

# Cloud Services for Device Utilization and Optimization of Hybrid Network

AR.Arunachalam, G.Michael, R. Elankavi

**Abstract:** Network devices are labeled as one of the essentially hard tasked equipment. These devices are dynamically taking part in the network based on the user demand. Thus the network is updated with new devices, as well as the existing devices find their way to update themselves based on the network changes to provide network services to users. Erstwhile the existing devices in the network left offhand to provide services due to the drastic changes in the hybrid network updates such as operating systems and those devices face incompatibility. This examination distinguishes the most usable gadgets in the crossover coordinate with the assistance of genuine considerable system. Likewise it talks about the usable gadget's measurements as a gathering of comparable nature. The statistics includes the packet usage, protocols used for communications, error messages. This analysis recommends cloud based services to solve compatibility issues by analyzing network traffic hindrances. This experiment uses over all 1000 pcs, 100s of hybrid network devices and a network analyzer software for observation and to analyze the fixed term of network traffic packets among the devices. The investigation additionally recommends the required strides towards the reusability of existing gadgets to give nature of administrations to the clients in the half breed arrange condition by methods for cloud based patches.

**Keywords:** Virtual Network; Hybrid Network; Bandwidth; Device utilization

## I. INTRODUCTION

The organizations have taken various measures and steps to follow or determine the needs in discovering of all the devices in a network[1],[3],[5]. It might include for other reasons such as compatibility issues and Quality of services for observing the devices that exist and part of the network. This research focus on the network devices that are particularly involve in impact on network traffic have been monitored and considered for the retention purposes and also the importance of providing the cloud based services to sustain those devices. In specific to these devices namely printers that face issues with compatibility or adapting the hybrid environment are to be considered for the future cloud based services[2],[4],[6].

There are observations that are made concern by the organization to retain the existing the devices and recommend cloud based solution for issues that are explained

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before. It firstly, the association ought to consider the assets that are being gotten to at a specific time and by which individuals. This reduces potential usage by whom and the purpose of usages; it allows the organization to secure their network from drudger accessing the network resources or important information when it travels on the network[7],[9],[11]. Furthermore, the association ought to be in a situation to screen the system transfer speed and ensure that it isn't backed off by bundles sent by obscure sources. Additionally an association ought to think about simpler usage and allocating of various jobs to various gadgets in agreement to the association gauges. This ought to incorporate observing of programming introduced on various gadgets, their licenses and when they are expected to terminate so as to maintain a strategic distance from gadget deficiencies, and the adaptations introduced for these gadgets programming rather go for a cloud based answer for lessen the obstacle[8],[10],[12]. In conclusion, an association ought to consider arrange revelation gadgets that in the event of a system disappointment will effectively identify that of purpose of disappointment and right the system issue in time utilizing a similar administration that given by the cloud. The following section ropes in the common problem that exist in the network instigated by the devices especially printers.

Tools to curb the issues and the device faults

It is well pragmatic that many tools to curb issues that limit the network performance services reaching the destinations. Management software is often used to discover and monitor performance of network devices as an unabridged. Common functions of management software are detecting the devices and solve the compatibility issues to access the network by providing an updates[13],[15],[17].

Monitoring the various processes performed by a device by waiting for the device to send information about the required updates. It causes again the traffic impact on the network. However, real devices grieve from drip [1,2]. The user uses these devices may or may not be aware of what these update is meant to give alert as it could be an update or just an alert that is unnoticed. Also software keeps track of those devices that are accessing the LAN remotely or locally. The traffic flow on the network rapidly increases which gives slow response to the device that need updates. Managing software used in a certain organization by keeping track of their license and the current versions of software being used.

These are the product could be open source or business programming. Components that decide the kind of programming to be utilized for system disclosure are explicit

to the necessities of every association.

A few factors that ought to be considered ought to be; the size of the system and the measure of cash the association is eager to save[14],[16],[18]It is again leading to non-friendly network structure that provides no user friendly services. The entire above scenario escalating the importance of the cloud based service to provide the necessary updates to the devices such as printer to reduce the network traffic slowdown and to deliver the compatible resources to the network.

The question that causes printer on the system lead to stop up the traffic that need prompt considerations are referenced in the as pursues segment, Printing is excessively moderate, Windows is sending print occupations to the off-base printer, My prints are excessively light, excessively spotty, or have even lines, My printer says my ink cartridge is vacant, My paper plate is unstable [4] are a portion of the client saw issues and other may have progressively basic to note and streamline. Different issues with gigantic documents that are not upheld by the inner memory to hold with a wired association check whether printer underpins 100Base-T or gigabit Ethernet. Assuming this is the case, confirm that your switch and system can deal with those rates - in the event that they can't, you're making a bottleneck, particularly when sending designs overwhelming records to the printer [5]. You may need to burrow around to get the subtleties - different printer producers give this data in various areas in the product. On the off chance that you don't see it in the driver programming, inquire in the manual [6]. This leads misperception; rather than having better elective cloud based administration is prescribed in this analysis. Then again Virtualization advancements have drastically changed the manner in which that we consider servers and system gadgets when all is said in done anyway numerous architects neglect to understand that these innovations have likewise made critical changes to our systems [7]. The system gadgets and offer countless administrations accessible to the client of course, likewise a noteworthy traffic generator over the system. Interestingly printers of yester-year, printers of today are generally organized and new mechanical attacks the more established printer left spur of the moment either gadget driver updates missing or the system is caused the traffic gradualness [8]. There are many research exercises fuelling to distinguish the system gadgets which are making the traffic all things considered in the network[9][10]. The printer is the gadget which is intently screen to improve the traffic by doing privately directed activity in an individual PCs those are unbinding NetBIOS, Network Access request and for expelling program traffic login contents maps to as often as possible utilized offers, and NT profiles can place organize proper printer object. The accompanying segment of the paper gives brief purpose for choice to this point by point printer probe the enthusiastic system.

## II. SCOPE

The scope of this research is to identify the issues of the network devices for a particular organization through the network infrastructure. This study is representing printers as a most effective device that provides services to the user next

to personal computers in an organization. The network efficiency is observed by running services, the protocols used for communications by the device printer is considered for analysis such as SNMP, DHCP, SSDP, UDP, TCP, NBNS, MDNS. Alongside the packet usage, protocols used for communications and error messages status and device statistics. Hence hastily justify that there necessary a cloud based patch service that optimizes the hybrid network devices performance.

## III. EXPERIMENTAL SETUP

The fig 1,below demonstrates the system engineering of test bed which associate three noteworthy systems and four administration based systems[19],[21],[23]. These systems give instructive and learning the board administration more than 2500 understudies and the resources in the grounds. This comprises of LAN and the accompanying innovative setups. Additionally the system is plot as three bunches to give the instructive administrations. For the powerful organization and upkeep of this system benefits, the order and bunch made in the office level.

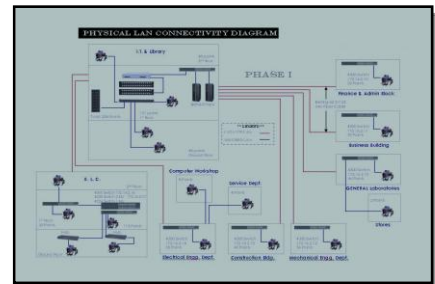


Figure 2 : Experimental Network Structure

The system configuration is built with most recent innovative peripherals with particulars, for example, cisco switches 4503E, SAN Switch IBM 2005 16B, cisco switches 1700,2800 arrangement; Firewall-CISCO-ASA-5510, cisco call director for IP telephones incorporate of CISCO-MCS-7800-KQGCY35, Pentium D 2.80GHz. It is in excess of 1000 hubs are normally Concentrated with UTP CAT-5, CAT-5E,CAT-6 and Fiber Channel switch made up of fiber multimode channels. The set up foundation coordinated with remote loyalty of different producers. The system is improved with Video conferencing upheld for entomb and intra conferencing office[20],[22],[24]. The system association additionally stretched out to reach VPN extranet. The client bolster gadgets provide food into top of the line organized HP and Xerox Laser fly printer and Photocopiers of different models. In this investigation, the system traffic of gadgets printer are observed on different time recurrence.

## IV. RESULT AND DISCUSSIONS

As the experiment began with the identification of list of devices on the network then collected information such as IP address and MAC addresses respectively to identify the devices as broad-spectrum. The software wireshark is used for analysing the data on the network. The devices' IP addresses are the parameter that is

used for filter the traffic exclusively printer traffic and their impact in the network are analysed. The details acquired during the analysis based on bandwidth consumption details by the devices, comparison List of network printer, Total packets against used protocols that are connected to printer services, traffic impact by the devices.

The results are discussed in this section starting from complete devices' list to printers that are considered second biggest traffic contributor next to desktop computers. The Table-1 below shows the list of devices for last six years, it has increased exponentially. The ratio between the printer and the personal computers are nearly 1:3 of the device increased from the starting point to the end for a period of time. The device printer has shown better growth among the other network devices. For the experiment purpose only active device at the ultimate office hours is considered for analysing the data. The Table-1 also depicted the only major devices that are used in an organizational environment.

It is also been depicted in the below fig 2. The legends in the fig 2, are promptly seen and it is clearer that the optimization support needed for the device printer since these devices' traffic also has an impact on the network quality of services.

Table 1. Over all device statistics

Resources/years	2007	2008	2009	2010	2011	2012
Computers	628	762	812	992	1024	1151
Printers	69	87	126	129	137	167
Photocopiers	16	14	27	41	33	44

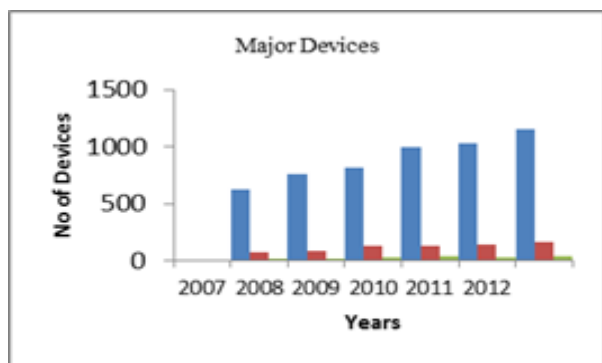


Figure 1- Over all device statistics

In addition to this optimization result analysis, the other devices are also given equal important. The printer appears to be second largest network device that pact influence on the network traffic[31],[33],[35]. This ensures that there need to be a cloud based service that cares the considerable amount of printers in the network. The following section discusses the traffic impact on the network by printers.

Table 2. Printer used packets statistics

Observations	Total Packets	Printer Used Packets	% of Packets
Data-1	10000	52	0.52
Data-2	11698	23	0.197
Data-3	36216	1325	3.659
Data-4	32606	148	0.454
Data-5	32996	146	0.442
Data-6	16154	51	0.316
Data-7	4312	27	0.603
Data-8	10000	0	0
Data-9	10000	53	0.53
Data-10	10000	53	0.53

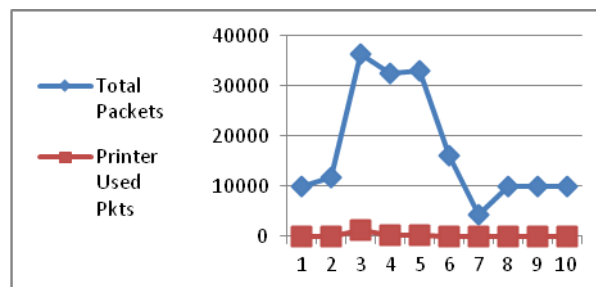


Figure 4- Printer's impact on the network

As discussed earlier, the network capable printer could create kiosk in the network traffic. The analysis depicted above indicates the data from various observations and the packet captured by the analytical tools. The table2, shows the frequency at the data-3 the printer has used the maximum of 1325 packets as compared with their Counterpart PCs and other devices in the network that create network traffic, Fig 3., depicted the variation of the printer impact on the network at different time interval as it is captured by the tool.

Table 4. Protocols used for managing device printers

Printer Used Protocols /Packets	SNMP	DHCP	SSDP	UDP	TCP	NBNS	BROADCAST	MDNS
52	0	0	48	0	0	0	4	0
23	19	0	0	0	4	0	0	0
1325	1265	3	0	2	0	39	16	0
148	4	1	120	2	0	7	14	0
146	4	1	120	2	0	6	13	0
51	0	0	50	0	0	0	1	0
27	0	0	16	6	4	0	1	0
0	0	0	0	0	0	0	0	0
53	0	0	40	6	4	0	3	0
53	2	0	48	0	0	0	2	1

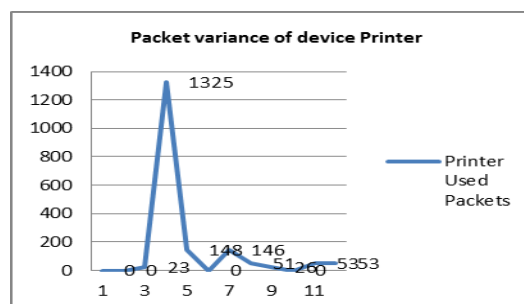


Figure 3 - The protocols used for device printer

Numerous Observation of the network on a specific time interval shown in the table 4 and fig 4, the Simple Network Management Protocols (SNMP) shows the involvement of network management. It had to stabilize the network by optimizing the devices those fall in the category of fault implication such as identifying the drivers, service unavailability.

On the other hand the Simple Service Discovery Protocol (SSDP) peaks up to detect the services that needed by the device printers[37],[39],[41]. Though the SSDP involves in the network discovery without the aid of Dynamic Host Configuration Protocols (DHCP) and Domain Name System (DNS) and it is still need to take part in the traffic for maintaining the flaw free network. The NBNS and BROADCAST all have the equal involvement in the network traffic maintenance and to provide quality of services to the end users. This inevitable state is paving the importance of having mechanism that tackle those device printers on the network might be passing through a clouds based services.

### V. CONCLUSION

The experiment carried out in the real time environment with live traffic of various LAN segment. It is noticed that many devices that take part in the network and provide services to the users. The hybrid network optimization point of view this study gives the importance to the devices that dynamically part to it. The bottlenecks created by the off-hand device printer traffic have been identified through the massive data collected in the sustainable network environment. The network management protocols such as SNMP, NBNS, DHCP and SSDP are identified in this study have mostly spent on optimizing the network. Simple Service Discovery Protocol (SSDP) is hugely supporting the network printers to provide the maximum services requested by the users. The data collected in the network clearly justify that the hybrid network require an amenities from the external cloud based patch services. This study insists the organization to strict to enable those off hand devices service by means of cloud based services [38],[40]

This study can be further enriched to create a prototype of hybrid network patch that is delivered using cloud based services. Also the same type of analysis can be carried out to optimize the wireless devices that are take part in the network dynamically. It can be also considered in the heterogeneous network environment. Also analysing device and providing cloud based optimized solution is challenging in hybrid network infrastructure. The forthcoming study in this field is encouraging and the implementation of cloud based patches could be the next publication

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