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Wireless Virtual Private Network Technologies for Smart Distribution and Utilization Service

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Application Requirements



Categories of Applications

Nowadays Communication Application mainly focuses on Marketing, Operations, Supplies, and Construction.

Marketing

- electricity information collection
- load control
- mobile payment (POS)
- payment terminal

Operations

- distribution equipment and line microweather monitoring
- network repair command
- automatic monitoring of power supply voltage
- mobile operation, maintenance patrol, mobile video
- complete life cycle management of network equipment

Construction

- infrastructure management
- engineering command and scene video
- site information transmission and design data transmission

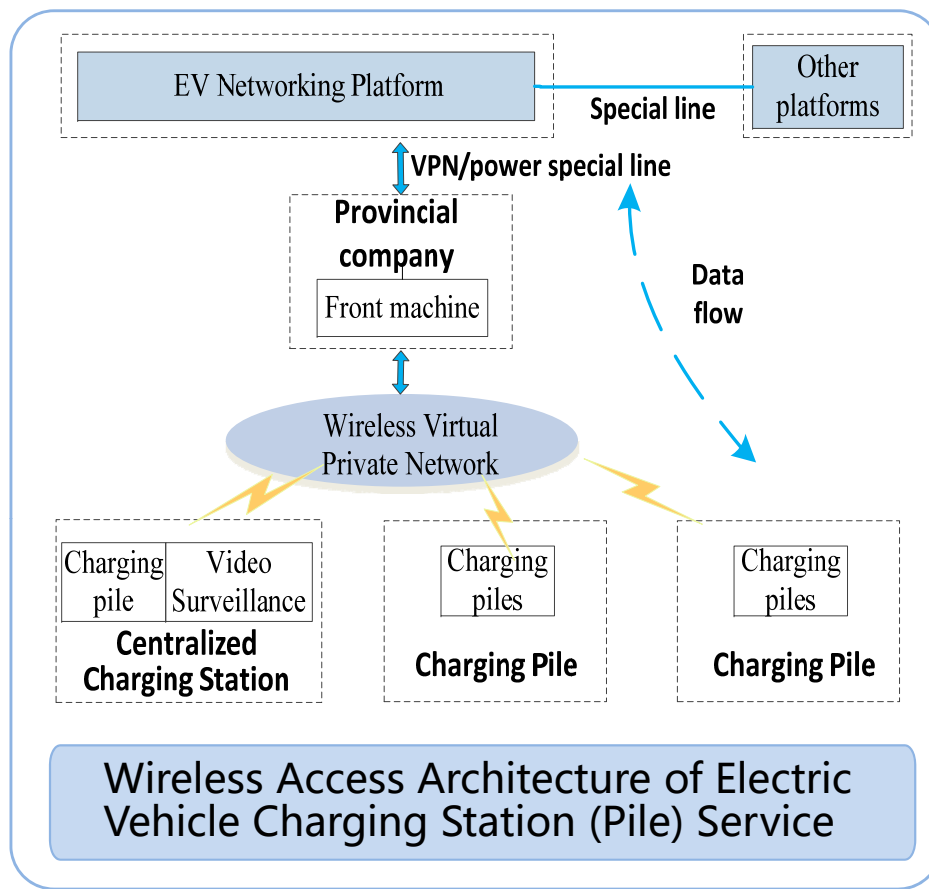
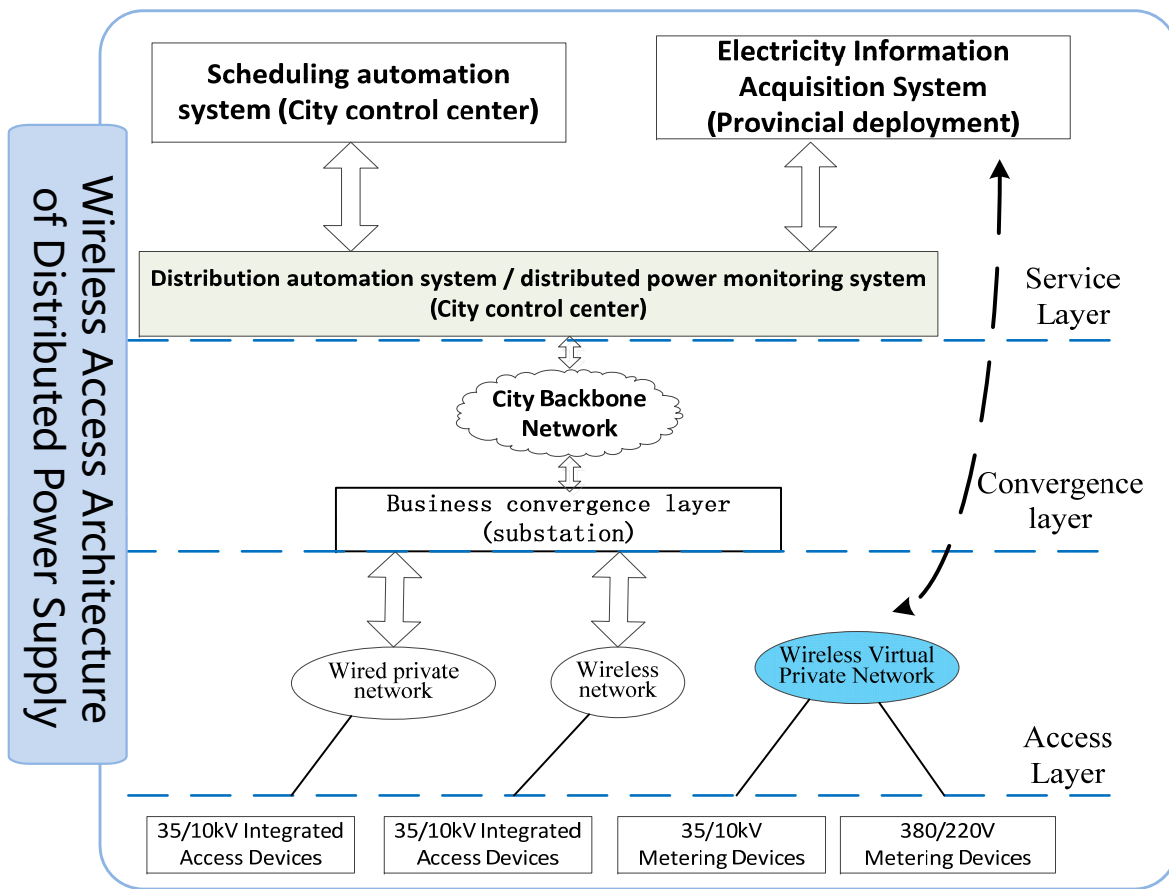
Supplies

- mobile application of material storage and on-site operation
- warehouse management and material allocation
- mobile service vehicle
- provincial vehicle management
- on-board GPS



New Applications

- **Distributed power monitoring and metering:** at present, there are 6177 new energy and distributed power sources in 35kV, and wireless communication occupies 61.8% ;
- **Electric vehicle charging pile and car network:** the current charging pile is 4.94 million, the wireless communication ratio is 93.2%, ;
- **Mobile operation and repair:** solve the demand for mobile operation of the power grid, and the number of the terminals is 40,000, and the 13th five-year plan is expected to increase by 60,000 ;
- **Network monitoring and Internet of things:** the current number of terminals is 910,000;
- **Internal vehicle management:** to meet the company's vehicle deployment management, and the number of terminals is 28,000, and it is expected to increase 40,000 units during the 13th five-year plan period.





Future Applications

Enterprise management

Through mobile phone, PAD and other terminal security, convenient access, realize office wireless and mobile, and improve work efficiency



Mobile office (OA)

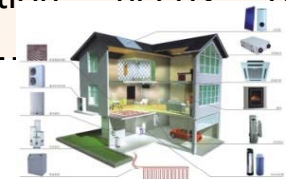
Industrial production



Enterprise WeChat

Social services

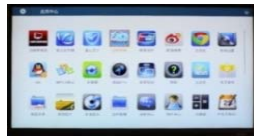
By installing software on the mobile terminal, the data and voice communication can be realized to meet the internal work and communication needs of the employees.



Smart utilization and demand response



Access the company's electronic mall platform through mobile terminal to serve the public



SGCC electronic mall

Through the wireless network communication technology, the various subsystems related to household electrical life are organically combined

The distributed energy storage of industrial and commercial and resident users



Distributed energy storage

To conduct real-time operation and monitoring, service charge and cross-district settlement of electric vehicle charging stations



Electric vehicle V2G

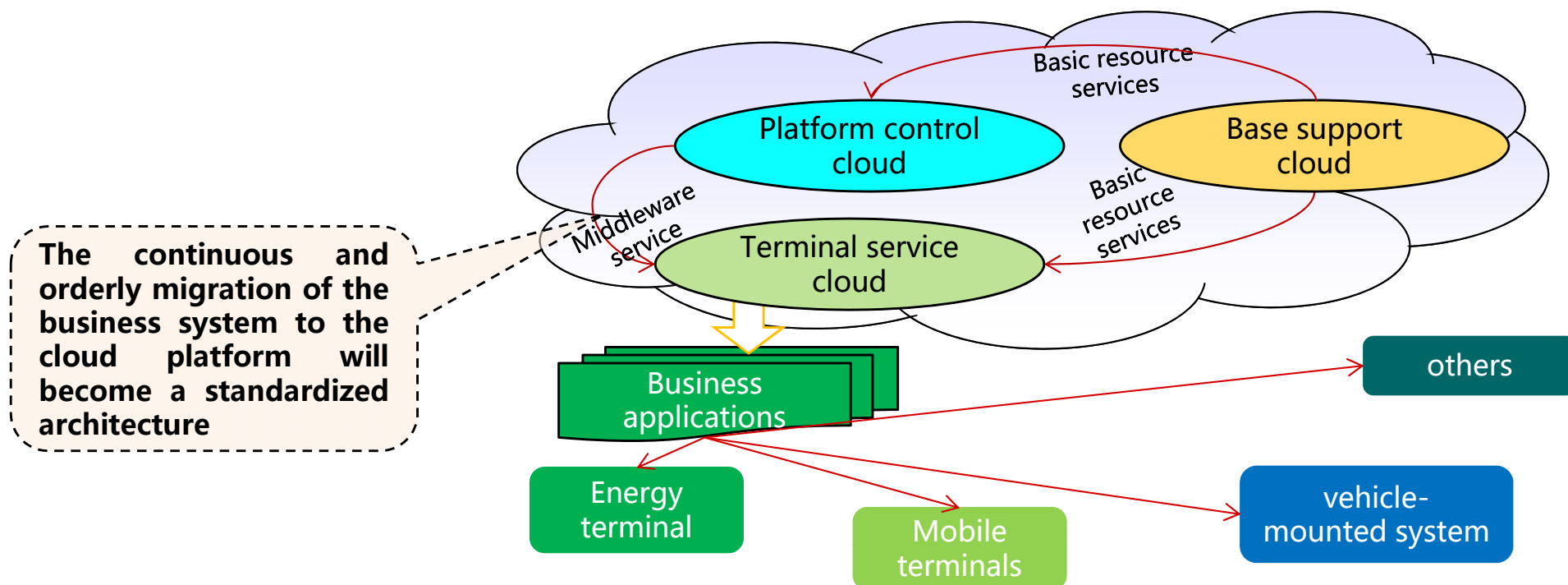


Mobile warehousing and material management

Based on mobile interconnection and iot technology, the information of warehousing equipment is registered, inquiring and warehousing management



Application Evolution





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How to Connect them?



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Widespread Connections





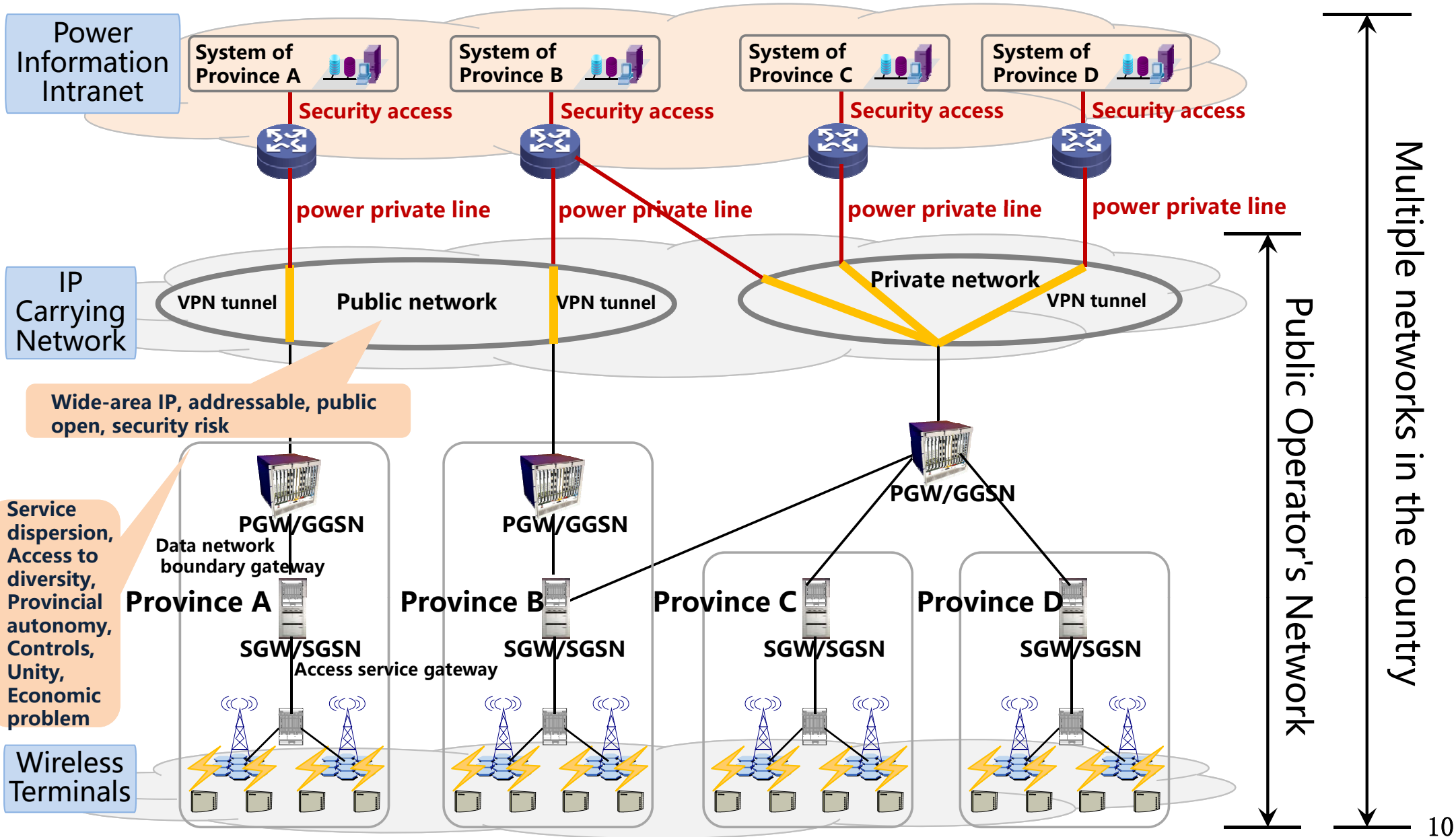
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What's the Problems?



Current Architecture of Wireless Network





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Problems:

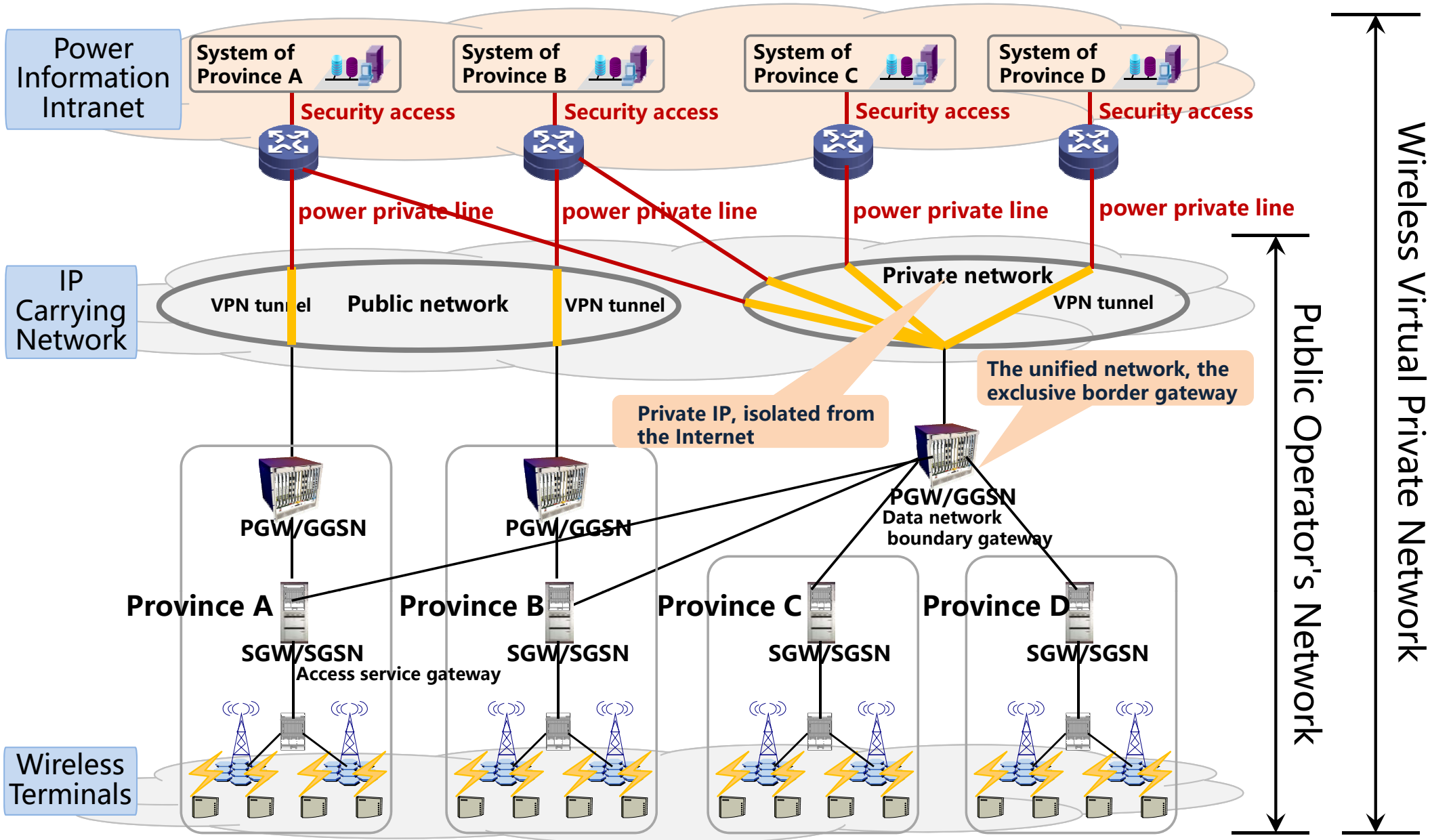
Diversity

Economic

Security

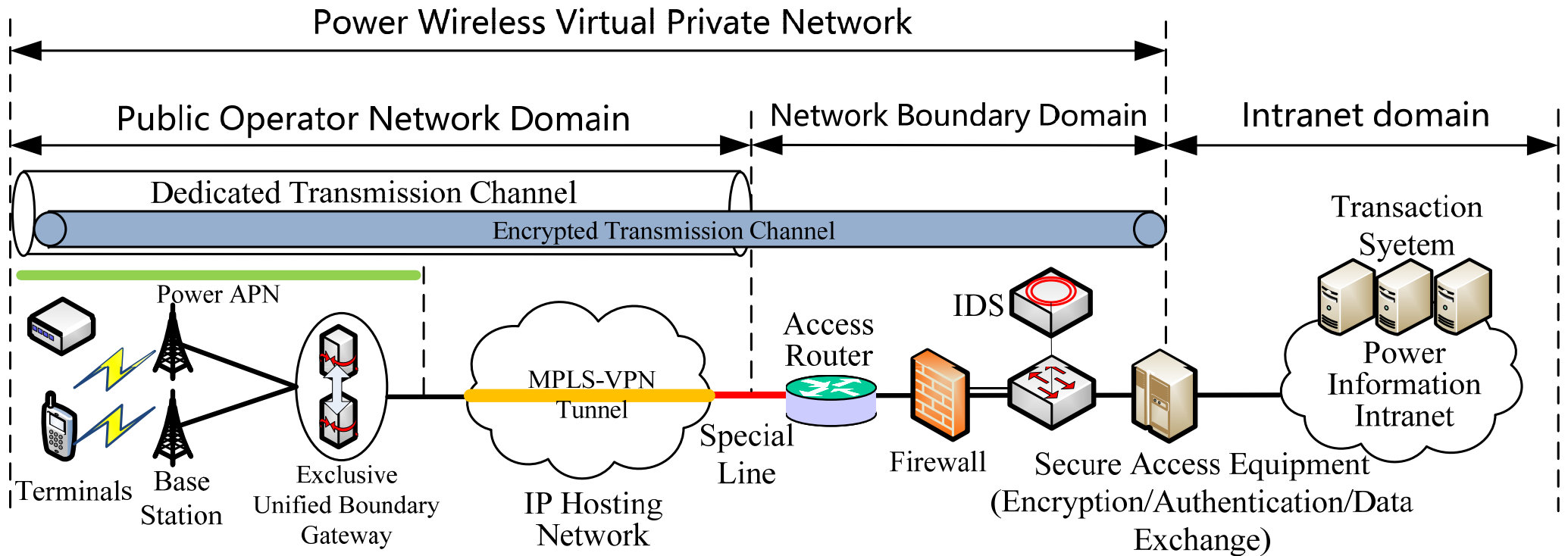


New Architecture of Wireless Virtual Private Network





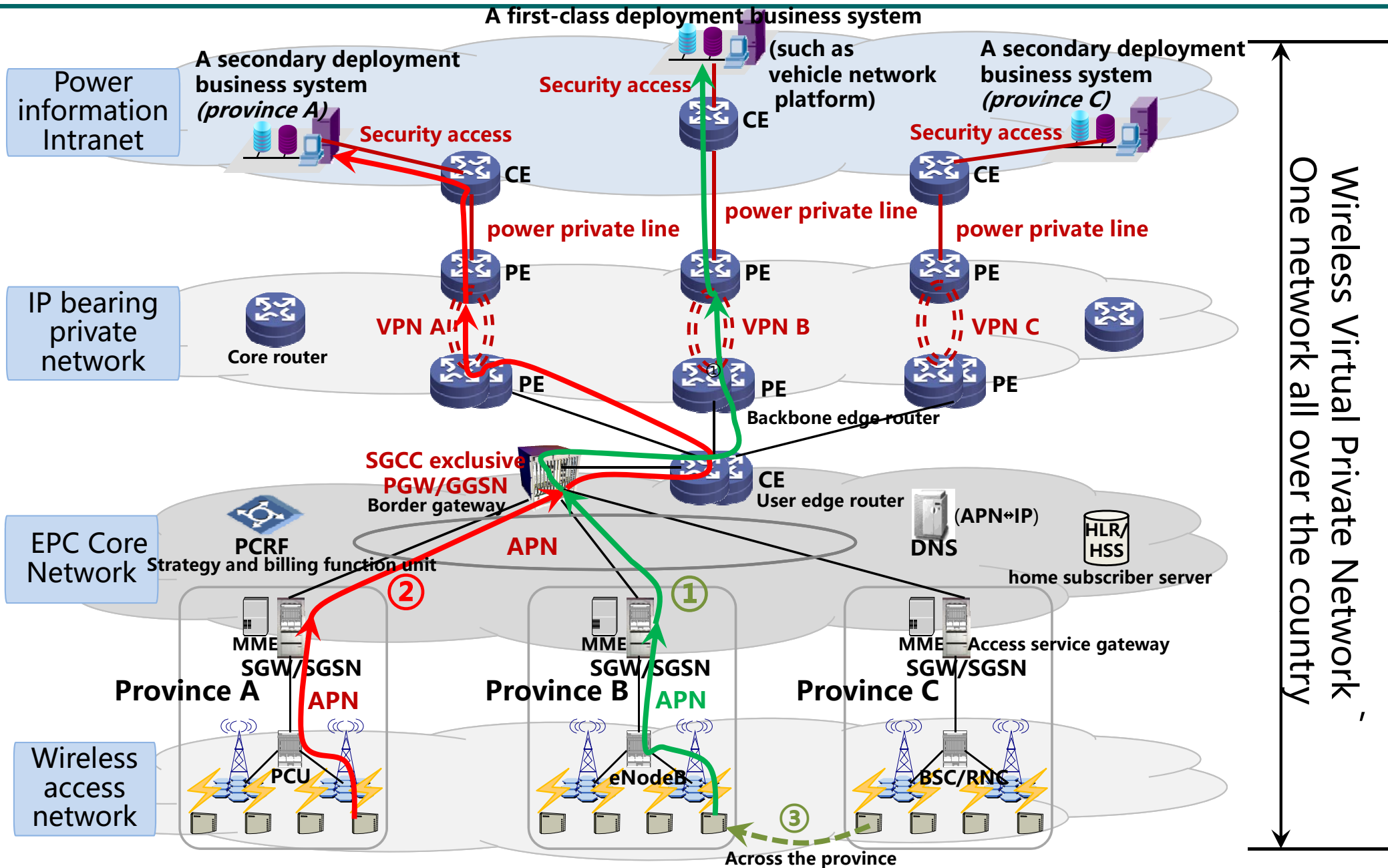
Model of Wireless Virtual Private Network



The new architecture of power wireless virtual private network consists of operator network domain, network boundary domain and power information network domain. By adopting the mode of provincial-level centralized convergence and border gateway unified export, the access network still takes the provincial company as the independent network unit for respective access.

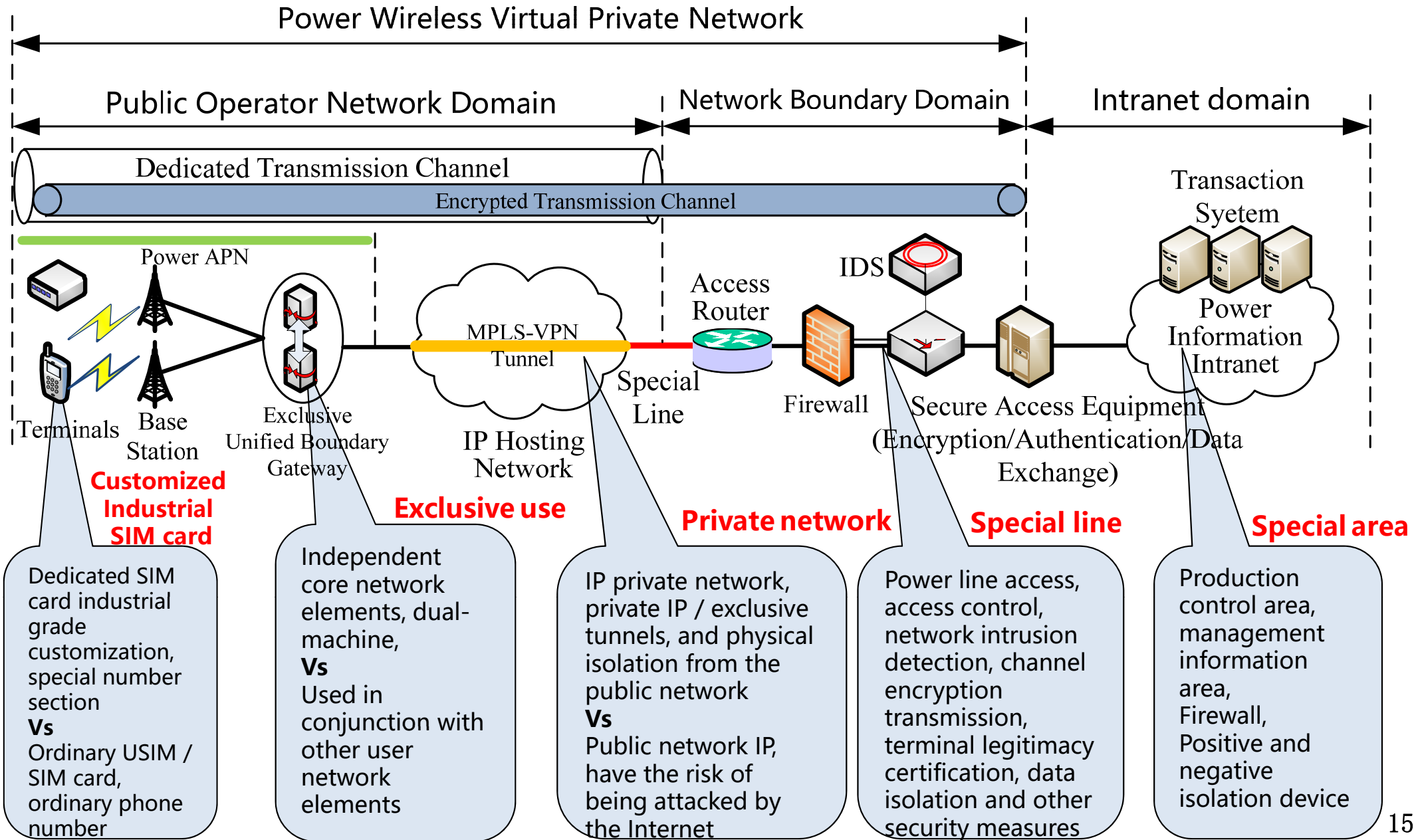


Core Network Elements of Wireless Virtual Private Network





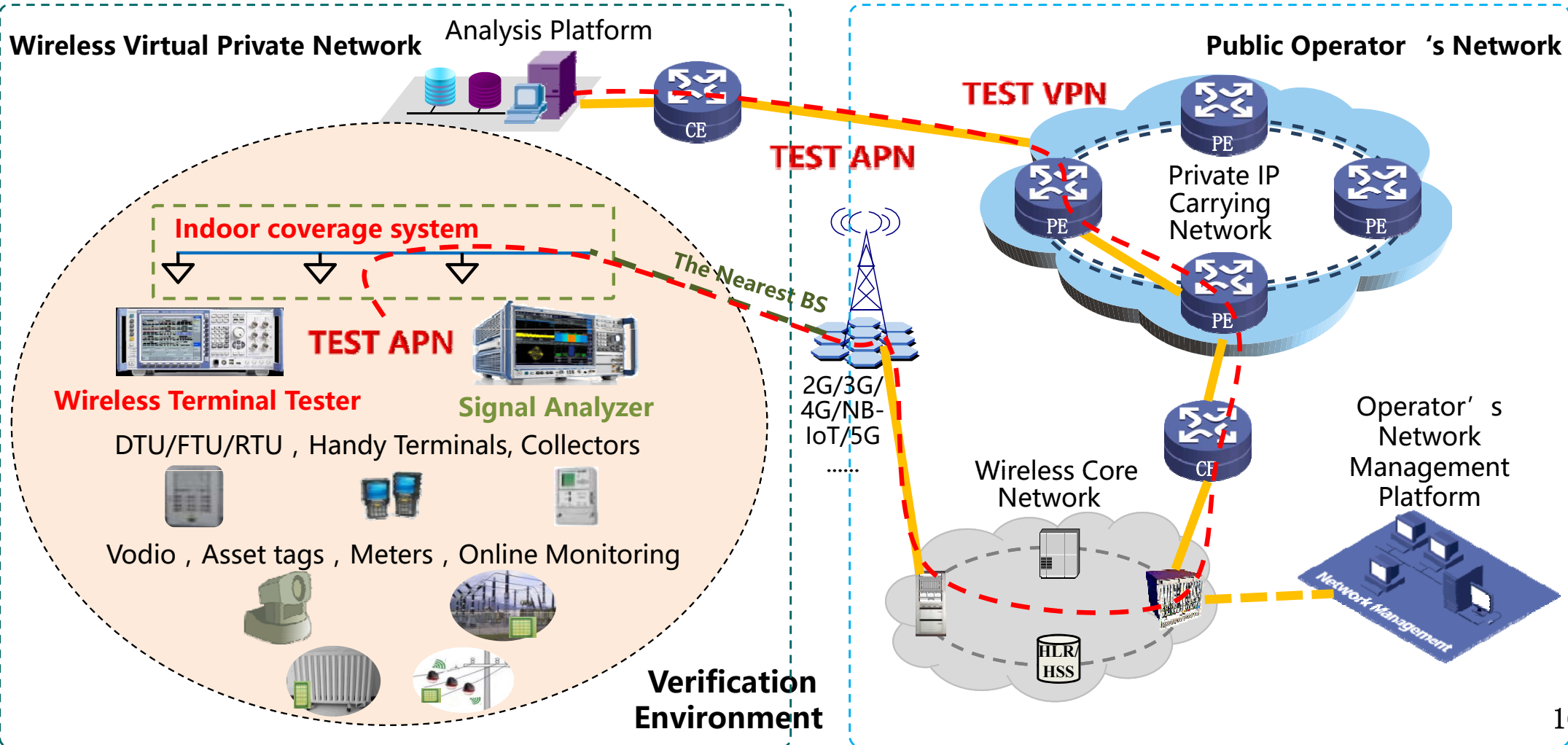
Security Comparison between Novel and Traditional Architecture





Laboratory Wireless Coverage and Testing System

In the laboratory , we deploy indoor wireless coverage system, use multipath MIMO antenna channel, and adjust RRU transmitted power by precision stepper attenuator. Signal features can be visual analyzed by signal analyzer and portable frequency spectrometer.





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epWVPN's Advantages :

Ubiquitous

Seamless Coverage

Strong

Unified

Secure

Economical

Maintenance-free



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epWVPN's Shotcomings :

QoS Guarantee—

Latency

Bandwidth

Reliability



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Solution :
Wireless Virtual Private Network



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Thank you for Attention!