

## **ABSTRACT**

*The need for digital storage is growing rapidly around the world as more and more digital media is made. Network Attached Storage (NAS) is a development of the traditional server, the NAS made specifically for file sharing as its primary role. But in fact, this network attached storage is located on a local area network in conjunction with other servers and client nodes so that the performance of network attached storage is decreased. This problem can be overcome by implementing a virtual local area network (VLAN) on the network.*

*VLAN is a technology where we can make more than one broadcast domain at Layer-2 Data Link. As previously known, in the regular LAN network, each node is connected to the same broadcast domain. Users who are on a VLAN will not receive broadcast packets from different VLANs. So that data packets passing the network would not be as crowded as before. This study will test the performance of FreeNAS (Open Source Software NAS) on the VLAN network that will be compared to its performance in the LAN. In addition, the comparisons between CIFS, FTP, and UPnP which is a feature of FreeNAS will be seen and analyzed at the time of data transfer and multimedia files playback.*

*From the research, it is known that the use of CIFS and FTP protocols which are services of FreeNAS reaches throughput 97.0071 Mbps and 98.3514 Mbps on VLAN network. Both protocols resulted in throughput reaches more than 95% of the maximum speed of Fast Ethernet medium. The use of NAS on a VLAN produce stable throughput around 96-97 Mbps compared to LAN that down to 39.8324 Mbps. Playback of multimedia files using the CIFS protocol and UPnP also shows the average throughput over the bit rate files. While the delay and packet loss showed no significant change. The use of VLANs can also stabilize the CPU Usage and RAM Utilization of NAS. In order to achieve maximal performance of FreeNAS, authors suggest the readers to use a Gigabit Ethernet as a medium and add RAM up to 8 GB.*

*Keywords: Network Attached Storage, Virtual Local Area Network, CIFS, FTP, UPnP.*