

OSN transmission equipment applies in the Metropolitan Area Transmission network and the optimizing with the network

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Abstract—Along with the high speed development of contemporary correspondence industry, the development of the transmission network as partial strut communication network is progressively developed. The SDH transmission facility also unceasingly is weeding through the old to bring forth the new, equipment function is unceasingly consummating and renewal. The Jilin city Metropolitan Area Network SDH transmission is mainly composed of HuaWei and Alcatel. This article has recommended HuaWei OSN transmission equipment applying in the Metropolitan Area transmission network and the optimizing with the network.

Keywords- *HuaWei Optical Switching Node; Metropolitan Area transmission network*

I. INTRODUCTION OF METROPOLITAN AREA TRANSMISSION NETWORK

Evolved by computer network, the development of new tele-communication technique gives new meanings to MAN and has blended telecommunications access network and CATV distribution network. Some documents have already mentioned metropolitan access network (Metropolitan Access Network). MAN coverage is probably within 80 km, the distance between repeaters is generally about the same as 5 ~ 7 km (depending on the size of the city).

Metropolitan area network (MAN) is not a new concept, in the early 90's, along with the computer network birth, a local area network (LAN), wide area network (WAN) and metropolitan area network (MAN) concept are produced. LAN usually refers to the campus and enterprise network; wide area network is a LAN Internet; city of LAN interconnection is often referred to as the metropolitan area network. Today, the computer network has made rapid development, at the same time, the traditional voice communication telephone network is quietly changing its own function, ISDN, ADSL, dial-up and rental 2 Mbit/s line for a variety of access methods is becoming the main means of group and individual user data transmission. At the same time, in the past one or two years, China Telecom, China Mobile, China Unicom, China Netcom, Chinese China Jitong communications operators have been built or are being prepared for the construction of transmission network own.

Trunk transmission network whose status is high is like the artery of the human body, but compared with the

abundant capillaries, the structure is relatively simple, the technology is relatively single, mainly in DWDM, SDH, construction cycle is faster. But the trunk transmission network is almost impossible to access the end users, operators of the investment is not easy to recover, only depending on the business leasing, as "operator" is not sufficient to support the huge investment and maintenance costs, operators must strive for end users.

Increasingly rapid development of the network business, Metro Transmission Network and for the operator to build data and traditional business provides a historical opportunity. It is to say, Metro Transmission Network will become the main battlefield to seize the opportunity of the operators and manufacturers, product integration, to provide the overall solution of the touchstone. As long as the overall planning implementation success, will form win-win situation for the operators, manufacturers and users.

As the extension and coverage of data backbone network and long-distance telephone network within the metropolitan area, MAN is responsible for group users, commercial buildings, intelligent community service access and leased circuit task. MAN will be the main source of operating income. Therefore, MAN will be based on an open broadband optical transmission platform, through various gateways for voice, data, image, multimedia, IP access and a variety of value-added services and intelligence services, and with the long-distance network operators and local PSTN interworking (City) integrated Services network.

MAN must support a variety of services, such as video, data, voice, etc.; it changes a lot in the structure, and makes a difference with different end users. It also has other features, such as a large amount of inverse, diverse and flexible accesses. Anyway MAN is a combination of technologies, products and network, which needs to lead the network according to the demand of business.

Metro transport network is the transmission network within the metropolitan area, which provides access to the underlying connection of data, voice, ATM, leased lines and other top broadband network applications.

Considering MAN must support a variety of services, such as video, data, voice, etc, Huawei OSN launched a series of intelligent optical transmission systems. It is a new

generation of intelligent optical transmission platform, combining SDH, Ethernet, ATM, PDH technologies, which makes it possible to transport voice and data services on the same platform, OSN3500/OSN7500 device supports E1, T1, E3, DS3, E4, STM1 (optical / electrical), STM-4, STM-16, STM-64, AU3 pass through, and 10/100/1000M Ethernet services[1].

II. NETWORKING AND APPLICATION OF JILIN HUAWEI METROPOLITAN AREA TRANSMISSION NETWORK

Metropolitan area network is to broadband optical transmission open platform, through the realization of voice, data, image, multimedia, IP access services and value-added services and intelligent services of various kinds of gateway, and with the operators of long-distance network interconnection of the city (the ground) integrated services network.

Coverage extension in the metro area as data backbone network and long distance telephone network, metropolitan area network undertakes group users, commercial buildings, intelligent community service access and leased circuit task, which has the characteristics of wide coverage, large amount of investment, access to diverse, flexible access mode.

At first Huawei SDH equipment in the network lied at the access level of the transmission network in Jilin, whose general networking method is point to point, in the form of chain or star. Among them, Henan Street, Zhanqian, Jiangbei, Jiangbei 2, Jiangnan, Songjiang are 7 OptiX 2500+ equipment, except for the new-added OSN2500 in Erdao Station, other 25 stations all adopt OptiX155/622 or 155/622H equipment.

In late 2005, the rapid development of PHS, large well-informed, intelligent networks and large business customers resulted in the shortage of part of the circuit of the original network. Although other parts of the circuit have a surplus, considering the further development of large business customers services, PHS, large well-informed, especially the startup of 3G, GN, IPTV, the original transmission networks are insufficient existing in the backbone layer, convergence layer. A 2.5G multiplex section protection ring has been set up with Henan Street, Qiaotou, Jiangnan, Zhanqian four nodes, using a Huawei OSN7500SDH transmission equipment, and increasing the light board to form a 622M protective ring. In addition, the original Optix2500+ equipment has been linked to the newly-built metropolitan area transmission network, which makes the backbone layer and convergence layer transmission equipment unified transport network. Not only is it easy to maintain and manage, but also the newly-built network greatly reduced the jumper of the hardware of 2M business circuit. A fast and flexible scheduling can be done through transmission equipment cross-slot configuration. The above all adopted Huawei T2000 sub-class unified network management system. The following shows the network topology of Jilin Huawei MAN.

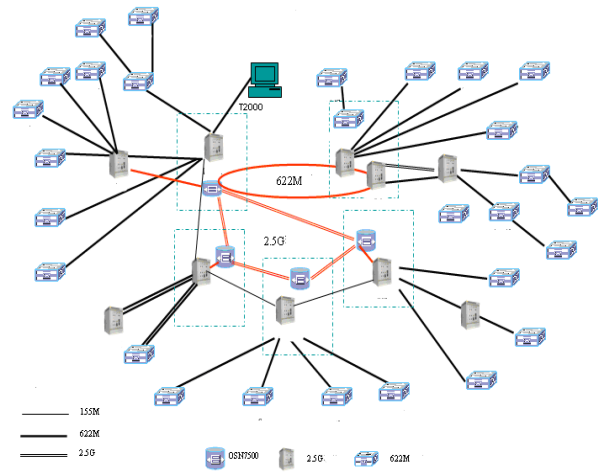


Figure 1: Jilin Huawei MAN

Transmission equipment used in the entire metropolitan area are Huawei's Optix OSN series and series of optical transmission equipment. Optix series which includes Optix155/622H, 155/622, 2500+ devices are generally used for metro access layer and aggregation layer; OSN series includes OSN7500 and OSN2500, generally used for metro core and aggregation layer. In addition, new local area network is used Jilin OSN3500. The following highlights OSN7500 equipment.

OptiX OSN 7500 intelligent optical switching system (hereinafter referred to as the OptiX OSN 7500) is the development of next-generation intelligent optical core switching equipment, based on metropolitan status and future trends. As intelligent optical switching platform, OptiX OSN 7500 is mainly used in business scheduling node MAN backbone layer, namely OCS (Optical Core Switching) device type. Its business exchange capacity, maximum reach 240Gbit/s high-end crossover, 40Gbit/s low-level cross[2].

OptiX OSN 7500 also has smart features, smart business looking to complete routing and end-to-configure features such as easy to use, flexible, and effectively improve the utilization of network bandwidth.

OptiX OSN 7500 combines SDH (Synchronous Digital Hierarchy), WDM (Wavelength Division Multiplexing), Ethernet, ATM (Asynchronous Transfer Mode), PDH (Plesiochronous Digital Hierarchy), SAN (Storage Area Network) and DVB (Digital Video Broadcasting) technology as one to achieve the efficient delivery on the same platform for voice, data, storage, network and video services[3].

Overall OptiX OSN 7500 device shown in Figure 2.



Figure 2: Overall OptiX OSN 7500 device

OptiX OSN7500 , as a large-capacity, intelligent core optical switching systems, is mainly located in the metropolitan area network backbone layer, perform a variety of types, service scheduling and transmission of different particles. As a high-end product in the field of NGSDN (Next generation SDH),it together with OptiX OSN 3500/2500/1500 MAN build a complete solution[4]. Figure 3 shows the application of the OptiX OSN 7500 in transport MAN.

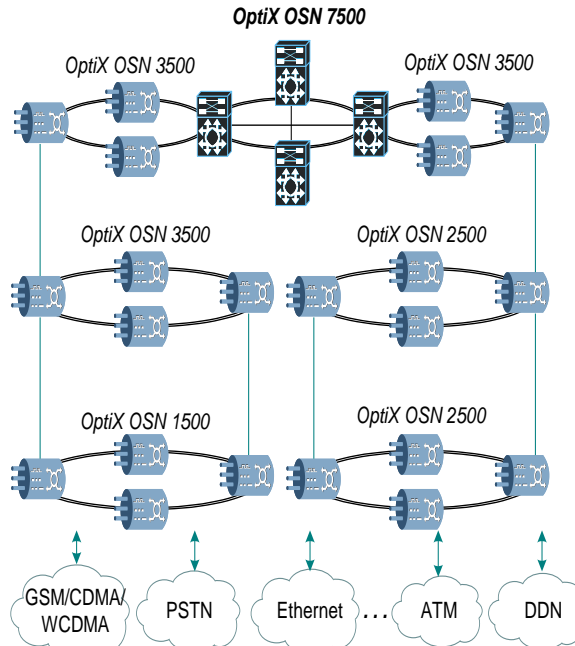


Figure 3: the application of the OptiX OSN 7500 in transport MAN

OptiX OSN7500 as an intelligent multi-service switching and transmission equipment used in the following situations:

Large urban core aggregation node

OCS in medium and small cities
Service scheduling node in provincial trunk

III. JILIN HUAWEI MAN NETWORK OPTIMIZATION

In recent years with the PHS business, ADSL business, enterprise networking, the new exchange alone a large part of the Department of Administration and other services and personalized circuit demand, Jilin City metro transport networks are in need of network expansion and optimization. The following is for Jilin Huawei MAN network optimization scheme proposed reform.

Situation analysis and description of Jilin transmission network equipment :

Jilin local transmission network is mainly made up of Alcatel 10G MAN, including 12 stations in Jilin City District Council, making up a three 2.5G and 10G ring network. NEC2.5G MAN, has formed a four-fiber ring, a four-fiber ring 622M and a two-fiber ring622M. Huawei Huawei MAN has formed a 2.5G ring and a 622Mring. Other SDH equipments are using Huawei equipment consisting of a chain structure, with a lot of PDH equipment existing.

To meet the needs of local independent tandem network intelligence projects for transmission circuit, the circuit is mainly opened at Henan Street, Qiaotou and zhanqian. Such 10G ring slot are almost fully occupied, and the remaining three 2.5G slot ring has been basically full, and slot Alcatel 10G equipment have all been filled, slot Alcatel 2.5G devices are basically full. As a result, it has been very difficult in the ring expansion of Alcatel.

The NEC MAN began building in 1995, after four relatively large expansion, the last time in 1999. The oldest batch of equipment services for more than 11 years , the latest time there for seven years. NEC equipment failure rate in the network, and most serious network security risks, because it is early SDH products, and NEC device does not have the carrying capacity of multiple services (such as data Ethernet, RPR, ATM services, etc.).

At present, the company is already using Huawei devices which have ASON features, so consider upgrading to Huawei's 10G 2.5G ring, 10G 10G upgrade only need to increase the light board and a point10G (OSN7500) device in Jiangbei station. The original 2.5 G ring of light board can link the original network Optix2500 + to 10G metropolitan . Then you can increase the network capacity, flexible service scheduling, and make it possible to gradually smooth evolution to intelligent optical network[5].

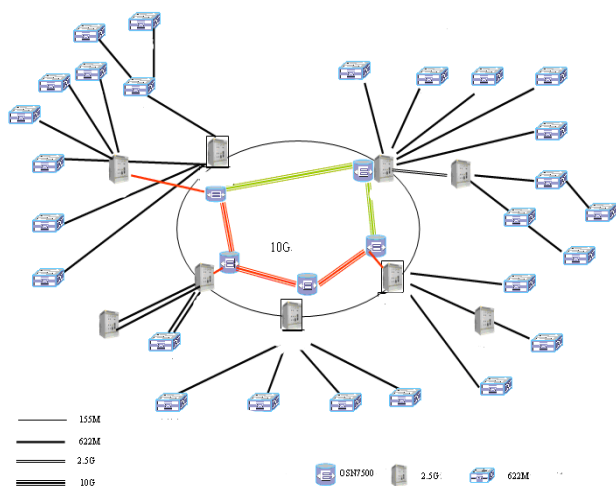


Figure 4 after-optimization of Huawei MAN

After completing the first step of the transformation , the Jilin City metropolitan area will have a further optimization and transformation with the development of IPTV,NGN, 3G to achieve a more flexible, secure, reliable business hosting.

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