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Eurotech and IBM Contribute Software to Connect Next Generation of Wireless and Mobile Devices

Eclipse Contribution to Create New Standard that Connects Internet of Things

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LUDWIGSBURG, Germany - 03 Nov 2011: IBM (NYSE: IBM) and Eurotech (ETH.MI) today announced that they are contr buting software to accelerate and support the development of a new generation of smarter wireless and mobile devices. The technology, which could become the basis for a new standard of mobile connectivity and interoperability, will be contributed to the Eclipse Foundation open source community.

The Eclipse Foundation, founded by IBM in 2001, is celebrating its 10th anniversary at EclipseCon in Germany.

Originally developed by IBM and Eurotech, the contr buted Message Queuing Telemetry Transport (MQTT) protocol is in use today among some industrial, mobile, and consumer applications, providing reliable device connectivity in industries such as transportation, energy, military, financial, social media and medical. Uses of MQTT range across projects as diverse as real-time monitoring for a ConocoPhillips pipeline, to a new lightweight mobile messaging application for Facebook.

Billions of embedded devices – from RFID tag readers, smartphones and cardiac monitors to GPS-aware systems, thermostats and smart appliances – can be interconnected to one another. Fueled by rapid growth in wireless broadband connectivity, this number is rapidly expanding. There are more than nine billion connected devices in the world today and according to a recent study conducted by Ericsson AB, that number is expected to reach 50 billion by 2020. (1)

Many of these devices tend to be industry focused and tied to proprietary technologies and platforms, making true connectivity a complex task. Further, there is an influx of instrumented products, such as power meters and washing machines some of which do not yet have access to the power of the internet. By connecting all of these devices with an open-source, cross-industry messaging technology, there is potential to create new systems of systems that can operate with one another l ke never before. This would help organizations more easily embrace growth opportunities across a wide range of industries, including retail, healthcare and automotive where the use of mobile and wireless devices are transforming the way they work.

For instance, today's smarter cities allow existing systems to alert operators of a broken water main and report the extent of flooding in streets and subways. However they are often closed systems. An open messaging protocol can be used to openly publish these events, enabling public and private transit systems to share and monitor these critical alerts. As a result, agencies would be able to adjust traffic signals, change routes, and notify commuters of alternative routes, transportation, lodging and meals on their mobile devices.

The architecture that the contributed technology enables can adapt easily to existing systems and provide a new level of connectivity across a wide range of systems – without requiring significant programming or reconfiguration of legacy monitoring systems.

"Just as Hypertext Transfer Protocol (HTTP) enabled open communication over the internet, we believe the creation of an open protocol for messaging can do the same for smarter systems," explains Mike Milinkovich, executive director, Eclipse Foundation. "History has proven that driving open standards, such as IBM and Eurotech's contr bution to Eclipse, is a proven strategy for rapid and widespread industry adoption."

Based on an industry proven open protocol, the MQTT technology will provide the missing piece needed to usher in this new level of access bility and connectivity among systems, and enable the creation of next generation Machine-to-Machine (M2M) solutions.

Open Communities Are Essential to Advance Connectivity and Open Markets

To further accelerate the development of these next generation products, Eurotech and IBM are also announcing that they will join as founding members with Sierra Wireless in a new Machine-to-Machine Industry Working Group at the Eclipse Foundation. The goal of the M2M Industry Working Group is to create an open development environment that will make it easier to integrate and connect systems of systems.

A scalable protocol like MQTT will bridge a wide range of platforms and devices including embedded, mobile, Web 2.0 and Enterprise IT. When backed by the open source community, it will allow system developers and integrators to usher in the next generation of applications with higher levels of innovation and functionality in order to create smarter buildings, industries and cities.

"As a founding member of the M2M Industry Working Group, Sierra Wireless is working together with IBM and Eurotech to advance the creation of software that simplifies and accelerates the creation of M2M applications," said Emmanuel Walckenaer, senior vice president and general manager, Solutions and Services for Sierra Wireless. "Open source contributions to the Eclipse community give developers confidence in the long term viability, continuous innovation, and ongoing community support of their M2M software platform."

The Eclipse Foundation became an independent not-for-profit corporation in 2004. Since then, it has transformed the software industry. The Eclipse community has played a critical role in IBM's product development. Over the last ten years, IBM has shipped more than 800 products based on Eclipse technology.

The IBM and Eurotech project proposal for their contribution is available at: http://www.eclipse.org/proposals/technology.paho.

For more information on IBM's open source initiatives, visit: http://www.ibm.com/opensource.

For more information on Eurotech, visit: http://www.eurotech.com.

For more information on Eclipse, visit: http://www.eclipse.org.

For more information about Sierra Wireless, visit www.sierrawireless.com.

For more information on the role that MQTT messaging technology is playing in helping to build a smarter planet, visit http://mqtt.org, or view the video Messaging for a Smarter Planet .

(1) Ericsson AB "Infrastructure Innovation - Can the Challenge be met?" Sept 2010

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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

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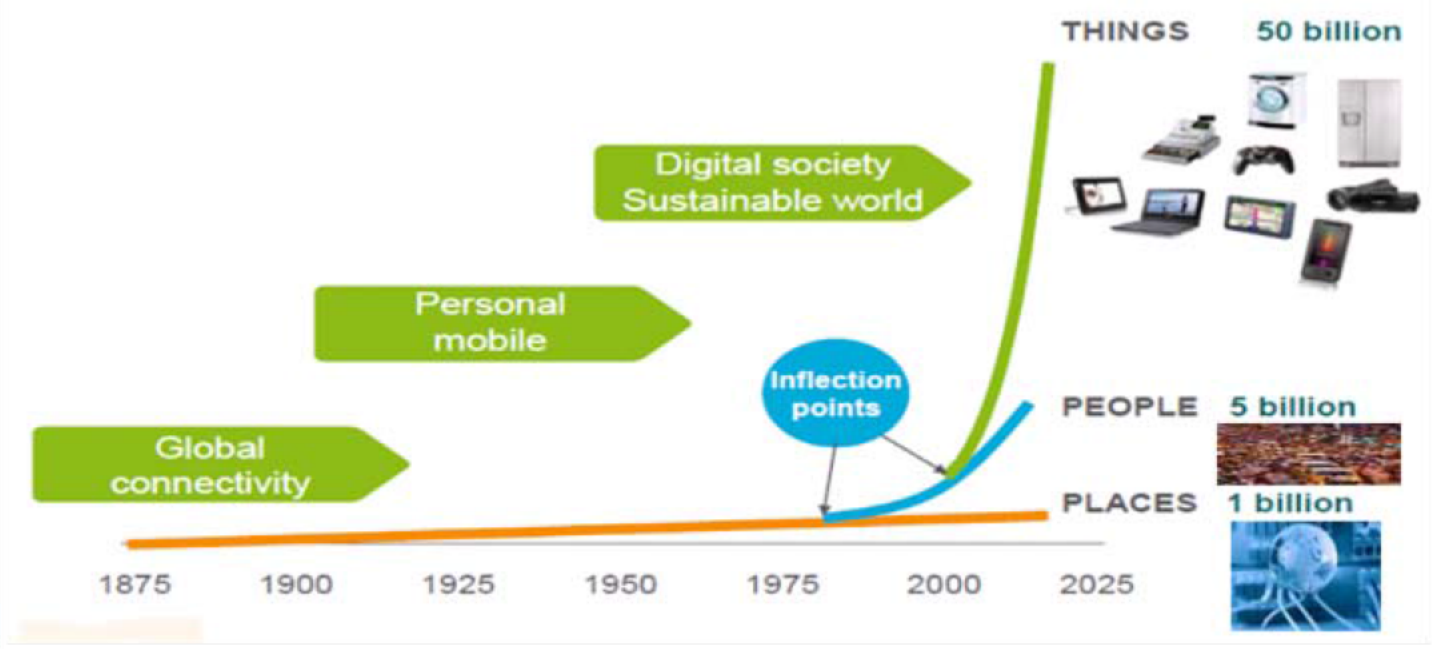
Source: Ericsson AB, "Infrastructure Innovation - Can the Challenge be met?," Sept 2010

[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

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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?

Under Embargo Until Nov 2nd

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

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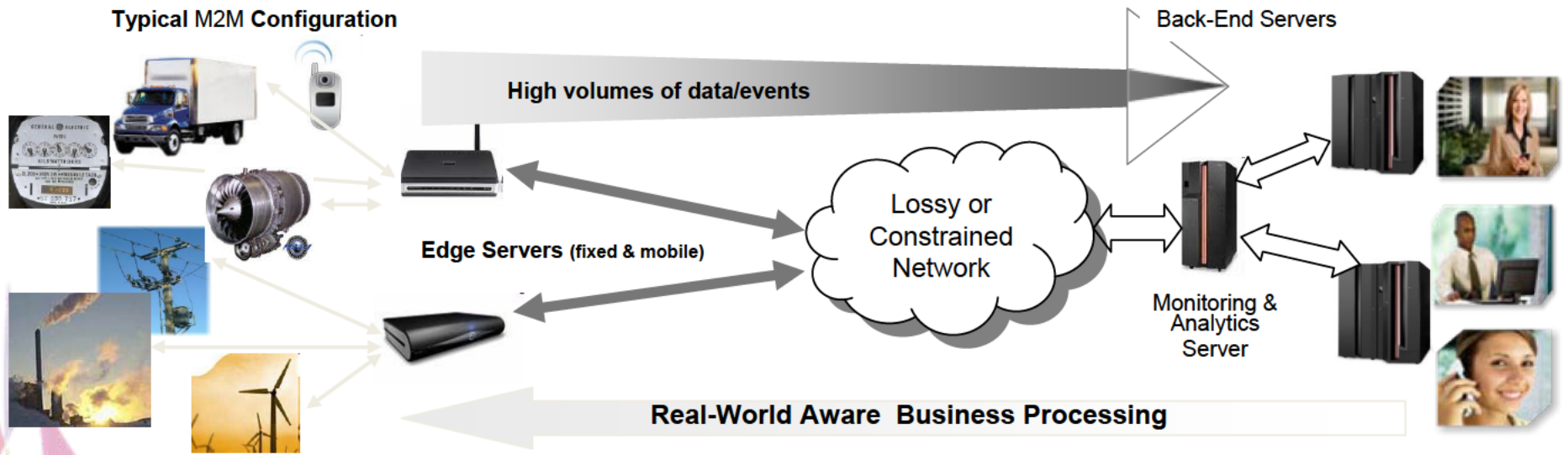
- **Enabled** reliable communications between individuals
- **Improved** delivery times over low latency connections
- **Helped** improve mobile battery life

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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

Typical M2M Configuration

Back-End Servers

High volumes of data/events

Edge Servers (fixed & mobile)

Lossy or Constrained Network

Monitoring & Analytics Server

Real-World Aware Business Processing

Bridge reliable networks over disparate wireless networks

Extending the reach of application, service and information delivery

Real world integration challenges

Monitoring
- temp, pressure...

Control
- valves…

low-bandwidth,
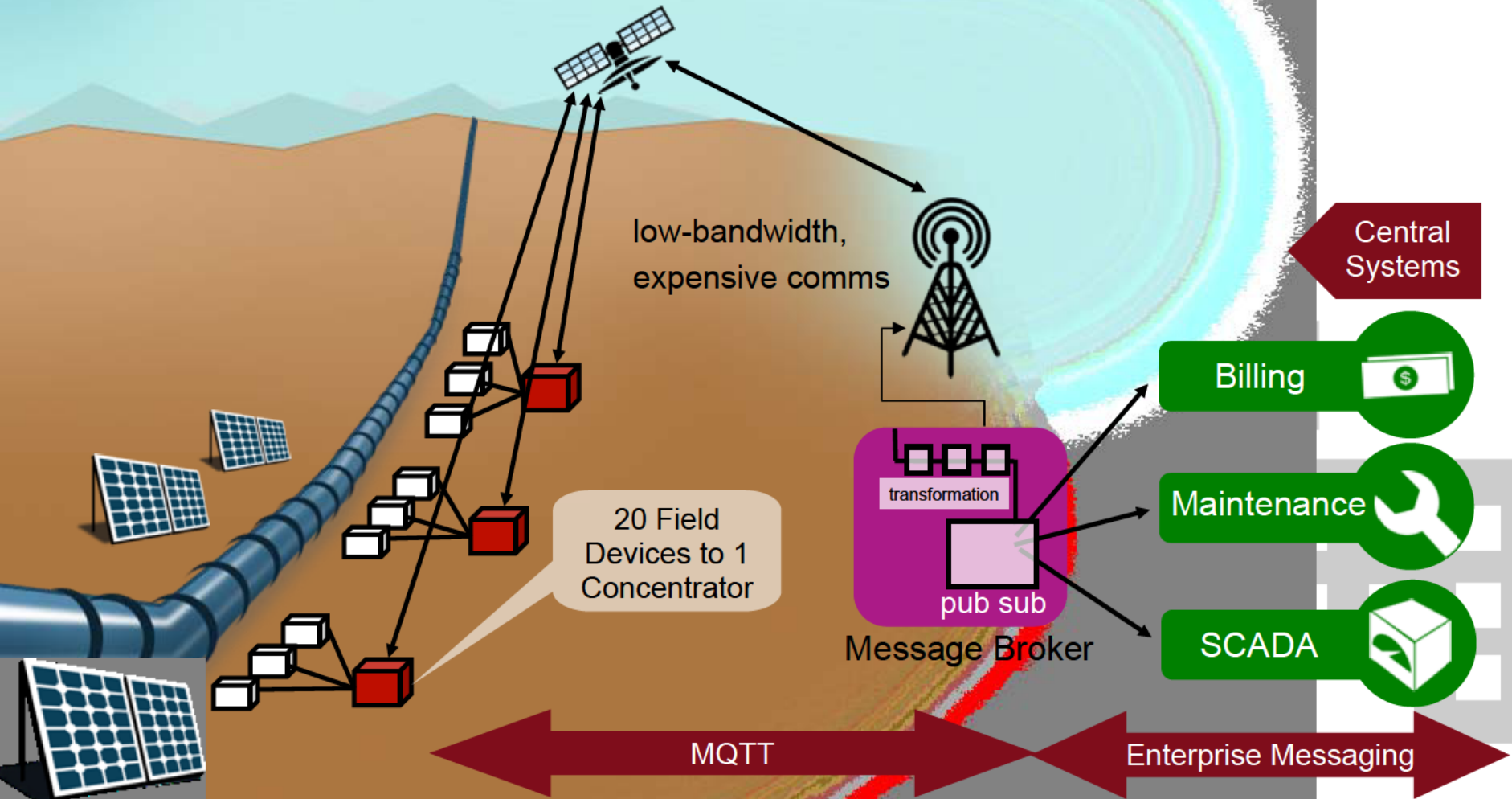expensive comms

Central Systems

Billing

Maintenance

SCADA

Proprietary polling protocol

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

low-bandwidth, expensive comms

Central Systems

20 Field Devices to 1 Concentrator

transformation

pub sub

Message Broker

Billing

Maintenance

SCADA

MQTT

Enterprise Messaging

- 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

eclipse

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Under Embargo Until Nov 2nd

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