BIG VIDEO BETTER FUTURE

Brief Overview of ZTE BIG VIDEO White Paper
# BIG VIDEO BETTER FUTURE

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1 Big Video, Better Future

1.1 The Big Video Era is coming

Throughout the development of video service and the future trends, ZTE believes that the whole development course of video service may experience four periods in succession: the cultivation era, the mature era, the outbreak era and the super video era. There are typical characteristics in each period as described below:

- **The cultivation era (2005~2015):** with the large-scale deployment of fiber and construction of the 3G / 4G network, the user’s access bandwidth improves gradually, the bandwidth per capita has reached 10~20Mbps. Online, high-definition and mobility has become the main features of the video service. 360P/480P mobile video and 720P/1080P wireline video become very popular;

- **The mature era (2016 - 2017):** wireline 4K, mobile 2K are introduced during this period, which has become an important feature of the advent of the Big Video Era. 100Mbps wireline to households has become the basic demand;

- **The outbreak era(2018~2020):** 4K video service becomes increasingly mature, 8K, VR/AR video services are introduced step by step 1Gbps wireline connection will be deployed for some high-end users;

- **Super video era (2021~2025):** 8K, VR/AR video business will be fully mature, holographic video will be introduced, 1Gbps wireline connection becomes the basic demand, 10Gbps wireline connection will be deployed among high-end users.

"The Big Video Era" defined by ZTE contains the last three periods above: the mature era, the outbreak era and the super video era. ZTE believes that, symbolized by the introduction of wireline 4K video and mobile 2K video, 2016 will be the first year of the Big Video Era! The arrival of the Big Video era is not only golden transformation opportunities but also huge challenges to operators worldwide.

1.2 Opportunities and challenges to operators

It is estimated that the number of global pay TV subscribers is expected to exceed 1 billion by 2017, among which the number of IPTV subscribers will be increased by 80 to 180 million. The investment in video industry worldwide will exceed USD 160 billion. Video will become the fourth basic service of the operators after Voice, SMS, and Data. Lots of High-end operators have made business plan for Big Video services, which is regarded as strategic opportunity for the transformation of the era of ICT.

With the continuous introduction of 4K, 8K, VR/AR, Network bandwidth will need to grow more than 10 times. The bit rate of 4K is 2~10 times of HD, and the demand for bandwidth is 22.5Mbps~75Mbps. 8K, VR will need higher bandwidth. 8K need 4 times of 4K's bandwidth, which is about 90Mbps~300Mbps. VR need 4~16 times of 4K's bandwidth, which is about 300Mbps~1.2Gbps, the maximum will be more than 1Gbps. All these services will bring unprecedented challenges to the operator's network.

Operators’ networks need evolution from traditional architecture which is designed for HSI services and high convergence ratio to the target architecture designed for Video services and low convergence ratio.
Operators need to transform the traditional network architecture focusing on the HSI service and following high convergence ratio principle to the target network architecture that focuses on video service and following low convergence ratio and flat architecture principle.

1.3 Connotations of ZTE Big Video

ZTE understands the Big Video by extracting four Big Video connotations, specifically, colorful video service, best video experience, boutique video network, and win-win video ecosystem.

Colorful video service
Compared with traditional video, the value of Big Video lies in the colorful services. ZTE Big Video solution can help operators to provide basic and value-added video services to their end-users. The basic video service keeps developing to higher definition, 4K, 8K, VR/AR, and even holographic video. Value-added video services include video call, Fixed and mobile convergence, multi-screen interaction, VR/AR games, online education, and smart home etc.

Best video experience
The best video experience is the core requirement of users when choosing the video service. The best video experience must achieve the best in content experience, operation experience, and watching experience. The V-QoE video experience evaluation system proposed by ZTE scientifically evaluates video experience from these three aspects. In addition, based on the V-QoE evaluation system, ZTE builds up a fixed-mobile converged video service end-to-end O&M system to monitor users’ video experience in real time in a thorough and accurate way, locate faults quickly, and ensure high-quality video service for customers as required.

Boutique video network
The best video experience cannot be realized without a boutique video network. To meet the Big Video’s QoS and QoE requirements, the bearer network must feature high bandwidth, low latency, low packet loss rate, and fixed-mobile convergence, and can meet requirements of the future network SDN/NFV architecture and fully realize flexible resource scheduling within the whole network. ZTE can provide ultra high bandwidth, low latency, and high QoS boutique fixed video network, boutique wireless video network, and boutique CDN solution that are required to support the Big Video service to help operators meet traffic challenges in the Big Video era, reconstruct networks, and build up Big Video networks.

Win-win video ecosystem
No single enterprise that can satisfy all requirements of the customer. To provide one-stop services for users and go further in the Big Video field, operators have to collaborate with partners in the industry chain, including content, ad, terminal, and equipment providers to build a Big Video ecosystem. ZTE, with its rich experience and position in the industry in the operator video field, maintains good relationships with industry chain partners so that it can provide operators with one-stop video service solutions and achieve
win-win situation through the video ecosystem.

2  ZTE’s Big Video End-To-End Solution

Based on four major connotations, ZTE Big Video solution is designed to provide end-to-end video solutions for telecommunication operators, covering terminal, network, services platform and intelligent maintenance system, which can help operators to achieve the overall success of the video service, and develop a better future.

ZTE End-to-end solution includes:

2.1  Terminal Solution for best user experience

- **Family solution:** with 4K@60P set-top box and home media center to build smart home. Provide video service of ultra high definition and video call, multi-screen interaction, games, on-line education etc.
- **Individual solution:** ZTE can provide 2K resolution VR video with ZTE AXON flagship mobile phone and VR helmet, and build non-screen IPTV environment with ZTE intelligent projector Spro.
- **VR/AR solutions:** ZTE undertakes the task of major VR/AR project of chinese national 863 plan, and provide self-developed 360 real-estate AR applications etc.

2.2  Boutique Network Solution

ZTE can build ultra high bandwidth, low latency, high throughput, NFV/SDN based FBB&MBB video boutique network to meet the requirements of 4K, 8K, VR/AR and other Ultra HD video services:

- **FBB network:**
  - Fixed products support 1Gbps/10Gbps access to households; 400G BNG/1T CR platform support ultra high bandwidth metro network.
  - Products for fixed network such as OLT/BNG support FCC, TCP optimization and other video optimization functions, which can guarantee best video service experience even in the same bandwidth.
  - OLT/BNG/CDN and other main network elements support virtualization evolution and can meet the requirement of network re-architecture in the future where DC acting as the center, to improve equipment resource utilization and efficiency.
  - HGU/BNG/CDN network elements support video probe embeded, to realize end to end video service quality monitoring and fault positioning function, fully protect the user’s video experience.

- **MBB network:**
With V-QoE video evaluation system and mobile network video evaluation system (VMAX), ZTE can build a mobile video networking standards ranging from the coverage optimization, interference optimization, capacity expanding and functions optimization to help operators to optimize the video experience.

- Pre-5G/5G, eMBMS, video optimization in core network, dedicated bearer for video service, service chain, MEC and other mobile network technology, ZTE can fully support mobile video boutique network construction and improve video experience.

**Integrated CDN network:**
- CDN can support fixed and mobile convergence. CDN provides video services both for wireline IPTV/OTT and mobile users, meanwhile, CDN can meet users’ requirement of multi-screen services.
- CDN is able to support hierarchical deployment, further deploy in OLT/RAN side, which provides the best experience for 4K, 8K, VR/AR etc.
- CDN can support NFV/SDN deployment, realize flexible resource scheduling.

### 2.3 Service Platform Solution

- Big Video service platform is constructed based on cloud architecture, which is open and can provide diversified services, and support rapid service deployment and gray release.
- Big Video service platform is capable of providing colorful services such as: 4K@P60, Video Call, fixed and mobile convergence, multi-screen interaction, and precision advertisement etc.
- Based on open service platform to open basic ability, value-added applications, CDN ability, terminal ability and support App-store, thus can support the third parties to develop more services.

### 2.4 Smart O&M and precision marketing platform

- The V-QoE system proposed by ZTE evaluates video experiences from end to end, as well as from four aspects of content quality, transmission quality and service platform and terminals.
- Big Video smart O&M and precision marketing platform, which based on big data technology, collecting data from series probes which deployed on terminal, network, CDN, provides smart O&M and precision marketing functions , including real time monitor of video experience, quick fault location and video experience oriented network planning and optimization.
- Big Video smart precision marketing platform, with its capability of collecting and deep-diving wide range video service data, is involved in precision marketing such as customer behavior analysis, customer portrait construction, content recommendation, and data monetization etc.
3 Market Performance

ZTE has profound experiences and advanced technology in Big Video field. ZTE maintains the largest market share in the global big video market. By now, ZTE has more than 80 commercial offices with the total system capacity up to 50 million and more than 80 international CDN projects with the total concurrency capability up to 30T. The Jiangsu Telecom office with over 6 million users is the largest single office in the world. Indonesia Telekom developed over one million new users within one year. ZTE will focus more on building Big Video Ecosystem, enhancing cooperation with operators, content providers, advertisers, chip providers, and TV providers etc. By end of June 2016, ZTE has signed various strategic cooperation agreements on Big Video with domestic operators such as China Telecom Shanghai&Beijing Branch, China Unicom Chongqing Branch etc. ZTE also strengthened collaboration with operators abroad like Telecom Indonesia. The global innovation center of ZTE Big Video has been established in Nanjing. All above actions are targeted to promote the healthy and win-win development of the whole industry and ecosystem.

With the core value of providing the best user experience from its Big Video service, ZTE is devoted to become the provider of colorful video services, the impeller of the network reconstruction, the leader of the standard and technology innovations, and the advocator of the Big Video ecosystem.