Nokia Siemens Networks

Communications solutions from Nokia Siemens Networks to enhance railway operations

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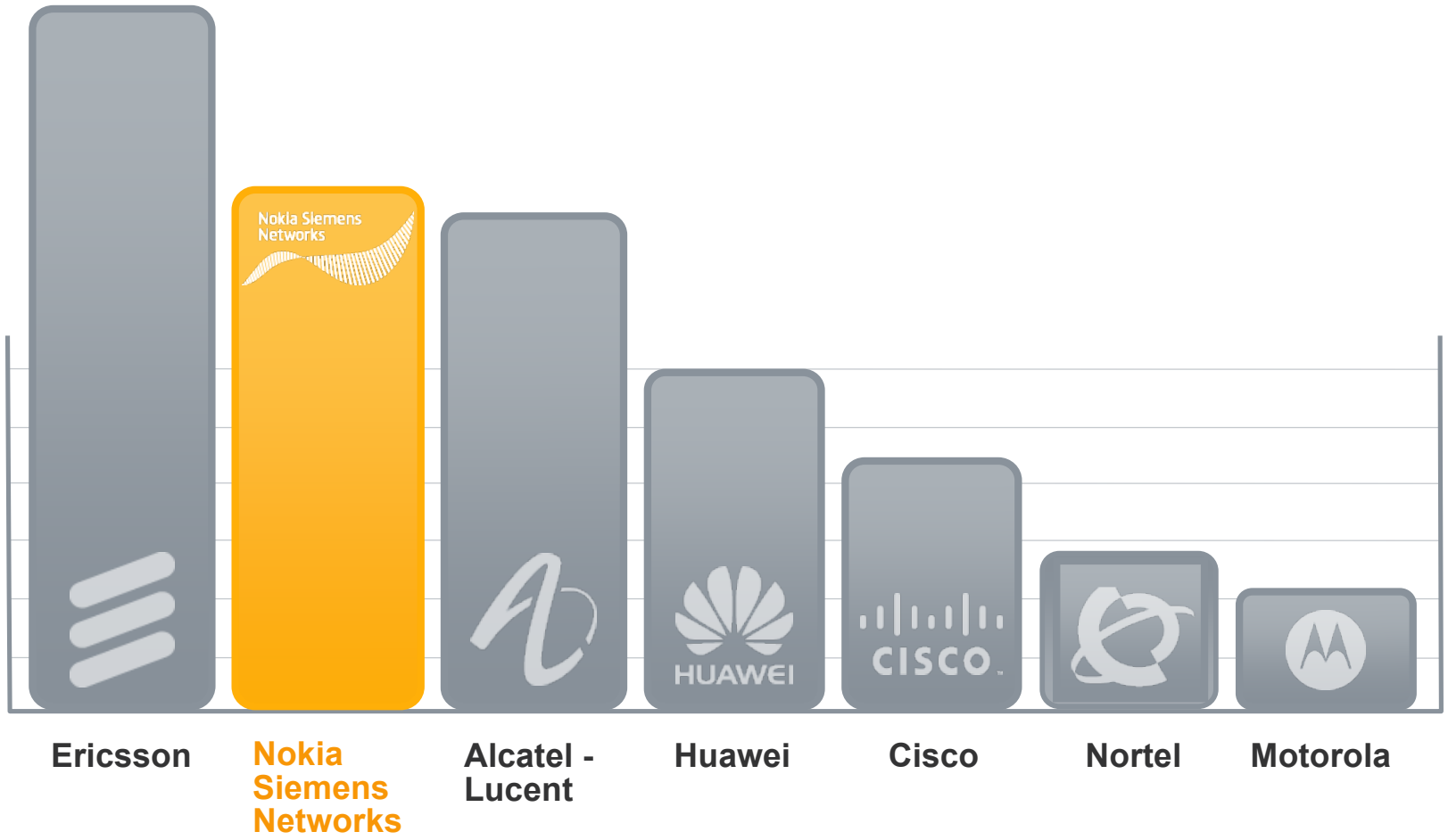
25.11.2009

Who we are

Our mission

Capabilities

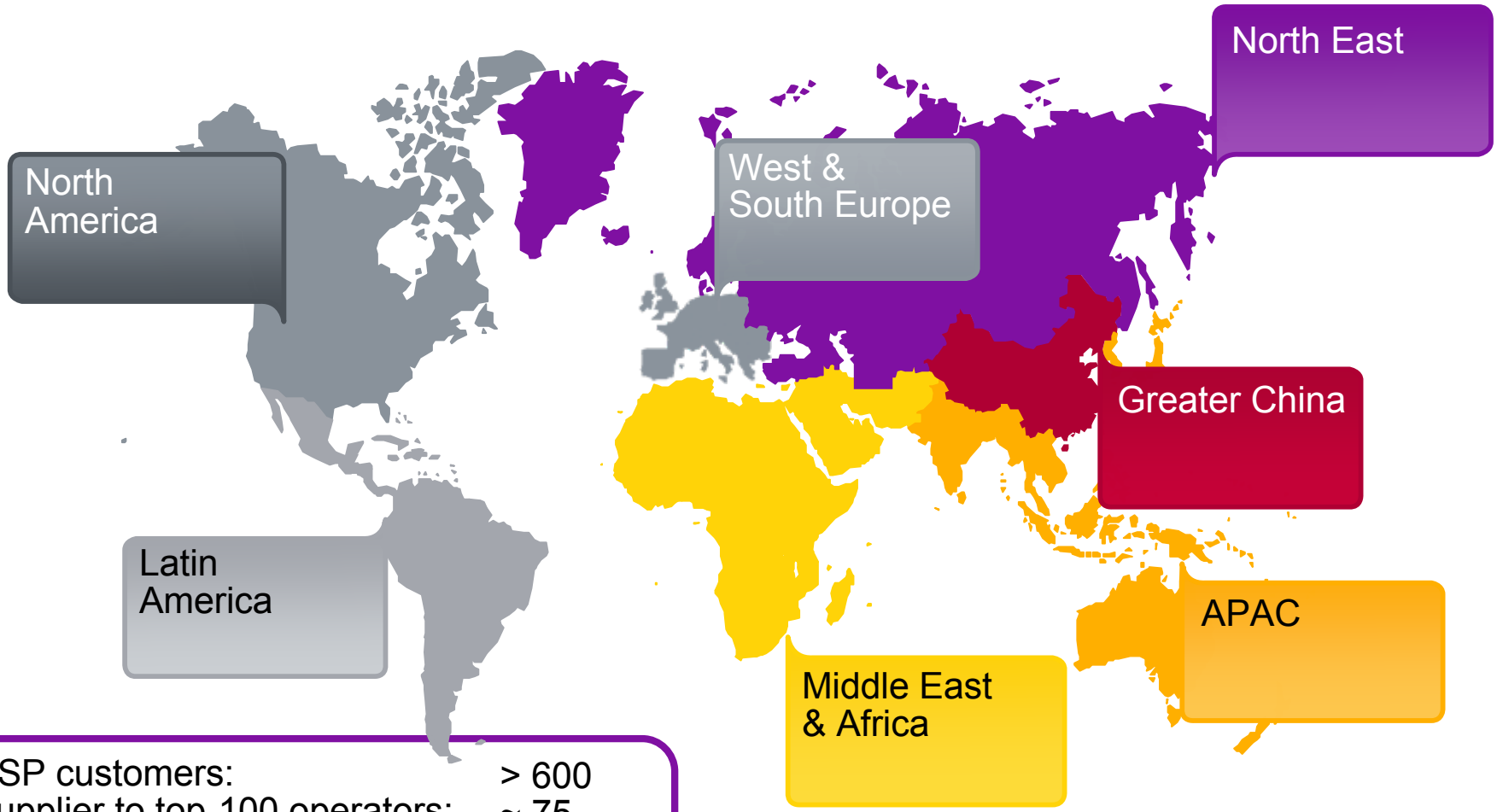
The world's second largest telecommunications supplier*



All companies with comparable carrier business revenues,
Source: Nokia Siemens Networks estimates and company reports

*Based on 2008 carrier business revenues

Global presence and service capability



CSP customers:	> 600
Supplier to top-100 operators:	~ 75
Connections served:	> 1.5bn
Countries:	> 150
Service professionals:	> 20,000

* Total Nokia Siemens Networks addressable market 2008 incl. services and competitive positioning
Source: Nokia Siemens Networks

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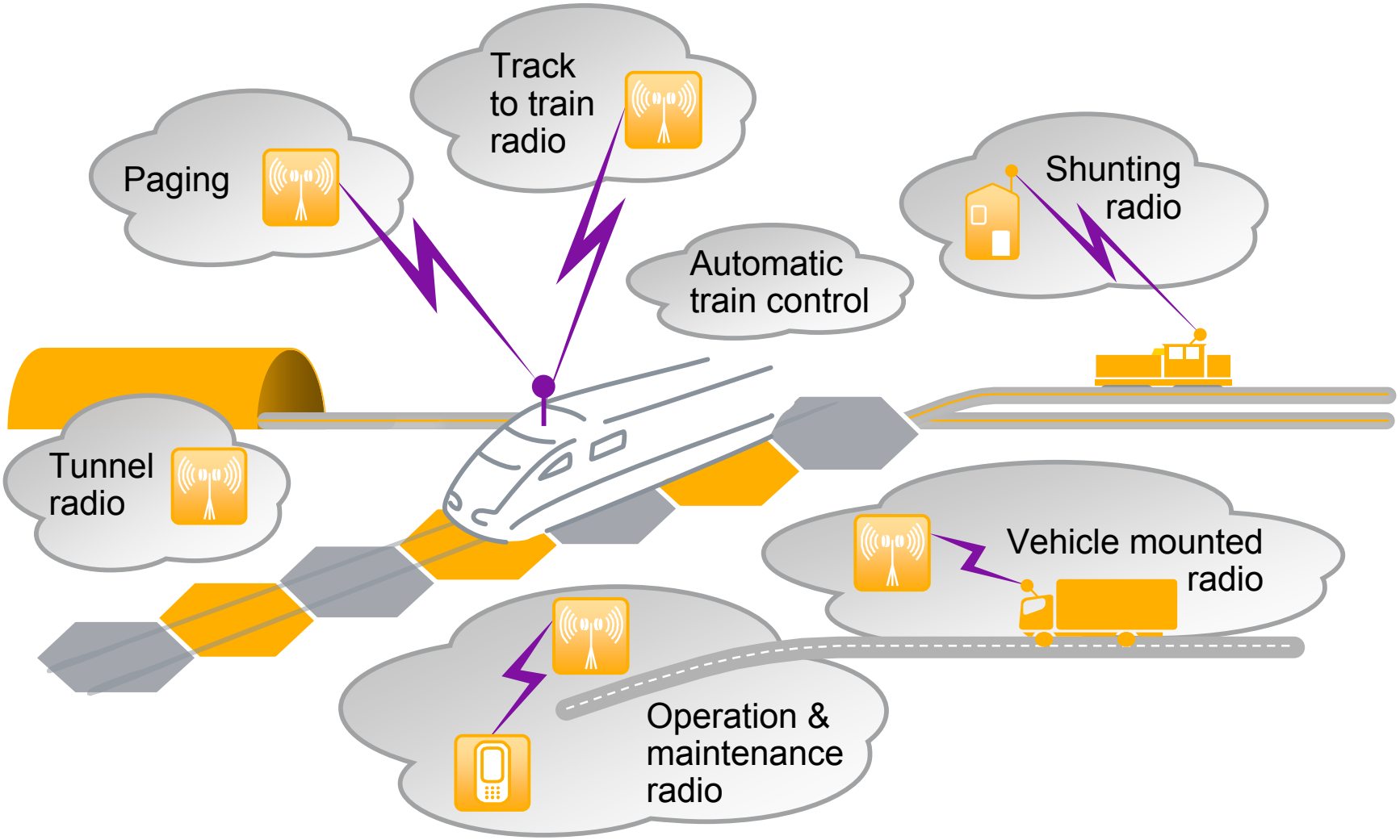
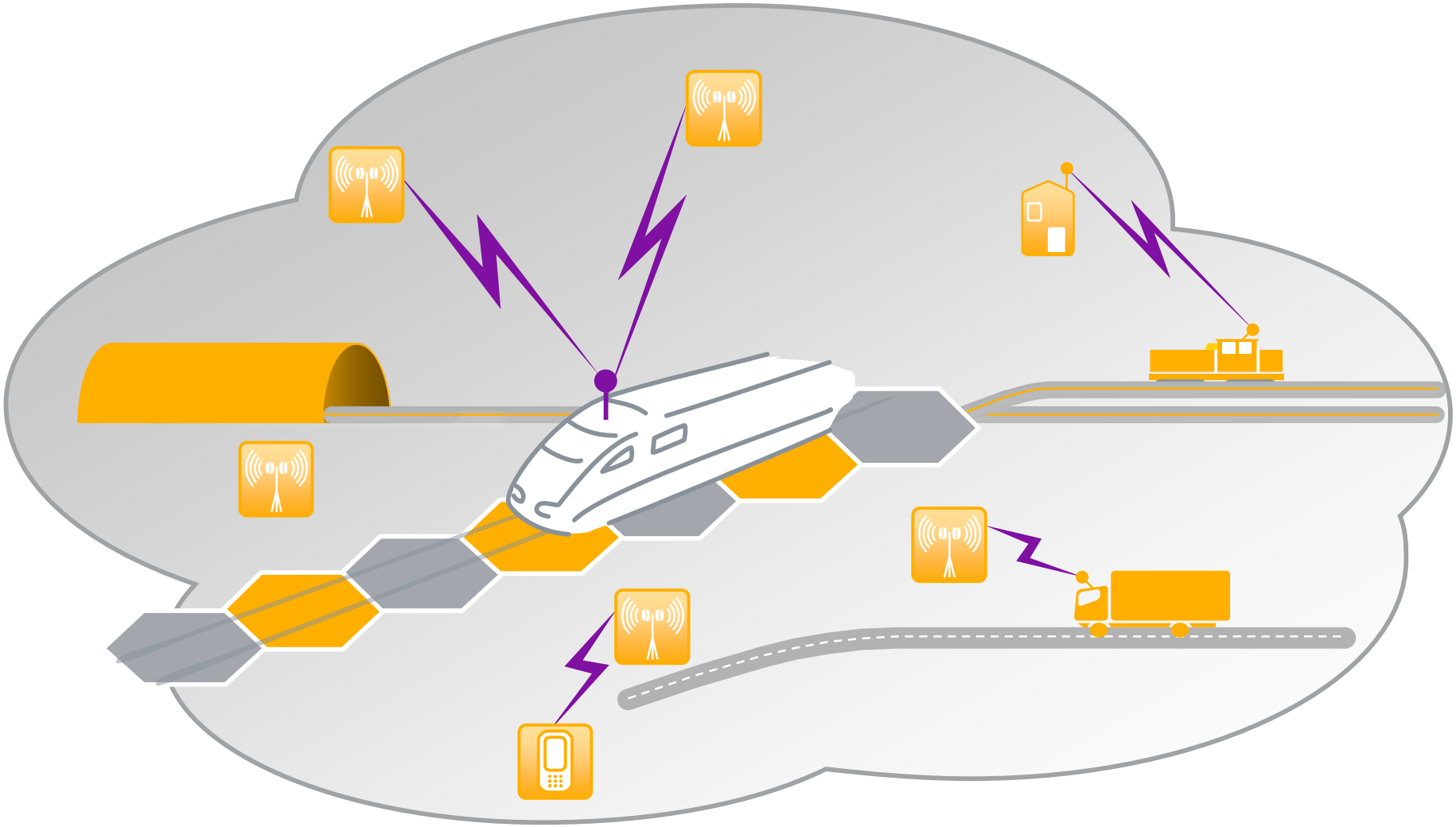
Capabilities

Old communication systems: Expensive to maintain, not interoperable



GSM-Railway:
One integrated and standardized solution



Applications

The ICT on Railways portfolio covers a full range of applications

Internet services

Portal and passenger services

Entertainment

Media players

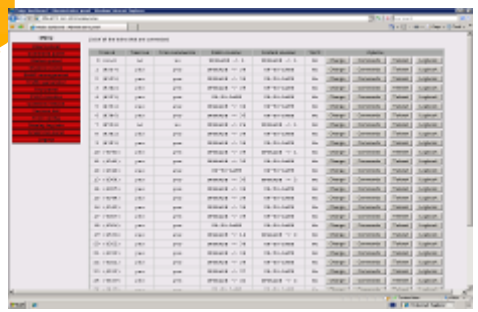
Applications

Revenue generating & service improvement	WLAN/VPN to passengers	Messaging System	Passenger Information	Online Ticket Sales	...
Cost saving application	Train Diagnostic & Monitoring	Train Positioning/ Fleet Management	Train operations	Passenger Counting	...
Security applications	Video Surveillance				

Video surveillance

Train operations

Location data



Remote software updates & maintain data

Applications – Passenger Information

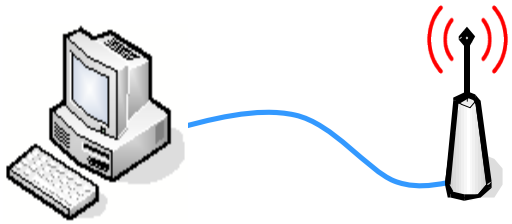
Content Creation

Page Editor

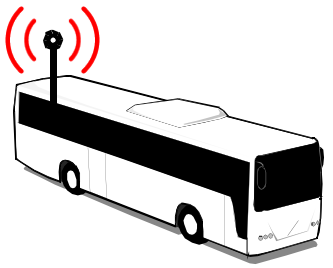
(Templates)

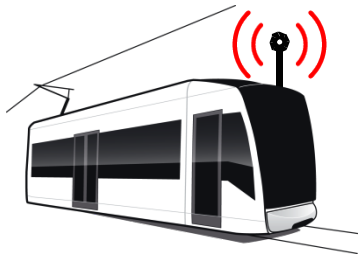
Content Management

Content Distribution



Content Presentation





Applications – Passenger Information
Solutions for all kind of public transport

Bus, light rail (tram & metro), rail (train)

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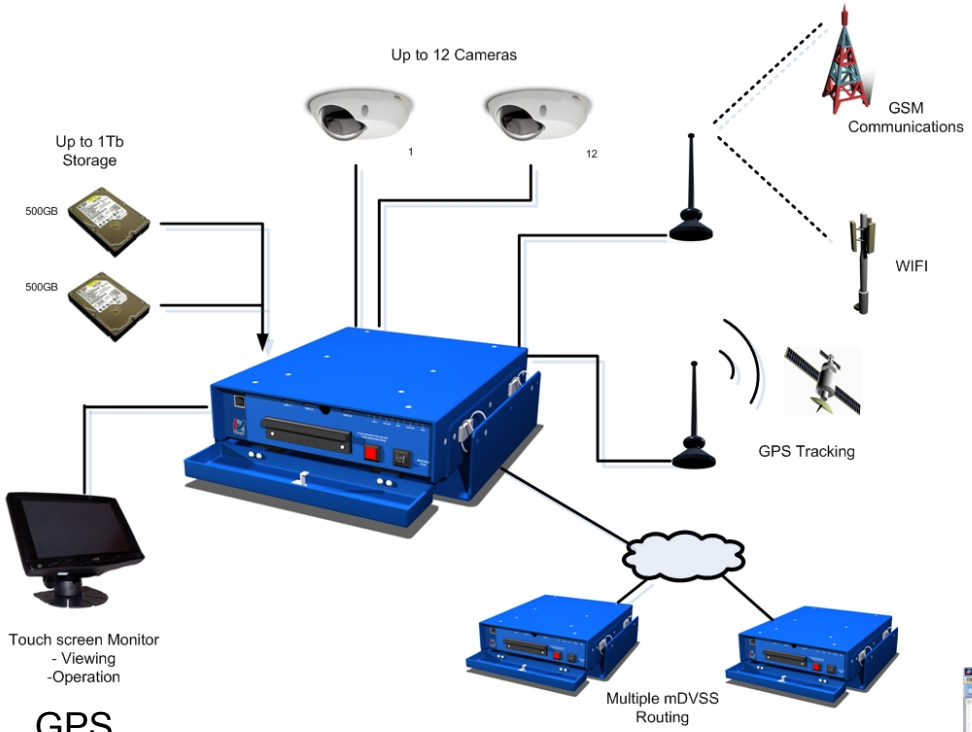
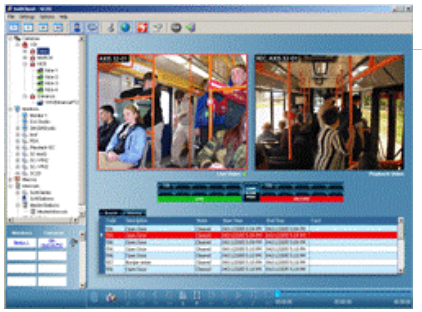
Applications – Video Surveillance

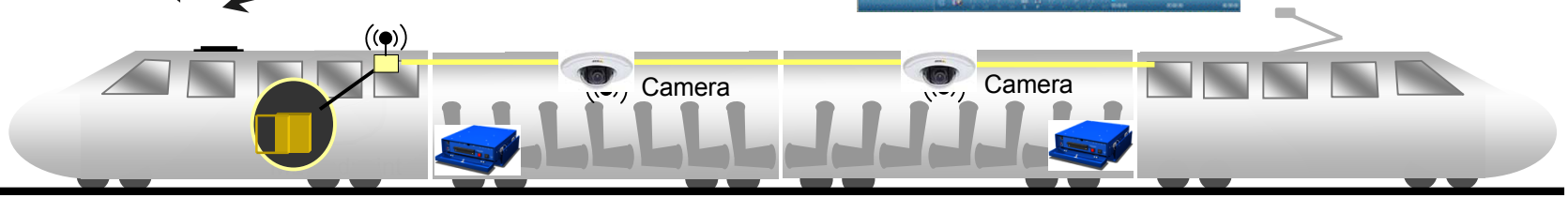


GPS

Backhaul

Control Room





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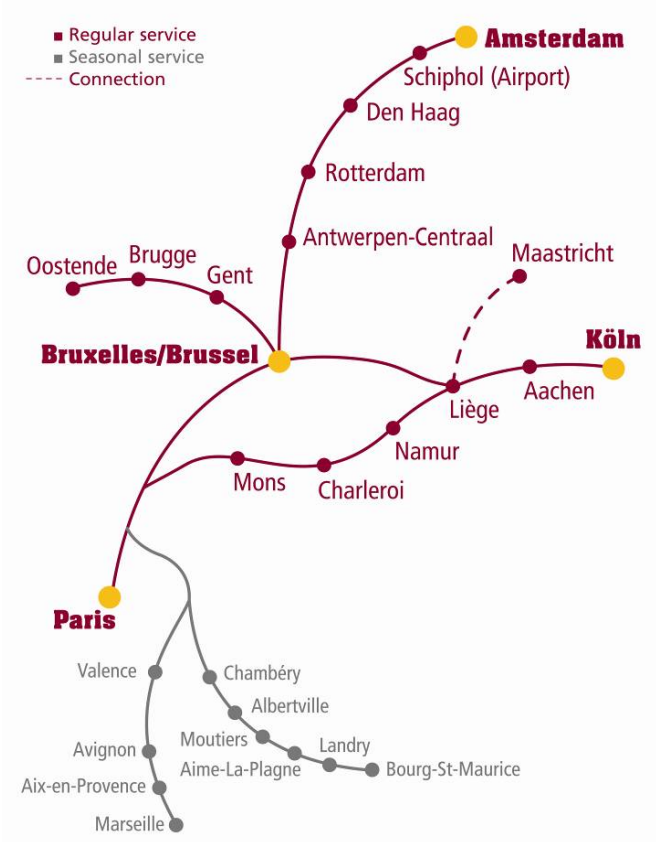
Applications – Internet on trains

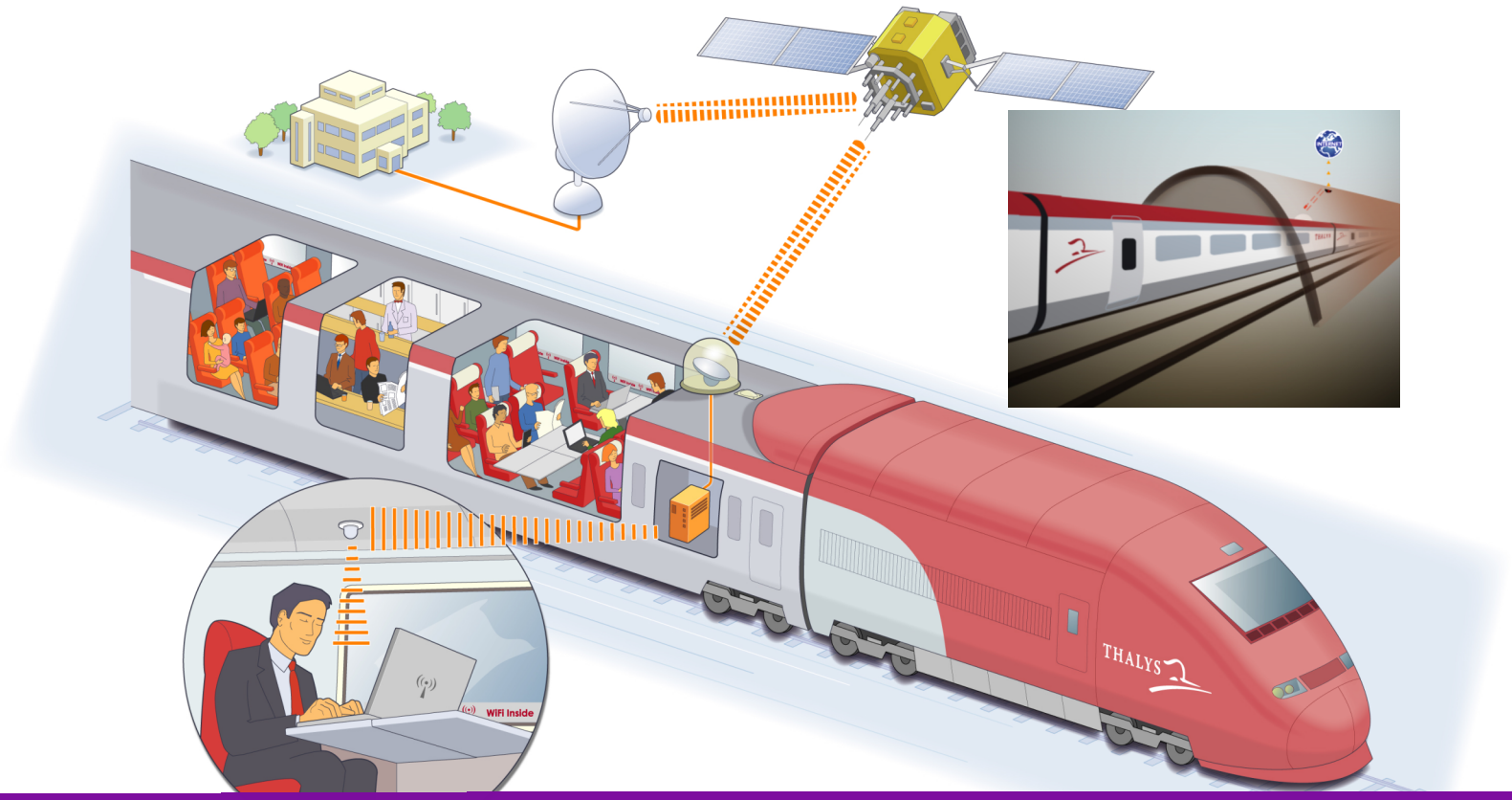


Specific challenges:

- High speed lines 320km/h => connectivity
- Content/marketing for 4 countries
- Regulations in 4 countries

"The **experience** of the consortium in the internet solution was a major asset for the project and Thalys international. The consortium offered the **best compromise between the technical solution and financial proposal**. " (Thalys)

Applications – Internet on trains
Continuous connectivity



Seamless switching between satellite, UMTS with Wi-Fi technologies provides continuous Internet connectivity on board the Thalys trains traveling across borders at the speed of 300 km/h

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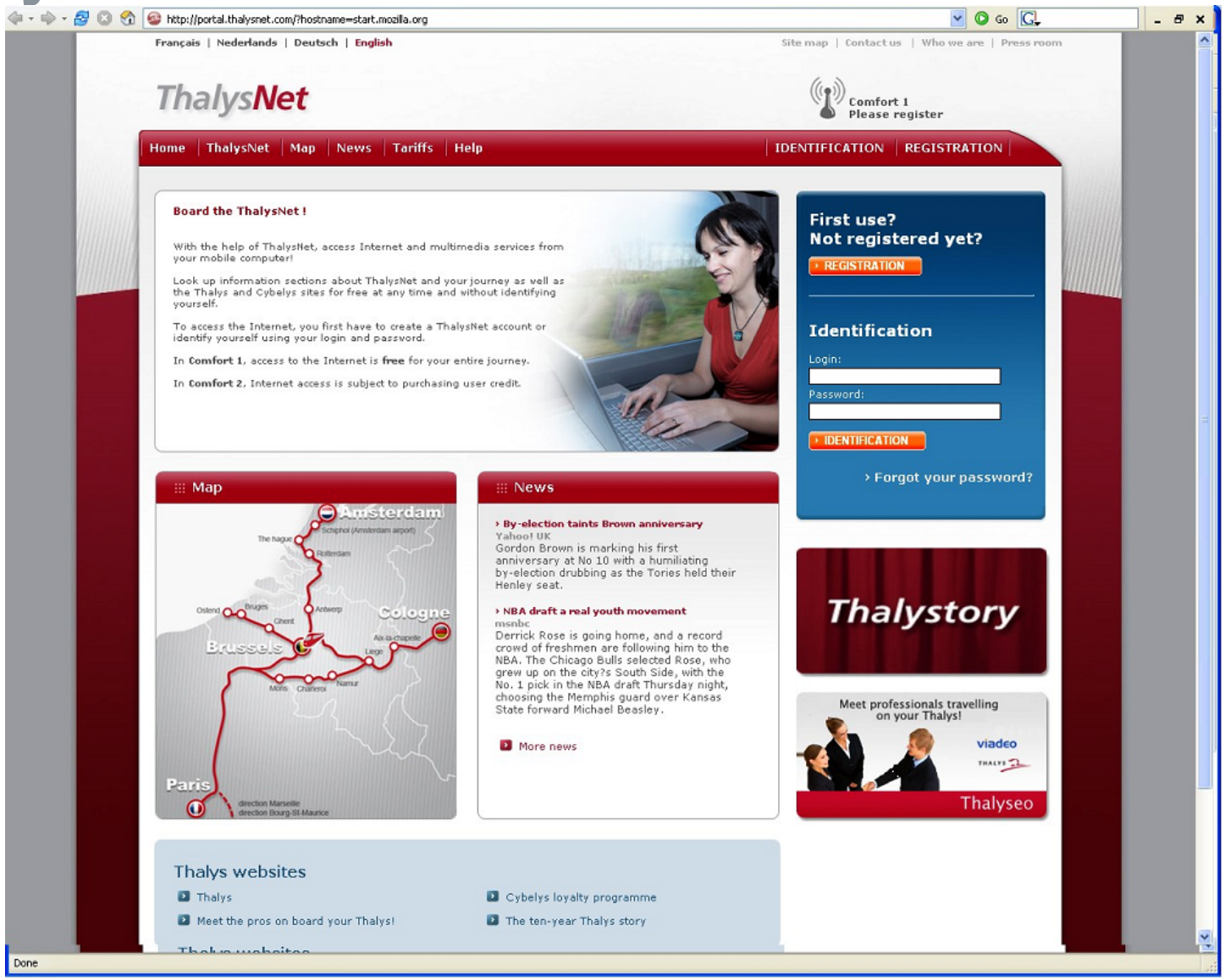
Applications – Internet on trains
Thalys Portal



Who we are

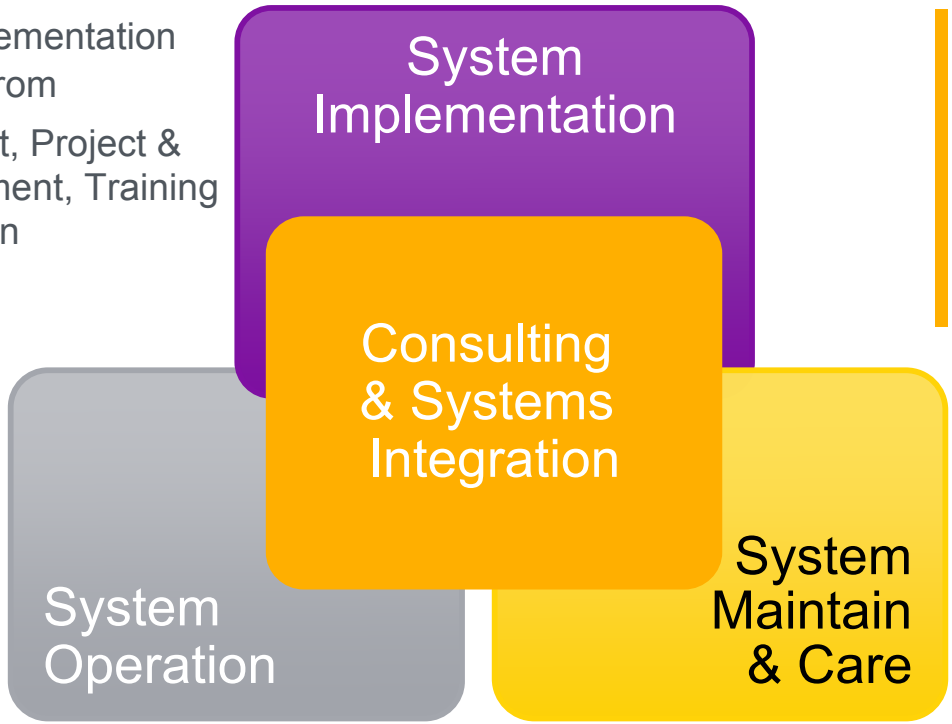
Our mission

Capabilities

Integration and services

Deliver a full implementation package ranging from

Installation support, Project & program management, Training and Documentation



Supporting Train operators in their efforts to address their business challenges and improve their business performance through consulting and system integration services

Planning and building the operations and management of the day-to-day tasks in a customer's network

Providing the best hardware and software maintenance services for optimal network performance

GSM-R and Solutions from Nokia Siemens Networks: The fast track to efficient railway communications

Active participation in European and international railway standardization

Experience obtained from 24 GSM-R projects, including turnkey and network operations

Best-in-class products, R&D, and production facilities

Number 1

"One-stop-shopping" with e2e ability

Strong commitment to GSM-R and long-term business and environmental vision

Strategic cooperation with local partners for necessary services and products

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Thank you!

Using 21st Century communications solutions to enhance railway operations – Available backhaul technologies today

	2G/EDGE	3G/UMTS HSDPA	WiFi	FLASH-OFDM @450/870MHz	Satellite
Bandwidth Packet delay type. values	30 … 160 Kb/s /ch Delays 600 … 2000 msec	300 … 1200 Kb/s Delays 160 msec	4 … 22 Mb/s Delays: 40 msec	1,5 … 4 Mb/s Delays: 40 msec	0.5 … 4 Mb/s Delays: 550 msec
Bandwidth Vs. speed	Degrades at higher speeds; network dependent (20 to 75 % @ 120Km/h)	Degrades at higher vehicle speed (>250 km/h) network dependent Not noticeable @ 120 Km/h	Mainly for stationary use Proprietary technology for fast handover	Seamless handover at high speed, thanks to built-in MOIP technology	Remains constant No noticeable Doppler effects below 500km/h
Coverage	Most countries completely covered by GPRS. EDGE is limited	Good in urban area's, limited in rural regions, but growing.	Only in railway stations	Only project specific (e.g. Germany T-mobile) Licenses required, 450 MHz not always free.	Country/region wide Affected by tunnels, rain, trees: LOS needed
Infra-structure	Agreements needed with network operators OPEX cost roaming	Agreements needed with network operators OPEX cost roaming	Large number of sites required, but cheap technology	Lower number of sites required due to large cells CAPEX & OPEX!	Several satcom operators offering 2 way IP services. Expensive techno.

GSM - R
Services Capabilities

Due diligence Support

Consulting & Technology Watching

Competence Development Services

Parameterization support

Integration & Validation

Application Products and Services Integration

Capacity Planning

Experts Support

Network Design

IT Solutions

Network Build / Turnkey Solution

Security

Operations Support

Multi vendor Care

Networks and Services Optimization

Network Maintenance

Spare Part Management

New Service Creation Solution

Hosting

Managed Services Solution

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