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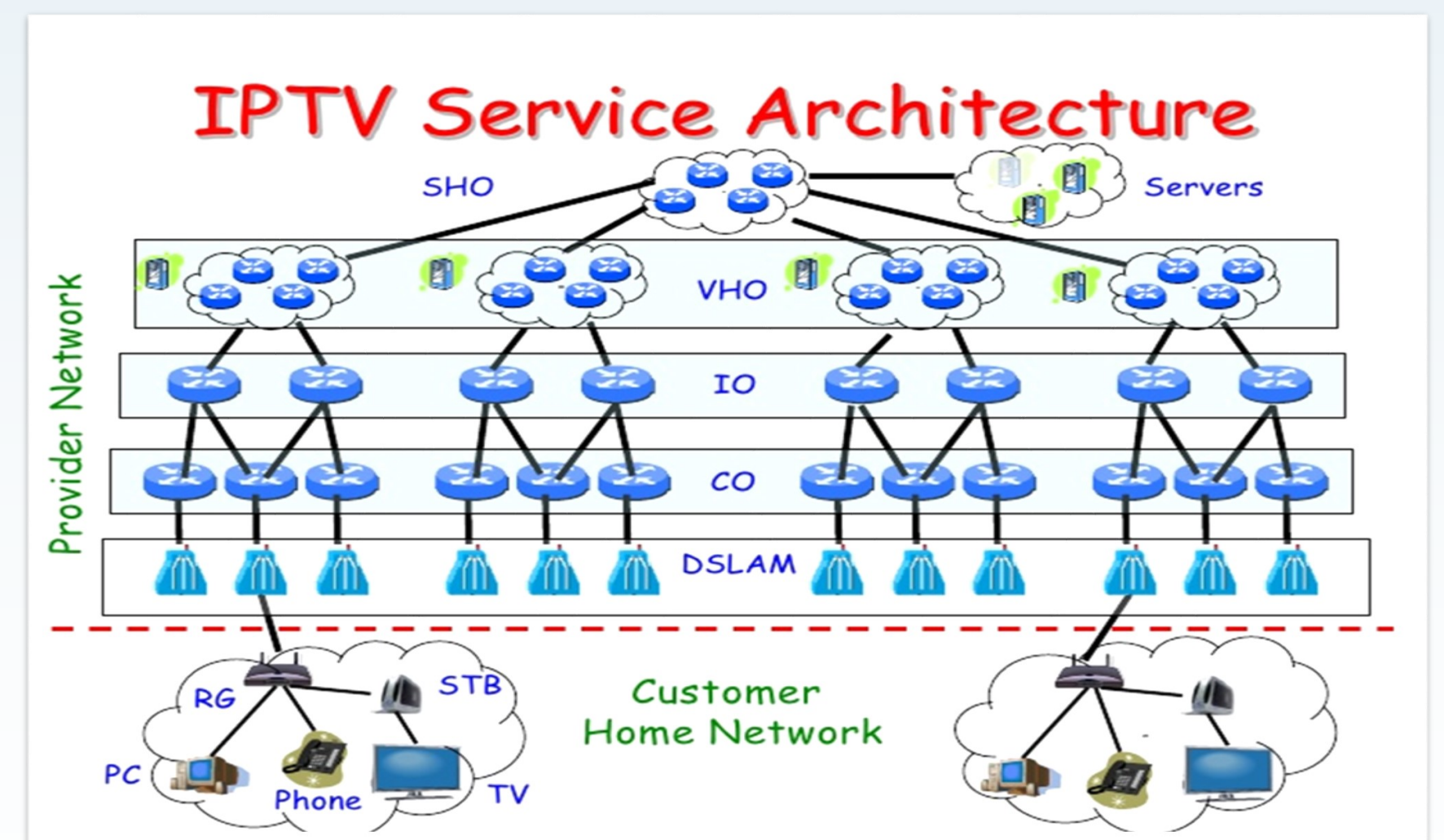
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Introduction

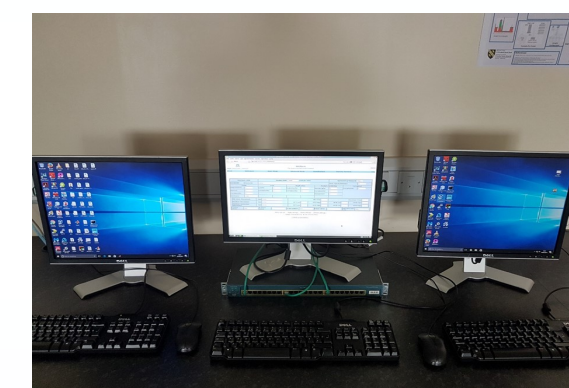
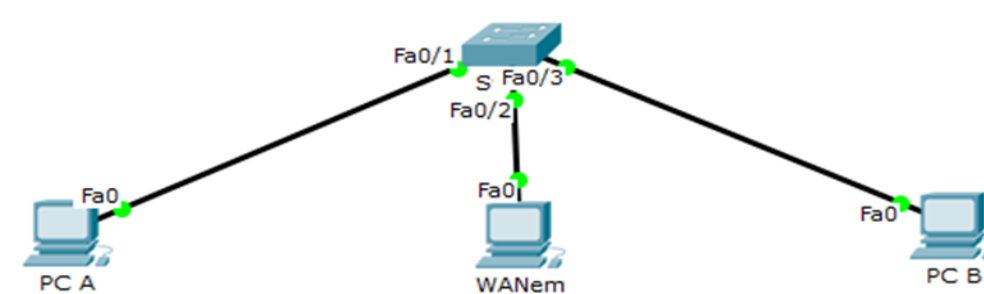
Internet Protocol Television (IPTV)[1] is the distribution of programming via audio-visual stream encoded as a succession of UDP[2] packets. The distribution of IPTV is done by a Service Provider (SP) like Netflix or YouTube. This service can be free or payment based. It can stream either stored video or live TV. IPTV can be accompanied by other IP services such as High-Speed Internet access and Voice of IP (VoIP). IPTV sends one Video at a time. The SP retains the original copy while the user watches the streamed content. When the channel is changed a new data stream is transmitted from the SP to the user. The primary protocol for multicasting is Internet Group Management Protocol (IGMP)[3] version 2. This is used for Real Time Streaming (RTS)[4], and on-demand videos. The most common video compression used is AVI, MPEG-2 and MPEG-4. IP is a best effort network so this means there is no QoS. IPTV is fast becoming the largest ways in which the public views videos from all over the world. Quality of Service has become paramount to networking firms and IPTV broadcasters alike. The aim of this project is to test how different types of strains on the network will affect the Quality of Service. This will be measured using a number of different simulation tools.

Aims & Objectives

- The aim of this experiment is to find out what the effects of delay, jitter, file corruption and packet loss have on a 480p video in AVI format.
- Extensive research into noise, delay, jitter corruption and packet loss.
- Synthesize different scenarios on simulation software.
- Implement monitoring software and analyse the outcomes.



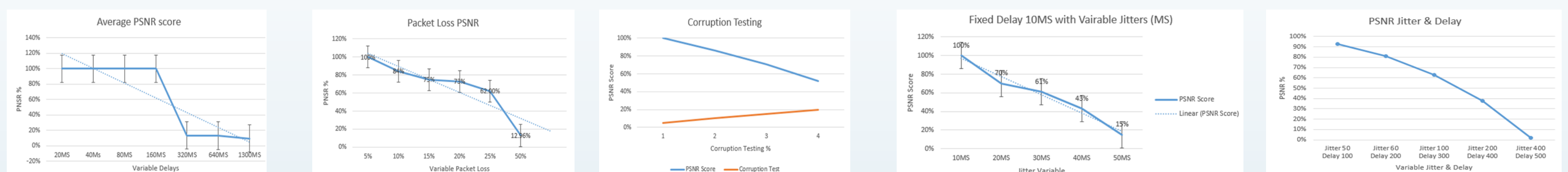
The Experiment



The experiment utilized three PC's and a Cisco switch. PC A & PC B are running Windows 10 with a basic setup (this is to make the experience as much like Joe Bloggs on the street). The PC's have had the data routed through the PC labelled WANem this was done by adding a simple route command in the CMD on PC A & B. PC labeled WANem is running a version of Linux created by TATA. This software recreates a Wide Area Network (WAN) in which the data will pass through. This software allows for the manipulation of file corruption, delay, jitter and packet loss. All the PC's are connected to the switch.

The Video file is stored on PC A. PC B will play the video file using VLC and record the outcome. WANem will change the parameters on the network. File from PC A will then be compared to the file on PC B and an PSNR score will be given, this is then converted into an MOS score. This will give us the results of the QOS of the video File.

Conclusion



There were 5 different experiments run. Phase one measured variable delays. The results for the first four tests were surprising showing very little change in the degradation of the video quality but test 5,6, and 7 show that delay on the network can cause serious video degradation meaning the videos were unwatchable. Phase two concentrated on variable packet loss. The results were as expected that it would not take a lot of packet loss on the system to cause major issues with the video file. Phase three was the corruption test. We started off on a very little amounts of corruption on the network which had no affect on the video data but ramping the corruption up 5% on each test showed that a corruption value of 20% on the network the video becomes unwatchable. Phase four the use of two interferences was implemented a fixed delay of 10MS (Milliseconds) and variable jitter of 10MS. The results were as expected the more jitter that was added the more the video quality diminished. The final phase the use of two variable was used. Variable delay and variable jitter both measured in MS. The network seemed to handle a larger delay with a fairly large jitter without any problems for the first test and the second test but after that the decline in video quality was very noticeable and after the last test the video was once again unwatchable. These test show that weather it be a delay, jitter or corruption on the network as long as there is no more that the maximum allowance the videos that are being transmitted should have the ability to be watched with a high quality of service but once the maximum allowance has bee meet this is where the problems will occur and more bandwidth would been to be allocated for better QOS.

References

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