

https://dspace.org/

A comparison of IP vs 3G network performance indicators

Venter, Jan

2012-02-01
http://hdl.handle.net/10539/11230

Downloaded from a DSpace repository. https://dspace.org/

Abstract

Telecommunication networks of mobile operators are evolving to use an underlying packet-based IP (Internet Protocol) network using Multi Protocol Label Switching (MPLS) as their core technology. The key performance indicators (KPIs) for monitoring the performance of the 3G mobile network's voice and data services are well established, as are the key performance indicators for interfaces and nodes on an IP network.

For this research report an investigation was done on the correlation between the IP KPIs and 3G KPIs through analysis of packet level traces to obtain the IP KPIs as well as reports on KPIs collected on the nodes of the 3G data network. The study was done on MTN South Africa's operational network at two sites for 2 observation periods of 30 days, with specific focus on the busy hour performance. In addition to the well-known IP KPIs, two extra measurements that were found during a literature survey (SRTO - Spurious Retransmission Timeout and ISR - Invalid Sample Ratio) were calculated based on the packet level traces of IP traffic. The 3G KPIs were chosen from industry standard network quality benchmark reports.

The correlation study found no strong linear relationships between the sets of IP and 3G KPIs. This was due to certain limitations in the experimental setup and the observed behaviour of the network (few instances of degradation of behaviour). Further study with modifications to the experimental setup and packet-trace analysis and possibly artificial introduction of negative network conditions will be necessary to verify if correlations exist between the IP and 3G KPIs.