



WWJMRD 2020; 6(4): 01-04  
www.wwjmr.com  
International Journal  
Peer Reviewed Journal  
Refereed Journal  
Indexed Journal  
Impact Factor MJIF: 4.25  
E-ISSN: 2454-6615

**Md. Abdullah Yusuf Imam**  
Assistant Maintenance  
Engineer, Department Of ICT,  
National University, Gazipur-  
1704, Bangladesh

**Prodip Kumar Biswas**  
Sub-Technical Officer,  
Department Of ICT, National  
University, Gazipur-1704,  
Bangladesh

## Advanced Policy for Reduction of Packet Loss with Gigabit SFP Module, SAN Switch and HBA Card

**Md. Abdullah Yusuf Imam, Prodip Kumar Biswas**

### Abstract

There are three types of single mode or multimode fiber cable- RC (Russia-Canada), LC (London-Canada), SC (Singapore-Canada) which comes from TJ box (fiber joining box) as the endpoint of main Optical fiber cable (which can be at most 3456 core in general). The RC or LC or SC cable is to be connected to the Media converter and an Utp cable is released from the Media converter and connected to any port of a Switch to activate the channel for passing the bandwidth through the activated line. Now our 1<sup>st</sup> concern is for reduction of packet loss through the whole channel by using switch with Gigabit SFP (Small Form-Factor Pluggable) module in comparing of using Media converter with or without SFP module and 2<sup>nd</sup> concern is to reduce packet loss by using SAN (Storage area network) switch with HBA (Host bus adapter) card for the supply of more than 100 MBPS bandwidth.

**Keywords:** SFP module, Optical fiber, Media converter, Switch, Packet loss, Bandwidth

### Introduction

#### 1. Why Packet Loss Occurs In Internet Network:

Many faults produce packet loss. Here are main:

- Connector problem
- Lose connection problem
- Many joint in cable problem
- Bandwidth problem
- Many browser at a same time problem
- Lan card problem
- Long distance problem

#### 2. How Could We Measure Packet Loss:

By Ping we can send request and receive response and By Jitter we get the variation in that response time and by measurement this two we can find packet losses.

#### 3. Media Converter & Tj Box:



**Fig.:1**



**Fig.:2**

In Fig.:1 TJ box or Fiber joining box, which is must to convert Optical fiber cable to RC,LC,SC cable & then for release as UTP an cable.

### Correspondence:

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Assistant Maintenance  
Engineer, Department Of ICT,  
National University, Gazipur-  
1704, Bangladesh

In Fig.:2 Media converter without SFP module where LC cable can be connected to the converter which comes from TJ box & an UTP cable will be released as the end of the channel for connecting it to the Switch port.



Fig.:3

In Fig.:3 Media converter with SFP module where RC,LC,SC cable from TJ box is connected to the SFP module & an UTP cable will be out as the end of the channel for connecting it to the Switch port.



Fig.:4



Fig.:5



Fig.:6

In Fig.:4, 5, 6 show serially RC,LC,SC cable (Length of this type of cable is too short), which are used to convert Optical fiber cable usable by media converter or Switch.

Now we look at the Scenario:

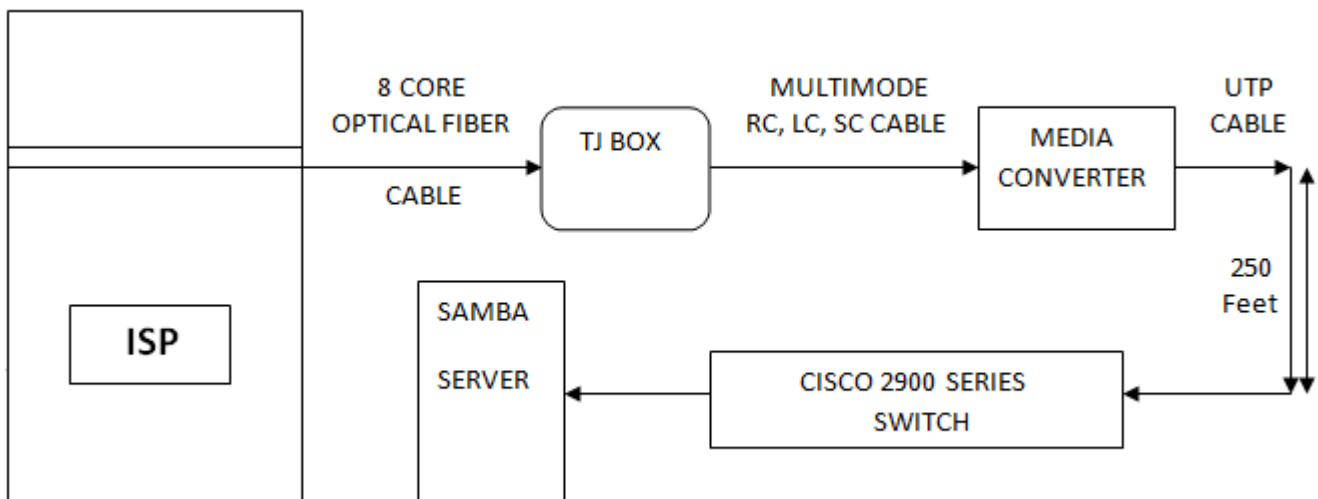


Fig.:7

There are two observations of this Fig.:7. In the position of media converter (If we ignore any other reasons of packet losses), 1<sup>st</sup> observation is: It will be without SFP module, 2<sup>nd</sup> observation is: It will be with SFP module. But both these two types of Media converter (in both observations) will not play any role of reduction of Packet losses if the network shows loss of Packets for the purpose of long distance from ISP to Server. In Fig.:7, if we predict that from media converter to switch there is about 250 ft

distance & for this long distance if there will be Packet losses occurred and to reduce the losses of packets, a Repeater will be established in the middle of the length but this could be not remove all Packet losses that have been occurred for the long distance and the distance is built by UTP cable only.

Now we look at the Scenario:

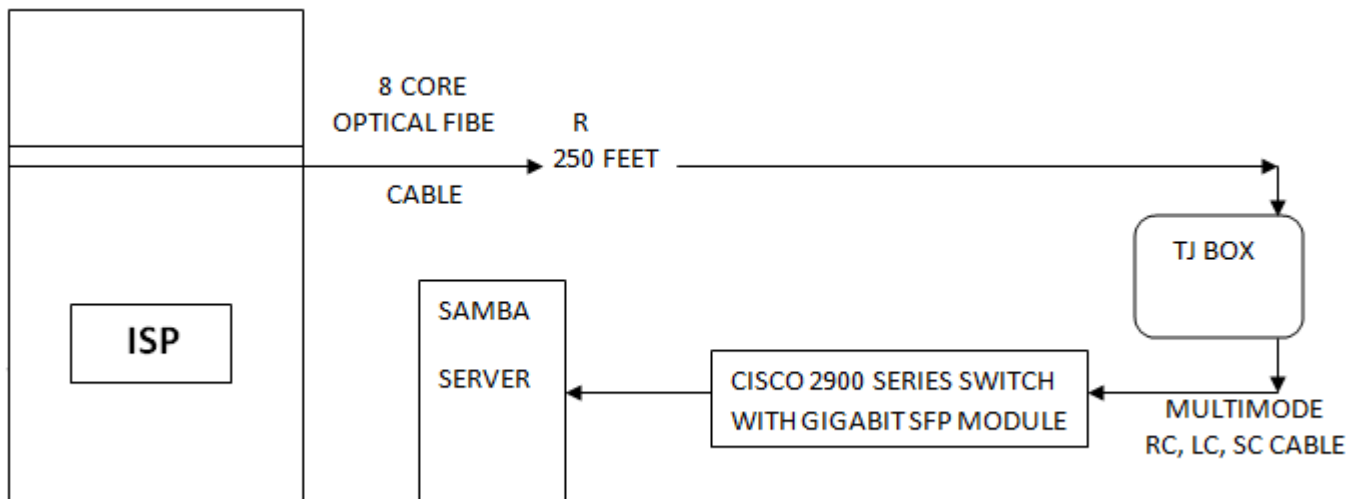


Fig.:8

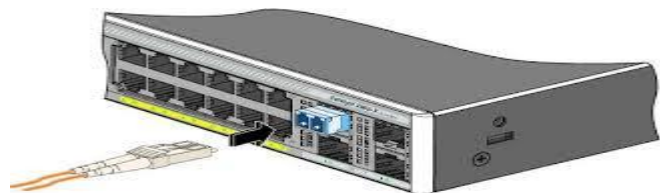


Fig.:9

In Fig.: 8, Media converter with or without SFP module is replaced with Cisco Switch with SFP module (Fig.:9) and 250 ft UTP cable is replaced with 250 ft Optical fiber.

#### 4. Decision: Case Study

By reducing of length of UTP Cable with Same length of Optical fiber cable, Packet loss can be reduced, no Repeater is needed and this can be possible by using SFP module with switch as an integrated device rather than use media converter with or without SFP module.

#### 5. Switch Port Capacity

In general Switch port bandwidth receive and delivery capacity is 10/100 MBPS. But the Question arises if we use

more than 100 MBPS Bandwidth, suppose 400 MBPS then how could we deliver it to Server for reduction of Packet when packet loss occur for Bandwidth problem and Many browser hit the server at a same time problem and the distance between Server and Switch is very long?

We have already introduced Gigabit SFP module which can pass bandwidth 1 GBPS or more and this could reduce packet loss up to ISP to switch. But from switch to server how could we manage the delivery of full Bandwidth (more than 100 MBPS) in a proper way to reduce the packet loss?



Fig.:10

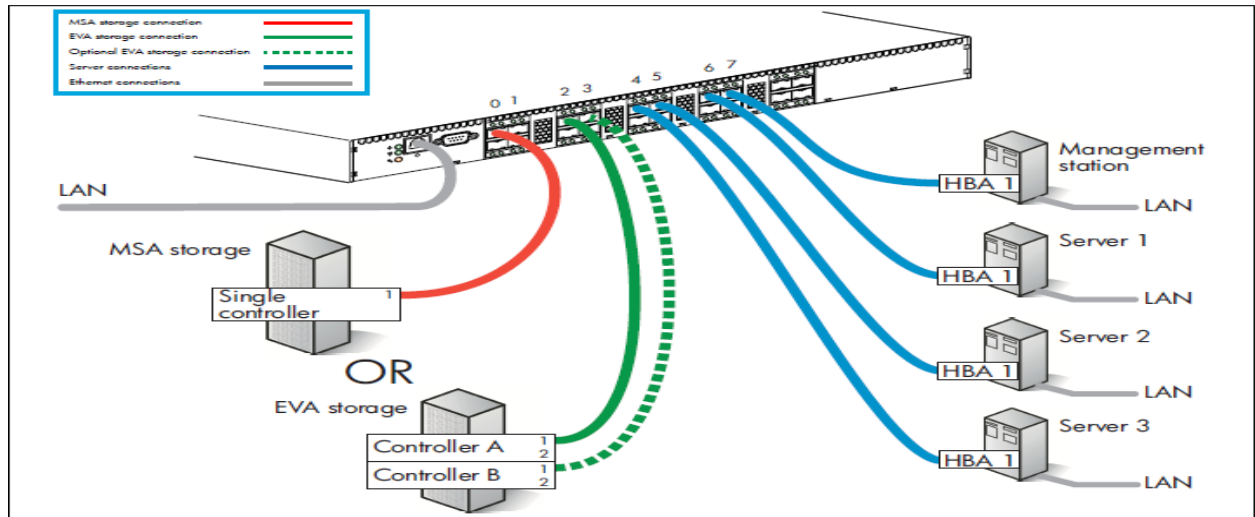


Fig.:11

Fig.: 10 shows HBA card. Now look at the Fig.:11, each server with HBA card is connected with SAN switch by optical fiber. If we ignore EVA storage, MSA storage and Lan in Figure:11 and connect the internet bandwidth to SAN Switch by replacing it in the position 2900 series switch with SFP module in Fig.:8 by SAN switch, then Bandwidth with more than 100MBPS/1GBPS can be passed through with the reduction of packet loss.

### 6. Decision: Case Study

By using SAN Switch and HBA Card in server we can pass through bandwidth more than 1GBPS and can use Optical fiber Cable instead of UTP Cable from switch to server.

### 7. Conclusion

100% Packet loss cannot be removed in some network. Ping and Jitter measurement varies from network to network. The time of sending and receiving Packet is depend not only on distance but also for Bandwidth and for the error connector also.

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