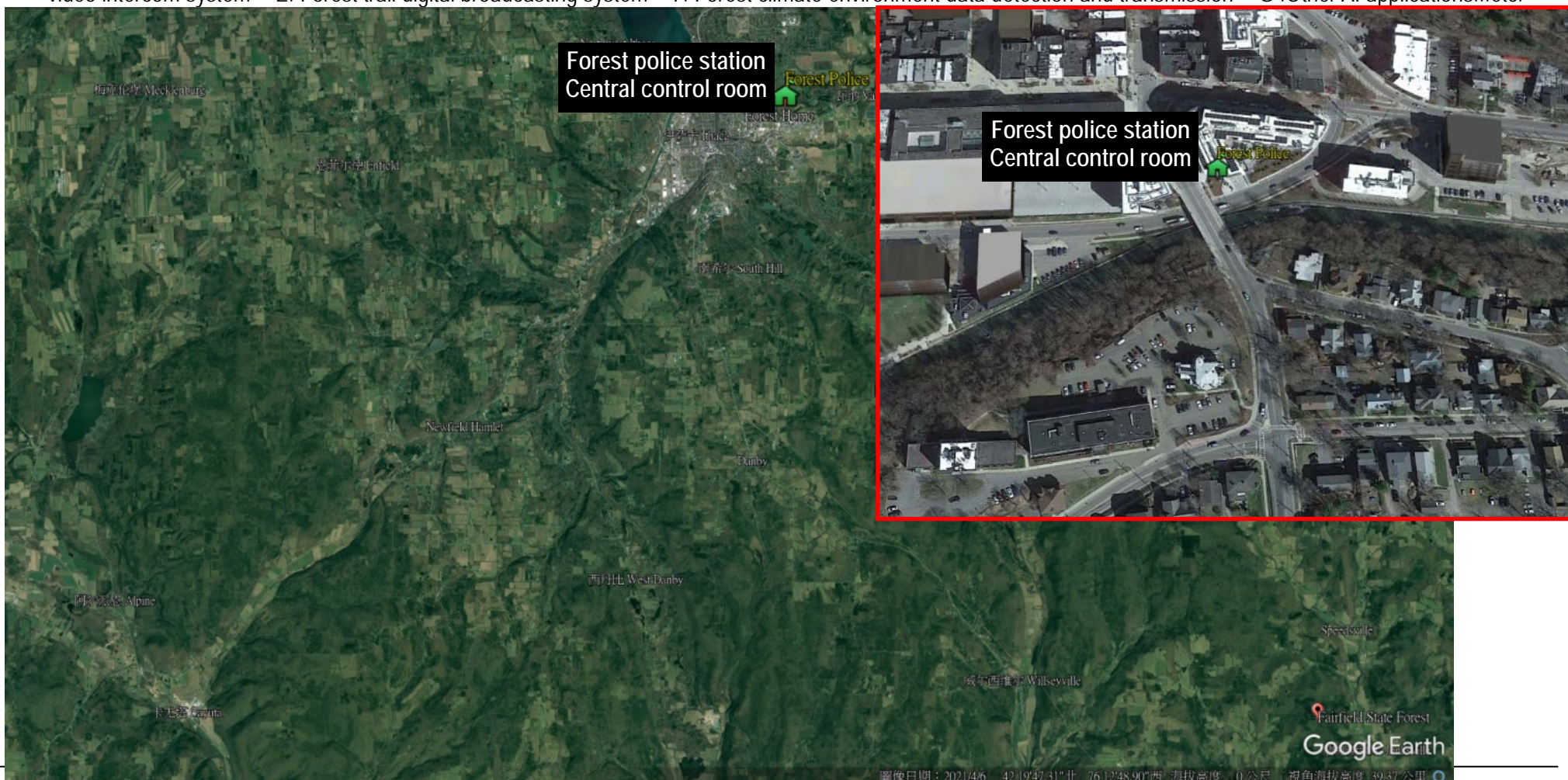


# Integrated application design of wireless transmission systems such as "fire prevention monitoring", "anti-theft forest monitoring", and "license plate recognition" of the forest police station

## 1、Map and system application operation requirements of the "surrounding geographical environment of Forest Police Station"

### ■ System application:

A. Forest fire prevention monitoring B. Forest piracy prevention monitoring C. Forest license plate record and identification monitoring D. Forest trail emergency video intercom system E. Forest trail digital broadcasting system F. Forest climate environment data detection and transmission G. Other AI applications...etc.

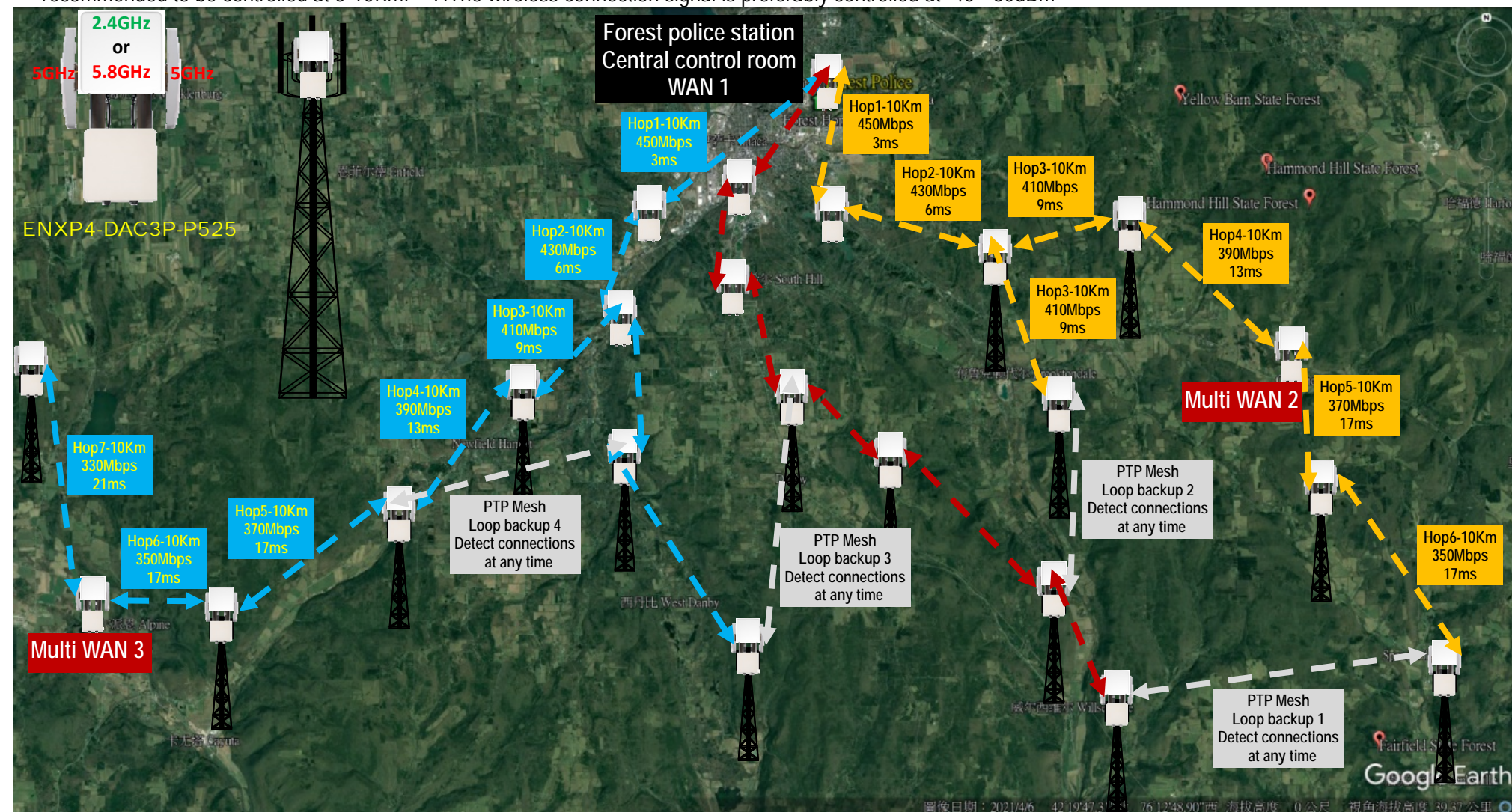




## 2、PTP Mesh Loops Backup wireless data transmission system "multi-point relay jumping platform wireless transmission backbone" design

### ■ PTP Mesh multi-point relay platform wireless transmission backbone technology explanation

A. Can support more than 20 consecutive Hops jump transmissions B. Each step reduces the transmission bandwidth by 10~20Mbps C. Continuous Hops jump 12 times can still maintain a bandwidth of more than 200Mbps D. The delay is about 2~4ms for each Hops jump. E. The PTP Mesh point-to-point transmission distance is recommended to be controlled at 5-10Km. F. The wireless connection signal is preferably controlled at -40~-60dBm

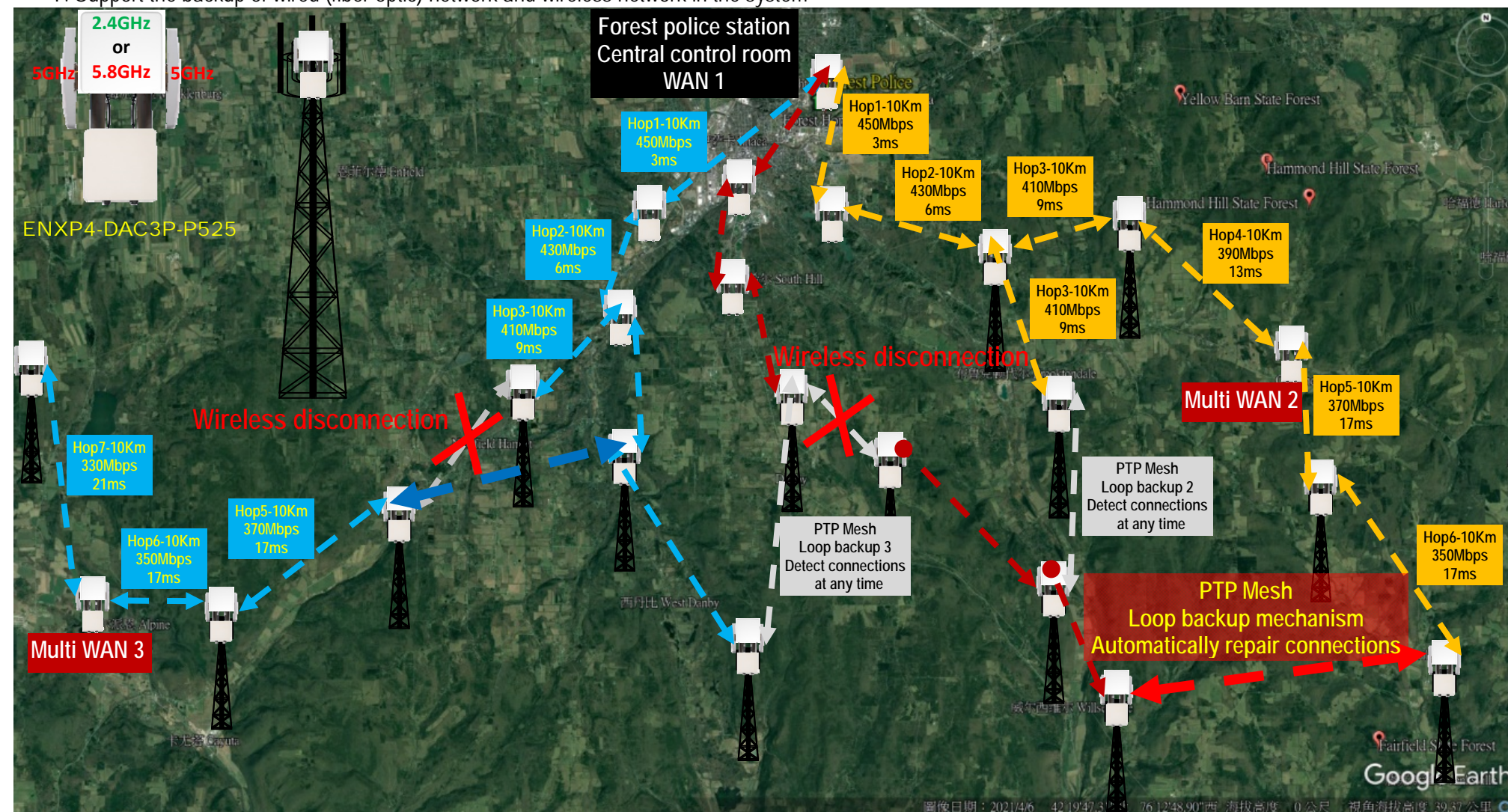




### 3、Explanation of "Loops backup repair" and "Bandwidth traffic and delay changes after repair" for the backbone of multi-point Hops jumping wireless transmission

#### ■ Circuit repair judgment mechanism:

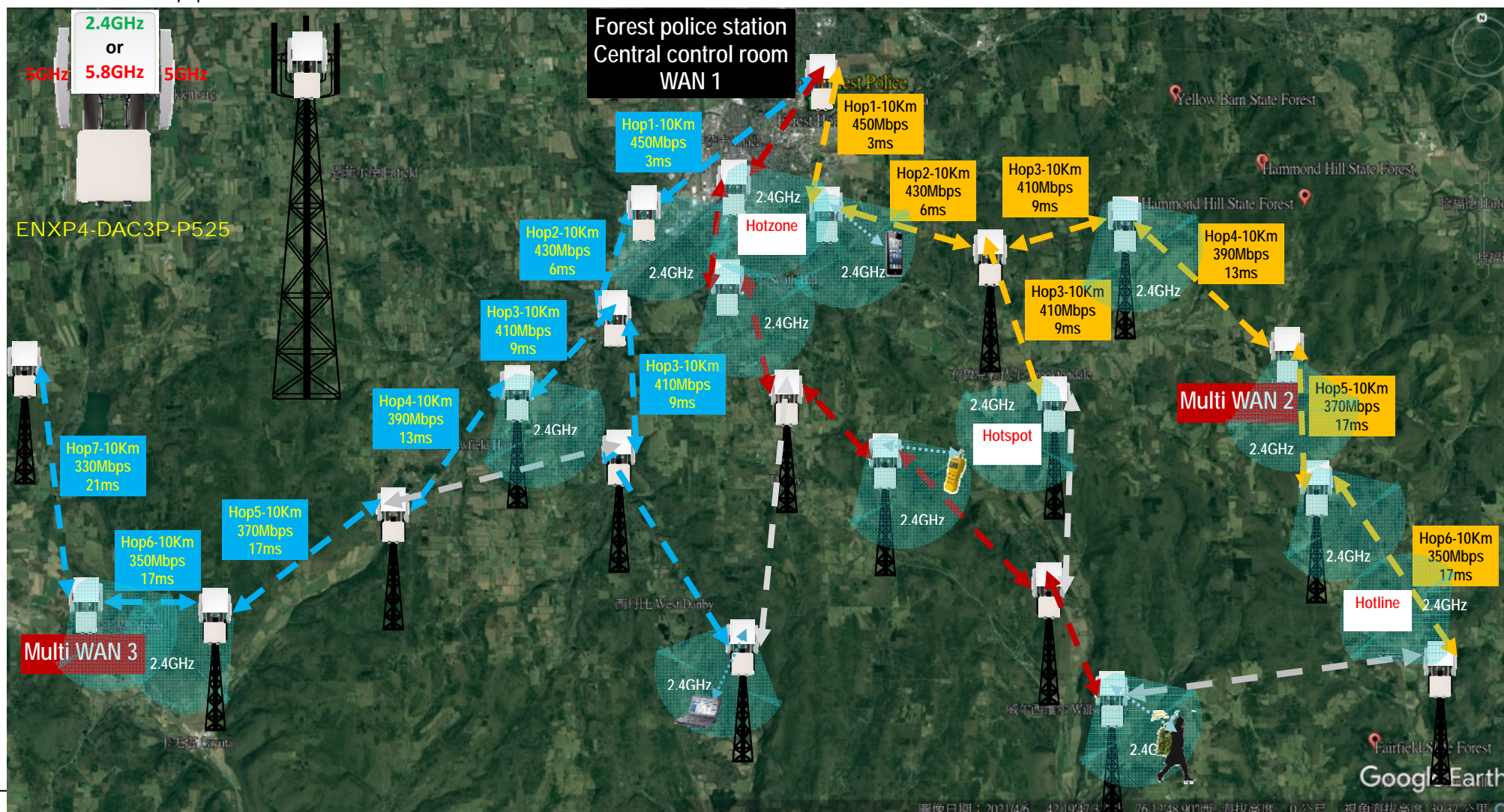
- A. Automatically detect the connection status of the whole system B. Judgment based on the decrease of RSSI of the connection signal C. Judgment based on the stability of the successful connection report D. It takes about 20 to 120 seconds to switch the connection path E. Support multiple loop automatic repair mechanism F. Support the backup of wired (fiber optic) network and wireless network in the system





#### 4、Diagram of "Wireless Information Highway Transmission System" and "Hotspot / Hotline" formed by multi-point Hops jumping platform

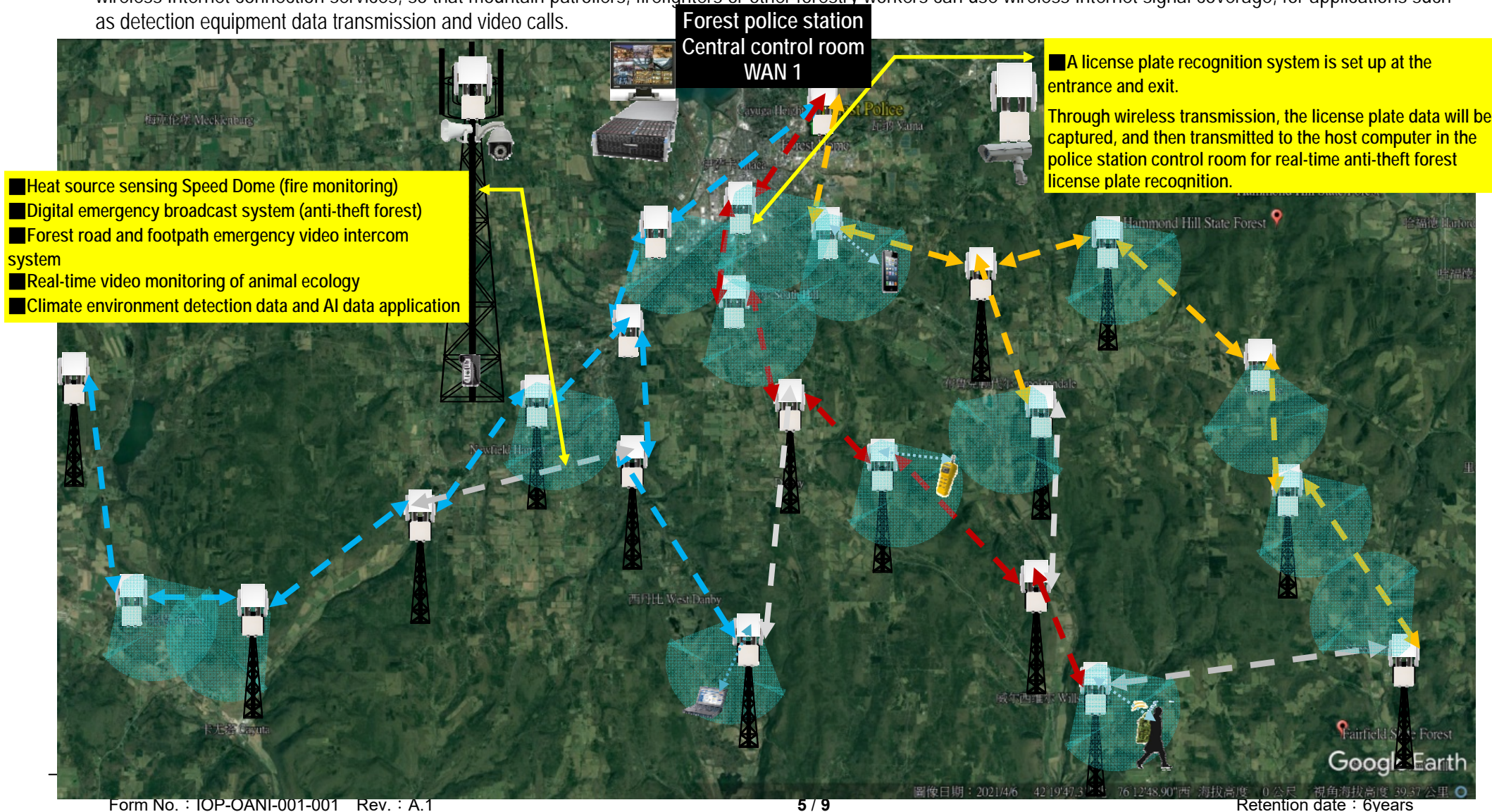
- Wireless Information Highway Mesh System: Using multi-point Hops jumping technology, the structure forms more than 3 wireless transmission backbones to form a wireless information highway network
- Wireless Hotspot / Hotline / Hotzone setup: Based on the wireless backbone operation, use the 2.4GHz wireless module to set the frequency as the AP to provide wireless Internet connection services, so that mountain patrollers, firefighters or other forestry workers can use wireless Internet signal coverage, for applications such as detection equipment data transmission and video calls.





## 5、System applications such as "fire prevention monitoring", "anti-theft forest monitoring", and "license plate recognition" of "wireless information highway transmission system"

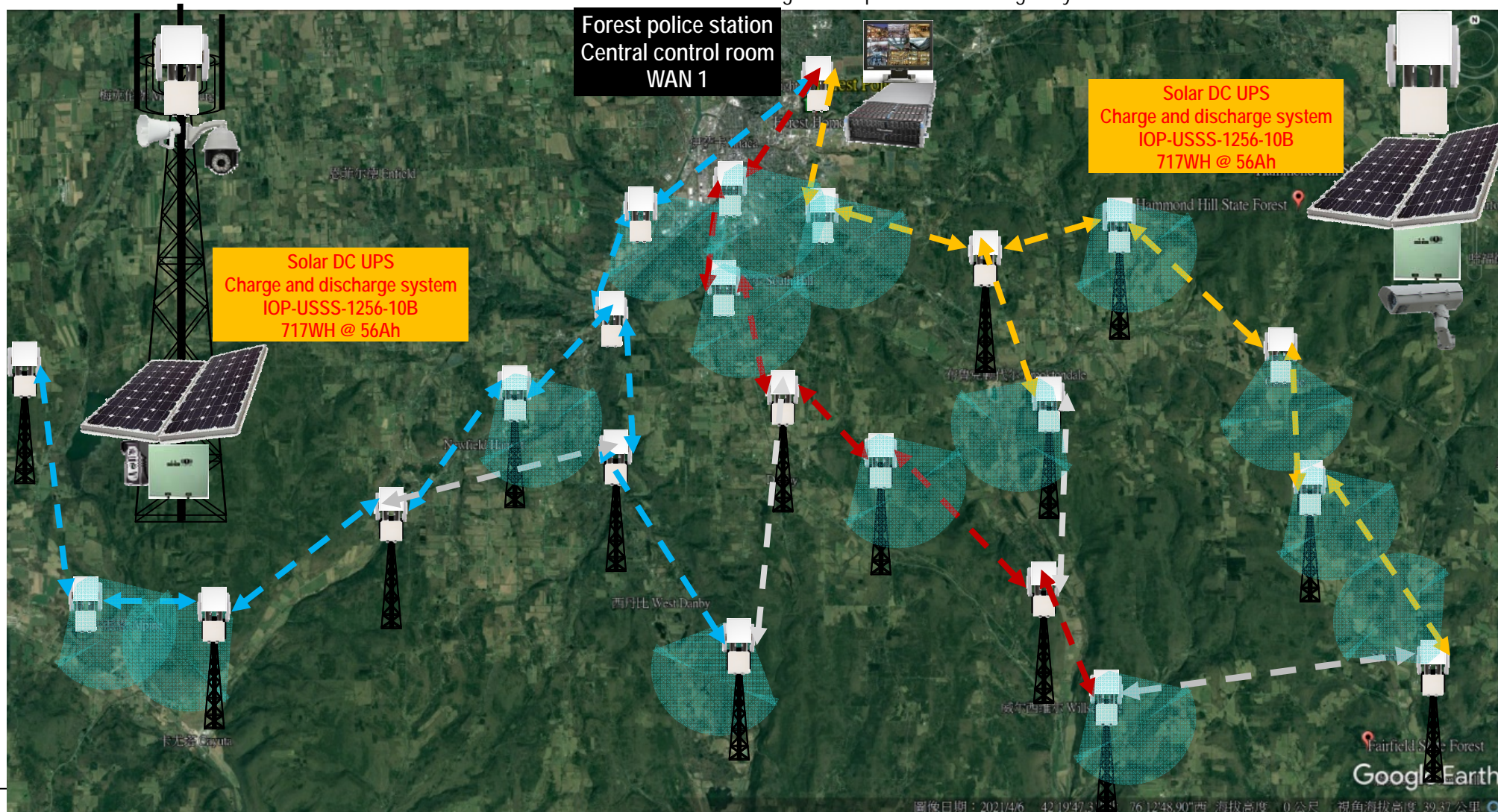
- Wireless Information Highway Mesh System: Using multi-point Hops jumping technology, the structure forms more than 3 wireless transmission backbones to form a wireless information highway network
- Wireless Hotspot / Hotline / Hotzone setup: Based on the wireless backbone operation, use the 2.4GHz wireless module to set the frequency as the AP to provide wireless Internet connection services, so that mountain patrollers, firefighters or other forestry workers can use wireless Internet signal coverage, for applications such as detection equipment data transmission and video calls.





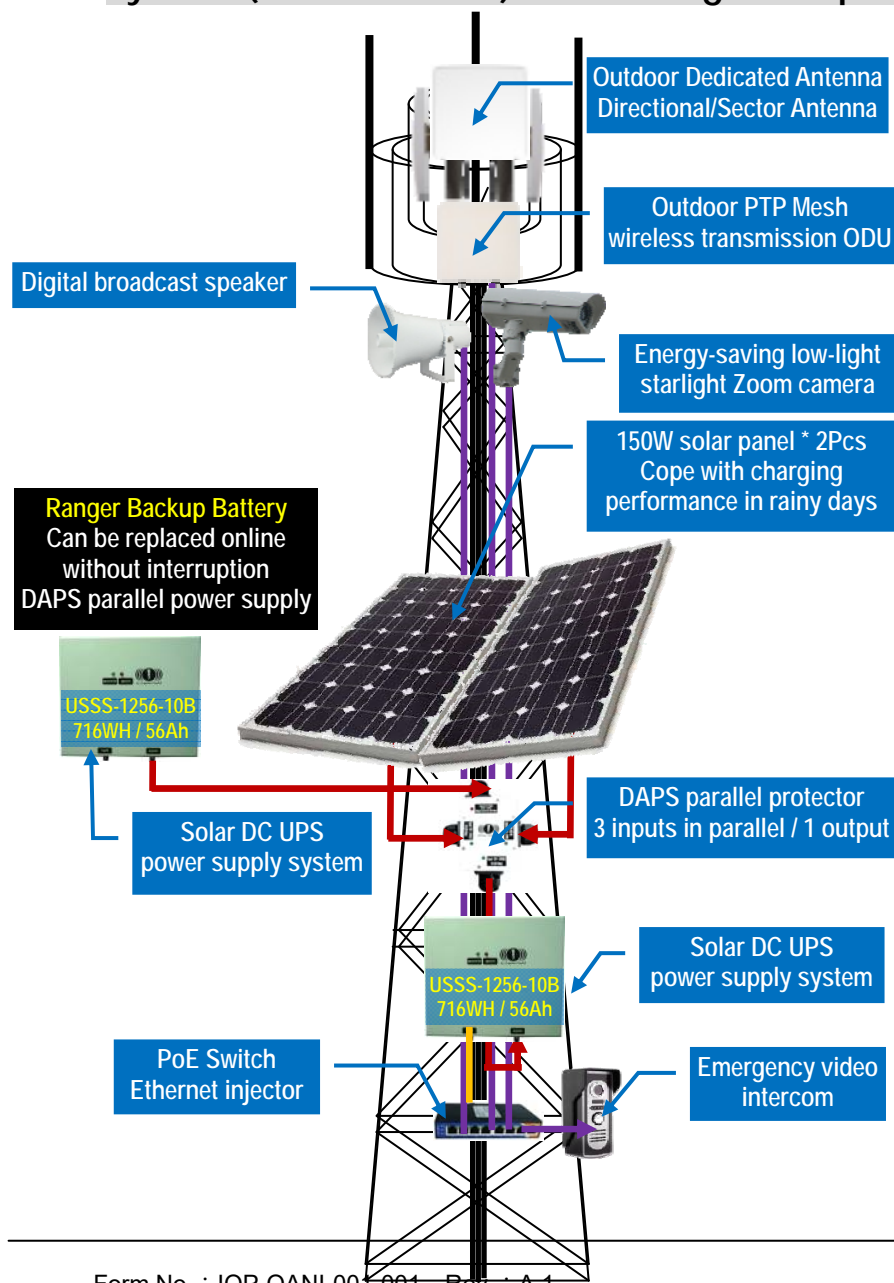
## 6、Solar wireless transmission power supply system (Solar DC UPS) and maintenance and power supply system solutions for mountain rangers to replace batteries regularly

- Solar wireless transmission power supply system: According to the local sunshine conditions in the forest area, set up a wireless monitoring system for energy saving or time-limited power supply, and plan an appropriate solar charge and discharge system to facilitate forest fire prevention, anti-theft, forest protection, animal protection, recreational activities and emergency Operation of the ambulance system.
- Mountain rangers regularly replace batteries: Since the installation of solar energy systems is difficult and charging performance cannot be guaranteed, it is recommended to use a maintenance and reinforcement mechanism for mountain rangers to replace batteries regularly.





## 7、The maintenance and power supply system solution for the solar wireless transmission power supply system (Solar DC UPS) and the regular replacement of batteries by mountain rangers



### Operation Estimation of Solar DC UPS Power Supply System

#### ■ System power consumption:

1. Outdoor wireless equipment: 4-8W/H definition, average 6W/H definition
  2. Digital broadcasting speaker: 0.5W/H (when not broadcasting silently)
  3. Energy-saving low-light starlight Zoom camera: 4-6W/H definition, average 5W/H definition
  4. Solar DC UPS power supply system: 0.5W/H
  5. PoE Switch: 0.5W/H
  6. Emergency video intercom: 0.5W/H (5W/H during operation)
- Total system power consumption:  $6+0.5+5+0.5+0.5+0.5 = 13W/H$

**Note A.** Instantly starting the digital broadcasting speaker will consume a lot of power. It is recommended to set up another parallel power system!!

#### ■ The design uses DAPS parallel power generation to supply the solar energy system of "continuous rainy days for 2 days/more than 2.7 days"

1. Battery capacity:  $13W/H * 24H * 2D * 115\% = 717W$
2. It is recommended to use DC UPS + dual solar panels with DAPS parallel power generation
3. Recommended to use: IOP-USSS-1256-10B 716WH 56Ah @ 12.8V \* 1 PCS

**Note B.** Because a small amount of power can be generated on rainy days ( $3*2=6W/H$ ), the actual operating time is estimated as follows:  $716WH / ((13-6)W/H * 8H + 13W/H * 16H) = 716WH / (56+208)W = 2.7 \text{ days}$

**Note C.** If you want to increase the number of consecutive rainy days, it is recommended to add 2 sets of solar DC UPS power supply systems. There is a chance to maintain the power supply capacity of 6-7 consecutive rainy days.

#### ■ Equipped with solar panels, the time to fully charge the battery is estimated (3 days or 1.5 days)

1. Suggested collocation: IOP-OSPSC-150180801\_150W \* 2 (One set must be equipped with 2 pieces)
2.  $716W / (5A * 13.8V * 90\% * 85\% * 120\%) = 716W / 63W = 11.4H$  (about 3 days)

**Note D.** If 2 sets of solar DC UPS power supply systems are added, it is possible to maintain the power supply capacity for 6-7 days of continuous rainy days, and at the same time, the time to fully charge the battery may be shortened to within 1.5 days.

#### ■ Mechanism for replacing and adjusting the design capacity of backup batteries for mountain patrollers: (Adjusted according to the results of sunshine power generation in various places)

1. Use the mechanism of regular mountain patrols by patrolling personnel to replace backup batteries or parallel supplementary power supply mode to build a successful maintenance mode for solar energy systems; the design capacity can be adjusted later to achieve a long-term successful operation mode.
2. If the sunshine conditions of the erection point are good, the system design may be able to maintain and operate normally for a long time!!

## 8、Simple network scanning management system operation icon (new products will also have MAC-Level 2 software tools)

EL\_ML\_Utility(x64) v1.1

Interface : Network adapter 'Realtek PCIe GBE Family Controller' on local host-c8:d3:ff:d3:fc:ce

Init NIC START STOP

Sta	Update	MAC	IP	Model	Firmware	CPU%	MEM%	PPS	UP Time	Seq.
●	10:57:48	34:4f:3f:5f:01:ae	192.168.51	EL-N-2	1.3.1_z	30	34	7531	16:48:30.986	278
●	10:57:48	34:4f:3f:5f:01:c2	192.168.52	EL-N-2	1.3.1_z	30	35	10556	59:40:04.717	278
●	10:57:48	34:4f:3f:5f:01:da	192.168.32	EL-N-2	1.3.1_z	34	38	5854	85:46:25.249	278
●	10:57:48	34:4f:3f:5f:01:b6	192.168.34	EL-N-2	1.3.1_z	9	35	1760	23:34:09.842	278
●	10:57:48	34:4f:3f:5f:01:ce	192.168.37	EL-N-2	1.3.1_z	34	37	6635	111:50:08.792	278
●	10:57:48	34:4f:3f:5f:01:3e	192.168.33	EL-N-1	1.3.1_z	1	30	13	85:46:09.663	278
●	10:57:48	34:4f:3f:5f:01:9a	192.168.31	EL-N-2	1.3.1_z	9	36	1743	21:01:58.065	278
●	10:57:48	34:4f:3f:5f:01:c6	192.168.35	EL-N-2	1.3.1_z	18	36	3563	24:18:30.136	278
●	10:57:48	34:4f:3f:5f:01:a2	192.168.39	EL-N-2	1.3.1_z	30	35	5440	72:33:13.789	278
●	10:57:48	34:4f:3f:5f:01:8a	192.168.38	EL-N-1	1.3.1_z	0	32	9	144:43:15.030	278
●	10:57:48	34:4f:3f:5f:01:b2	192.168.36	EL-N-2	1.3.1_z	6	36	1371	20:26:24.209	278
●	10:57:48	34:4f:3f:5f:01:ba	192.168.40	EL-N-2	1.3.1_z	22	37	3534	140:16:06.995	278
●	10:57:48	34:4f:3f:5f:01:d2	192.168.41	EL-N-2	1.3.1_z	14	35	1869	139:19:35.008	278
●	10:57:48	34:4f:3f:5f:01:ca	192.168.42	EL-N-2	1.3.1_z	4	35	1042	62:17:01.443	278

Node Status : Query Seq. : 278

Status Counts

●	14
●	0
●	0
●	0
Total	14

Time : 00

F/W Upgrade : 5 Minutes to Reboot

FTP Server IP : . . .

EL f/w name :

ML RSU f/w :

ML OBU f/w :

Notes :

Steps :

1. Select Correct Interface.
2. Press Init NIC Button to initialize NIC.
3. Set Check Level Number @ GreenYellow fields.
4. Set Query Interval @ Time GreenYellow field.
5. Press START Button to discover network.
6. Press STOP Button to stop discovering.

Msg : Init NIC...

Msg : Init NIC Success!!

Msg : Start discovering...



## IOP-FBLLX-DACXX-XXXX Wireless Device Model Analysis



**IOP-EBLLX-DACXX-XXXX**

Company Name : IOP = IO-Power

Product Series Name : EBLL / ENXP

Product Model : 4 / 5 / 6

RF Module SPEC : Dual Band 802.11ac

Antenna Frequency : 2.4 / 5.8 / 5.8GHz

Antenna Type : P-Patch / S-Sector / E-Thernet

Functions : P-PTP Mesh / M-MESH / H-Hi-mobile

Number of Modules : 2 / 3

## IOP-EBLLX-DACXX-XXXX 無線設備型號解析

**IOP-EBLLX-DACXX-XXXX**

公司名稱：IOP = IO-Power

產品系列名稱：EBLL / ENXP

產品型號：4 / 5 / 6

射頻模組規格：Dual Band 802.11ac

天線頻率：2.4 / 5.8 / 5.8GHz

天線類別：P-Patch / S-Sector / E-Thernet

運作功能：P-PTP Mesh / M-MESH / H-Hi-mobile

射頻模組數量：2 / 3