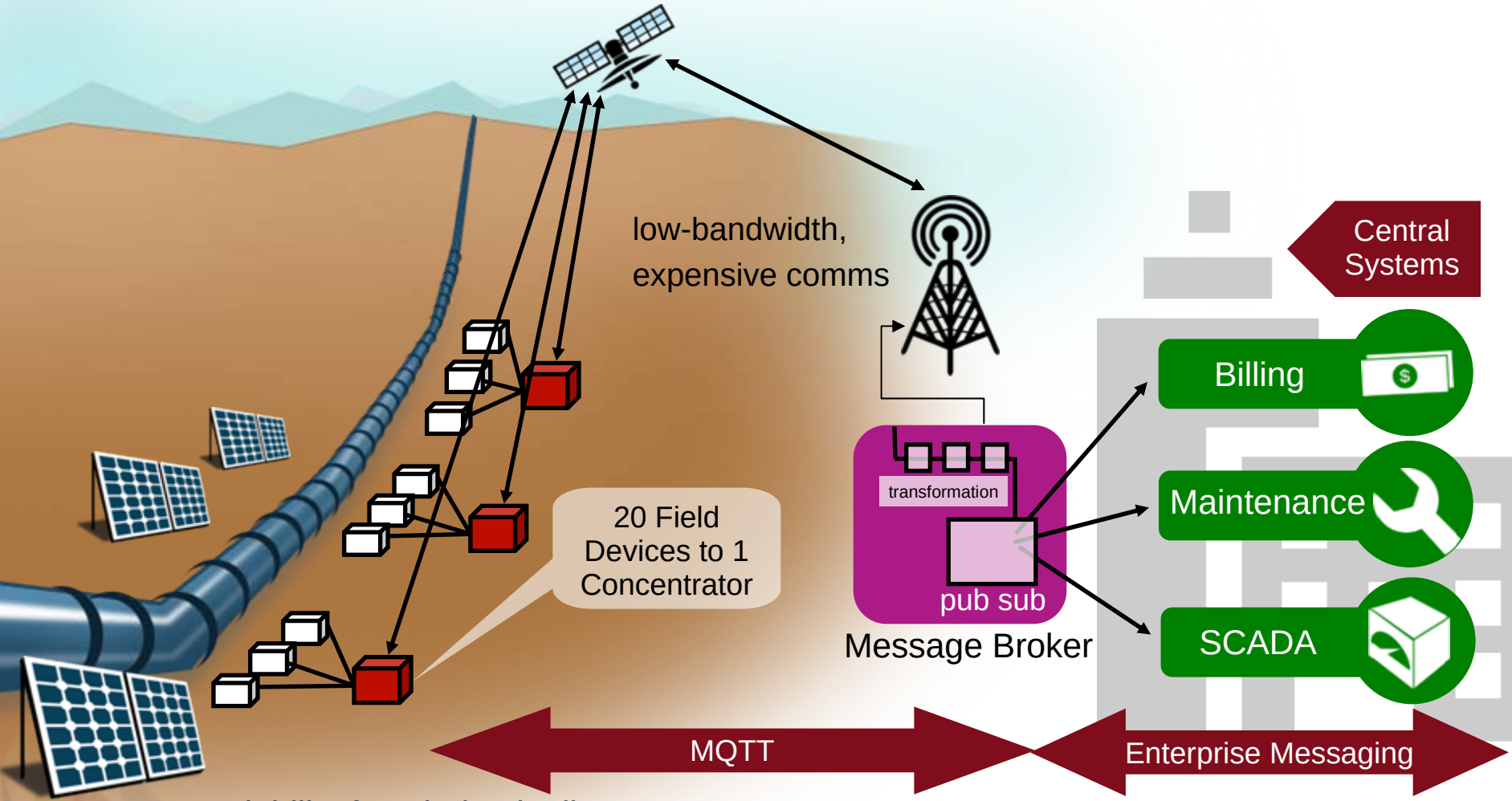
Real world integration challenges



4000 devices integrated, need to add 8000 more BUT:

- Satellite network saturated due to polling of device
- VALMET system CPU at 100%
- Other applications needed access to data ("SCADA prison")

Enterprise to physical world solution with MQTT



- Scalability for whole pipeline!
- Network traffic much lower - events pushed to/from devices and report by exception
- Network cost reduced
- Lower CPU utilization
- Broken out of the SCADA prison – data accessible to other applications

MQTT in the marketplace

- IBM WebSphere MQ V7.1
  - Telemetry support for extended reach
  - Lightweight connectivity for real time updates from mobile devices, sensors and business applications
  - Fully interoperable with IBM WebSphere MQ, enabling existing JMS applications to extend beyond the edge of the enterprise

- Eurotech Everyware Software Framework (ESF)
  - MQTT package for embedded hardware platforms
  - M2M Strategic partnerships based on MQTT
    - Wind River: Embedded operating systems
    - Intel: M2M Gateway

Open technology is essential to advance connectivity

- MQTT open specification, V3.1 available Aug. 2010

- Eclipse Industry Working Group for M2M
  - Broad scope to address technology and market development engaging developers across initiatives including Web, IoT, and Smarter Planet
  - Eclipse provides vibrant community for extensible frameworks, tools and runtimes

- Eclipse Paho project for open source MQTT client
  - Proven development and licensing model
  - Encompasses business, web, and embedded developers
  - Open source software project to encourage adoption

- Next steps
  - Develop community
  - Move to standard organization

More Info

- MQTT
  http://mqtt.org
- Eclipse M2M Industry Working Group Charter
  http://wiki.eclipse.org/M2MIWG_charter_draft
- MQTT Specification
  http://www.ibm.com/developerworks/webservices/library/ws-mqtt/index.html
- WebSphere MQ and MQ Telemetry
  http://www-01.ibm.com/software/integration/wmq/
- Eurotech MQTT
  www.eurotech-inc.com/mqtt-protocol-for-data-delivery.asp
- MQTT: the Smarter Planet Protocol
  http://andypiper.co.uk/2010/08/05/mqtt-the-smarter-planet-protocol/
- Google Group
  http://mqtt.org/get-involved
- Mosquitto
  http://mosquitto.org/


THANK
YOU