Wireless Monitoring in Freeway
Requirement Background

In recent years, China's highway construction has achieved great success. By the end of 2015, the national highway mileage 125 thousand km has reached. It is expected that the total mileage will exceed 200 thousand km by 2020. The corresponding expressway net video monitoring system as one of the core high speed highway electromechanical "three systems" also has made tremendous technological progress. The new freeway video network monitoring system has almost all digital, networked, digital video monitoring system integration. However, the traditional optical fiber and 3G transmission scheme is difficult to achieve the monitoring coverage due to the geographical and cost factors. The existence of blind area in a lot of places, monitoring for important areas and temporary operation are not in place and emergency treatment is not timely which bring difficulties to the remote command and often causing great economic losses.

Requirement Analysis

The modern highway video surveillance system need to achieve full coverage, cost control and no blind spot monitoring, the use of a new generation of transmission technology with digital, networked, and command scheduling system can be effectively integrated with the existing command and dispatching system. Plug and play is supported on the monitoring of the new temporary area which is convenient to maintenance, can ensure the smooth running of the highway and accident can be treated in a timely manner.

The use of WLAN wireless transmission scheme greatly reduce the construction cost and supplies, and its convenient installation, good expansibility, without geographical constraints, only one input for life, the main transmission network can do more than 200Mbps at 10 kilometers, far to meet existing needs, and greatly saves the problem check and troubleshooting time through professional maintenance debugging tools, it has been greatly favored by the customers in the existing video surveillance.
System Topology

a. Freeway monitor topology / full monitor

According to the linear characteristics of the highway, we can collect data at close range, and then transmitted them to the service area or optical access point.

In order to achieve coverage of railway section, we should set up a monitoring point every 1km. Repeater coverage range of 5 ~ 8km, so take service area / fiber access point as the center, covering about 15 ~ 20 km, about 40km length, basically reached the interval distance between each of the service areas.
Each monitoring point transmits data through the TB5E to repeater. TB5E has two fast Ethernet port, and it can take two cameras. You can connect them through a switch if there were more than two cameras.

**Monitoring point equipment connection:**

i) One camera connection

ii) Multi camera connection

Every monitoring point usually contain multi camera on both sides of the highway, and it can be connected to TB5E through a switch. The video data is transmitted to a near distance convergent point by TB5E.
Repeater connection:

i) Receive video data from each monitoring point by TB5E.

ii) Sending data from the convergence point to the convergence center by TB5HP-25I.

Transmit data from repeater to the service area or the optical fiber access point through TB5HP-25I.

b. Repair / maintenance / construction / accident and other temporary increasing accident

TB5E connect to 1 or 2 cameras, and transfer data to the nearest repeater point.
c. Service area monitoring and Internet service

Service area entrance, exit, rest area and parking area and so on ground monitoring are used TB5E, it can send data to the top of the service area building.
Service area at the top of the tower and internal equipment diagram:

Service area at the top of the tower: on the one hand, we use TB5E to receive service area monitoring data; on the other hand, we use TB5HP-25I to receive the data from repeater.

At the same time we can use TB2I to surf the Internet in the service area and public area.

Wireless Internet Service in Service Area:
d. Road Monitoring Center

All the data in the highway is converged to the service area and then connected to the wide area network or the public security private network, road monitoring center can view the implementation of road conditions, publish scheduling information and so on through wide area network (WAN) or public security private network.
Application case