M2M-Powered Transportation Surveillance
at World Expo 2010 Shanghai

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Problem Definition

- Expo 2010 Shanghai China expects
  - total of 70 million visitors in six months
  - average >500,000 daily visitors

- Unparallel challenges in handling
  - Traffic jams
  - Scheduling optimization
  - Safety protection (including anti-terrorists) of buses and VIP vehicles
Solution Overview

- Shanghai Telecom (telco) + ZTE (supplier) ➔
  - Wireless (CDMA2000 + Wi-Fi) Vehicle Monitoring (video/voice + M2M sensors) and Service Management System

- Customers
  - Bus companies, freight fleet, emergency bureau (hospital/fire/police), and gasoline carriers.

- Deployment
  - Deployed since March 2010 to 43 VIP vehicles and 100+ other vehicles (buses, trucks, emergency vans, gasoline trucks)
  - Plan to install on 10,000 vehicles in 2011 with US$10M revenue
Business Models

China Telecom (telco) + ZTE (supplier) ➔
End-to-end M2M solution including video monitoring terminals, sensors, M2M control platform, M2M applications, etc.

$ Transportation company pays China Telecom
  $ Subscription fee by number of served vehicles
  $ Network usage fee by volume of video traffic

$ Revenue from advertisers for commercials shown on video monitoring/display terminals in the vehicles.
Architecture and Services

Integrated Architecture:
- M2M platform (new)
- Global-eye platform (existing)

Rich Services:
- 3G Video Monitoring
- Vehicle Management
- Real Time Location
- Speeding Alarm
- Route Violation/Side Turnover/Collision Alarm
- Door Alarm
- Smoke/Fire Alarm
- Manual Alarm
- Automatic Station Announcement
- …
3G and WiFi

- **3G is used when a vehicle is working:**
  - Commands/requests/responses
  - Actively reporting real-time sensor data and safety alarms
  - On-demand (via SMS wakeup) sending surveillance video frames and map data to control center

- **Wi-Fi is used when a vehicle is parked:**
  - Sending logs and all recorded video to control center for archiving
  - Note: Wi-Fi AP are installed at stations and parking lots

- **Automatic switchover between 3G and Wi-Fi**
Functions and Features

1. Vehicle Monitoring – selection, locating, tracing, plotting…
   - Video uploading – 2fps, 1 camera, wake-up via SMS
   - Video recording at 25 fps to local media, 3~4 cameras, store 7 days

2. Map Services

3. Vehicle and Driver Scheduling

4. Alarming – speeding, off-route, turn-over, collision, illegal door opening, illegal lane-crossing, manual alarming …

5. Statistics, Reporting, Query, and OA integration
   - For example, for collision diagnosis, collect speed data every 0.2 seconds, and analyze with the speed data in the last 30 seconds before each stop, the photo snapshots at each urgent braking operation, and the traced routes and speed info in the whole trip.
Solution Highlights

1. Always-connected always-optimized network connection
2. Digital recording and storage for easy analysis
3. Remote real-time surveillance and scheduling
4. Voice surveillance, point-to-point talk, point-to-multipoint broadcast of commands
5. Dedicated servers installed at popular spots to multicast or broadcast image/video to large number of current viewers
6. Centralized monitoring and control interfaces with fixed/mobile clients and browser interfaces.
From Vertical to Horizontal Integration Model

VERTICAL MODEL

M2M Platform configured per service

HORIZONTAL MODEL

Integrating services into the M2M Platform, adapt to different M2M Terminals
Promoting Global Eye Service
- Global Eye brought over CNY 1 bln in 2008 for China Telecom.
- The most typical video-monitoring oriented broadband M2M application

Focusing on Five M2M Markets
- Security applications
- Smart-Grid electricity
- Logistics and traffic application
- Finance
- Personal positioning application

M2M Strategies of China Telecom:
- Phase I - Main strategic goal is to fast cut into the markets.
- Phase II - Quickly promote standard terminals, and reduce production costs.
- Phase III - Provide a true ubiquitous network for government and enterprise customers.
ZTE M2M Solutions

- Comprehensive M2M products and end-to-end solutions
- Standard-based architecture and interfaces
- Fast customization and time-to-market
ZTE Contributions to M2M Standards

**ETSI M2M TC**
- M2M solution architecture, M2M service platform, M2M Devices, and M2M Gateways

**3GPP**
- SA workgroups, RAN M2M workgroup
- Study items in SA2: Time Control, Monitoring, Signalling Congestion Control, MTC Subscriptions, Low Mobility
- RAN M2M: Enhancements to random access channels

**3GPP2**
- TSG, RAN M2M
- M2M requirements, Device identification and address assignment

**CCSA**
- Leaders in M2M workgroups
  - TC10: Smart Home
  - TC5: Sensor Network
Quick Summary

$ With M2M-powered transportation surveillance solution, telcos can leverage existing CDMA2000 network and earn new revenues from enterprises/government and advertisers.

$ Telecom operators have advantages in M2M ecosystem and should play leading roles in vertical M2M solutions.

$ ZTE actively endorses M2M standards, and provides fast customizations/joint innovations for M2M service providers.
Thank You!