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2003 World Congress

Norwich Union Insurance Telematics Pilot - Pay As You Drive™

Telematics trial of usage based motor insurance
Date: 23 October 2003
Volker Fricke, IBM Development Laboratory, Boeblingen, Germany

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Agenda

1. Business view
2. End-to-End view on technical solution
3. Technical aspects of Black Box device
4. Remote Device Management
5. Summary and outlook

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About: Norwich Union

Norwich Union Insurance is the UK's largest insurer with a market share of around 16 per cent and is more than 1.5 times the size of its nearest rival. It is also the largest personal lines insurer.

It has a focus on insurance for individuals and small businesses. Norwich Union Insurance insures:

- one in five households
- one in five motor vehicles
- more than 700,000 businesses

Norwich Union products are available through a variety of distribution channels including brokers, corporate partners such as banks and building societies and Norwich Union Direct.

Norwich Union's news releases are available on the Aviva plc website at http://www.aviva.com

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Business statements from Norwich Union and IBM:

- **Robert Ledger, Norwich Union programme director** said: “This initiative provides drivers with the opportunity to really be in the driving seat when it comes to controlling their premiums“.

- **Liz Kennett, Norwich Union** said: “It will be particularly beneficial to those who do short journeys or those who don‘t use their car that often….. It‘s a much fairer system of working out car insurance“.

- **Bill Pieroni, general manager for IBM Global Insurance Industry**, said: “Telematics technology is already proving its tremendous value to drivers and passengers with added safety features, new services, and entertainment. Now we want to help determine whether this on-demand approach to insurance coupled with IBM services and infrastructure can benefit the insurance industry and motorists with more accurate insurance premiums based on actual vehicle usage”.

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News about the revolutionary “Pay As You Drive”™ trial got a lot of attention in the UK press.

MOTORING Hi-tech trial planned

NU looks at ‘pay as you drive’ insurance

By PAUL HILL

Black boxes to log every car journey

MOTORISTS will be given ‘black boxes’ to fit in their cars – so insurers know how well they are driving.

The data recorders will be attached to the engine and log how often a car is used

BY WENDY VUKOSA

scheme with 5,000 motorists later this year, with the policy commercially available by 2004.

Insurer plans to record driving habits with black boxes in cars

BY ABBA AKBAR

PRIDE AND JOY: A rarely driven car could qualify for lower premiums with Norwich Union

Black box could lower premiums

MOTORISTS who rarely use their cars could pay lower insurance premiums if a high-tech pay-as-you-drive scheme catches on.

Norwich Union wants to trial a tracking device with 5,000 drivers later this year. Black

anti-theft devices already fitted to some cars.

Using global positioning system (GPS) satellite technology, they send data on cars’ locations down mobile phone lines.

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Business Partners contributed significantly to this complex project:

CELESTICA

Hardware design and manufacturing of Black Box

IBM

Architecture, Development, Integration, Maintenance and Hosting

MOTOROLA intelligence everywhere

Map Matching Software

NAVTECH

Navigation Map Data

orange

Wireless Network Provider

QNX

RTOS used on Black Box

RAC

Installation of Black Box

TELCONTAR

Location-based Solutions

VANGUARD

Installation of Black Box

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A complex Systems Integration Project with Hosting and Ongoing Maintenance for two years.

NORWICH UNION

IBM

orange

VANGUARD

RAC

CELESTICA

MOTOROLA intelligence everywhere

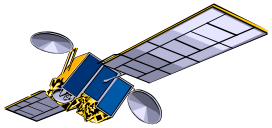
QNX

TELCONTAR

NAVTECH

The End-to-End Solution strongly supports privacy of the vehicle users.

2. Journeys and events are periodically uploaded to Telematics Gateway.



GPS

GPRS

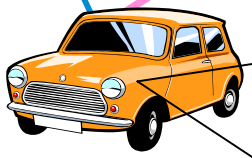
‘Orange‘ Wireless Network

MAP Data

Telematics Gateway

3. Journey points map-matched for later data mining.

4. Journeys can also be viewed against a map-background



1. Black Box records and stores GPS journey data

Black Box

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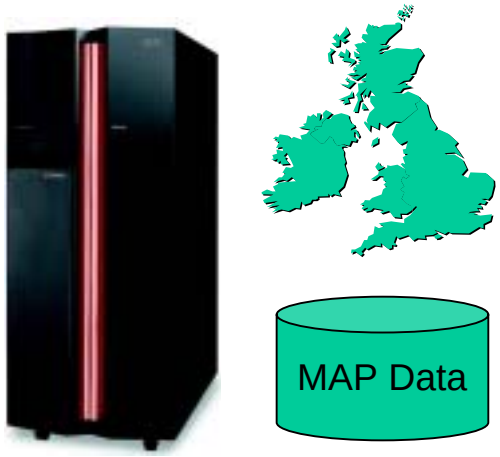
The Telematics Gateway is built using IBM Hardware & Middleware, Custom Applications and 3rd Party Software.

- IBM eServer (pSeries and xSeries)
- IBM WebSphere EveryPlace Server
- IBM DB2 Database
- IBM MQ
- IBM MQe
- Navtech Map Data
- Motorola Map Matching



Functions:

- Receive data from the Black Box units
- Processing to relate trip data to road network maps
- Aggregate the data and store in data warehouse
- Manage and control the trial and the deployed Black Box units

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Inside the Black Box are advanced technologies to collect the data and support additional services.

- Processor: ARM9, 133Mhz
- DRAM 32MB
- Flash 16MB
- Trimble GPS 12 Channel
- Wavecom GPRS class B Device
- QNX Neutrino Real-Time Operating System
- IBM Java Virtual Machine (JVM)
- IBM Service Management Framework (SMF)
- IBM MQe
- IBM Device Agent

The Black Box shares similar dimensions with PDA's.

GPS Device

GPRS Device

DRAM

Processor

FLASH

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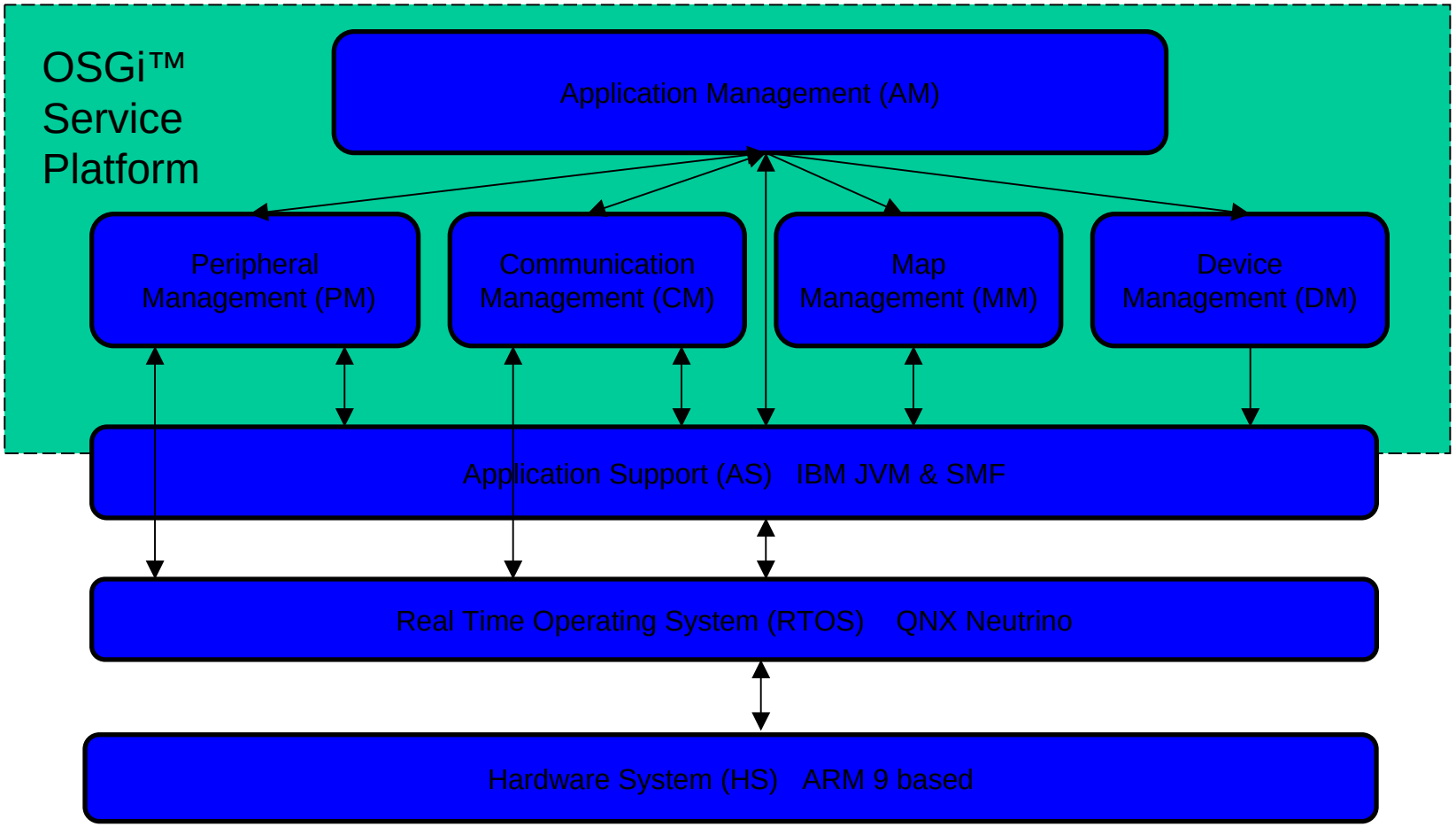
The Software Architecture is based on modular, re-usable and extensible components.



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The majority of the Black Box software components are implemented as OSGi Bundles.

- OSGi Service Platform Release 2 Services used:
  - Configuration Admin
  - Log Service
  - Service Tracker
  - Preference Service
  - Http Service

- Additional OSGi Services specifically developed as part of this project:
  - GPS Service
  - Communication Service (SMS, Voice, Data)
  - Power Management

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There are multiple benefits for using the OSGi Service Platform on the Black Box.

- Benefits of using the OSGi Service Platform for Norwich Union Telematic project:
  - Short Application Development
  - Re-use of tested and standardized components
  - Life-cycle Management (see next chapter)

- Additional OSGi Services which could be used of current OSGi Service Platform Release 3:
  - Position Service (part of GPS Service)
  - Wire Service
  - Start Level

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Additional specific vehicle requirements could be standardized in future releases of the OSGi Service Platform.

- Power Management
  - “Instant-On” of the application (short power-on time)
  - Several power-states (on, off, sleep, partly off)
  - Sleep: Requires applications to react on power-sleep event
  - Scheduled or event-trigged wake-up

- Platform Resource Management
  - Monitoring and check resource utilization
  - Application-level monitoring and recovery
  - Include hardware functions for recovery (watchdog)

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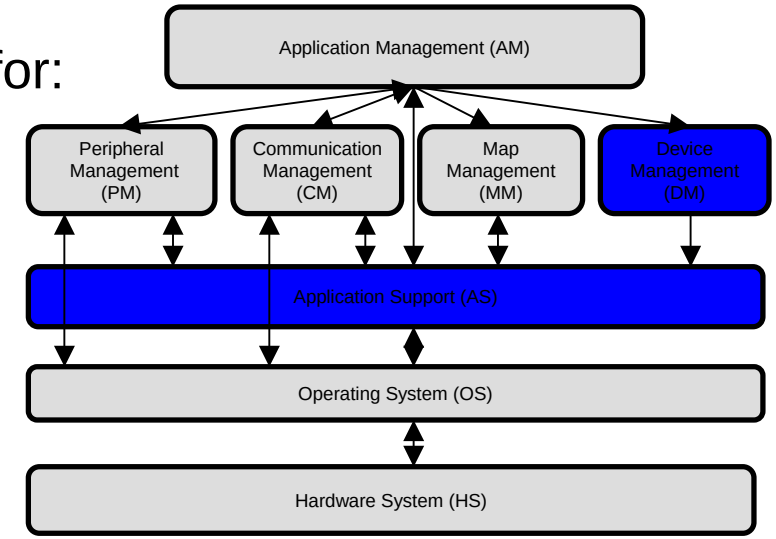
Remote device management of the Black Box is an integral and important part of the architecture.

- Device Management Components being used:
  - Device-side: IBM SMF and Device Agent (OSGi Bundle support)
  - Server-side: IBM Device Management Server (DMS): Part of IBM WebSphere EveryPlace Server
- Remote Device Management used for:
  - Software Distribution
  - Device Configuration (e.g., Upload policy,…)
- Recovery and Watchdog back-up



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The Telematics Gateway supports a large number of Black Box units for software/configuration data and is scalable for future growth.

- Initially 5,000 vehicles will be enabled
- Telematics Gateway contains functions to manage software distribution and device parameters of the OSGi Service Platform.
- Device software and parameter update is initiated by the Telematics Gateway.
- The remote device management is designed to be scalable to support an even larger population of Black Box units (vehicles) which are based on the OSGi Service Platform.

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Summary and Outlook

- ✓ This large scale Telematics Trial (5,000 Black Boxes) will help to determine the parameters for a new usage-based insurance model.
- ✓ The technical infrastructure is built on platforms, such as the OSGi Service Platform, to enable value-added services in the future as:
  - Stolen vehicle tracking
  - Emergency-call
  - Service-call
  - Off-board navigation
  - …

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Questions?

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About: IBM

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To learn more please visit http://www.ibm.com

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About: IBM Development Laboratory Boeblingen, Germany

- Founded 1953 (2003: 50 year anniversary)
- Largest IBM Development Laboratory outside US
- 2003: aprox. 1700 Employees
- ASIC Design Center
- eServer zSeries Hardware
- Linux Porting on Mainframe (Linux for zSeries)
- SAP Solutions
- Grid Computing
- DB2 Tools
- Workflow Solutions
- WebSphere Portal Server and Speech
- **Pervasive Computing** and Smart Card
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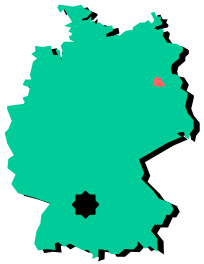

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