

HUAWEI ENTERPRISE ICT SOLUTIONS **A BETTER WAY**

Improved performance for the transport sector through ITS

Norman FRISCH
Business Development Transport Solutions

enterprise.huawei.com

HUAWEI TECHNOLOGIES CO., LTD.



Huawei: A Global Company with local presence



Global Presence

- 150,000+ employees worldwide
- 14 regional HQ, 140+ branch offices
- 23 R&D centers, 45 training centers

Transport sector experience

- **16 years** of ICT supply into transport sector
- **14.000km of GSM-R** lines contracted globally
- **Smart City, Aviation, Road & Rail** projects all across the world

Challenges Faced by wireless systems for Urban Rail Transport

Service Requirements of Urban Rail Transport



CBTC: Bidirectional real-time transmission of train control information



Train Dispatching



Video transfer in train and along railway



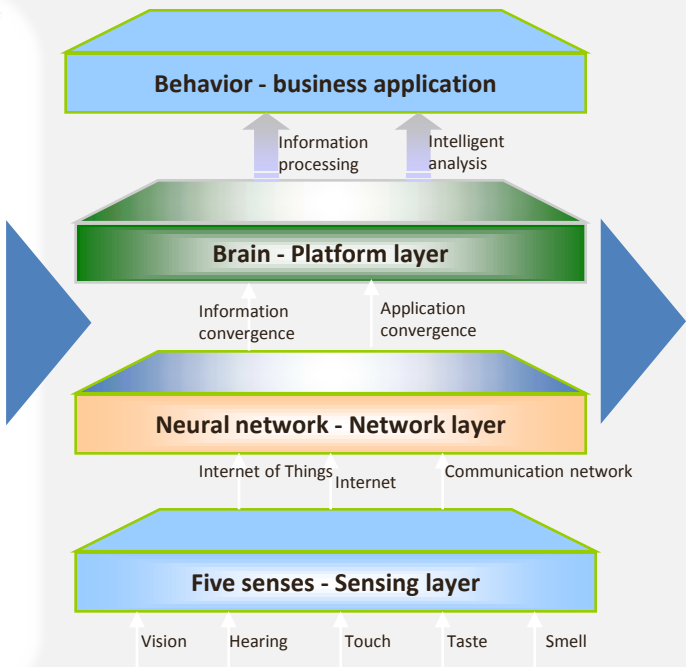
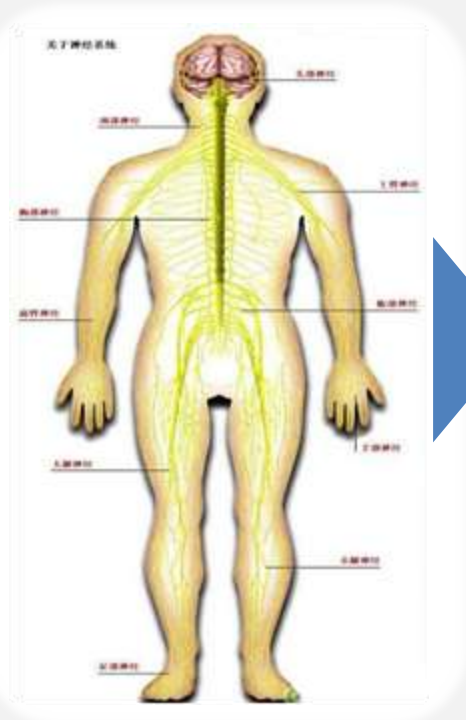
PIS: Real-time broadcast of video, information, and disaster emergency



Current Challenges

1. Free & open frequencies, and lots of interference
2. No QoS guarantee mechanisms
3. More sites, and difficult maintenance in tunnel
4. 3 independent networks, and high operation costs
5. Only voice, and no **data & video dispatching**
6. No ways to guarantee better service performance in high mobility

Efficient operation



Control Centres

- Traffic Management
- Asset Assignments
- Emergency command center (ECC)
- Toll collection and accounting



Data Centres

- Cloud Computing
- Big Data processing / query
- Predictive Analytic Tools..



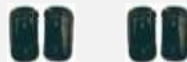
Transmission Networks

- Wireline optical/copper
- Wireless LTE, Microwave



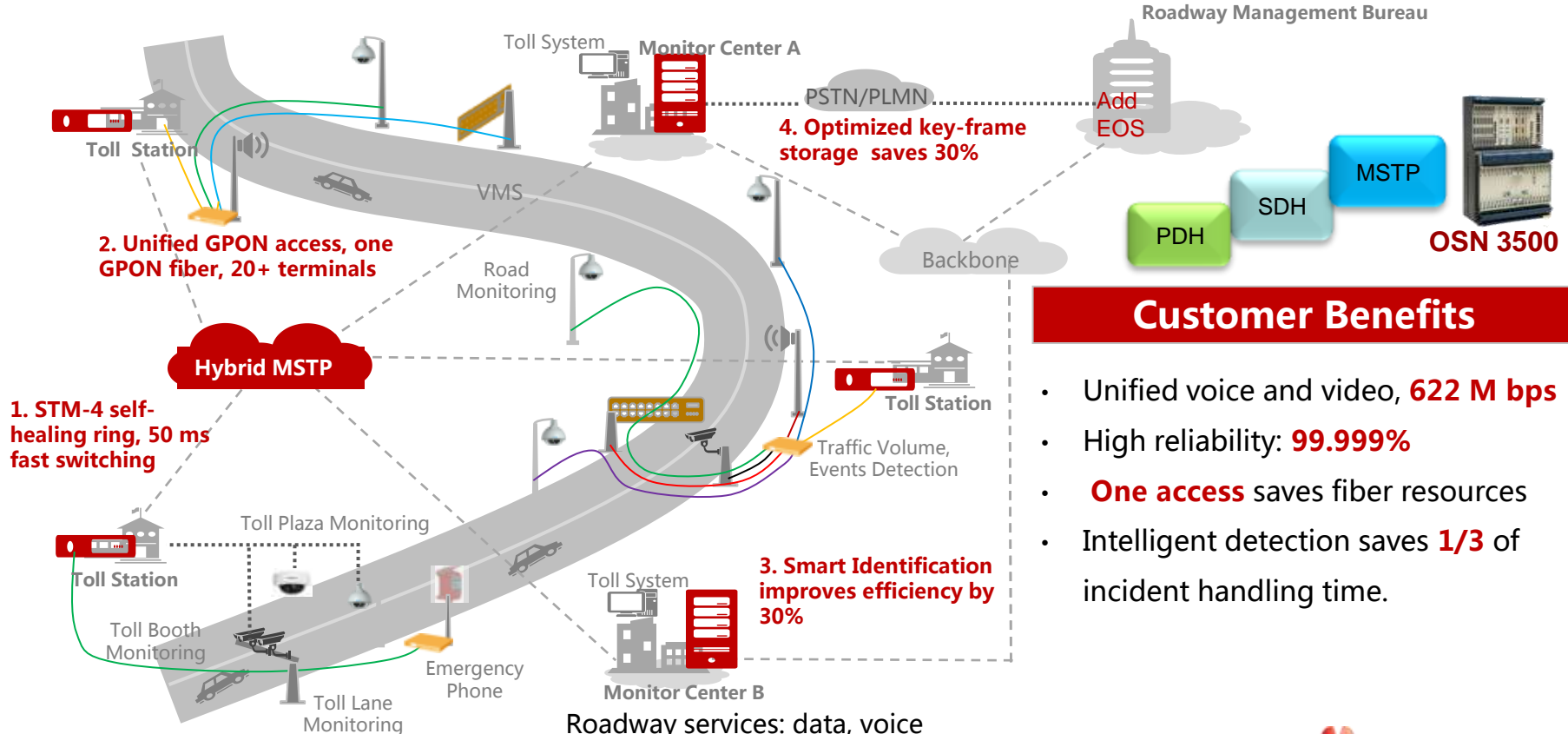
Sensing Network

- M2M terminals/gateways
- Detection Traffic Load, Bookings
- CCTV analytic tools



It's all about integrated communication

Hybrid MSTP: masters Complex ICT setup along the road



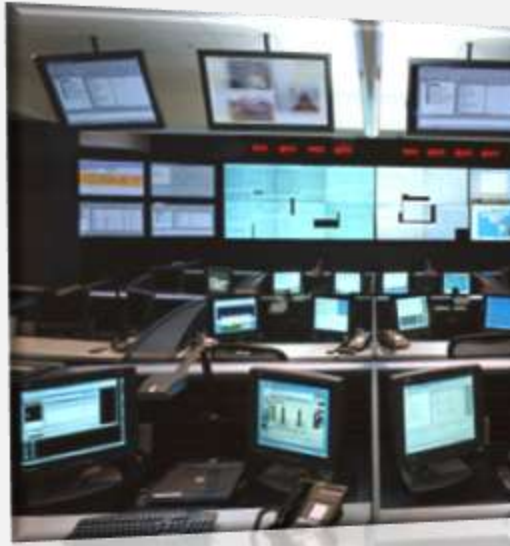
Customer Benefits

- Unified voice and video, **622 M bps**
- High reliability: **99.999%**
- **One access** saves fiber resources
- Intelligent detection saves **1/3** of incident handling time.

Roadway services: data, voice
 TDM services: video, office and other IP services
 ICT technology: **Hybrid MSTP**



Typical demands to ICT in the Transport Sector



VOICE trunking

- GSM-R
- TETRA
- DMR...

- Group Calls (VGCS/VBS)
- Push to Talk (PTT)
- Direct Mode (DM)
- Priority & Pre-emption (eMLPP)

VIDEO

- LTE
- WiFi
- WiMAX

- Push to Video
- Vehicle to Ground video
- Mobile & static Video surveillance

DATA

- LTE
- WiFi
- TETRA

- Asset management /tracking (transporter, container, vehicle, resources..)
- Maintenance data
- OSS data feed

Emergency Response Communication



Multi-screen Recording



Traffic Command Center



TP Decision Room

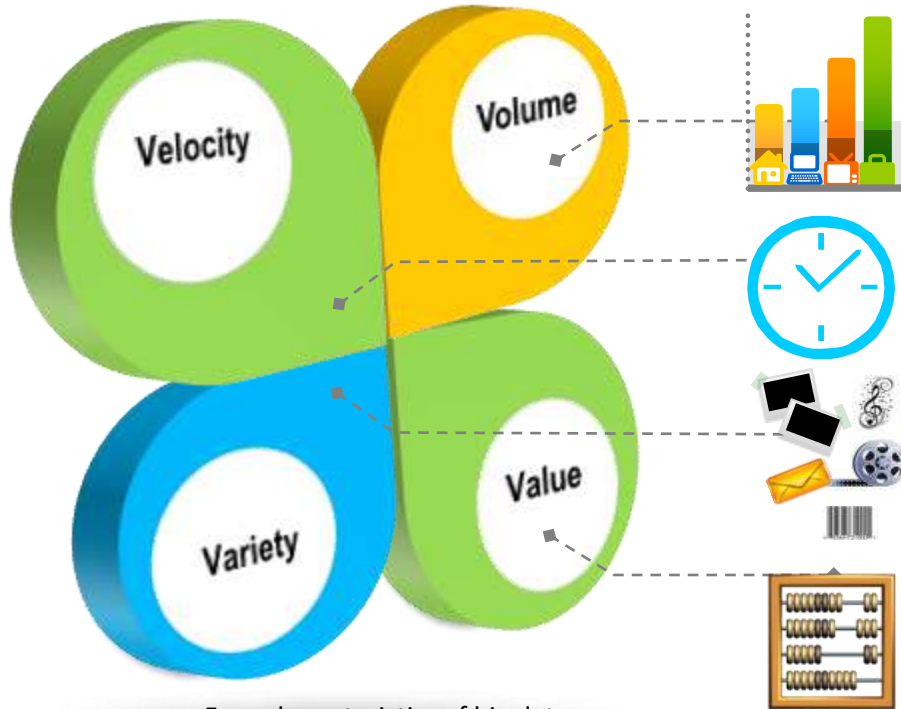


Remote Training



...ability to integrate independent networks

Transport Big Data has 4V Characteristics



Four characteristics of big data
Source from IDC

Massive Data Scale

- Traffic data storage from TB to PB
- Traffic flow data, system log, tolling data, traffic signal control data...

Fast Data Analysis and Processing

- On line response within 1 second

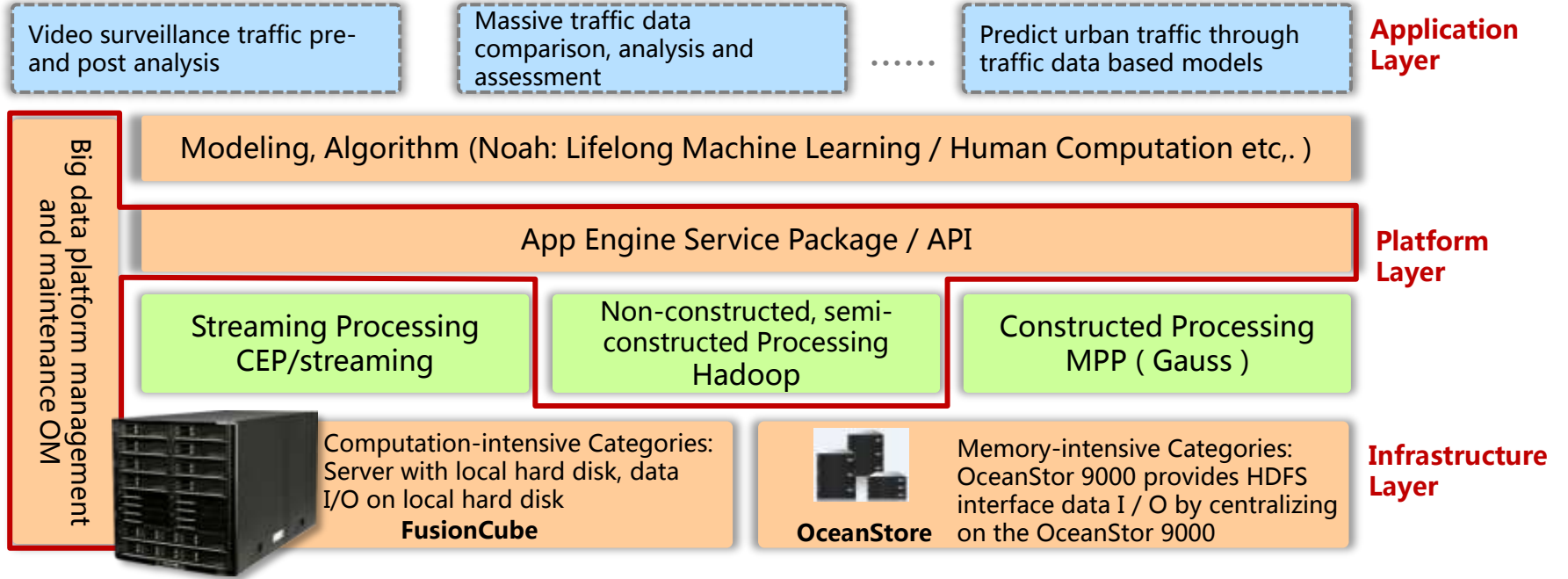
Various Data Type

- Video, image, sensor data, GIS information
- Documents, image and video unstructured information accounts for 90% of traffic data

Significant Data Value

- Traffic simulation and planning
- Improve traffic operational efficiency
- Enhance traffic safety

Big Data Copes With the Urban Traffic Challenge



The biggest challenge for a good decision is processing data quickly!

Huawei eLTE Urban Rail Transport Solution: Innovation & Convergence, Changing the Future of Metro Wireless Communication

Innovation

- Mainstream Technology, First launch globally
- Advanced anti-interference technologies in air interface
- Multi-level QoS algorithms
- High mobility, and seamless handover algorithms

Convergence

- One network to bear PIS, CCTV, broadband trunking, and CBTC simultaneously
- Broadband trunking to support voice & video dispatching simultaneously
- Convergence of broadband trunking & video conferencing

Change

Safe Operation

- Specialized anti-interference technologies
- Multi-level QoS algorithms
- High mobility, large coverage, and seamless handover

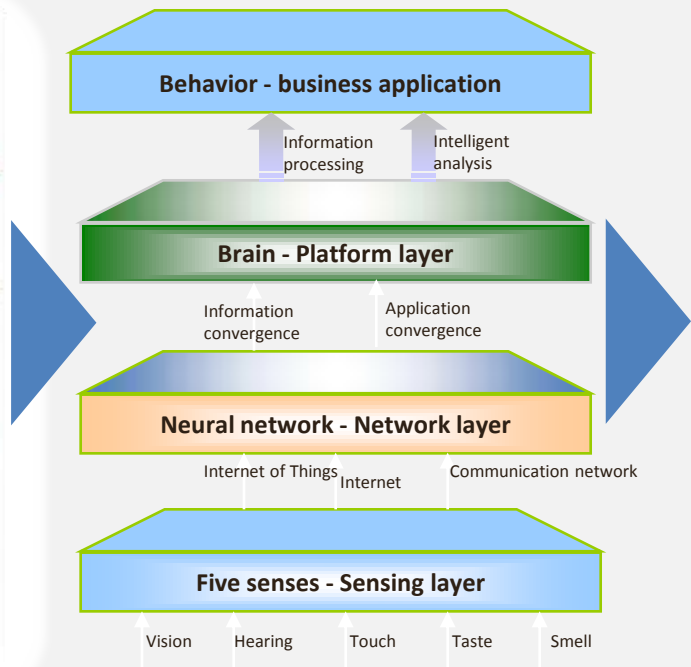
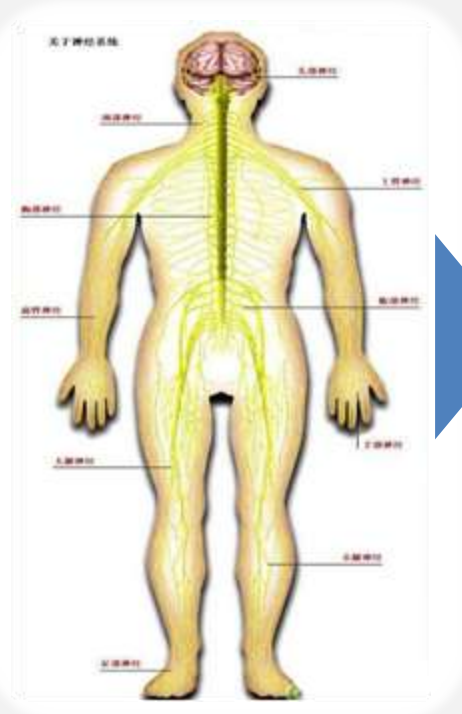
Agile Dispatching

- Visualized dispatching to ensure real scene visible, command directing up to group members
- Convergence of broadband trunking & video conferencing, and fast decision

Convenient Travelling

- PIS over LTE to support real-time passenger information, and news broadcast
- CCTV over LTE to know & control onsite emergency
- Telepresence over LTE: telepresence & video conferencing convergence

Efficient operation



FusionCube



OceanStore



OSN 3500

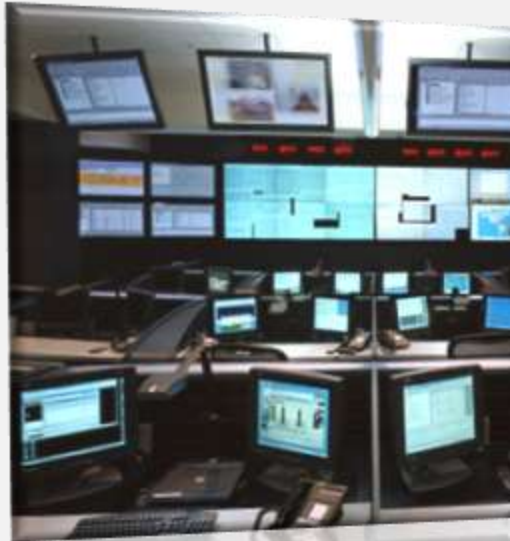


Lte



It's all about integrated communication

Typical demands to ICT in the Transport Sector



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- GSM-R
- TETRA
- DMR..

lte VHF UHF
GSM-R TETRA

- Group Calls (VGCS/VBS)
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VIDEO

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WiFi **lte**

- Push to Video
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DATA

- LTE
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TETRA **WiFi** **lte**

- Asset management /tracking (transporter, container, vehicle, resources..)
- Maintenance data
- OSS data feed

Multi vs. Single-network

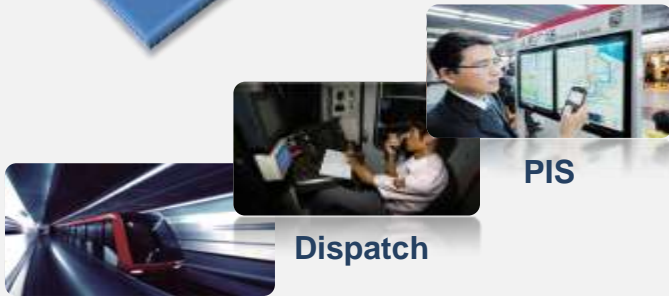
the 90's

- Physical separation of services
- Multiple skills
- Exponential OPEX



today

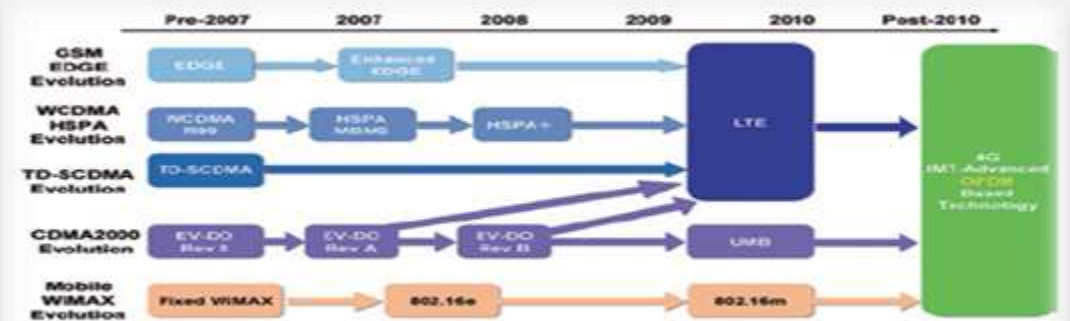
- More bits per Mhz
- abundant data bandwidth
- Easy to operate
- One fits all



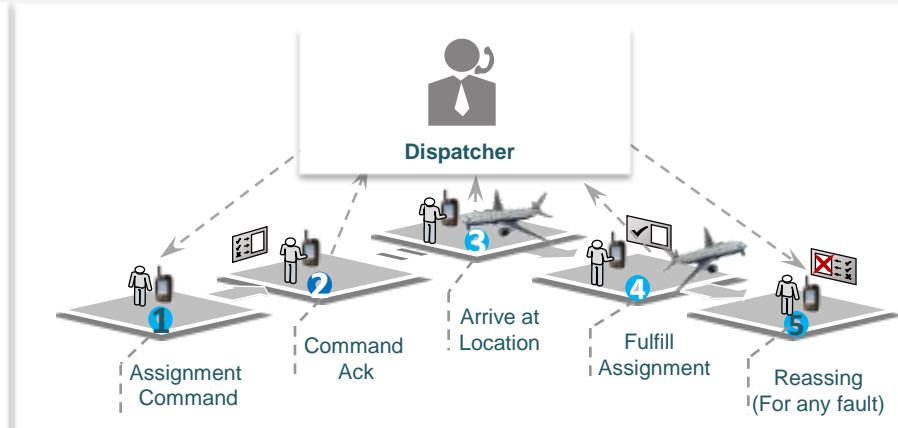
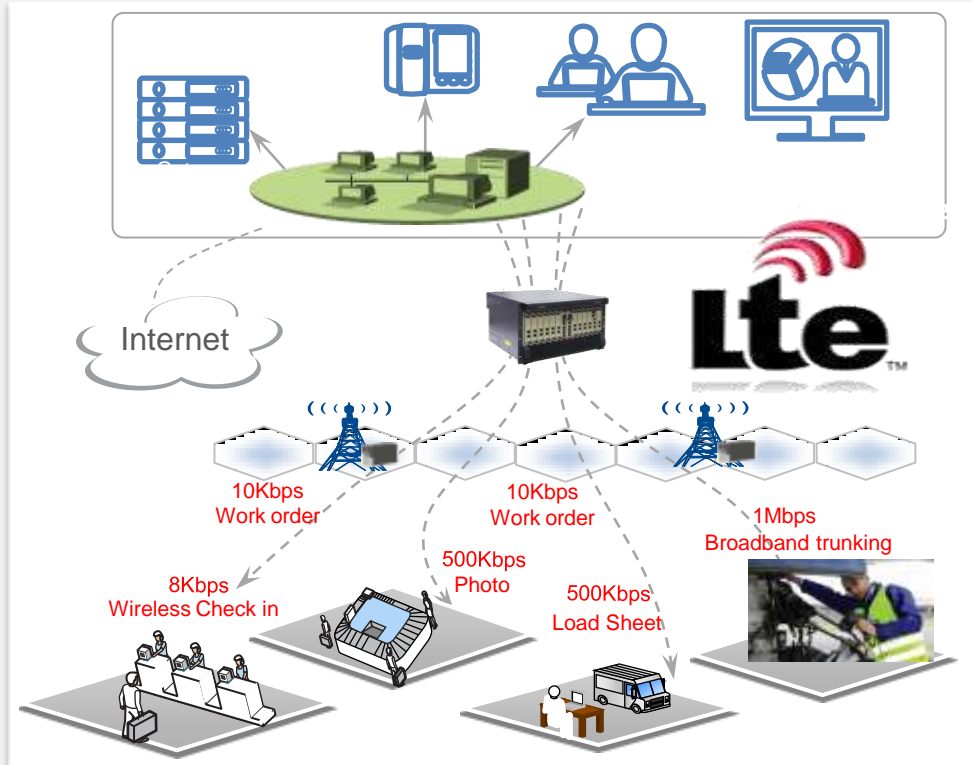
PIS

Dispatch

Asset Management



LTE Multi-media Dispatching Improves Work Efficiency



The right person, at the right time and place to get exact information to do the right thing, How easy is that?

- **Broadband trunking Push to Video, PTT**
- **Work order / resource assignments**
- **Photo & Video guidance off-site support**
- **Voice and data at the same time**

LTE Zhengzhou Metro Line

Project overview: total length of 26.2 km for phase 1, 20 stations, 25 trains, 80km/h, 10MHz of **TDD 1.8GHz frequency**

Target: One technology to Substitute Multiple Networks used for Metro operation

Services:

- Real-time **video Surveillance** (4Mbps per train) and broadcast (8Mbps per train)
- Passenger Information Services, PIS
- Software Upgrade to voice trunking & train control

Launched at media event: 29 November 2013

Passenger operation to commence in December 2013





Xi'an Airport · China

- 1st LTE trunking on airport (2011)
- One net – One handset
- satisfies peak hour requirement 3k calls
- Increased efficiency by 500%
- Total of 175 Airports contracted

Yantai Port · China

- 1st LTE for port industry
- Voice trunking, video and TOS
- Simplified RF covers two port terminals



ShuoHuang Railway

- Multi-loco synchronization
- Cargo throughput increased
- Voice Dispatching
- Video Surveillance



Close Cooperation with Partners to Help Customers Succeed

Help Customers Succeed

Industry Partners



Consulting & Designing Partners



Partners (100+)



Innovation & Convergence, Changing the Future of Metro Wireless Communication

Innovation & Convergence



Safe Operation, Agile Dispatch and Satisfied Customers



be smart

HUAWEI ENTERPRISE ICT SOLUTIONS **A BETTER WAY**

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Innovative eLTE Solution for Zhengzhou Metro

