Caltta LTE Solution for Rail Transit, integrating Passenger Information System (PIS), onboard CCTV, Communications-Based Train Control (CBTC), and Multimedia Trunking Services in one system. Reliable QoS is guaranteed based on the priority of each service.

Caltta LTE Solution for Rail Transit supports moving speed up to 350km/h and multiple wireless coverage schemes to accommodate various requirements and services.

Caltta LTE Solution for Rail Transit consists of three subsystems:

**Control Center Subsystem**
Core network devices are deployed at the line control center. The core network provides the upper-layer service system with the data exchange and trunking dispatch functions. In addition, the core network manages lower-layer base stations and terminal authentication, implementing wireless data and multimedia trunking communications.

**Train Station Subsystem**
The Base Band Unit (BBU) of a base station is deployed in the equipment room of a train station. The Radio Remote Unit (RRU) of a base station is deployed by leaky coaxial cable or antenna to cover the rail line, and the indoor distribution system is deployed to provide wireless coverage in the train station hall.

**Train Subsystem**
The Train Access Unit (TAU) is used to implement data access of trains. The PIS, CCTV, and CBTC onboard devices can be connected to the TAU through a switch to implement train-to-ground wireless transmission. The train conductor is able to communicate with the dispatcher and onboard staffs by professional dispatching terminals.
Main Services

**PIS Multimedia Trunking Dispatch**

The LTE integrated trunking core network provides various multimedia trunking dispatch services, such as group call, individual call, broadcast call, emergency call, and priority management. In addition, it supports characteristic functions like location-based call, functional number, and matrix access.

**Video Dispatching**

Onboard cameras are used for real-time video dispatching over the cab, front of the train, and carriage, implementing video scanning over the carriage, detection of hidden dangers, monitoring of and preventive check in key areas, and collaborative emergency handling.

**CBTC**

The wireless dual-layer networking and device redundancy technologies are used to build a highly reliable network. In addition, the perfect QoS mechanism of the LTE is adopted to implement high-priority guarantee of the CBTC service in comprehensive service mode.

End-to-end Products

**Unified CN (EPC+DSS)**

- **Professional Trunking**: unified dispatching, Push-To-Talk with call-setup time less than 250ms.
- **Higher Reliability**: major boards support 1+1 hot standby, N+1 backup, bad sharing and hot swap; NE level disaster recovery.
- **Higher Security**: two-way authentication, VPN, IPSec & end-to-end encryption.
- **Easy to Operate**: client/server architecture, remote operation, multi-level authorization and centralized management.
- **Good Scalability**: modular hardware design, supports smooth capacity expansion by easy upgrade.

<table>
<thead>
<tr>
<th></th>
<th>ZXTS eTC1000</th>
<th>ZXTS eTC500</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of users supported</td>
<td>200,000</td>
<td>100,000</td>
</tr>
<tr>
<td>Number of groups supported</td>
<td>20,000</td>
<td>5,000</td>
</tr>
<tr>
<td>Number of base stations supported</td>
<td>2048</td>
<td>128</td>
</tr>
<tr>
<td>Number of ongoing trunking calls supported</td>
<td>5,000</td>
<td>1,000</td>
</tr>
<tr>
<td>Throughput</td>
<td>40Gbps</td>
<td>5Gbps (expandable)</td>
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**LTE for Rail Transit, the Best Choice**

**Hangzhou City Metro (The Global First Commercialized LTE Train-to-Ground Wireless Network)**
- Line length: 20.8 km, 18 stations
- Train speed: 80km/h
- Freq. Band: 1.8 GHz
- Services: PIS/CCTV/TCMS
- LTE multicast technique, higher spectrum efficiency

**Wenzhou City Railway (The Global First LTE-based Train Dispatching System for Metro)**
- Line length: 77 km, 28 stations
- Train speed: 120~160km/h
- Freq. Band: 1.8 GHz
- Services: PIS/CCTV/Visual Dispatching
- National Strategic Demonstration Project of China

**Chongqing Metro Project (Chongqing is the largest city in the west China)**
- Line Length: 32.15km, 19 stations
- Freq. Band: TDD 1.8 GHz
- Speed: up to 120Km/h
- Services: CBTC signal, Inter metro line operation
- Dual-layer LTE for Rail system and key devices redundancy solution to satisfy CBTC highly reliable and highly stable transmission.

**Xi’an Metro Project (Xi’an is a famous historic city of China)**
- Line Length: 35.2km, 29 stations
- Freq. Band: TDD 1.8 GHz
- Speed: up to 80Km/h
- Services: CBTC/PIS/on-board CCTV
- LTE shares the same leaky feeder cable with other Private Mobile Radio (PMR) network such as PDT and Tetra.
- Geography level, network level and product level redundancy ensure high reliability of CBTC transmission, fulfill urgent text distribution.