Take a giant leap forward

**Airlink – High Performance Wireless Broadband
Onboard Connection**
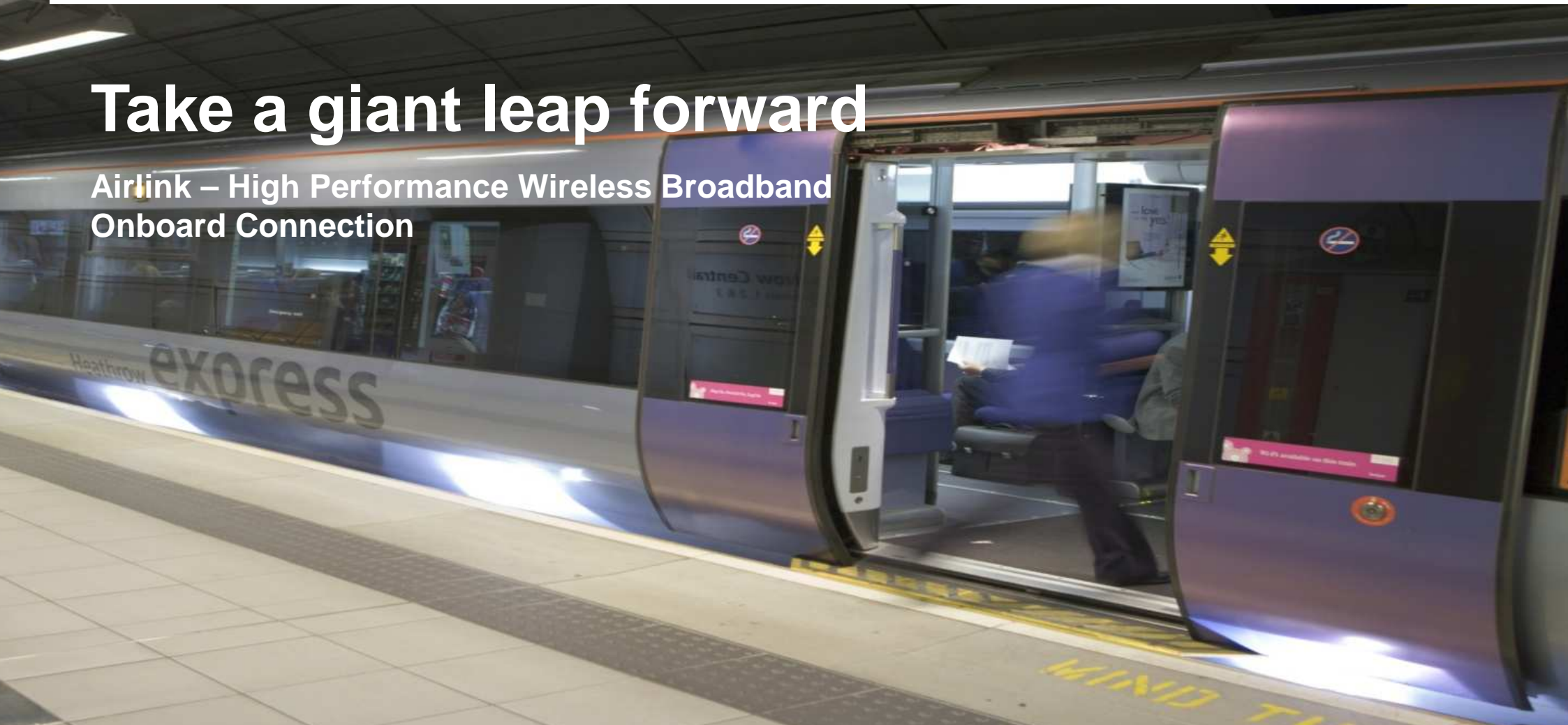
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The Airlink Vision

- A system that provides completely transparent IP-based communication between wayside and onboard equipment with one or more standard Ethernet interfaces
- Flexible platform with ability to support a variety of applications concurrently
- Tailored for the market of rail and automotive applications
- Black box IP router that guarantees a specified bandwidth, packet delivery and latency

We believe: **One Solution, Applications Unlimited**

=> a single onboard platform supporting your multiple applications
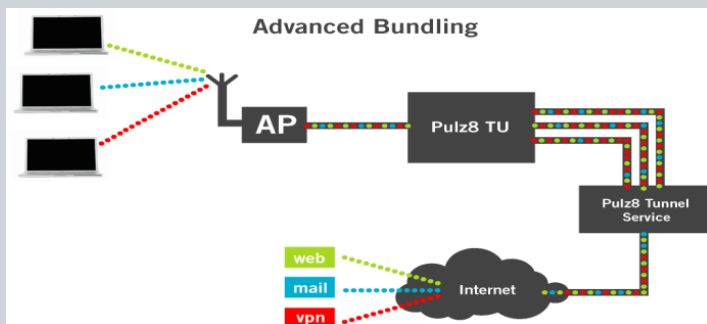
# Market Drivers for Communication to Trains

Operations:
- CBTC
- Real-time Operation data
- 24/7 Maintenance data
- Ticketing / Point of Sales
- Remote Configuration / Diagnostic
- Communication for staff
- Asset Tracking (over GPS)
- Passenger Counting

Security applications:
- CCTV
- Level crossing monitoring
- Equipment Intrusion
- Incident Analysis
- Online virtual Black Box
- Emergency Intercom

Passenger:
- Passenger Information System
- Internet-on-Board
- Entertainment
- Media Content Platform
- At-seat Audio
- Enhanced Cellular Coverage

Operations

Security

Passenger
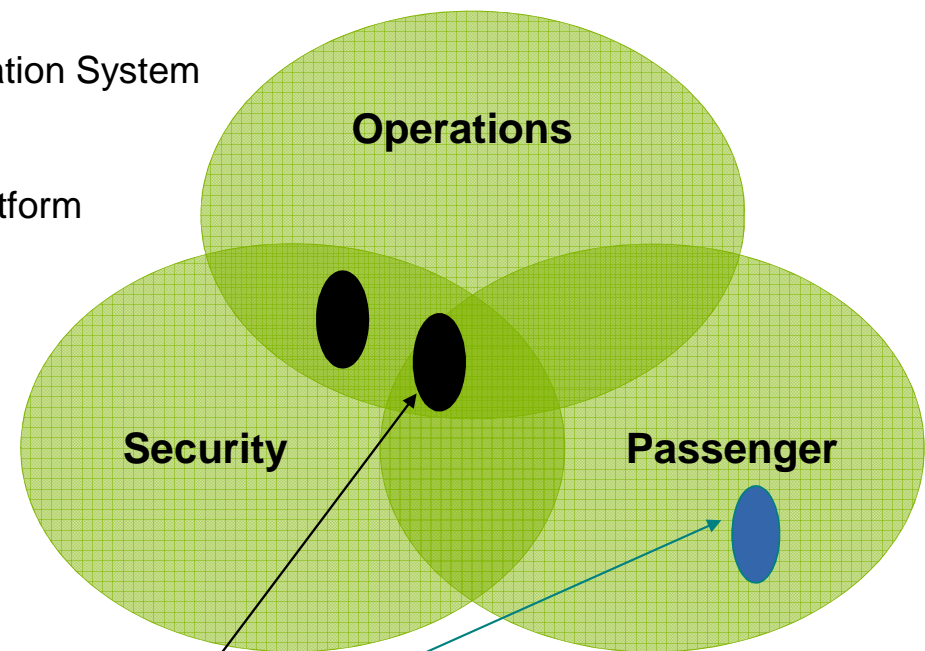
Value for Train Operators

Value of Onboard Internet

Key Parameters Train Broadband Success

- Backhaul technology is essential (E.g. 2G/3G does not provide enough bandwidth and reliability)

- Price and characteristics of the backhaul is a key factor for the success of Train Broadband

- WLAN, IEEE 802.11b seen as choice by Train Operators, building their own networks (dedicated or combined – Train Control is the main application).

- Network Operators will usually look into other backhaul technologies; e.g. WiMax (e.g. FlashOFDM) with roaming to 3G/LTE and/or WiFi in specific areas.

- Especially for passenger applications, Train Broadband calls for cooperation between Train Operators and Network Operators.
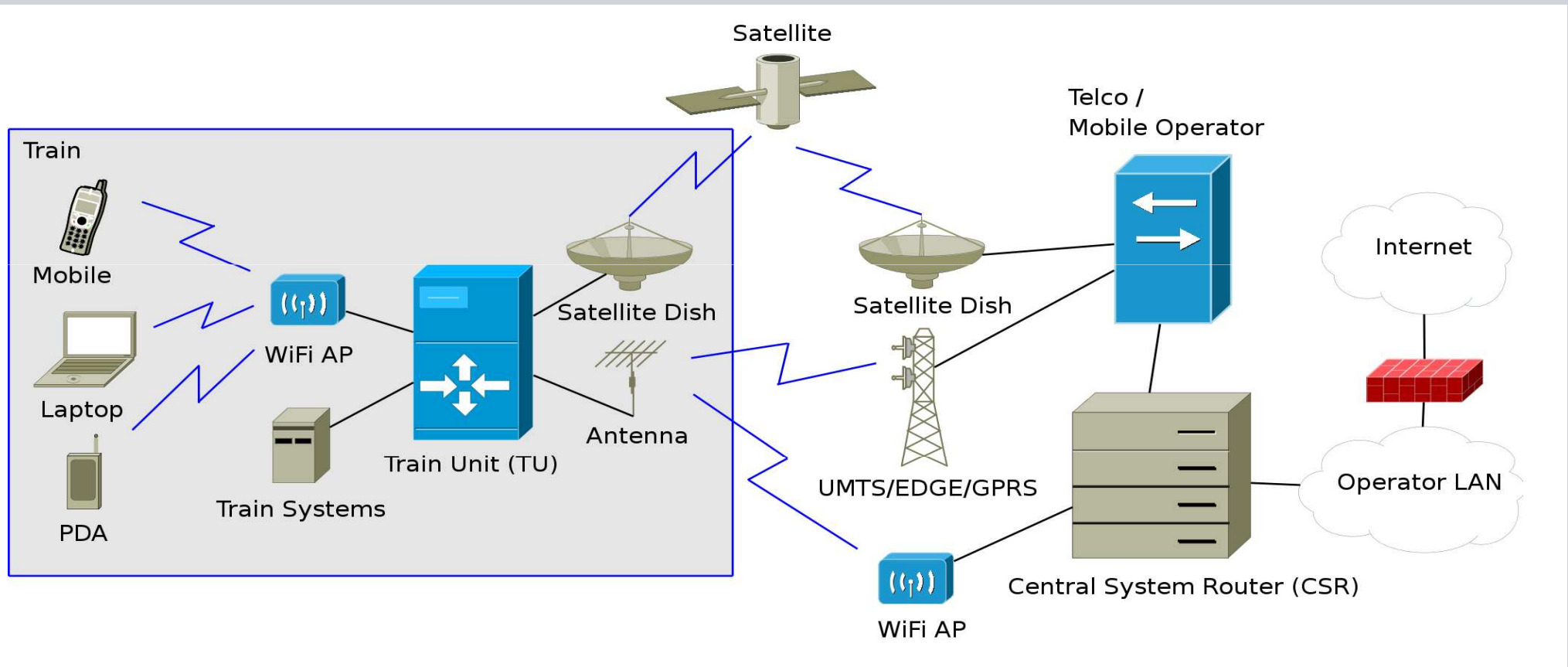
System Overview

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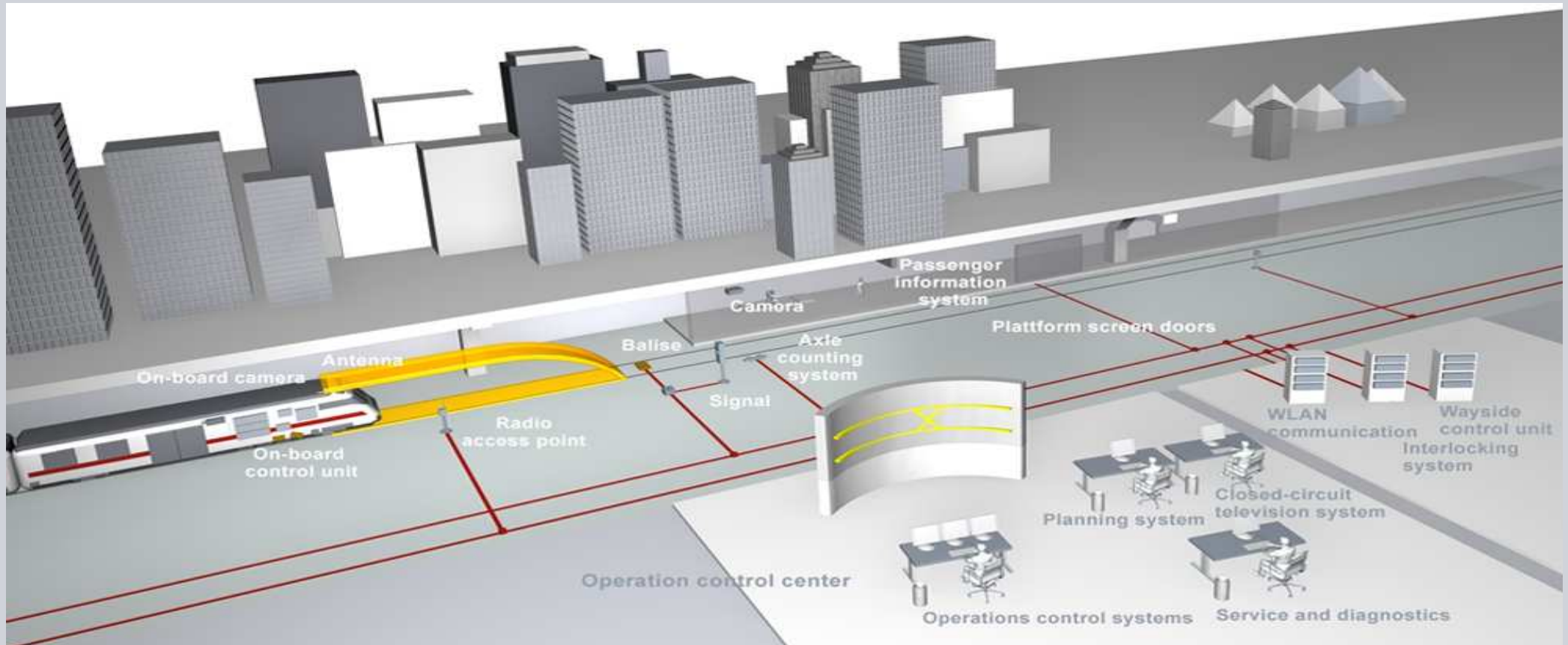
General Airlink Communication System Concept
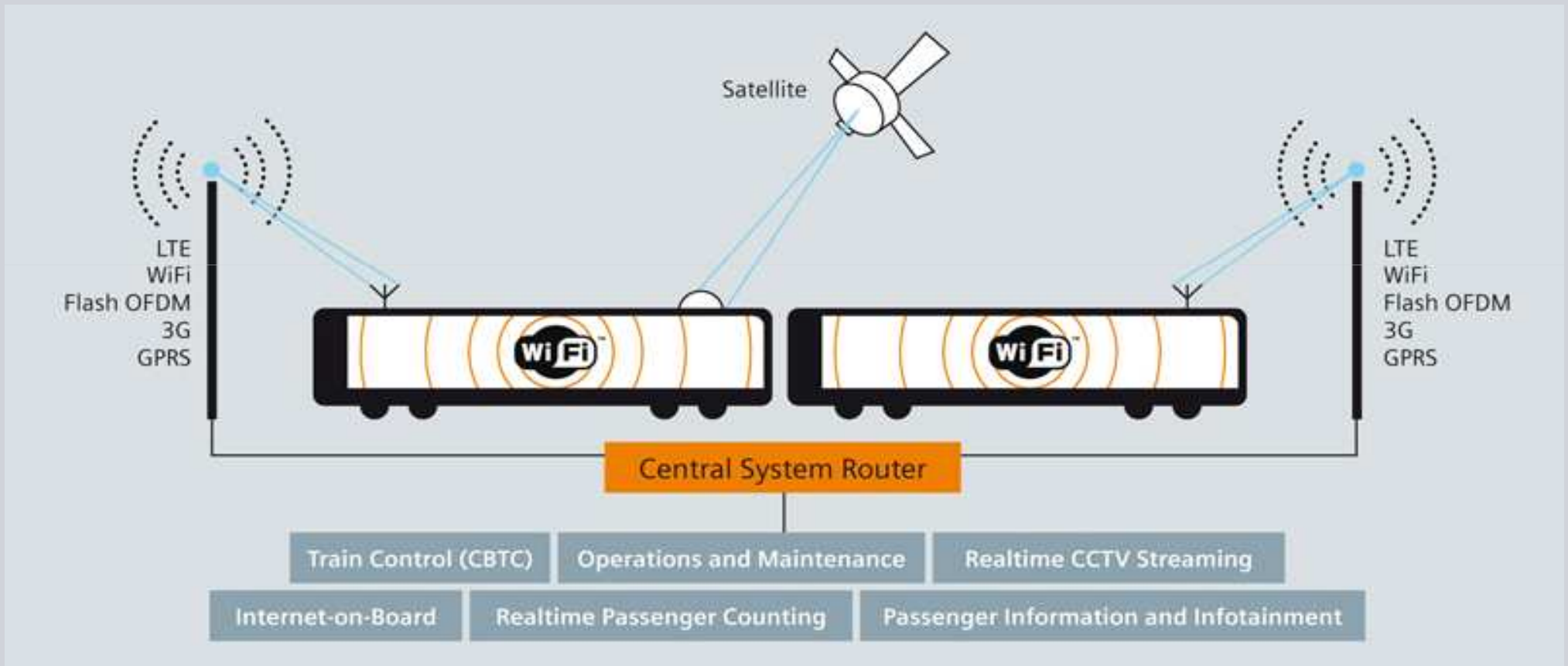
Airlink Media System Architecture

Airlink Media Features (1)
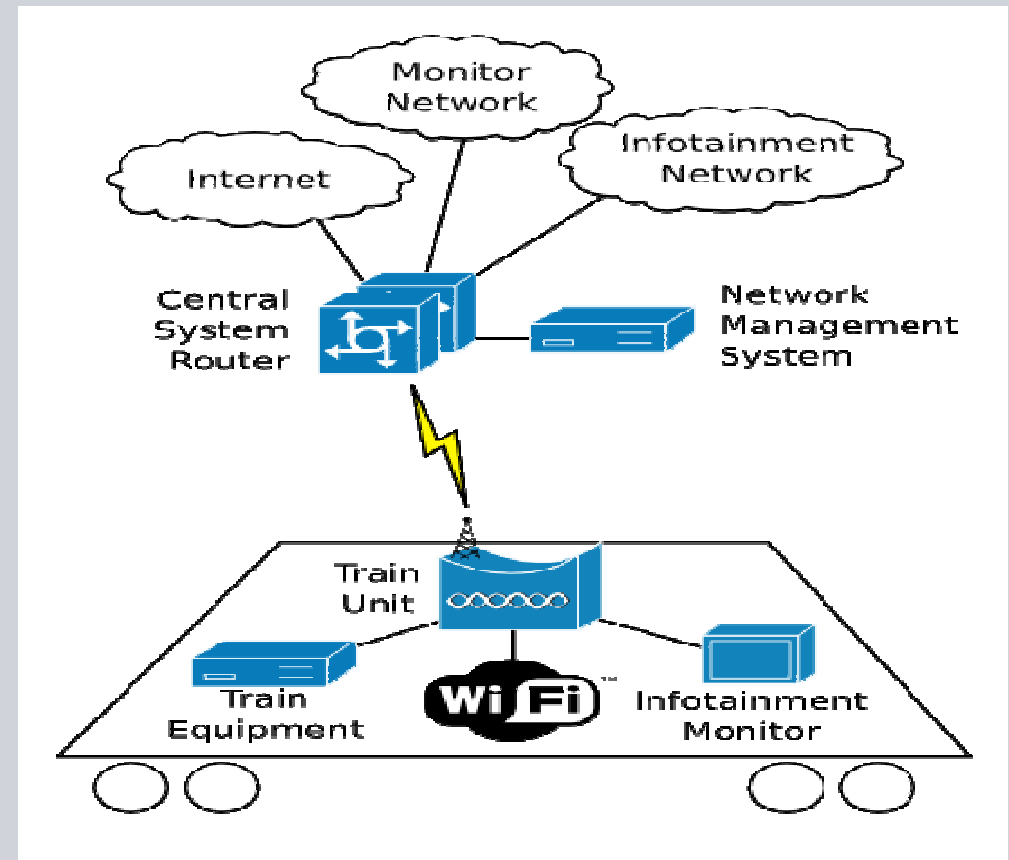
Wireless Passenger Internet
- No special setup required
- In-train caching for improved performance

Custom Networks
- Routed to the land side
- Possible applications:
  - Maintenance Data
  - Passenger Information System
  - CCTV
  - Passenger Counting
  - Public Address

Each network usage is kept separate
- Prioritized delivery to land side

Airlink Media Features (2)

GPS
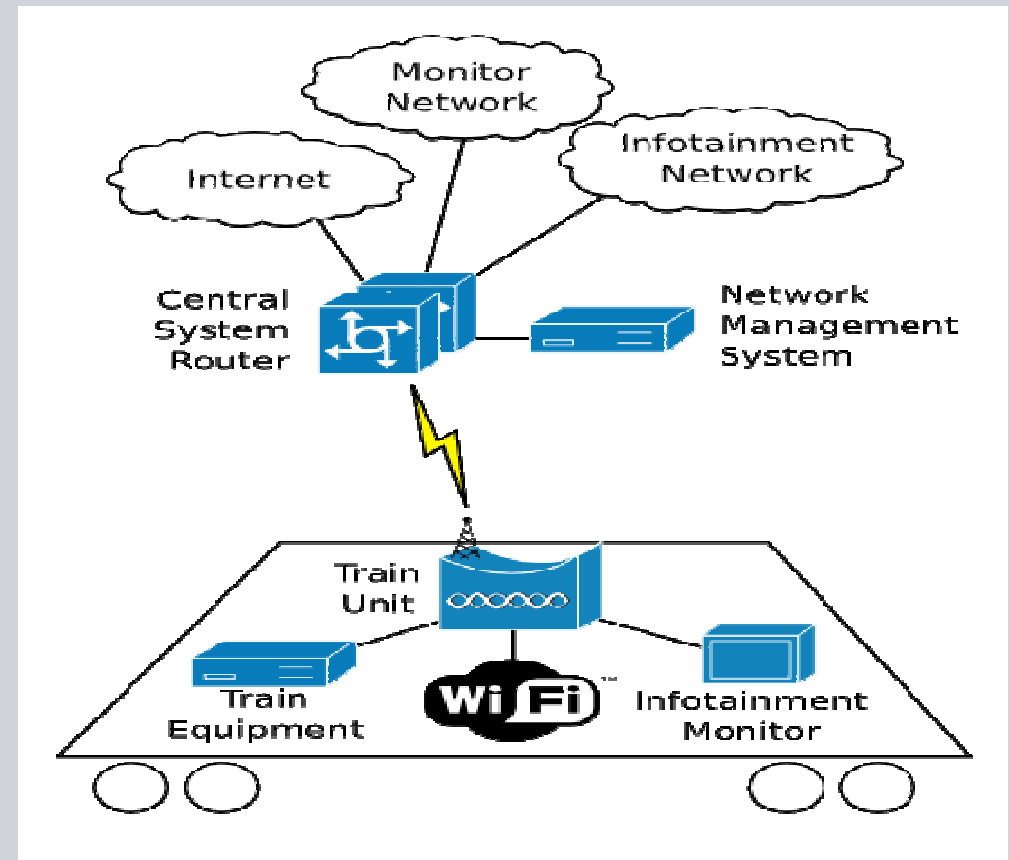- In-train units can subscribe to Train Unit GPS data

Scalability
- New Train Units can easily be added to the system, even after launch

Maintenance
- Train Unit software can be updated remotely

Adaption
- The Train Unit can be extended with new functionality

Airlink – Benefits

- Scalable system availability up to 99,9998% for train control
- B1 encryption for security
- Easy migration to new radio technologies
- Use of COTS HW (e.g. for localisation)
- Multiple concurrent applications (train control, video, PIS, IoT, etc.)
- Roaming between various radio technologies
- Synergetic concurrent operation of a variety of radio standards (WLAN, GSM(-R), UMTS, EDGE, SAT, LTE, etc.)
- Application Assistance:
  - Caching onboard
  - Terror-logging
  - GPS for other applications
  - Coupling
  - FM transmitter unit

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Airlink Train Control & Public Data System in China

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Nanjing Metro Line 2

Following the successful equipment of Line 1, Siemens and Nanjing Research Institute of Electronic Technology Consortium awarded contract for equipping Line 2 of Nanjing Metro System.

Line length

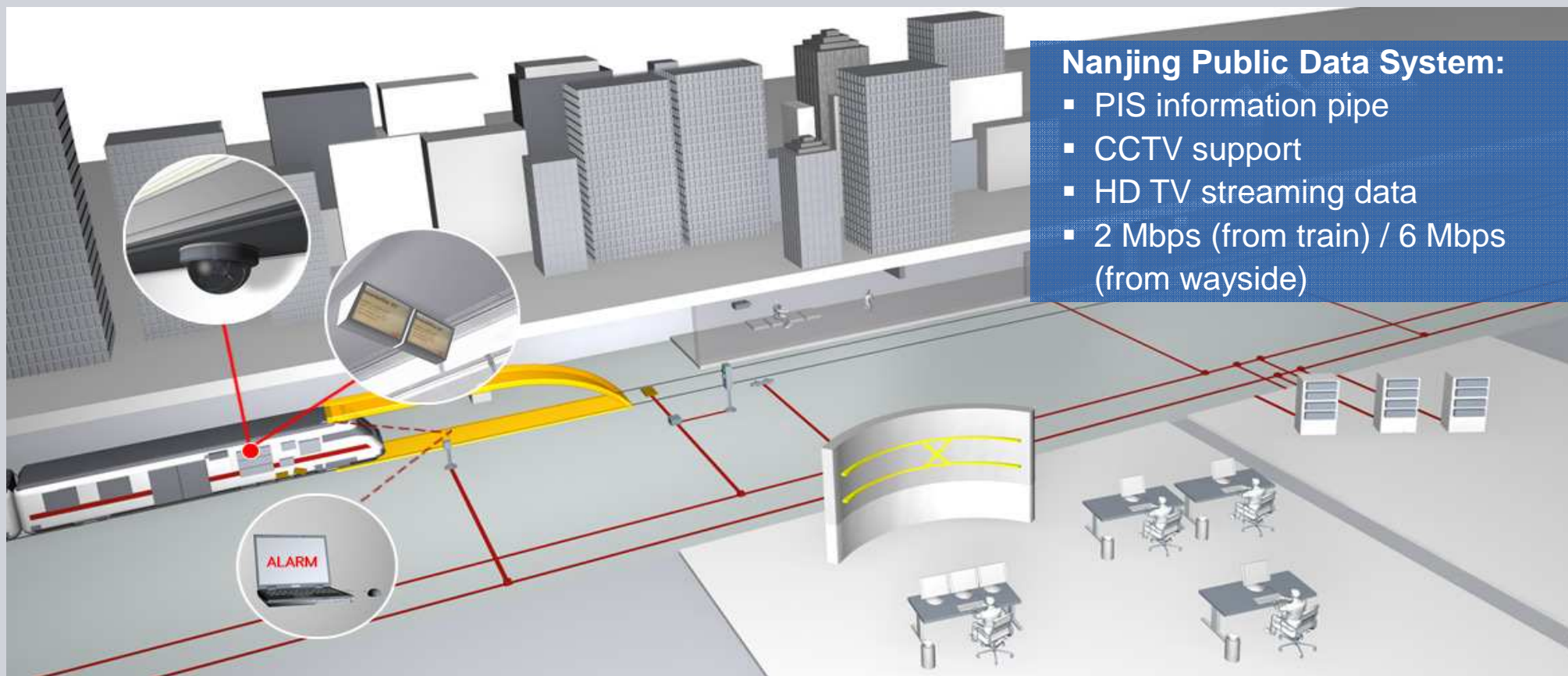- 19 stations along the 25.5 km line. 24 train sets equipped.

Project scope

- Trainguard MT Train Control System with CBTC
- Airlink Radio Transmission System
    - For Train Control
    - For Public Data System

Commissioning date

- May 28, 2010

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Airlink – Public Data System & Train Control Overview

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Nanjing Public Data System:
- PIS information pipe
- CCTV support
- HD TV streaming data
- 2 Mbps (from train) / 6 Mbps (from wayside)

ALARM

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Onsite in Nanjing

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Passenger Entertainment in Denmark

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Denmark, DSB S-train

Project scope

- Broadband enabling of 135 Metropolitan Train sets (960 Wagons) by the Danish rail operator DSB.

Butlernetworks & Siemens pulz8 is providing:

- Super broadband bandwidth for free Internet Onboard, Live TV, Real time Passenger Information, advertisement platform and technical communications between onboard train equipment and landside systems

Line length

- 84 stations along the 155 km line

Commissioning date

- November 2009

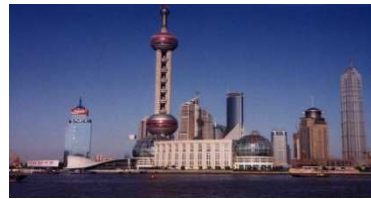**Siemens Rail Automation Radio System References**

New York, Canarsie Line

Nuremberg, RUBIN

Barcelona, Line 9

Shanghai, MAGLEV

Paris, RATP Ouragan renovation

Guangzhou, Lines 4 and 5

Budapest, Line M2

Beijing, Line 10 and Olympic Branch

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Future Projects

Guangzhou Foshan, China
Chongqing, China
Suzhou, China

- Train control applications
- Project delivery Q3 2010

Helsinki Metro, Finland

- Train control applications
- CCTV and Audio for staff
- Project delivery Q2 2011

PATH, New York, USA

- Train control applications
- Project delivery Q4 2011

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