

VOIP-BASED MULTIMEDIA SERVICE

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In this work, we report an assessment on VOLTE. End-to-End traffic analysis shown by defining the number of calls on the PSTN Public Switched Telecommunications Network side, you can also define the amount of bandwidth needed on the IP leg of the call.

VOLTE is a VoIP-based multimedia service, in which, voice calls and video conference services can be provided. The basic difference between VOLTE and VoIP over LTE is that VOLTE traffic is guaranteed with given QOS parameters and is delivered over dedicated bear which has the highest priority while VoIP traffic is delivered over default bearer which only preserves “best effort” QOS. With VOLTE, the end user can enjoy voice and LTE data speeds simultaneously on a single carrier. Since operators are currently relying on their 2G/3G CS networks for voice services, there is no way to offer voice and LTE data simultaneously without the use of dual-transceiver devices capable of simultaneously access to both 2G/3G network and LTE network . When deploying VOLTE, mobile network operators have to face many difficulties and challenges.

It is important to examine the challenges that VOLTE brings to LTE. For mobile operators, in order to ensure that VOLTE provides the same high level service that 2G/3G CS voice provides today, three following benchmarks have to be met: Call completion and call retention rates of 99% or better. Total end-to-end delay of less than 300MS

Voice quality that is as good as or better than 3G circuit switch voice . IMS is designed for call session control not only for LTE, but other network technologies as well, including UMTS, CDMA2000 Wi-Fi and even wired networks .So there must be the combination of interworking VOLTE with traditional circuit- switched voice.

The above challenges can be divided into three categories as follows:
Challenges of Technology: Due to the fact that VOLTE is based on IMS there are many new protocols which are related to IMS such as IPv6, Sig Comp IP Sec and P-headers that make matters worse. The integration of the LTE protocol stack with the IMS control layer is to be taken care of and end-to-end IMS signaling must be tested over the LTE access network. In addition, implementation of mobility between the packet switched LTE and the circuit switched networks is also an issue.

Challenges of Implementation: The operators would look for temporary solutions before moving on to a full-fledged IMS architecture. **Challenges of User satisfaction:** Performance of the network for crucial real-time services needs to be tested with real-time audio and video quality measurement tools. Calculation the bandwidth needed on the WAN link.

End-to-End Traffic Analysis show by defining the number of calls on the PSTN Public Switched Telecommunications Network side, you can also define the amount of bandwidth needed on the IP leg of the call
Let's CDR has the following statistics K 36,000 minutes per day S 12,882.4 minutes per day C 28,235.3 minutes per day.

You are making the assumptions that can use the ERLANG B model for sizing your trunk groups to the PSTN want to have a Grade of Service GOS of P.01 on each of your trunk groups.

Computing the traffic load for the PSTN links at each node as follows:
K= 102 BHT Busy hour traffic a telecommunications traffic measurement given in ERLANGS S = 36.5 BHT C = 80 BHT.

By using the ERLANG B formula you will experience a blocking rate of ~0.01139. Use a codec G.729 to use between POPs with following bandwidth: 26.4 kbps per call full rate with headers 11.2 kbps per call with VAD With Voice Activity Detection 9.6 kbps per call with CRTP. Compressed Real-Time Protocol (CRTP) 6.3 kbps per call with VAD and CRTP.

The bandwidth needed on the link between the K and the S is:
Full Rate: = 2.534 Mbps VAD = 1.075 Mbps CRTP = 1.651 Mbps
VAD/CRTP = 700.8 kbps

The band width needed on the link between the K and C is: Full Rate: = 1.9 Mbps VAD = 806.4 kbps CRTP = 1.238 MBP VAD/CRTP = 525.6 kbps
Therefore , VAD and CRTP have a substantial impact on the bandwidth needed on the WAN link.

The evolution of operator infrastructure has led to the implementation of soft switches that allow migration to an All-IP network. However, the IMS architecture has been dominating industry due to its open interfaces for the deployment of converged services. The main challenge is to provide a consistent end-to-end Quality of Service through an IP service, such that the requested QOS requirements are satisfied when the deployment of a service involves the infrastructure of two or more operators, which are autonomous networks whose administrative domains are managed according to their own policies. Although operators must agree on the QOS requirements for a particular service among a set of IP services, operators do not configure their network devices in the same way because they have their own internal topology and QOS mechanisms that depend on their network devices and other non-technical management requirements.