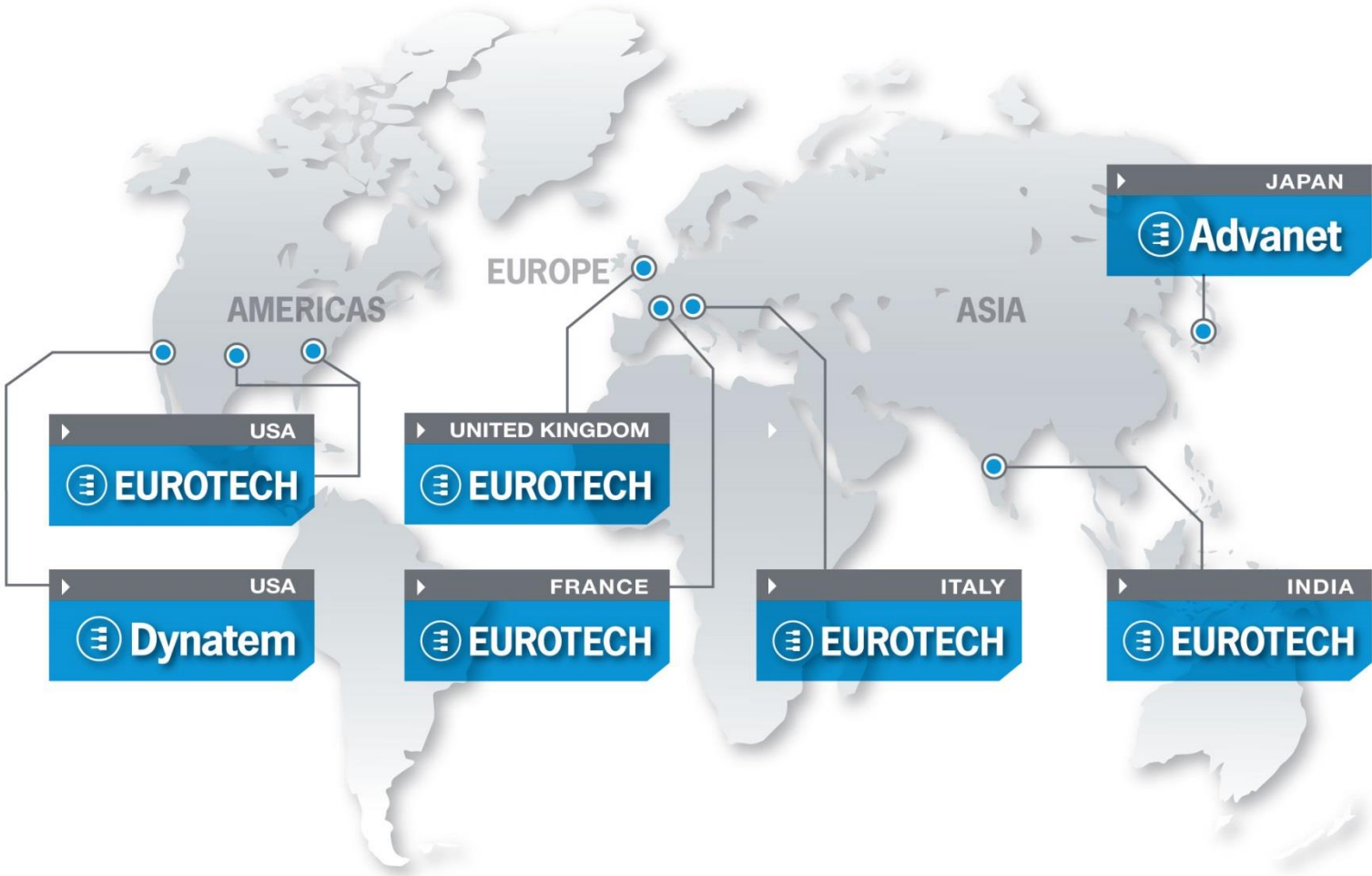


Real Use Cases where Eurotech applied KURA for businesses

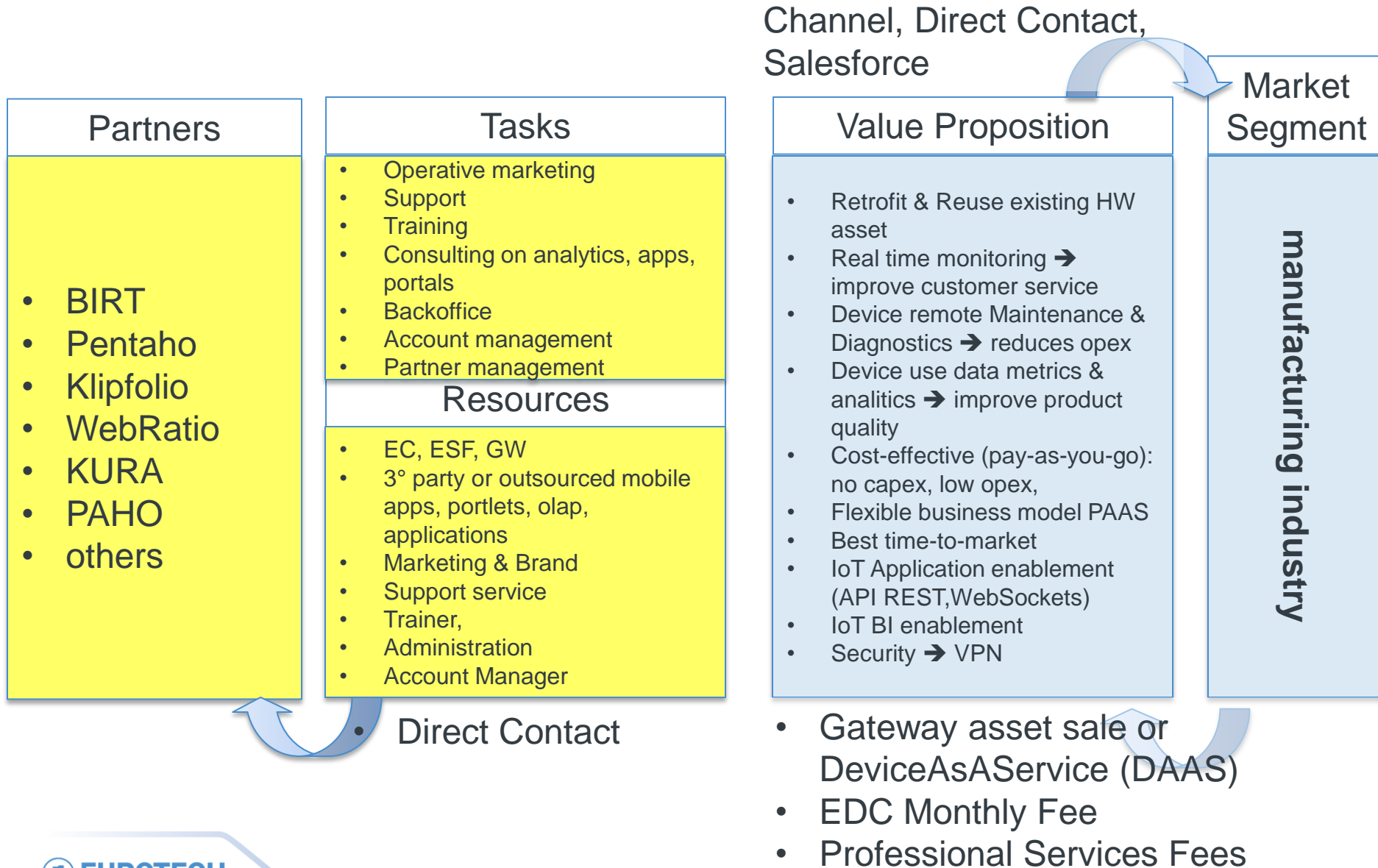
Eurotech's Essence

- **World top 10 player in the Embedded Computers market**
- **Behind the products of more than 20 Global 500**
- **One of two European producers of High Performance Computers**
- **Public Company, in the STAR segment of Italian Stock Exchange**
- **Core competences: Miniaturization & Interconnection of computing devices**
- **2 Strategic Business Units:**
 - NanoPC SBU: Pervasive Computing Devices & Device Data Management
 - HPC SBU: Green Petascale High Performance Computers
- **1 horizontal Line Of Business**
 - M2M & IoT Software Framework & Cloud Integration Platform

Eurotech Group Global Footprint

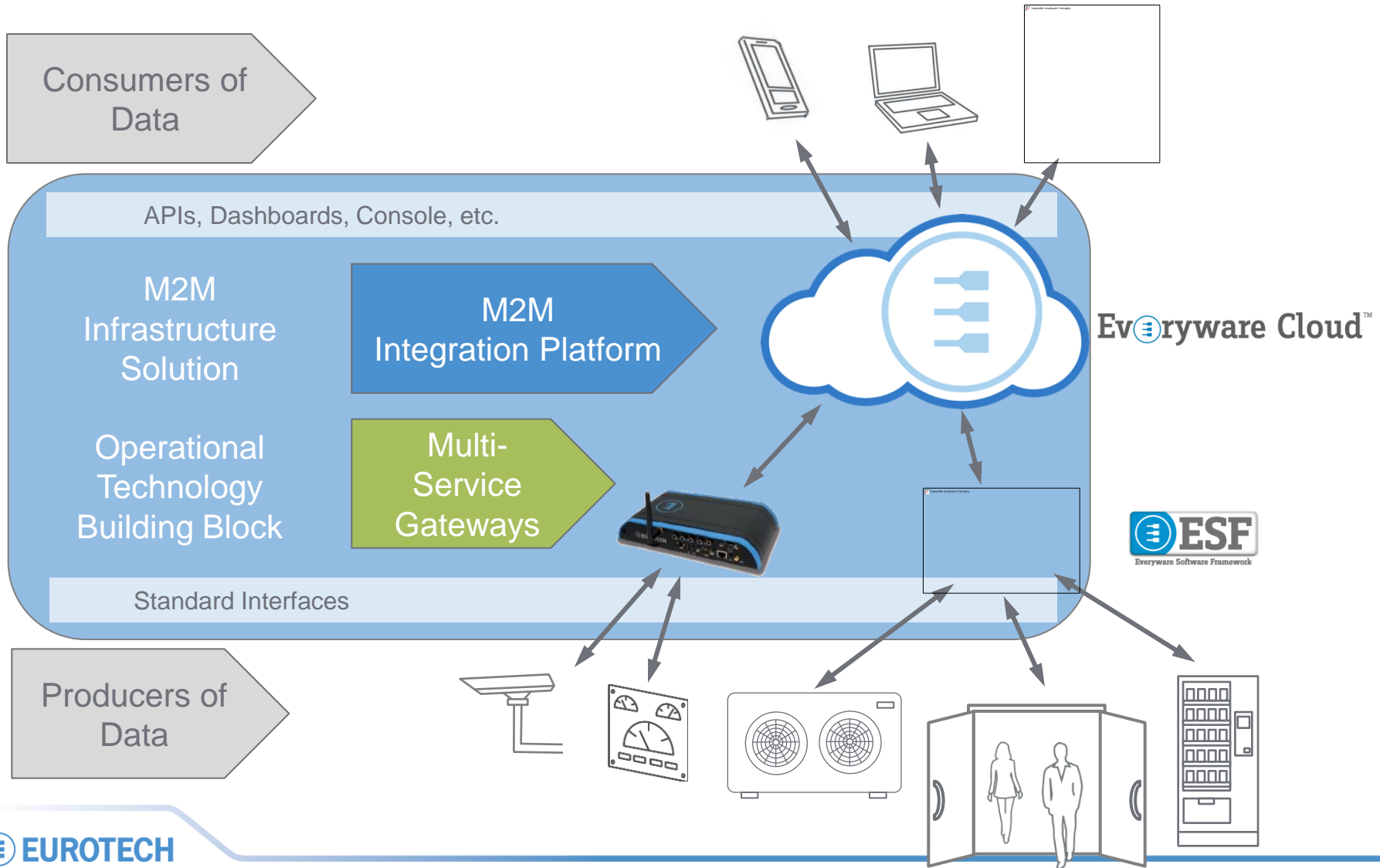


Business Model - Manufacturing Industry



The Internet of Things

Distributed Systems Architectural Overview

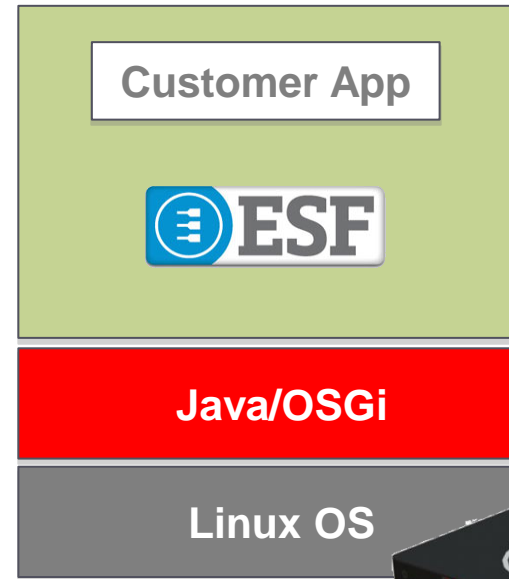


Everyware Software Framework (ESF)

What is ESF?

ESF is a **Java/OSGi-based Application Framework for M2M Service Gateways and Edge Nodes** that simplifies the design, deployment and remote management of embedded applications.

- 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



Derived from ESF, Kura is an open source Java/OSGi-based Application Framework for M2M Gateways, part of the IoT Projects of the Eclipse Foundation

KURA

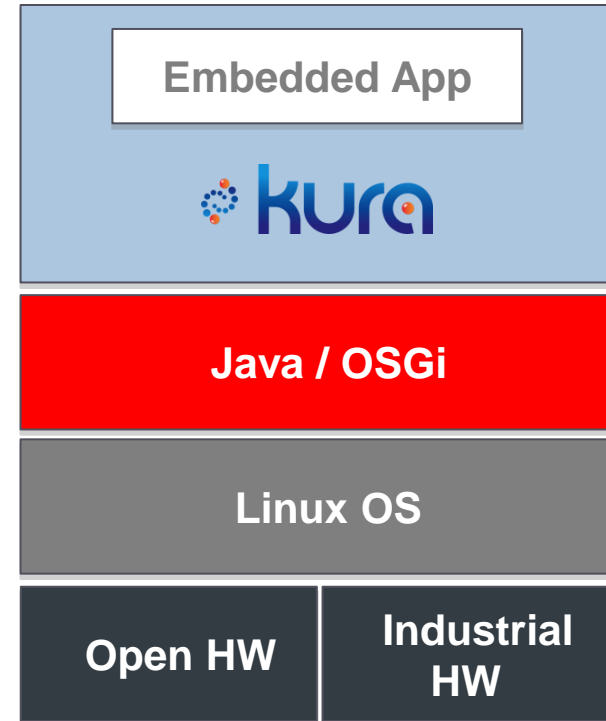
What is Kura?



- Modular software for IoT Gateway Service
- Manage cloud connectivity
- Network configuration and administration
- Support for different protocols
- Remote management and access
- Integrated development environment
- Application portability
- Open sourced in Eclipse IoT



Based on Kura, ESF is commercially supported, remotely managed, and optimized for industrial gateways and applications.



ESF vs Kura

What ESF offers beyond Kura

ESF is leveraging the Kura implementation, but adds some important elements :

- ESF is commercially supported by Eurotech and does contain a genuine Java VM (Oracle)
- Eurotech certifies a fully supported java/osgi/ESF stack; we do the release validation and testing on the Eurotech and other 3rd party devices
- On supported devices ESF comes pre-installed, configured and tuned
- A VPN service is available as a standard bundle of ESF. A VPN server is available as part of EC to provide on-demand VPN service between server-side app and devices.
- ESF contains more field protocols that are outside the scope of Kura
- ESF enables remote Device Diagnostics via Everyware Cloud
- ESF enables remote Device Provisioning (remote software upload) via Everyware Cloud
- ESF will include or be integrated with advanced app design tools like:
 - Oracle Event Processing tool integrated
 - BitReactive (they made a prototype on top of Kura)
- ESF can be integrated by Eurotech with 3^o parties' (Eurotech partners) sw tools/platforms

ESF, KURA & Paho

What ESF & KURA offers beyond the Paho MQTT Client

ESF adopts the MQTT Paho implementation and adds some important features :

Data Services:

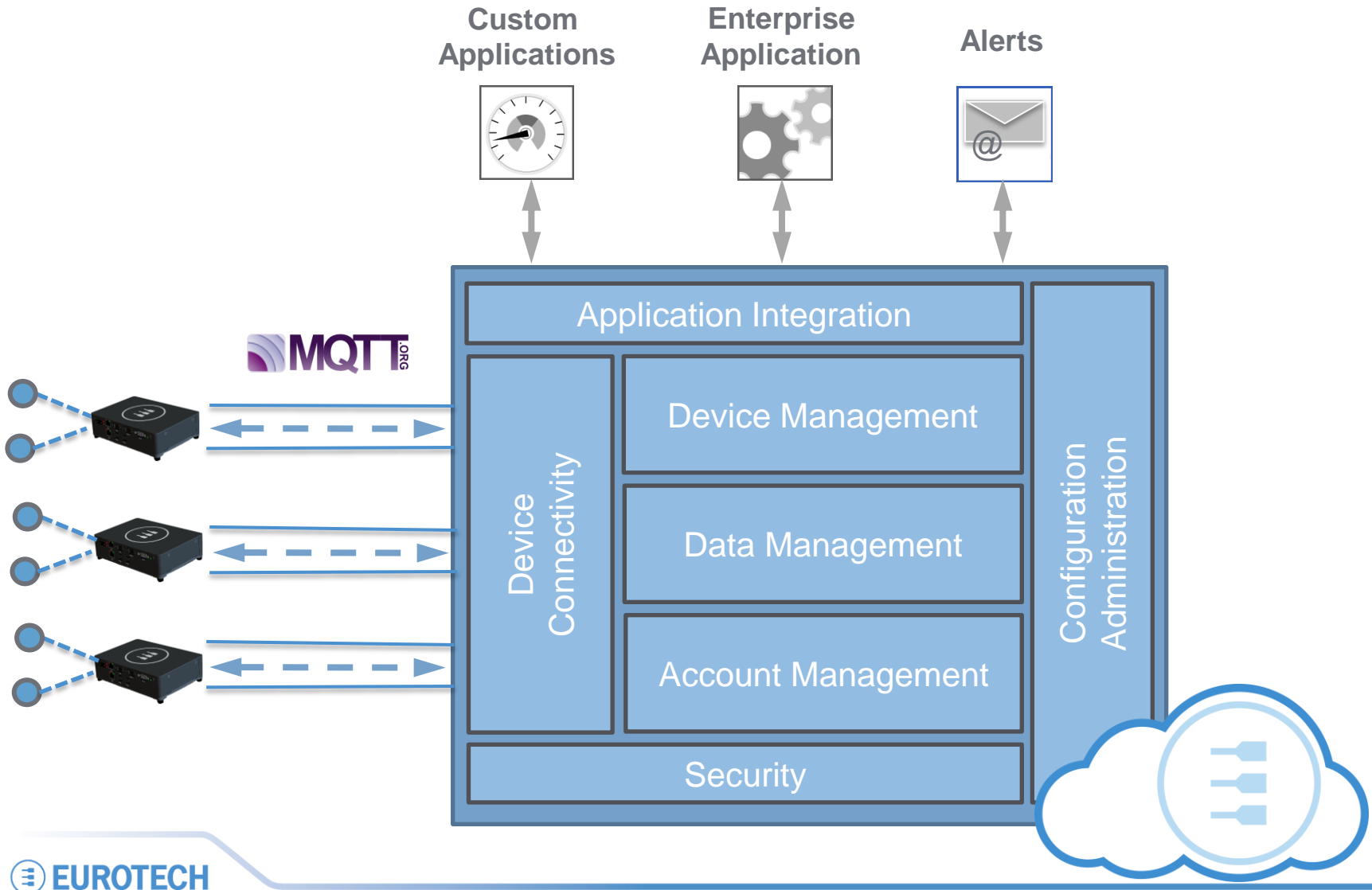
- Manages remote connectivity and reconnect policies
- Manages message queuing with priority
- Manages message store while disconnected and resume publishing on reconnects
- Operates on an abstracted transport protocol

Cloud Services:

- Data model for telemetry applications
- Topic partitioning across applications
- Compression
- Birth, Death & App certificates
- Request and Response message exchanges
- Simplified code for remote resource management

Everyware Cloud™

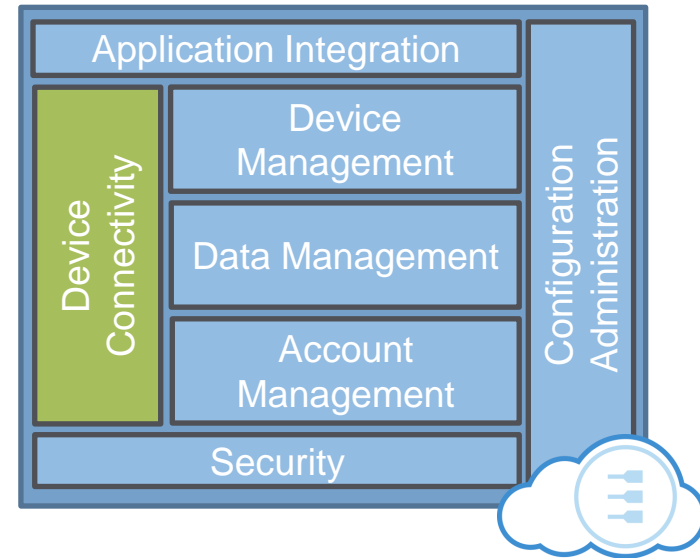
Functional Overview



Everyware Cloud™

Device Connectivity

- Designed on the MQTT Protocol
- Secure with SSL and Authentication
- M2M Optimized
- Built-in Device Tracking
- Device Initiated Connection
- 2-way Communication
- Publish and Subscribe
- Hierarchical Namespaces
- Data Agnostic Payload
- Optional Eurotech Payload for M2M with Data Compression
- Java, C Implementations



Everyware Cloud™

Device Connectivity

Devices

Table Map

Refresh Live Export Delete


Status	Client ID	Display Name	Model	Last Report Date	Uptime
●	00600c80d030	Helios PCN demo AMR	helios	Sep 4, 2012 6:14:43 PM	24062660
●	00600c80e08f	Helios PCN demo INNOTRANS 2012	helios	Sep 21, 2012 5:43:09 PM	26180
●	00600c80e290	Helios 2 PCN demo AMR	helios	Jan 23, 2013 7:40:58 PM	45660
●	device1	GPS Client	helios	Jan 23, 2013 7:40:40 PM	34

Page 1 of 1

Displaying 1 - 4 of 4

Devices

Table Map



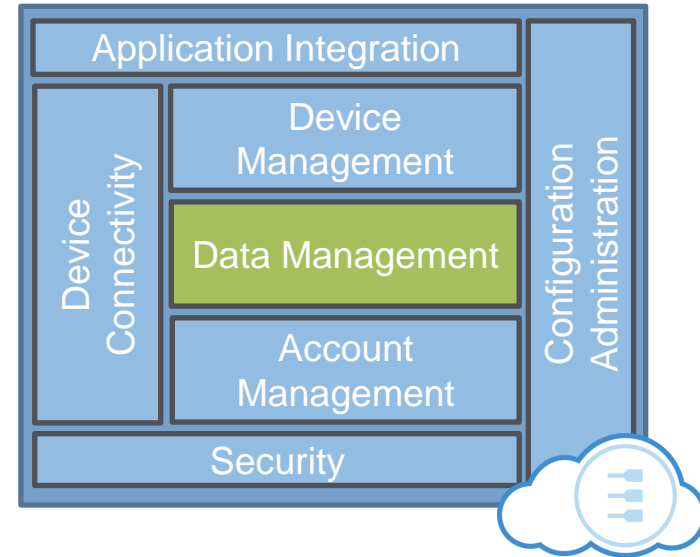
Profile History

Device Information		Software Information	
Display Name:	Device_Id_0	Operating System:	Mac OS X x86_64
Client ID:	Device_Id_0	Operating System Version:	10.6.8 unknown
Status Information		JVM Name:	Java(TM) SE Runtime Environment Apple Inc.
Status:	MISSING	JVM Version:	1.6.0_35-b10-428-10M3811 20.10-001-428
Uptime:	Unknown	JVM Profile:	Java Platform API Specification 1.6
Last Event Date:	Nov 7, 2012 6:48:45 PM	Network Information	
Last Event Type:	MISSING	Interface:	en0 en0 (192.168.1.133)
Hardware Information		IP Address:	192.168.1.133
Model Name:	EDC Device Model Name	Applications Information	
Model ID:	EDC Device Model Id	Application Identifiers:	N/A
Part Number:	EDC Device Part Number	GPS Information	
Serial Number:	EDC Device Serial Number	Latitude:	46.369079
Firmware Version:	EDC Device Firmware Version	Longitude:	13.076729
BIOS Version:	EDC Device BIOS Version		

Everyware Cloud TM

Data Management

- **Datastore**
 - NoSQL database optimized for large volume inserts
 - Redundant, Replicated, Highly Available
 - Data Discovery on Assets and Topics
 - Data Aggregation on Topics
 - Big Data Ready
- **Complex Event Processing Engine**
 - Continuous Queries for Real-Time Analytics
 - Declarative SQL-like language
 - Complex Statistical Operations
- **Triggers**
 - Alerts: SMS, Email, Twitter
 - Integration: MQTT, REST



Everyware Cloud™

Data Management

Evryware Cloud™
Welcome, demo_PCN. [Logout](#)

Account: demo_PCN

- Overview
- Devices
- Rules
- Data by Topic
- Data by Asset
- Settings

Data Query by Topic

Select the Topic under which the data was published, then select one or more of the available metrics for that topic. Finally click the Query button and view the results in a tabular form or in a graph format. The Results Chart only displays numeric metrics (integer, double, float); metrics of type boolean and byte array are not included in this chart.

Available Topics:

Topic	Last Post Date
demo_PCN	Jan 23, 2013 5:10:13 PM
count	Jan 23, 2013 7:40:13 PM
gps	Jan 23, 2013 7:39:55 PM
info	Jan 23, 2013 7:39:55 PM

Available Metrics:

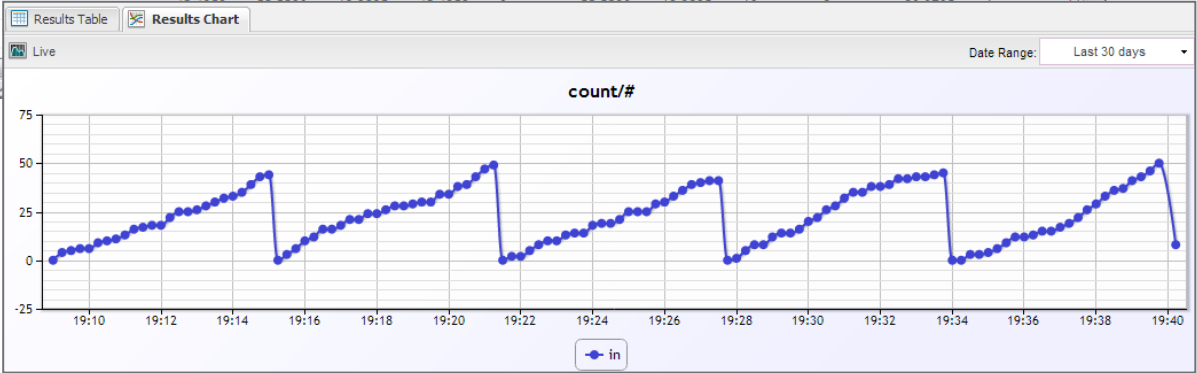
Metric	Metric Type
<input checked="" type="checkbox"/> Metric	
<input checked="" type="checkbox"/> VehicleID	String
<input checked="" type="checkbox"/> altitude	Double
<input checked="" type="checkbox"/> latitude	Double
<input checked="" type="checkbox"/> longitude	Double
<input checked="" type="checkbox"/> position_altitude	Double
<input checked="" type="checkbox"/> position_heading	Double
<input checked="" type="checkbox"/> position_latitude	Double
<input checked="" type="checkbox"/> position_longitude	Double
<input checked="" type="checkbox"/> position_precision	Double

Query

Results Table
 Results Chart

Export ▼ Date Range: Last 30 days ▼

Timestamp	Asset	...	VehicleID	altitude	latitude	longitude	position...	position...	position...	position...	position...	position...	position...	position...
01/23/2013 19:39:55.979	device1	...	...	42.4353...	52.5230...	13.3635...	42.4353...	0	52.5230...	13.3635...	10	3	60.3656...	1
01/23/2013 19:39:50.974	device1	...	...	42.4353...	52.5230...	13.3635...	42.4353...	0	52.5230...	13.3635...	10	3	60.4561...	1
01/23/2013 19:39:45.972	device1	...	...	...	...	...	...	...	...	...	...	...	...	...
01/23/2013 19:39:40.971	device1	...	...	...	...	...	...	...	...	...	...	...	...	...



Everyware Cloud™

Data Management

The screenshot displays the 'Rules' management interface. At the top, there are navigation buttons: '+ New', 'Edit', 'Refresh', and 'Delete'. Below this is a table listing rules:

Status	Name	Statement	Actions
●	PCN Rule	select *, intMetric('onboard') as onboard from EdcMessageEvent where semanti...	Email

Below the table, there are two main sections: 'General' and 'Rule Information'.

General

Rule Information

Name: PCN Rule
Enabled: Disabled
Description: Test Rule
Statement: select *, intMetric('onboard') as onboard from EdcMessageE

Rule Actions

Email

To: stefano.paolini@eurotech.com

An 'Update Rule: PCN Rule' dialog box is open, showing the following details:

Update Rule: PCN Rule Refresh Delete

Rule Information

* Name: PCN Rule
Status: Enabled Disabled
Description: Test Rule
* Statement: select *, intMetric('onboard') as onboard from EdcMessageEvent where semanticTopic.startsWith("count/info") and intMetric('onboard') > 2

Rule Actions

+ Add - Remove

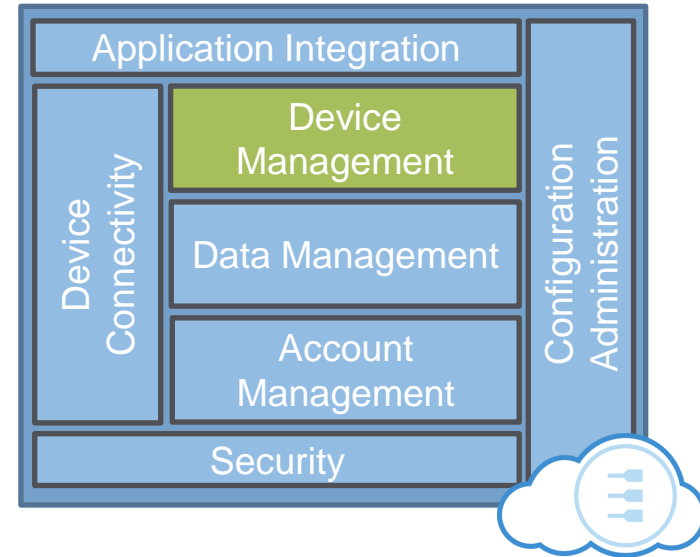
Email To: stefano.paolini@eurotech.com
 Twilio SMS
 Twitter Subject: EDC PCN alert
 MQTT Body: On date \$receivedOn, asset \$asset, belonging to account \$account, published on topic \$semanticTopic a Onboard value of \$onboard.
 REST

Buttons: Submit, Cancel

Everyware Cloud™

Device Management

- Laid over MQTT connection
- Real-Time Device/Connection Status
- Device Event Logging/History
- Device Profile and Localization
- Device Configuration
- Snapshots and Rollbacks
- Application Lifecycle Management (FW, App remote update)
- Device Access On-Demand VPN
- Remote OS Commands
- Based on OSGi Standard



Everyware Cloud™

Device Management

Everyware Cloud™ Welcome, edcguest. [Logout](#)

Account: edcguest

Overview

Devices

Rules

Data by Topic

Data by Asset

Settings

Devices

Table Map

Refresh Live Export Delete

Status	Client ID	Display Name	Model	Last Report Date	Uptime
●	AAAAAAAA	DevEmulator	DevModelName	Today 2:29:07 PM	2692130
●	F0-DE-F1-C4-53-DB	DevEmulator	DevModelName	Today 6:30:03 PM	4176897560

Page 1 of 1

Displaying 1 - 3 of 3

Profile History Configuration Command Packages

Execute:

```

Jan 16 08:44:06 vespone rsyslogd: [origin software="rsyslogd" swVersion="5.8.10"
Jan 16 08:45:01 vespone CRON[28052]: (root) CMD (command -v debian-sa1
Jan 16 08:47:59 vespone anacron[27086]: Job 'cron.daily' terminated
Jan 16 08:47:59 vespone anacron[27086]: Normal exit (1 job run)
Jan 16 08:55:01 vespone CRON[28156]: (root) CMD (command -v debian-sa1
Jan 16 09:05:01 vespone CRON[28168]: (root) CMD (command -v debian-sa1
Jan 16 09:15:01 vespone CRON[28199]: (root) CMD (command -v debian-sa1
Jan 16 09:17:01 vespone CRON[28202]: (root) CMD ( cd / && run-parts --rep
Jan 16 09:25:01 vespone CRON[28283]: (root) CMD (command -v debian-sa1
Jan 16 09:35:01 vespone CRON[28327]: (root) CMD (command -v debian-sa1
Jan 16 09:45:01 vespone CRON[28341]: (root) CMD (command -v debian-sa1
Jan 16 09:55:01 vespone CRON[28354]: (root) CMD (command -v debian-sa1
Jan 16 10:05:01 vespone CRON[28364]: (root) CMD (command -v debian-sa1
Jan 16 10:15:01 vespone CRON[28449]: (root) CMD (command -v debian-sa1
Jan 16 10:17:01 vespone CRON[28455]: (root) CMD ( cd / && run-parts --rep
Jan 16 10:25:01 vespone CRON[28500]: (root) CMD (command -v debian-sa1
Jan 16 10:35:01 vespone CRON[28601]: (root) CMD (command -v debian-sa1
Jan 16 10:45:01 vespone CRON[28696]: (root) CMD (command -v debian-sa1
Jan 16 10:55:01 vespone CRON[28960]: (root) CMD (command -v debian-sa1
Jan 16 11:05:01 vespone CRON[29174]: (root) CMD (command -v debian-sa1
Jan 16 11:11:23 vespone dhclient: DHCPREQUEST of 192.168.3.171 on wlan0
Jan 16 11:11:23 vespone dhclient: DHCPACK of 192.168.3.171 from 192.168.3.1
Jan 16 11:11:23 vespone NetworkManager[945]: <info> (wlan0): DHCPv4 sta
Jan 16 11:11:23 vespone NetworkManager[945]: <info> address 192.168.3.
  
```

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Everyware Cloud™ Welcome, edcguest. [Logout](#)

Account: edcguest

Overview

Devices

Rules

Data by Topic

Data by Asset

Settings

Devices

Table Map

Refresh Live Export Delete

Status	Client ID	Display Name	Model	Last Report Date	Uptime
●	AAAAAAAA	DevEmulator	DevModelName	Today 2:29:07 PM	2692130
●	F0-DE-F1-C4-53-DB	DevEmulator	DevModelName	Today 6:30:03 PM	4176897560
●	edcguest-device-client	MultiBrokerIT	MultiBrokerIT	Today 11:02:51 AM	18046

Page 1 of 1

Displaying 1 - 3 of 3

Profile History Configuration Command Packages

Refresh Apply Reset

WatchdogService

CloudService

The CloudService manages the connection with the Everyware Cloud Platform. Its configuration parameters are used to determine the MQTT broker and the credentials to be used to connect to the platform. Upon a configuration change, the current connection will be closed and reopened with the new configuration.

* mqtt.account:
Name of the Everyware Cloud account.

* mqtt.broker-uri:
URL of the mqtt broker to connect to, for example, mqtt://broker-sandbox.everyware-cloud.com:1883/ or mqtt://broker-sandbox.everyware-cloud.com:8883/.

* mqtt.username:
Name of the user within your account to connect as.

* mqtt.password:
Password of the user within your account to connect as.

mqtt.client-id:

Device identifier: The identifier has to be unique within your account. If left empty, this is automatically determined by the client software as the MAC address of the main network interface.

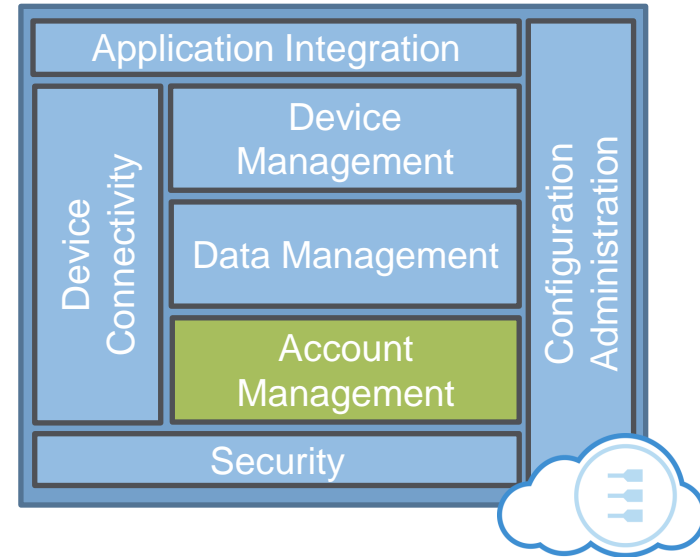
Components Snapshots

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Everyware Cloud TM

Account Management

- Multi-Tenant Architecture
- Hierarchical Accounts
- Topic Partitioning for Messaging
- Data Segregation through Virtual Private Database
- Separate Execution Context for Complex Event Processing
- Service Plans
- Usage Tracking
- Automated Provisioning of new Tenants
- Management of Dedicated Instances in the Cloud



Everyware Cloud™

Account Management

Settings

General Usage **Users**

+ New Edit Refresh Delete

Username	Email	Administrator
demo_PCN	demo_PCN@eurotech.com	<input checked="" type="checkbox"/>
demo_PCN_apis		<input type="checkbox"/>
demo_PCN_broker		<input type="checkbox"/>

Settings

General Usage **Users**

Usage Summary

Number of Devices: 3 of 5

Data Used: 0 of 5 MB

Export ▾

Date	Data Used (kB)
Jan 26, 2013	0
Jan 25, 2013	0
Jan 24, 2013	0
Jan 23, 2013	402

New User

User Information

* Username:

* Password:

* Confirm Password:

Note: if the credentials are used by devices, update them accordingly in the device configuration.

Display Name:

Email:

Phone Number:

Access

Role: Administrator

Permissions:

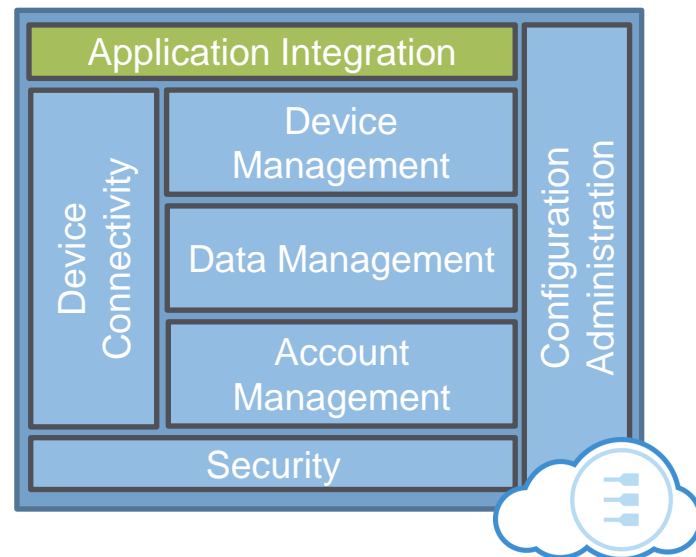
- Permission
- account:view
- account:manage
- broker:connect
- data:view
- data:manage

Submit Cancel

Everyware Cloud TM

Application Integration

- Easy to use REST APIs
- Encompass all platform functionality
- XML and JSON formats
- HTTP/MQTT Bridge for Device Control
- Real-Time REST/Comet APIs
- Google Chart Tools Native Support
- Extensive Documentation
- Complete sample code
- Rich Example Library



Google Chart Tools



Everyware Cloud™

Application Integration

EUROTECH EVERYWARE CLOUD API

REST Data Model Files and Libraries

Home

Introduction

The Everyware Cloud exposes a comprehensive set of Web Service APIs for application integration purposes. The Everyware Cloud REST API allows you to build applications that use Representational State Transfer HTTP calls to retrieve, modify, or publish platform data. For example through the APIs, you are able to access all the functionality of the Console or to control a device from your application built on top of the Everyware Cloud.

The Everyware Cloud platform conforms to standard REpresentational State Transfer (REST) protocol to expose its Application Programming Interfaces (API). REST has emerged over the past few years as a predominant Web service design model. REST-style architectures consist of clients and servers. Clients initiate requests to servers, while servers process requests and return appropriate responses. Requests and

```

https://api-sandbox.everyware-cloud.com/v2/devices.xml
everyware-cloud.com
File Edit View Favorites Tools Help
<?xml version="1.0" encoding="UTF-8" standalone="true"?>
- <devicesResult xmlns="http://eurotech.com/edc/2.0">
  - <device>
    <accountName>myEdcAccount</accountName>
    <clientId>334455AABBCC</clientId>
    <uptime>123</uptime>
    <status>DISCONNECTED</status>
    <displayName>C client</displayName>
    <modelName>test_model_name</modelName>
    <modelId>test_model_id</modelId>
    <partNumber>test_part_number</partNumber>
    <serialNumber>test_serial_number</serialNumber>
    <firmwareVersion>test_firmware_version</firmwareVersion>
    <biosVersion>test_bios_version</biosVersion>
    <osVersion>test_os_version</osVersion>
    <jvmName>test_jvm_name</jvmName>
    <jvmVersion>test_jvm_version</jvmVersion>
    <jvmProfile>test_jvm_profile</jvmProfile>
    <connectionInterface>test_connection_interface</connectionInterface>
    <connectionIp>test_connection_ip</connectionIp>
    <lastEventOn>2012-08-01T09:52:39.915Z</lastEventOn>
    <lastEventType>DISCONNECTED</lastEventType>
  </device>
  
```

EDC Example Projects — Read more

Clone in Mac ZIP HTTP SSH Git Read-Only https://github.com/eurotech/edc

branch: master Files Commits Branches 1

edc-examples /

Update EdcRestExample to demonstrate the use of limitExceeded flag an...

- pierrpilot authored 3 days ago

 - cleanweb-dashboard 2 months ago Removed readme [stepaloin]
 - edc-c-client 2 months ago Three lines of code, three errors [calligaris]
 - edc-comet-gps 9 days ago updated to v2.0.5 of EDC [wes-johnson]
 - edc-comet 6 months ago adding edc-comet and edc-comet-gps exar
 - edc-google-charts-dashboard 4 months ago Add example for EDC DK devkit (which us
 - edc-java-client-gps 9 days ago updated to v2.0.5 of EDC [wes-johnson]
 - edc-java-client 9 days ago updated to v2.0.5 of EDC [wes-johnson]
 - edc-rest-endpoint 9 days ago updated to v2.0.5 of EDC [wes-johnson]
 - edc-rest 3 days ago Update EdcRestExample to demonstrate t

Firefox GPS/Comet Example Dashboard

file:///C:/eclipse/workspaces/indigo1/myFirstWorkspace/edc-comet-gps/src/main/webapp/index.html

GPS/Comet Example Dashboard

Map

account	asset	semanticTopic	receivedOn	position.latitude	position.longitude
myEdcAccount	my-device	gps/data	Sep 13, 2012 15:02:10.438	48.85685728980499	2.354321002960205
myEdcAccount	my-device	gps/data	Sep 13, 2012 15:02:09.414	48.856889163208008	2.3541207313537598
myEdcAccount	my-device	gps/data	Sep 13, 2012 15:02:08.410	48.85688926147461	2.3539181382598877

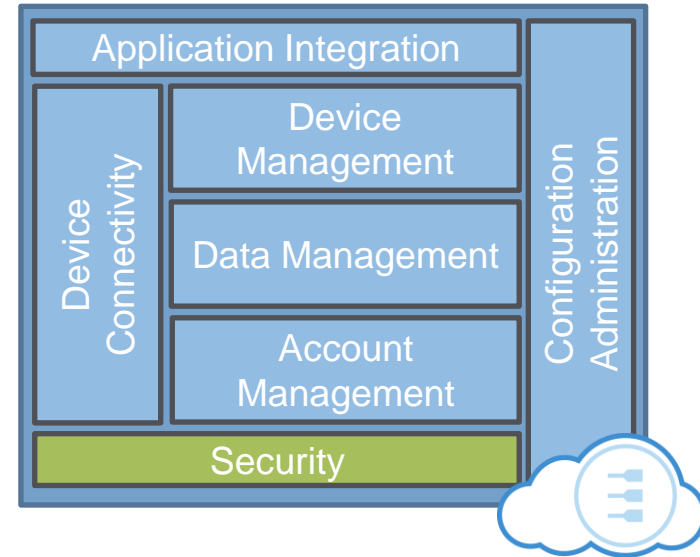
Gauge

- Speed (KPH): 60
- Heading: 0
- Altitude: 46.45

Everyware Cloud™

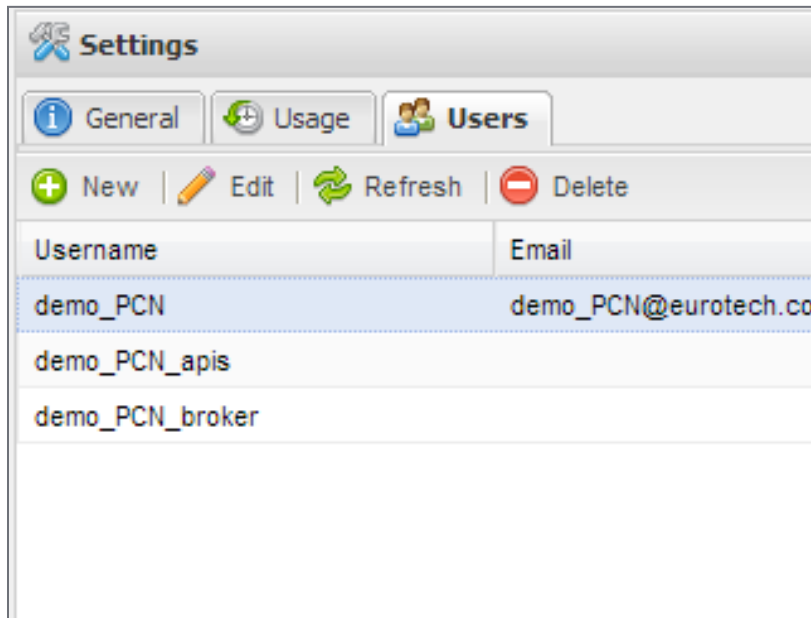
Security

- **Access Control**
 - Centralized Access Control
 - Authentication via HTTPS and SSL
 - Role-Based Access Control
 - User Management
- **Data**
 - Tenant Isolation
- **Device Connectivity**
 - SSL with Authentication
 - Two firewalls in front of broker
- **Device Connectivity**
 - On-demand VPN Connections



Everyware Cloud™

Security

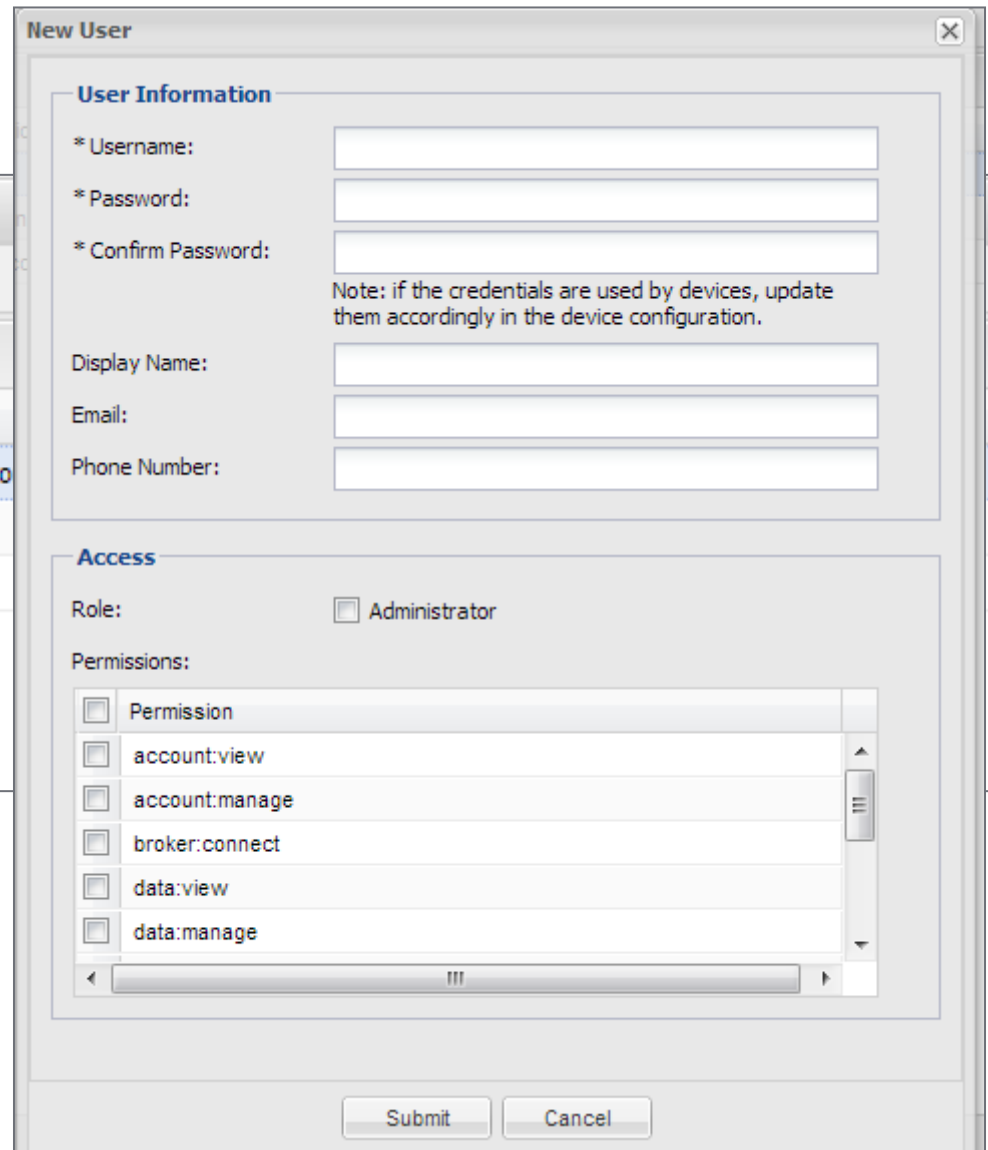


Settings

General Usage **Users**

New Edit Refresh Delete

Username	Email
demo_PCN	demo_PCN@eurotech.co
demo_PCN_apis	
demo_PCN_broker	



New User

User Information

* Username:

* Password:

* Confirm Password:

Note: if the credentials are used by devices, update them accordingly in the device configuration.

Display Name:

Email:

Phone Number:

Access

Role: Administrator

Permissions:

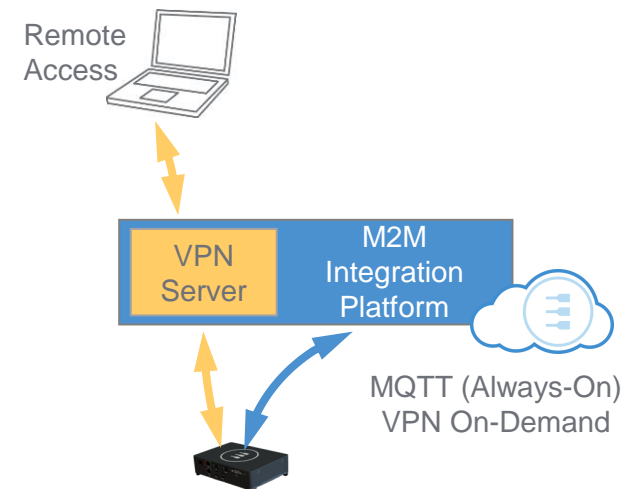
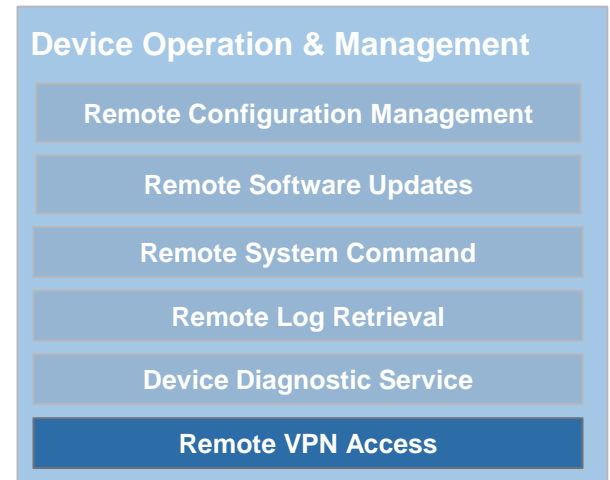
- Permission
- account:view
- account:manage
- broker:connect
- data:view
- data:manage

Submit Cancel

Everyware Cloud TM

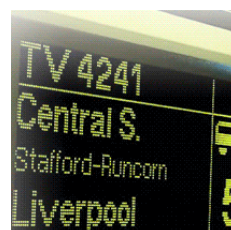
Remote VPN Access

- Secure initiated transparent IP connection between remote systems and devices in the field
- Gateways behind firewalls can be reached
- No IP addressing conflicts prevent or complicate the establishment of connections
- Using the established MQTT channel for initiating the VPN connection to the remote device (openVPN)
- Requires ESF 2.x / Kura 1.x and the Everyware VPN Client on the device side



Use Cases – some real examples

Internet of Things & M2M Applications Everywhere...



Vertical Market Example Use Case

Use Case: Industrial Air Conditioning System Monitoring

Application:

The customer, a leading manufacturer of industrial grade air conditioning (chiller) systems was looking for a solution that would allow them to **monitor constantly the status of deployed Air Conditioning Chillers world wide**. The main data monitored in real time: **pressure, temperature, power consumption, efficiency**

Data transferred via different transports (3G, Ethernet, WiFi) using Internet connections in real time to operations (and R&D).



Product:

ReliaGATE 50-21



Key Factors:

- ③ Short time to market due to EDC approach
- ③ Modbus / PLC support in ESF
- ③ Flexible powerful hardware platform
- ③ Real Time telemetering data

Vertical Market Example Use Case

Use Case: Reverse Vending Machine

Application:

Reverse vending machine vendor needed a **rugged, reliable** communications **gateway** to **exchange data from remote** sites in harsh environments **with operations and maintenance centers**.

Adding EDC to the solution allowed the IT team to **eliminate plans to expand data center equipment**, power and space to manage and process increased data traffic.

Data streams enable new functions, such as one-to-one advertising.



Products:

Custom Gateway



HW / SW
Development
Services

Support

Key Success Factors:

- ③ Short time to market for hardware
- ③ EDC, offering real time data collection
- ③ Lower Opex for device diagnostics and preventive maintenance
- ③ improved Monitoring
- ③ Rugged hardware to reduce maintenance costs
- ③ Users preferences data analytics

Vertical Market Example Use Case

Use Case: Retail Energy & Asset Management

Application:

The customer required a programmable Intel cellular platform for **monitoring of refrigeration units at grocery stores for energy and asset management application.**



ReliaGATE 50-21



Key Success Factors:

- ③ Started with Helios... software portability by ESF
- ③ Eurotech SW/HW knowledge and experience
- ③ Flexible hardware platform
- ③ Looking into EDC for long term data storage

Vertical Market Example Use Case

Use Case: Coffe Machines

Application:

The customer required a solution for **monitoring of consumption and user preferences** and **remote diagnostics** of their existing coffe machines sold worldwide.



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Key Success Factors:

- ④ ready-solution, fast time to market
- ④ cost effective business model
- ④ Real time data on user preferences to improve the product design (eliminating unused functions)
- ④ Real time monitoring for better preventive maintenance
- ④ worldwide footprint



Thank You!

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