Discussion on the Innovation Practice of Speed-up Service of Broadband Network Intelligent

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Keyword: Broadband network; Intelligent speed; Intelligent pipeline

Abstract. With the advancement of operators' optical reform work, the overall bandwidth of broadband users will be comprehensively and substantially improved after the all-optical network is realized. As the basis of fixed-line broadband intelligent pipeline, broadband intelligent speed-up has always been the core strategy and important measure for the intelligentization of operators' networks at home and abroad. This paper analyzes the status quo of broadband intelligent speed-up service, and follows up the current situation of China to propose the need of intelligent speed-up platform. The realization of intelligent speed-up service provides effective protection for today's networked life.

Introduction
Comprehensively improving the intelligent carrying capacity of the network, supporting various business developments and having the ability to integrate information services quickly, conveniently and differentiated will become one of the key initiatives of major telecom operators in the new competitive situation. At present, the capabilities provided by users are mainly based on bandwidth speed. In order to meet the needs of differentiated Internet applications, more fixed network capabilities would be opened in the future, and the coupling relationship between network capabilities and Internet services would be strengthened. Such as routing capabilities, network storage capabilities, home gateway capabilities, etc. The current intelligent pipeline solution focuses on dynamic configuration delivery. In the future, it can enhance traffic collection and traffic awareness in the network. Through big data analysis, it can grasp the current status of network traffic, user behavior habits, user experience and then enrich the content of intelligent pipeline. Users can increase the broadband Internet access rate conveniently, autonomously and in real time through the intelligent speed-up platform. At this stage, users can speed up to 50Mbps.

The Business Status of Broadband Network Intelligent Speeding

Preempt Each Other in Broadband Networks.
In the past, broadband intelligent speed-up was based on overall speed-up, which mainly improved user uplink and downlink bandwidth. Traffic of all applications and common traffic interact with each other and preempt each other. The future business needs rapid growth of application speed to meet the needs of fast-growing applications, especially the strong appeal of CP/SP user experience, which requires rapid deployment and development of application speed.

Market Users’ Needs.
In the past, Broadband Intelligent Speed-up product operation analysis, intelligent speed-up products are popular among users due to their real-time, dynamic and on-demand speed-up features. However, the simple user bandwidth increase is impossible to synchronize user awareness and application experience. Many domestic and foreign operators have designed application acceleration, application guarantee, flexible traffic and content charging for applications based on user location, user behavior, user access time, and application scenarios. It tightly bundles broadband and applications, such as thunder speed-up, P2P speed limit, step flow metering, etc. Operators can also develop business alliance strategies, and divide the business into video, games and Internet, and then explore the business value of each application.
Intense Competition in the Communications Market.

The continuous development of communication technology and the issuance of 4G communication licenses, the increasingly fierce competition in the communication market, the quality of online video, the increase of online game quality and the diversity of online streaming media and limited broadband speed have become the main constraint of user network activities. Only by providing users with comprehensive data services with full data can we enhance core competitiveness and new profit growth points. Intelligent speed-up can be used to dynamically adjust the user access bandwidth in real time. It is also called dynamic bandwidth service.

Experience Requirements of Users Cannot be Met.

As the increased user experience, improved online video quality, increased online game quality, and diversified online streaming media, the limited bandwidth speed has become the major constraint on users' network activities. As well as users’ online time and network time are becoming more and more fixed. If you let users choose high-quality and high-bandwidth packages for a long time, they would be unbearable, or unacceptable for economic reasons. So, launching intelligent speed-up services can meet the needs of such users.

Necessity Analysis of Intelligent Speed-up Platform Demand

Positioning of Intelligent Speed-up Platform.

Intelligent speed-up platform is the platform with capability to carry China Telecom broadband intelligent speed-up products. It takes the intelligent configuration and implementation of China Telecom's pipeline as the core, construct the broadband refined operation capability for the service and provide the differentiated bandwidth adjustment function through the control of the user service access point (BRAS/SR).


The construction of the intelligent speed-up platform will meet the business needs of the overall speed-up, application speed-up, and IPTV control and protection. Users can flexibly order and change broadband products through online links after becoming the telecom-level business management platform. The products ordered by the user can be inquired and managed to realize the normal billing of the products ordered by the user.

Interface Requirements for Platforms and IT Systems.

Intelligent speed-up platform is built on a provincial basis. Interconnect with the automatic activation system and the billing system to implement service activation and billing file uploading. Interconnect with the resource management system to obtain the user line reachable bandwidth rate and broadband access type. Interconnect with the network hall to realize the interface between the query user intelligent speed-up platform and the IT system, including the interface with the electronic channel: Interactive interface between intelligent speed-up platform and electronic channels such as MBOSS. The interface adopts an intermediate service layer protocol interface to implement the request functions of user speed-up initiated or ceased. As the main electronic channel, the online business hall provides users with broadband intelligent speed-up function, new installation, change and unsubscribe, and user interface for business use and experience.

Performance Requirements.

The performance requirements mainly stipulate the key performance indicators of the intelligent speed-up platform. This indicator is the basic performance requirement that the platform should have. The performance of the actual on-line platform is subject to the engineering bidding requirements. Business acceptance performance requires business acceptance refers to the intelligent speed-up platform receiving the intelligent speed-up service acceptance request from the IT system; the intelligent speed-up platform handles the business acceptance. After the processing, the intelligent speed-up platform returns the processing result to the IT system. This function refers to the performance of the intelligent speed-up platform in the middle of the process of receiving the request to return results.

Data Backup Management.

Intelligent speed-up capability engine includes forward speed up module server/backward speed
up module server, intelligent speed up service management module server, capability open module server, user self-service portal server, client interface management server (in response to client request), log server and information push management server. Method of data’s backup.

**Personal Virtual Dial-up Users.**

When users use some services such as video, download or online games, the bandwidth requirements will increase rapidly, but users won’t use this service for a long time. If let users use high-bandwidth packages for a long time, they can't bear it or can't accept it for economic reasons.

**Self-service Speed Increase and Stop of Users.**

The user enters the first page of intelligent speeding, and the system automatically retrieves the user online information database according to the user's online IP information, then verifies the user's speeding permission and allows speeding. The page presents the user license speed-up resource according to the speed-up business strategy and the user has accelerated the total time of the month.

**Discussion on Intelligent Speed-up Business**

**Implementation of Intelligent Speed-up Technology.**

Intelligent speed-up is a kind of service that enables telecom broadband access users to use their web pages and other convenient and fast ways to autonomously realize their own broadband access rate or specific application broadband rate within a certain period of time. According to different service objects, it can be divided into two business forms, specifically the overall speed increase and application speed increase.

**Speed-up Capability Engine.**

The speed-up capability engine provides an interface module that is responsible for receiving and parsing the authentication accounting package information. Forward speed control module is responsible for sending bandwidth adjustment instructions. The backward speed control module is responsible for sending the backward speed policy management and delivery functions. The speed-up capability engine module includes user policy verification, speed request receiving, cost control, command delivery, pre-processing of policy rule and online verification of users, etc.

**System Function Architecture.**

The intelligent speed-up system can realize the coordinated control bandwidth and priority of three key network nodes based on IDC exit, BRAS and home gateway through DACS system. It is a control system based on broadband network quality differentiation. Network-wide deployment can achieve end-to-end service assurance. The intelligent speed-up system provides the corresponding application according to the user's needs, thus creating a broadband refined operation capability and providing a business model based on bandwidth and application guarantee.

**Establish Data.**

The database records the electricity usage behavior in detail, and summarizes the tester's electricity consumption rules and behavior patterns through data-oriented mining technology. Track incidents and quantify safety issues. Provide data foundation and theoretical basis for further improving system intelligence and future R&D and application of green energy-saving technologies. Using 4G-LTE mobile internet technology, experiment managers use mobile phones to remotely monitor the power usage of laboratories through mobile applications.

**Improve Platform Resource Utilization.**

In the practice of intelligent pipelines, in order to gradually expand the scale of coverage with the development of the business and ensure the scalability of the business, Jiangsu Telecom chose to load the intelligent speed-up system on the cloud resource pool, and gradually increase resources according to the scale of business development.
Conclusion

Broadband intelligent speedup is a new type of service that can adjust the user access bandwidth in real time and dynamically. It is also called dynamic bandwidth service. Under the current severe market competition, it is of great significance to carry out broadband intelligent speed-up value-added services in terms of creating new revenue points, coping with market competition, and promoting the development of broadband services. Therefore, in order to adapt to the competitive situation of the future communication market and the construction project of broadband intelligent speed-up. Build a smart speed-up platform, open up new business models, provide differentiated services to OTT and users, gather partners, and strengthen the regulatory position of communication companies throughout the value chain.

Project Funding: Jiangxi Provincial Department of Education Science and Technology Research Project (No.GJJ181056)

References