

The entire network topology display system of terminal communication access network

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Abstract. Now order terminal communication access network is network technology in Shanxi Province is diversiform, device type complex, lack of unified technical standard, the terminal communication access network management system of construction constitutes a great obstacle. Need to build a "unified communication interface and communication standard, unified communications network management" of the terminal communication access network cut in the integrated network management system, for the terminal communication access network of shanxi electric power company and subordinate power supply company comprehensive management standardization management, the integration of the auxiliary support.

1 Introduction

Smart grid development will focus on power generation, transmission, substation, power distribution and utilization, scheduling, seven links, such as communication information, and marketing automation, distribution automation is an important part of the current smart grid development, with the electric communication is the key to a successful decision with electrical automation system construction. Terminal communication access network has wide coverage, equipment type complex and numerous technical standard, the lack of unified technical standards and management norms, the construction of communication network management system constitutes a great obstacle.

Thus, according to the national grid company in terminal communication access network management system construction unified communication interface and communication standard, unified communications network management demand as the goal, the construction of a set of network communication access network terminal manufacturer based integrated network management system, implementation supported by communication comprehensive monitoring of computerized, networked, standardized terminal communication access network management system, to enhance data analysis ability and the sharing and communication management system construction; And focus to provide various manufacturers professional network management unified entrance, improving the efficiency and level of communication, communication management system for the company to provide technical support.

2 Project overall design and technical solutions

For the terminal communication access network equipment of large quantity and many kinds of Shanxi Province, the characteristics of wide distribution, EPON third-party network management system with electric network communication equipment manufacturers (EMS) or equipment on the basis of the integration of integrated function such as data acquisition, integrated monitoring module, for operation maintenance electrical communication with an intelligent management system. Provide a warning function of centralized monitoring system to achieve regional network management information, communication access network terminal manufacturers through production forward regional special VPN access to provincial company collection server, regional companies related certification by web access province system, data deployment in province centralized way, the third party network management system and provide the unified entrance, calls to various cities, each manufacturer of professional network management client, the user can of various system resources, configuration, topology, alarm query, and within the scope of the authority to allow for the configuration changes.

Third party for the construction of the network management system will make full use of modern communication and information technology, based on the development of digitization and automation system, intelligent power grid development needs as the core, constantly improve's ability to allocate with electrical communications resources at all levels, improve and

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improve the carrying capacity of all kinds of communication business's ability to resist all kinds of natural disasters and the external force damage, electrical network construction in line with the strong smart grid with the integration of intelligent management system.

3 Software configuration

The system uses commercial relational database as the data source, through the uniform resource model, in the unity of the support across systems software framework based on the platform, according to the system function and the interaction between the relationship, formulate the corresponding software modules, the integrated acquisition platform, comprehensive monitoring, resource management, system management, auxiliary functions and main software module, realize the real-time monitoring terminal communication system, resource management, supporting the business analysis, and main application functions of support.

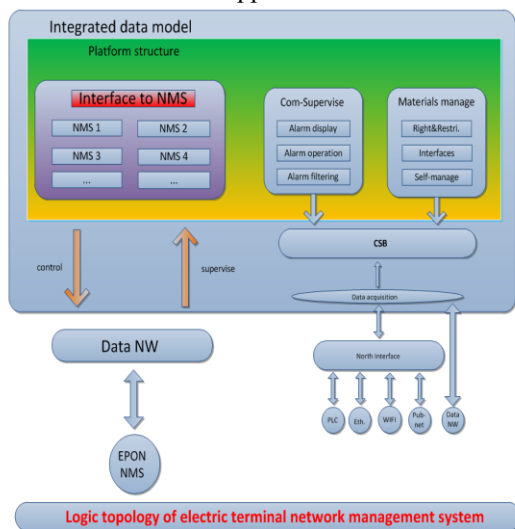


Figure 1. Integrated data model.

Monitored system: including terminal communication access network of EPON access system in different manufacturers, have a combination of electrical communication with PLC, industrial Ethernet, the expansion of the wireless network function.

Integration platform: based on multithreading and preparation of the acquisition agreement and realize the integration of collection and process monitoring, management functions, through standardized north interface protocol implementation of the access network system of data collection.

Communication comprehensive monitoring: with integration platform for interaction, obtained by the monitoring system of the alarm information and topology information, such as real-time data on the basis of the implementation of comprehensive monitoring communication system in the form of entire network topology.

System management: provide with electricity network intelligent management system since the system management, security management, and other basic functions.

Professional network and unified entrance: by each manufacturer professional network management in city bureau to provide local service and management system to provide the various cities, each manufacturer specialized network unified entrance, call professional network client, see the resources, such as topology, alarm information, and the permissions allow, within the scope of the configuration management.

4 Integration of entire network resources configuration management

To the north of the interface, protocol conversion function as the foundation, implementation for access to the factory for network management interface, realize the integrated network management system for the network management system configuration, alarm, performance, such as real-time data acquisition, and to build a unified data model, realize the terminal communication access network in the entire network topology display system for the entire network of different manufacturers and different technical standard network management network, the properties of the network elements of abstracting, realize the unity of the each type of resource storage format, at the same time through the unified data model will be cut in the manufacturer of different manufacturers, different technical standard configuration management functions of network management integration to the terminal communication access network in the entire network topology display system, realize the unified data model based on the entire network factory network configuration management functions and the integration of network resources management.

At present, China's main electric power communication transmission medium to optical fiber is given priority to, through their will power plants, substations and other electric power facilities and various communication site. Communication according to the classification of management level of power grid in China, can be divided into national backbone, provincial backbone, regional backbone level 3, at all levels with different optical communication network according to the function and demand rate level and different network topologies, effectively ensure the safe and stable operation of power system.

Sort is various, the main business is in the power system include: data services, such as power system protection and safety automation devices of power grid data, the electric power market supply and demand data, dispatching automation operation data and information management system and office automation system of information data, etc.; Voice services, such as grid internal conference calls and dispatching telephone, production management, etc.; Video business, such as video conference, industrial video; Multimedia services, such as E-mail, interactive videotex, the multimedia conferences, etc. These business requirement for time delay, bandwidth, reliability difference is bigger, cannot be treated in the same way when processing.

By adopting SDH and ATM as the bearing layer of the business, can realize the point-to-point communication service. However, if you want to realize the entire network data real-time interaction, must solve 1 point to multipoint and multipoint to multipoint communication problems.

5 The entire network topology display

Using the unified data model, data correlation and topological connection network elements such as technology, implement a topology based on IBM Ilog engine components, and extensions for the actual application requirements, with different ICONS show a variety of different network and topology, using dynamic layout, graphic topology automatically connected at the same time, form data serialization compression storage technologies such as show the diversification of network elements for multiple grouping (according to the area, sites, lines, and other forms of network and the regional organization or management requires grouping).

a. Integration assembling platform

Integration platform for multiple management system configuration data, alarm data and performance data acquisition design integrated process management tools, integrated platform for integration of multiple sets of EPON network, multiple acquisition agreement, through friendly interactive interface, the log processing methods such as; Control the acquisition modules (including the system configuration data, alarm data and performance data acquisition) working condition and working process, so as to realize the management and monitoring during the process of collecting all the system itself. In addition to the expansion of the system of support for a variety of other techniques. Integration platform for electric power communication network information collection can bring series of technical advantages.

At all levels are now running network of SDH network, telecommunication level Ethernet have compatible with the network function and characteristics of the SDH can gradually withdraw from operation and transition to the telecommunication level Ethernet, also can be used within the scope of the access layer is small to retain and realize SDH network and telecommunication level Ethernet network. Telecommunication level after the completion of Ethernet, SDH network, data network power system can be unified to the telecommunication level Ethernet transmission platform, reduce or even avoid the SDH network, data network points cause the waste of resources

b. Comprehensive supervision

Integrated network management through the management of machine and network management interface service for the data of the north, complete with the interaction of EPON system, so as to realize the access configuration data, alarm data, real-time monitoring of the performance data. At the same time to ensure the comprehensive network and access network system of loosely coupled, ensure the system security.

c. Alarm management

Alarm management is a comprehensive monitoring technology in the basic functions, including alarm filtering system, display, processing, analysis the whole process. Alarm management function module mainly summarized as: alarm processing, alarm operation, failure analysis, historical alarm query and statistics, several advanced features.

Management main detection parameters for different types of level alarm detection parameter setting management, main categories including emergency alarm level Settings, alarm filtering and warning, and other functions. The general alarm query, statistics, confirmation, remove, delete, storage, and other functions outside the system to provide a list of the alarm information display interface, real-time display of collecting the alarm; System can also according to the alarm information, the fault location to management of related objects, and show to the entire network topology.

6 Professional network management unified entrance

According to the unified data model for the system to provide various cities, each manufacturer specialized network client unified entrance, through unified entrance, a key to the user can log in the professional network management, resource view, topology, alarm, and the permissions allow, within the scope of the configuration management.

Sytem management

Provides the basis for integrated network management system management system system management functions, including user rights management, system monitoring and data backup recovery management, and other functions.

b. User rights management

User rights management is for users of the system and user rights management support functions, the system USES the tree structure to achieve the user based on the structure of the enterprise internal management system, realize the user's group management, managers can for new users of the system, delete, query and modify etc operation; On the user permission management system provides the powers of a matrix distribution management functions, to achieve user permissions rapid distribution management system.

d. Sytem supervision

Through uniform data model in storage manufacturers run data network management system, integrated network management also provides for EPON system and the third party server management system itself, the key software service and network environment monitoring, and in exceptional cases run warning trigger system itself. Monitoring objects including server, PC, its running state; the operating system, service process, such as database software running status.

e. System data backup and recovery

To ensure the system in the event of a failure in the first place to recover and use the system to provide the data backup and restore function. In the process of data backup recovery system will also support the

classification of data backup, classification, delete, can according to user needs, in the case of ensure data integrity system implementation for system data backup and recovery quickly.

7 Conclusion

Through the integrated network management system through the north to help users to realize the interface and protocol conversion function more manufacturers focus on configuration management of network management system, and further use of unified data model achieved under the unified interface centralized monitoring of multivendor network management data, and on this basis using the data correlation and topological connection technology such as network elements implements access global network elements, topology and real-time warning information on the topology of the concentrated display and positioning, solves the user previously confined to the opposite of each subsystem is now monitoring, maintenance, enhances the management of operations staff and equipment repair efficiency; For the entire network transformation, equipment updating and open

cut business support and implementation of auxiliary provides effective extension.

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