Pilotfish

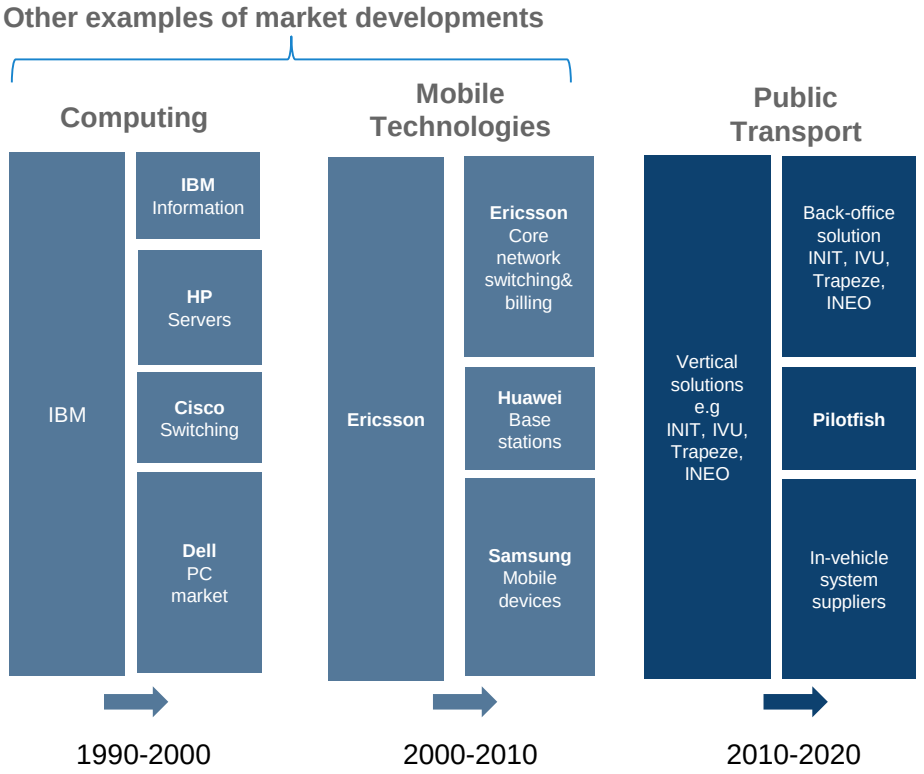
Transforms and accelerates the digitalization of bus- and train operations

COMPANY PRESENTATION

AGENDA

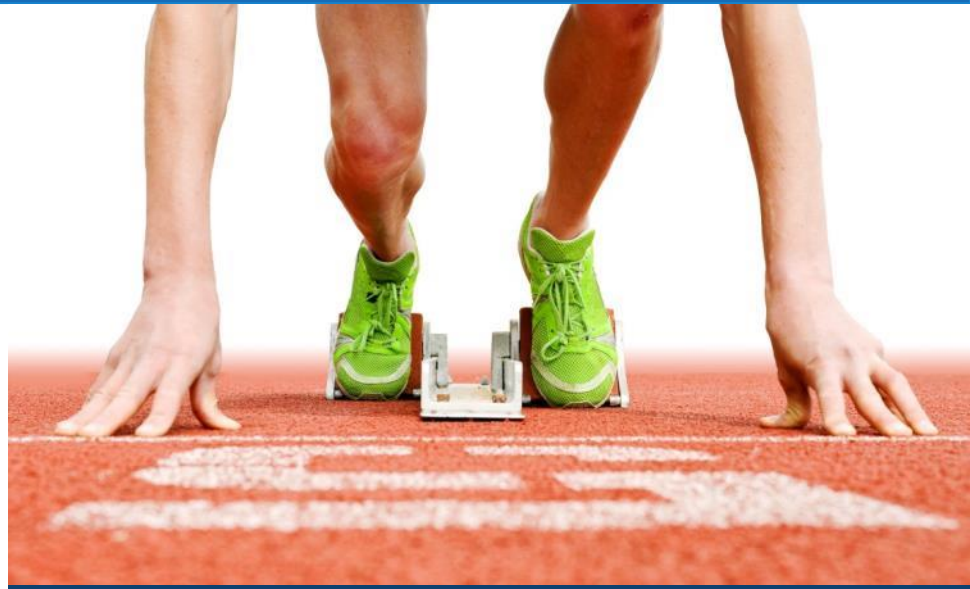
- Introduction
- Paradigm shift
- Technology
- A modern vehicle platform

"Pilotfish is driving the paradigm shift towards **MODULARITY** with open standards and cloud based applications, vital for the efficiency and attractivity of public transport in Europe"



Pilotfish®

- ✓ Product and services designed and ready to serve customers in all parts of the world.
- ✓ Organization competencies and processes are in-place.
- ✓ Customers satisfaction is high!
- ✓ Strategic partnerships in France and Germany.
- ✓ Pilotfish offer and leadership in implementing on-board networking standards.



“Pilotfish has a highly scalable business model”

Tomas Gabinus, CEO Pilotfish

Pilotfish®

The operator's business

Planning

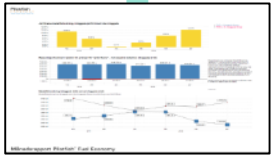
Production / operation

Follow-up

Pilotfish open platform

Pilotfish Vehicle Communication Platform (VCP)

Pilotfish cloud services



Purchasing

Education

Driver support / eco-driving

Maintenance and Integration

KPI´s

Pilotfish offering

Partner Systems & services

Digital signs, passenger Wifi
Passenger counting, apps
Vehicle supplier systems, Alcolocks

Connection to partner systems

Tachograph
Videosystems
Ticketing systems

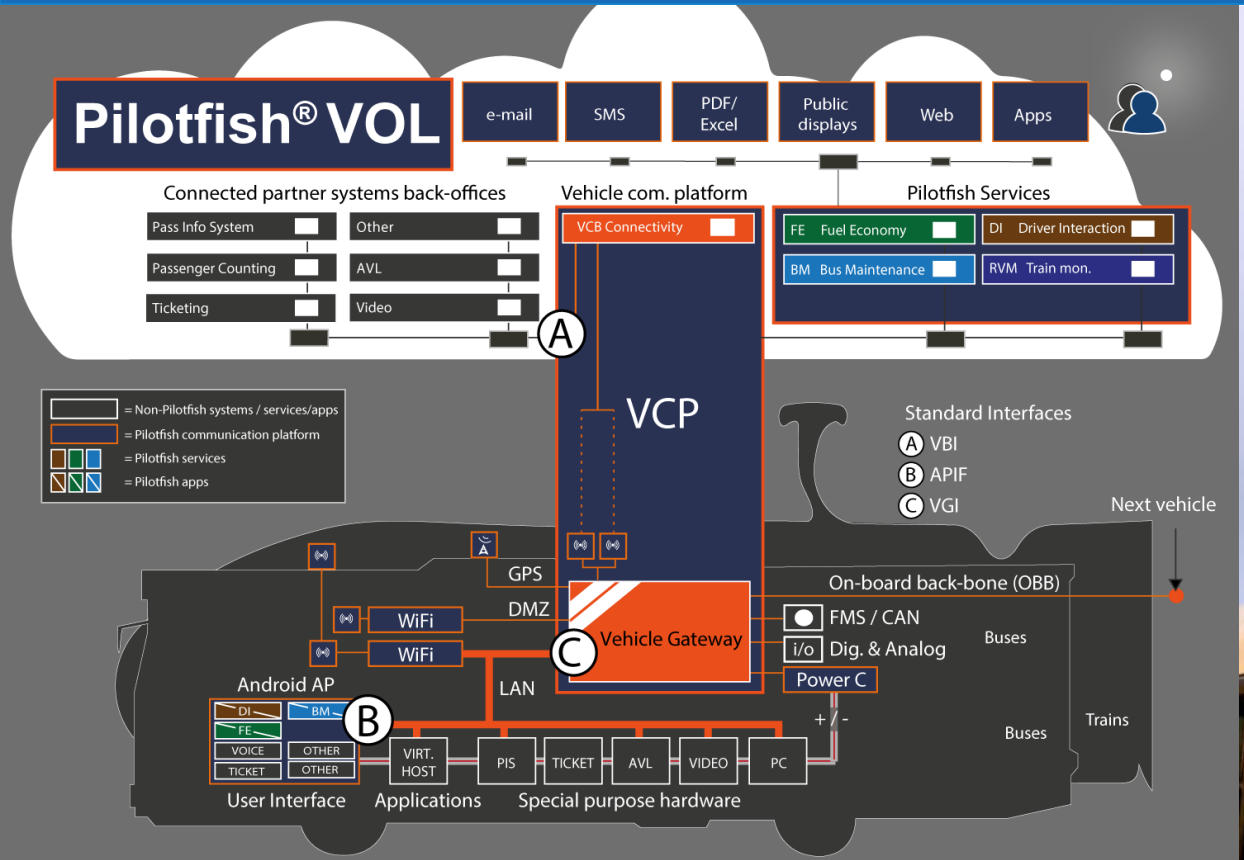
Pilotfish®

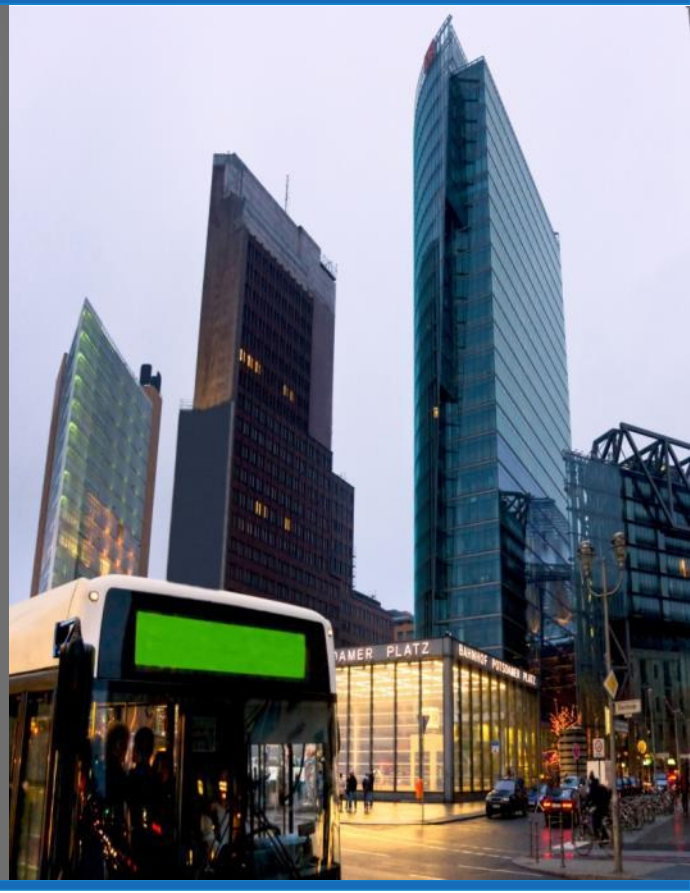
COMPATIBLE SYSTEMS

What to expect in a modern vehicle IT platform!

- **Cloud connectivity**, on-board systems and communication link
- **Messaging sharing** structures, new application for IoT designs
- **Modularity**, shared data and services

PILOTFISH ENABLES EASY INTEGRATION TO ANY NEW SYSTEM OR SERVICE





Pilotfish®

Cloud connectivity:

The communication networks used to communicate with vehicles will be faster and cheaper (4G usage).

The data volume used between a vehicle and back-office are no longer a major issue. Vehicles will always be Online. On-board computing will be reduced.

Because of today's rapidly developing of new technology and electronics, the future ITS systems will be smaller, faster, cheaper and use less power. More smart sensors, less "bus PC" hardware and more logic and data processing will move to the cloud / backoffice.

Messaging sharing structures:

The messaging between vehicle and back-office as well as sharing data onboard will most likely evolve towards event triggered messaging and publish/subscribe designed framework, like MQTT commonly used in IoT's systems.

Here it's just used in another application.

On top of the messaging framework the data content can be formatted in different ways, like plain text, cvs, xml or more modern style google protobuff format or JSON, and for “over the air” communication generic compression can be used.

Modularity:

UITP and ITxPT members has over the years worked hard in various CEN groups with ITS standards. One, related to onboard systems is EN13149-7/8/9 (part 9 are still under work).

The standard enables modularity and SOA architecture.

One important improvement in this standard is the ability of “plug and play” functionality concerning device and service identification. It's based on the mDNS and DNS-SD framework. This is the key component for sharing data and services on-board. Most likely framework like MQTT will end up in one of those standards.

Vision for modern APC system designs

- Sensors will be standalone, network based and possibly no need of central on-board unit.
- Comply with EN13149 standards
- Use the shared network based services such as “Geolocalisation service” (Ex. GPS positioning).
- Make use of FMS based signals over the FMS2IP services
- Use the generic messaging framework MQTT for local as well as back-office communication.
- At back-office, real time processing of sensor data, and feedback to vehicle and other systems.

What is MQTT?

Principles and Assumptions

MQTT was designed for low-bandwidth, high latency networks in the late 1990s/early 2000s. Today it’s the commonly used IoT framework.

As a result, the designers made a number of key choices which influenced the way it "looks and feels".

What is MQTT?

Principles and Assumptions

- Simplicity, simplicity, simplicity!
- Provide a solid building block which can easily be integrated into other solutions.
- Be simple to implement.
- Publish/subscribe messaging.
- Useful for most sensor and system applications, and enables devices to come online and publish "stuff" that hasn't been previously known about or predefined.

What is MQTT?

Principles and Assumptions

- Zero administration (or as close as possible).
- Behave sensibly in response to unexpected actions and enable applications to "just work" e.g. dynamically create topics when needed.
- Minimize the on-the-wire footprint.
- Add an absolute minimum of data overhead to any message. Be lightweight and bandwidth efficient

What is MQTT?

Principles and Assumptions

- Expect and cater for frequent network disruption (for low bandwidth, high latency, unreliable, high cost-to-run networks)...
- This gives funktions like “Last Will” and “Testament”
- Data agnostic.
- Don't mandate content formats, remain flexible.

Thanks!

Pilotfish®