Application of APN in Heat Network Monitoring System

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Abstract. At present, most heat network monitoring systems adopt wireless GPRS/CDMA transmission mode, and the data are transmitted back to the information center by the RTU or intelligent instrument of each heat exchange station.The topological structure of the network mostly adopts the star structure. The specific method of transmitting data through the network is very important. APN technology is one of the access modes, which USES the platform of telecom operators to form a private network to achieve the purpose of data monitoring.

Quote

APN refers to wireless access point, usually we commonly used mobile phones, PDA, tablet computer and so on have GPRS/CDMA functions, network Settings will have APN access point fill in, such as CMWAP, CMNET, etc., this is unicom or mobile company to end users provide access point name, through the user name password verification can enter the wan.Because of this technology, the vast number of mobile users can connect to the Internet at any time anywhere[1].

APN Technical Characteristics

The main characteristic of APN is network specificity.Such as the domestic telecommunications market situation, telecom operators represented by telecom, mobile and unicom manage their own wireless microwave communication networks, and all three operators have their own apn business.When using APN, you need to specify one of the operators as the partner, and the operator completes the binding between the phone number and the IP address. When the remote DTU (digital transmission unit) login to the GPRS/CDMA network with a special APN name as the access point, it will get an Intranet special IP address, which is bound to the phone number.The terminal of the login network forms a local area network. The operator isolates this network completely from the public network by means of special technology and carries out data encryption transmission to form a virtual private network.At present the hot network system computer end mostly USES the fixed IP to add or the dynamic IP to add the domain name binding way, these two kinds are to use the sharing public network communication, and the collection computer parallel still has many office computers, the network stability will have the influence, certainly also has for the collection data to pull the special line.But the computer is exposed in the public network, vulnerable to external intrusion, the use of APN technology can avoid the problem of intrusion.

APN is actually the identification of an external public data network, including enterprise intranets, Internet, WAP sites, industry intranets such as water power systems and other private networks.Network end if you want to know which network to access after the operator did the activation, which network segment of the IP assigned to you (because each network assigned IP may be different, some private network, some public network IP)?This is distinguished by APN, for

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example, in the AT instruction of the network, APN=cmnet means Internet, and APN=cmwap means dedicated WAP data network.Of course, each operator may have different names, such as unicom is uniwap,uninet, etc., and hot network enterprise private network may be "**gongre.com". The division of hot network enterprise private network is ultimately a private LAN, completely separated from the public network link, so as to guarantee the specificity of data transmission[2].

Heat Network System Structure

Fig. 1 All heat exchanger station flow device and controller by RS485 connected on the GPRS DTU, DTU configuration about APN according to the enterprise special name fill in name, and password can be set separately, each node and are point-to-point communication between computers, computer terminal GPRS ROUTER, ROUTER port mapping functions are used to convert the computer connected to the APN private network.

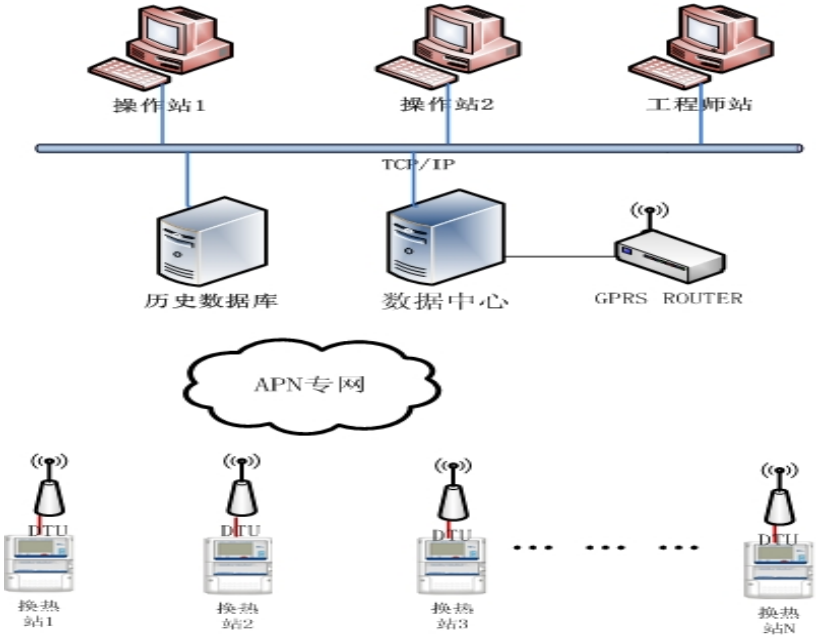

Figure 1. Heat network system structure

APN Technology Security

APN platform through GPRS/WCDMA Network APN set in the enterprise, use of VPDN technology (Virtual Private Dialup Network, dial a Virtual Private Network, using the layer 2 tunneling protocol in dial-up Network technology of the construction of Virtual Private Network) for the user to achieve the enterprise Private Network to the extension of wide-area wireless networks, for the enterprise customer provides an end-to-end enterprise VPN wireless access solutions.With the APN platform, the data acquisition terminal can access the heat network monitoring application system through APN to ensure the security of data transmission between them.After APN access, a dedicated GRE data transmission tunnel is established between the wireless network and the internal network of the heat network, through which only legitimate end users can access the heat supply network.Special lines (SDH, MSTP, etc.) are used to connect the APN platform to the heat network Intranet system.In terms of security, the characteristics of APN are: support user name, password, MSISDN authentication;Can cooperate with GGSN to achieve the function of SINGLE APN;Support MSISDN, APN and user name to control the business according to the time period;Support enterprise private network; Support IP address pool binding

and static IP address binding two forms of IP resource allocation, you can set the enterprise domain bound to the IP address pool, or a user bound to the IP address pool or specific IP address;Support the monitoring and management of hot network wireless terminal[3-5].

The security measures to identify legitimate users, as the most basic security measures, prevent unauthorized users from logging into the hot network monitoring system.The user name and password authentication of the acquisition terminal adopts the user name and password authentication of the hot network application system.

Bind mobile phone number and mobile phone IMEI number, bind mobile phone number and mobile phone IMEI number, prohibit unauthorized end users and unauthorized mobile devices from connecting to the hot network monitoring system, improve security, and ensure the identity of the connected terminal.

IMEI (International Mobile Equipment Identity) is the abbreviation of the International Mobile Equipment Identity code. Each Mobile phone's IMEI code is unique in the world. Authorization of the Mobile phone's IMEI code can be used as one of the conditions to judge whether the user is legally logged in.

Development Trend of APN Technology in Five Heat Networks

APN is relative to other such as ADSL special line fixed IP, ADSL special line dynamic IP+ domain name binding access way, the capital investment is relatively high, because all through GPRS/3G network, and the need for operators background network technology processing support. But from the stability and the special network special aspect is very applicable, from the current operator traffic monthly, network technology upgrade trend, the future operating cost is on the decline trend, if because the communication instability and maintenance cost is too high to lead to the rise of heating cost, in fact and APN access cost is offset.In addition, there are still efficiency problems between ADSL wired network and DTU wireless network. APN access ensures that all wireless access points are in a LAN, which can completely guarantee the communication efficiency[5-8].

According to the current development of 2G/3G/4G network technology, security considerations have gradually become the focus of attention of industrial and civil enterprises. Links connected to public networks are always threatened by various parties, and private network dedicated lines have become an inevitable trend.

Conclusion

Although the use of APN is a relatively large investment, but in the future maintenance and communication stability is incomparable to other combination.So monitoring projects like the heat network with APN access to the comparative advantage.

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