WINDOWS 8 V/S LINUX UBUNTU 12.10 – COMPARISON OF THE NETWORK PERFORMANCE

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Abstract

Networking has been an integral part in the computers, ever since its evolution. Over the years, networking features of the operating systems varied so much, and then, evolved to the form it is now. Networking features vary as the platform changes, and the various operating systems will have different networking features. The topic Windows Vs Linux has been debated for many years. Here, the aim is to bring out the weaknesses and focus on the strengths of the two operating systems Windows 8 and Linux Ubuntu 12.10 in terms of its networking capabilities and security. The networking performance of the operating systems is compared on the basis of certain parameters. The comparison results were obtained with D-ITG on two systems connected with Ethernet cable. Performance of UDP protocol was measured when generating two gaming traffic patterns and one VoIP call.

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1. INTRODUCTION

Since**,** the generation of computers **Linux v/s Windows** has been a subject of debate. This mainly focus on the pros and cons of both the operating systems based on the networking performance, given a set of requirements, it also attempts to reveal which OS would be best suited for use to you. Here, **Windows 8** and **Ubuntu 12.10** – the most popular Linux distribution, are used for the comparison. Windows has evolved a lot over the period of time, and a lot of new networking capabilities are added to the system. In the first version of the Windows, the networking features were all run through the command line. A lot of changes happened thereafter in the look and feel, and the features. Same is the case with Ubuntu too.

Here, the performance of both the operating systems is measured with D-ITG on two systems connected with Ethernet cable. Performance of UDP protocol was measured when generating two gaming traffic patterns and one VoIP call. The delay, jitter and throughput of the responses are measured, and these parameters are used to conclude which one is better of the two.

D-ITG is used as primary network performance measurement tool since it works on Windows OSs and two types of meter used to measure network performance related metrics which include: OWD (One-Way-Delay) and RTT (Round-Trip-Time).

2. RELATED WORKS

For evaluation of network performance of different OSs the most significant papers have been studied. IPv4 and IPv6 performance evaluation for TCP (Transmission Control Protocol) and UDP(User Datagram Protocol) traffic on Windows Vista and Linux Ubuntu has been performed in [3].Compared to Linux Ubuntu, Windows Vista showed higher CPU usage and lower delay and throughput. Evaluation of network performance of five different versions of Windows OS was conducted in [4]. The Windows Server 2003 showed worse performance when it was compared with others. It was found that the average difference between versions range from 3% to 5% for TCP traffic, whereas it is around 4% for UDP traffic. However, according to author's conclusion, there is no clear winner.

In wireless LAN IEEE 802.11g environment network performance evaluation of Windows 2003, Windows XP and Windows Vista is performed in [5]. The results reveal that in terms of the round trip time and bandwidth Windows Vista has lower performance than the other two OS. In [6] Linux, Windows Server and Windows XP OS packet forwarding evaluation is performed. In the case of kernel or Internet Protocol packet forwarding performance measurement results indicate packet-forwarding performance has been found to be the best in Linux in terms of delay, packet loss and throughput.

3. WINDOWS 8 - NETWORKING ENHANCEMENTS

3.1. Data Usage Tracking and Metering

Windows 8 track the amount of data usage per network by default, when a network from the network list has been clicked that can be shown optionally. This is useful, in the case when

there is a need to keep the track of how much data is used on mobile (3G/4G) and other networks that have usage limitations.

3.2. Real-Time Network Usage Statistics

Along with the other changes, the stats of data usage can be affixed to the Task Manager. The current usage of the network and usage listed history along with the other resource stats of each process can be viewed.

3.3. Wireless Connection Options

There is a new feature on the top of the network list: Airplane mode, will disable all wireless communications when turned on just like on the mobile devices and is found to be useful on laptops and mobile devices than desktops. There have been some features changes and improvements though the functionality of the network list remains similar to previous Windows versions. Once connected successfully to the network, a differently worded prompt can be seen asking if it's a private/work or public network.

3.4. New EAP Types

In Windows 8, a few new EAP types natively supported by Windows will be seen. Authentication types, EAP-SIM/AKA/AKA Prime, along with Wireless Internet Services Provider roaming (WISPr) can be found that ease the connection process to Wi-Fi hotspots. There is no use of a third party supplicant or client in enterprises or campuses since support for EAP-TTLS has been included when implementing this 802.1X authentication type.

3.5. SMB Protocol Updated

The Server Message Block (SMB) protocol has been updated, along with improving the administration, availability, performance and security of file storage and sharing of resource. Apart from this it adds more support for storage of application server. Some of the new features include SMB multichannel, SMB Encryption etc.

3.6. New IP Address Management (IPAM)

The new IP Address Management (IPAM) helps to discover, audit, monitor and manage the IP addressing of networks. IPAM provides the reports on the utilization and the details of the IP address. IP addresses can be organized by blocks, ranges and individual IP addresses.

4. LINUX V/S WINDOWS

4.1. Network Flaws

Fig 4.1 Windows 8 Metro desktop

Fig4.2. Ubuntu 12.10 desktop

4.1.1. Windows

One main problem is that it slows down. Being an inferior operating system it has never been able to shed this old label as when it comes to capabilities of networking this may be because Microsoft Windows from the very earliest releases was intended to be used as a single user system rather than anything else. However in more recent releases mainly with the release of Windows XP it has become a lot more up to speed with the networking systems of modern days. Although it has been found that even this release was not having the same capabilities as any other networking systems of multiple users. In Windows XP system the multiple users can log on to the single PC system at the same time. And so, it has been said that Windows XP supports Fast Switching for the users.

4.1.2. Linux

Critics of Linux contend that it is old and outdated software. Some also disagree that it is not generally very user friendly and also good knowledge is needed in order to use the software before the user mainly tries out to set up a fully working network whereas on the other hand a lot of 'Setup Wizards' has been present in Windows which help even the least qualified user setup simple networks in their own homes.

4.2. Security

When coming to security issues, Windows has the position for being the worse as it has been seen that Windows are under the attack of worms, viruses and Trojans when compared to Linux systems.

5. WINDOWS 8 V/S UBUNTU 12.10 – NETWORKING PERFORMANCE

In order to compare the networking performance of Windows 8 and Ubuntu 12.10, for getting a greater insight of knowing which of them is having the better networking features, results were obtained with D-ITG on two systems connected with Ethernet cable. Performance of UDP protocol was measured by one VoIP call. The results can be summarized Table 5.1. The metrics used in performance measuring include:

5.1. Delay

Delay specifies the time by which the data bits can be transmitted from one computer to another across the network. From this comparison, it is quite evident that the delay is lesser for the Ubuntu, and hence, it will take lesser time to send/receive the data.

Table 5.1 Comparison of networking features of Windows 8 and Linux Ubuntu 12.10

Performance Metrics	Windows 8 (IPv4)	Ubuntu 12.10 (IPv4)	Windows 8 (IPv6)	Ubuntu 12.10 (IPv6)
DNS (TCP)				
Delay	13.4 ms	11 ms	60 ms	50 ms
Jitter	0.69 ms	0.75 ms	0.62 ms	0.75 ms
Throughput	0.99 Kbps	1.05 Kbps	0.96 Kbps	1.05 Kbps
Voice (UDP)				
Delay	22 ms	20 ms	60 ms	50 ms
Jitter	0.2 ms	0.2 ms	0.58 ms	0.6 ms
Throughput	11.1 Kbps	15 Kbps	11.1 Kbps	15 Kbps

5.2. Jitter

Jitter represents the delay variation. There is not much variance in this between the two,and so, the variance will be the same, and hence, it will not affect the network delay by much.

5.3. Throughput

The rate of measure at which data can be transmitted through the network is termed as throughput. Here, the throughput is considerably higher in the case of Ubuntu, and hence, the data is sent faster in this case, than in the Windows.

CONCLUSIONS

It is quite evident from the comparisons that, Ubuntu has been the better performer as far as the networking performance is concerned, although it is not an easy topic to research. It has been found that Linux Ubuntu 12.10 is having lesser delay for smaller packet sizes and delay variation is larger in the case of TCP traffic. But, the throughput is larger compared to Windows 8 for DNS traffic. For the UDP traffic also, the Linux is said to have lesser delay but larger delay variation. The throughput is found to be higher for Linux Ubuntu than Windows 8 in case of larger packet sizes.

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