

ZTE NG-DSLAM

Solution Overcomes the Challenges of NGN DSLAM Design

Digital subscriber line access multiplexers (DSLAM) are a leading broadband access technology, delivering high-speed data transmission over existing copper telephone lines. The next generation of DSLAM platforms has to deliver greater density, higher bandwidth and lower cost per port. Any solution must be able to handle the diversity and inter-operation of networking technologies such as IP-to-ATM switching. The first challenge in the future evolution of the DSLAM market though is to enable migration from centralised ATM-based systems to a decentralised IP-based architecture requiring much greater data processing capability. ZTE NG-DSLAM technology is the ideal solution to enable this migration from ATM to the IP-based structure of the next generation platform.

1. Design challenges for next generation DSLAM

The ability to deliver voice, video and data is the goal of every telecom operator, and next generation DSLAM offers the potential to deliver these multiple revenue streams from a single IP packet network.

There are many design challenges for a successful DSLAM line-card, including:

- The ability to support the transition and eventual convergence of ATM and IP networks
- Increased port density - typically 24 to 96 ports
- Increased bandwidth from high performance services and standards, such as ADSL-> ADSL2+ and VDSL->VDSL2/+ for "triple play"
- Intelligence moving to the edge of the network as a traditional DSLAM assumes some edge router functionality
- Maximising the existing infrastructure to accommodate more users
- Maximising Return On Investment (ROI) by reducing cost per port or user
- Supporting required protocols such as ATM, IP, VLAN, RTP, PPP, PPPoE/oA, L2TP, Diffserv, ML-PPP, MPLS
- POS, Routing, Bridging, QoS, etc.
- Managing QoS to ensure prioritisation of latency sensitive traffic to meet service level agreements
- Configurable bandwidth based on policy configuration across ATM, PPP, Ethernet, and IP technologies

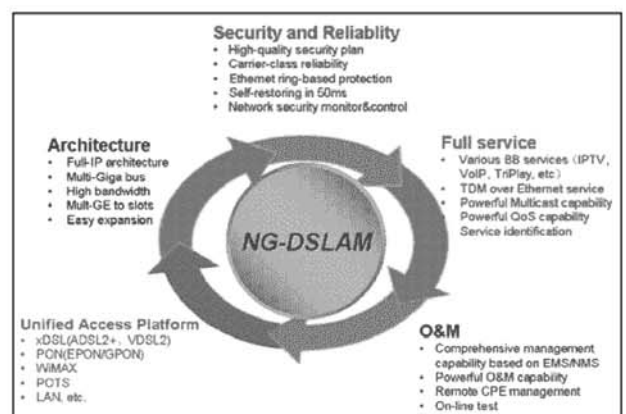
- Multiple QoS dictates the need for different hierarchical IP or ATM traffic scheduling and shaping capability
- Ensuring the security/confidentiality of subscriber information
- Providing the ability to add new features and functions through software based on market and subscriber demand

A robust DSLAM line-card design must also combine the best density, throughput functionality, scalability and cost-efficiency to provide equipment vendors with a distinct competitive advantage.

2. ZTE NGN-oriented NG DSLAM

To accommodate these requirements for the development of next generation networks and services, broadband access layer equipment is evolving to a platform - NG DSLAM.

ZTE NG DSLAM is designed with a multi-Giga, multiple-bus architecture to enable an extensive range of ultra bandwidth services. It features flexible networking capabilities with carrier-class reliability and full-service protection functions. This is a new type of access layer equipment with wired (xDSL, POTS, LAN), wireless (WiMAX, WLAN), and fibre (EPON/GPON) access capabilities. As a unified service access platform, it provides network management, QoS management, security management, and operation and maintenance management oriented to the various services provided. Its full service open architecture supports completely seamless integration with the NGN. Effectively, it is an NGN-ready super IP-DSLAM access platform. As it has evolved from the ATM/IP DSLAM, the NG DSLAM is compatible with the functions of the earlier equipment.



3. Features of ZTE NGN-oriented NG-DSLAM technology

Compared with earlier DSLAM access equipment, the significant characteristics of ZTE's NG DSLAM technology are:

- Multi-Giga bus, and multiple Gigabit service slots
- Full-service open architecture supporting full service access, bearer and transmission, to implement full service platform-based access
- Extremely powerful access capability supporting multiple access modes
- Flexible networking capabilities with carrier-class reliability and full service protection
- Full IP architecture, multi-Giga bus and easy expansion
- High-quality security solution, high reliability Ethernet-ring protection, 50ms self-recovery and network security monitoring
- Full range of broadband services (IPTV, VoIP, and triple play), TDM over Ethernet, powerful multicast capability, service identification, service perception and multi-service edge
- Sound EMS/NMS capability and powerful operation & maintenance capability
- Unified Access supports xDSL access, PON optical access, wireless access, POTS access and LAN access

4. ZTE NG DSLAM solution - FSAP (Full Service Access Platform)

FSAP is the full service access platform for ZTE's NG DSLAM solution. Building on its long experience in broadband access R&D, ZTE has launched the new-generation ZTE FSAP to address the needs of large-capacity, high-bandwidth and high-quality video, audio, data, and interactive services. It also addresses the need for the access layer to evolve to the NGN.

The ZTE FSAP is a new multi-service access platform that provides broadband services such as XDSL, LAN and PON. It allows carriers to build access layer networks with full service bearer capability.

The ZTE FSAP family consists of the following: FSAP 9800 with large capacity and active/standby redundancy; FSAP 9803 with medium capacity; FSAP 9805 with medium to small capacity and high/low temperature resistance of -40°C ~ +65°C outdoors; FSAP 9806 with small capacity

Pizza box; and FSAP 9807 with small capacity and high/low temperature resistance of -40°C ~ +65°C outdoors.

The large capacity FSAP 9800, Macro FSAP 9803 and Pizza box 9806 have been already put into commercial application.

5. Typical application areas of ZTE NG DSLAM technology

ZTE NG DSLAM can implement the following networking applications:

- Mixed insertion of EPON/GPON cards, enabling the concurrent delivery of services
- Mixed insertion of Wimax cards, meeting pilot and small-scale service needs
- Smooth upgrade to support access of VoIP and POTS, providing voice services

The ZTE NG-DSLAM system has fully optical access equipment PON with powerful broadband functionality and meets the optical access networking requirements of TDM access by using GPON. It also provides VoIP voice functions and supports Gigabit Ethernet ring protection enabling reliable, full-service, high-bandwidth transmission. It also supports the extremely powerful broadband functionality that can be achieved by adding DSL boards.

6. Commercial application of ZTE NG-DSLAM

Many ZTE NG DSLAM systems are in commercial applications around the world. To date, ZTE has deployed over 15 million DSL products in more than 40 countries including Romania, Greece, Egypt, India and Pakistan. In 2005, Gartner reported ZTE as one of the top three DSL providers in the world. Also in 2005, ZTE became a global supplier of ADSL equipment to France Telecom. At the 2004 Olympics ZTE's DSL successfully provided athletes, referees, journalists and spectators from all over the world with quality broadband services in 16 venues and news centres. Other regions like Hong Kong, and the mainland provinces such as Guang Xi and Shang Hai have deployed ZTE DSLAM systems already.

With over 10% of its revenues committed to R&D every year, ZTE is developing the very latest DSL technologies, including ADSL2/2+ and VDSL/VDSL2. In addition, ZTE also offers new technologies such as SNOOPING ++, on-line usage monitoring software and M+1 terminal protection to provide operators with next-generation broadband products.