

## Internet Service Provider : Review paper

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**Abstract:** *This paper defines the usage and properties of an Internet service provider company. It shows the operational and functional aspects of any ISP. This paper focuses on what all study goes into making a basic internet service provider. It comprises of all the data and pre requisites that need to be fulfilled before forming an ISP. The sole motive is to define a simulation and provide a mock platform for the ISP.*

**Keywords:** *ISP, Network Design, Routing, Protocols, Security, Network Devices, Frame Relay, DHCP.*

### I. INTRODUCTION

An Internet Service Provider (ISP) is the term for the provider that is able to give you access to the Internet, generally from a computer. An ISP is your gateway to the Internet and everything else you can do online. As soon as your connection is activated, you'll be able to send emails, do e-commerce shopping, do research and more. The ISP is the link or conduit between your computer and all the other "servers" on the Internet. You may feel like you're talking to your friend directly through email, but in reality it's more "indirectly." [3] Your email goes from your computer, to the ISP computers/servers, where it's sent along to its destination through other servers on the network. Of course, that's its "electronic" path: the transmission is still virtually instantaneous. Every home or organization with Internet access has an ISP. The good news is, we don't all have to have the same provider to communicate with each other and we don't have to pay anything extra to communicate with someone who has a different ISP. [9]

Bulls Eye pvt ltd is an organization possessing an ISP that interconnects our different wings present at distant locations, not only with each other but the Internet at large. This paper aims to depict the networking aspect of the ISP involved in this process.

### II. OBJECTIVE

This paper contains the details of Departments of Bulls Eye pvt ltd (the dummy company in order to formulate the mock network) office spread in different buildings of the company. Various Routing protocols have been implemented in different branches of Bulls Eye pvt ltd and all the departments can communicate with other different departments through the Redistribution among different Routing Protocols. RIP, OSPF are the basic dynamic routing protocols that are being used heavily these days. One is a distance vector protocol, RIP.

Whereas OSPF is a link state protocol. RIP works on a routing metric of hops. We make use of all these protocols in order to fulfil our requirement. Routing Protocols EIGRP along with the Synchronous Number, Static Routing & its concepts including the Default Routing as well has been applied. The different Routing Protocols are running and which has been synchronized to work with Frame Relay Switching Technology. The Routing Protocols which have been implemented are Default Routing and RIP as well. The IP Parameters have been provided to the Access Layer devices through the DHCP servers enabled for Multiple VLANs. Each VLAN has been further configured through Frame Tagging which makes the Inter VLAN Routing Possible. [5] The Frame Relay Switching Technology has also been used so that the ISP connection can easily be established & maintained.

### III. PROJECT REQUIREMENTS

#### A. Hardware Requirements:

CPU Speed: 2GHz recommended or higher

Processor: Pentium Processor or above

Memory/RAM: 1GB minimum, 2GB recommended or higher

Display Properties: Greater than 256 color depth

Size of Hard Disk: 60 GB minimum

NIC Card

#### B. Software Requirements:

Software Used: Packet Tracer 5.3.2

Operating System: Microsoft Windows XP, Vista, 7 or higher.

#### Packet Tracer:

Packet Tracer is a Cisco router simulator that can be utilized in training and education, but also in research for simple computer network simulations. The tool is created by Cisco Systems and provided for free distribution to faculty, students, and alumni who are or have participated in the Cisco Networking Academy. [12] The purpose of Packet Tracer is to offer students and teachers a tool to learn the principles of networking as well as develop Cisco technology specific skills.

#### Features:

The current version of Packet Tracer supports an array of simulated Application Layer protocols, as well as

basic routing with RIP, OSPF, and EIGRP.[3] While Packet Tracer aims to provide a realistic simulation of functional networks, the application itself utilizes only a small number of features found within the actual hardware running a current Cisco IOS version. Thus, Packet Tracer is unsuitable for modeling production networks. With the introduction of version 5.3, several new features were added, including BGP.

#### IV. NETWORK MAP

Before building any particular network on the simulator or in reality it should firstly have a network map, which is the blue print of the network to be formed. [7] The following map is the base map based on which we have configured our network.

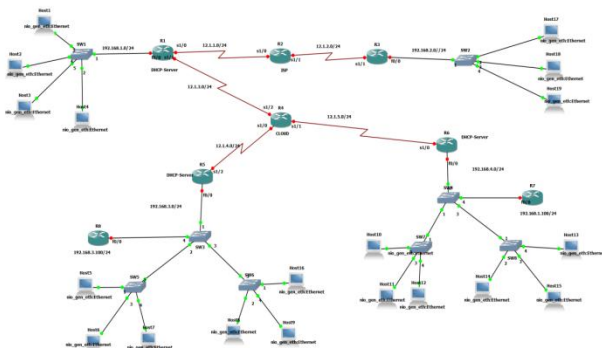


Fig. 1. Network Map

#### V. CONCEPTS AND METHODOLOGY USED

1. **ISP:** An Internet Service Provider (ISP) is the company that is able to provide you with access to the Internet, typically from a computer. If you hear someone talking about the Internet and they mention their "provider," they're usually talking about their ISP. An ISP is your gateway to the Internet and everything else you can do online.

2. **Routing:** It is the process of selecting a path for traffic in a network, or between or across multiple networks. Routing is performed for many types of networks, including circuit-switched networks, such as the public switched telephone network (PSTN), computer networks, such as the Internet, as well as in networks used in public and private transportation, such as the system of streets, roads, and highways in national infrastructure.[11]

3. **Routing protocols:** So-called routing protocols are the family of network protocols that enable computer routers to communicate with each other and in turn to intelligently forward traffic between their respective networks. [8] We are using various routing protocols, mainly RIP, OSPF and EIGRP.

4. The following chart depicts the comparison between all these protocols along with IGRP (pre-EIGRP)

Table 1. Routing protocol Comparison

	RIP v1	RIP v2	IGRP	EIGRP
<i>Interior/Exterior?</i>	Interior	Interior	Interior	Interior
<i>Type</i>	Distance Vector	Distance Vector	Distance Vector	Hybrid
<i>Default Metric</i>	Hopcount	Hopcount	Bandwidth/Delay	Bandwidth/Delay
<i>Administrative Distance</i>	120	120	100	90 (internal) 170 (external)
<i>Hopcount Limit</i>	15	15	255 (100 default)	224 (100 default)
<i>Convergence</i>	Slow	Slow	Slow	Very Fast
<i>Update timers</i>	30 seconds	30 seconds	90 seconds	Only when change occurs
<i>Updates</i>	Full table	Full table	Full table	Only Changes
<i>Classless</i>	No	Yes	No	Yes
<i>Supports VLSM</i>	No	Yes	No	Yes
<i>Algorithm</i>	Bellman-Ford	Bellman-Ford	Bellman-Ford	DUAL
<i>Update Address</i>	Broadcast	224.0.0.9	224.0.0.10	224.0.0.10
<i>Protocol and Port</i>	UDP port 520		IP Protocol 9	IP Protocol 88

Based on this comparison we choose the appropriate protocol for the apt network connection. Depending upon the security requirements and other aspects the suitable protocol is chosen.

#### VI. FUTURE SCOPE

The scope for improvement in any project is inevitable. The future prospects of our project can be better if a few more points are considered and implemented successfully. These points are listed below:

- The network range can be expanded.
- More data centers can be assigned.
- Security can be enhanced by using advanced security management techniques like firewall.
- More no. of clouds can be brought in.
- Flexibility according to contemporary needs can be enhanced.

#### VII. CONCLUSION

The overall outcomes of all the study performed on the network aspects of the dummy ISP which is to be formed. The study formulates the blue print of the network to be formed in future. Even after the successful completion, all the future scopes are in the process of being implemented according to its feasibility on both time and cost aspects. Hopefully in future this could well become into a real ISP company's simulator network and used widely for troubleshooting even. If continuous improvements in all these algorithms occur in the right direction circumstances would definitely be secure in the future.

We hence conclude by thanking our teachers for helping and guiding us through in creating this project, we are grateful for their kind lessons and guidance.

#### VIII. REFERENCES

[1] Sarita Kumari, Research scholar. "A research Paper on Cryptography Encryption and Compression Techniques". International Journal Of Engineering And Computer Science ISSN:2319-7242 Volume 6 Issue 4 April 2017,

Page No. 20915-20919 Index Copernicus value (2015): 58.10 DOI: 10.18535/ijecs/v6i4.20 .

Level Images”, Proceedings of the 11th International Conference on Parallel and Distributed Systems (ICPADS'05), 2005.

- [2] Prashant B Swadas, Samip Patel, Dhruvi Darji, A Comparatively Study On Visual Cryptography, International Journal of Research in Engineering and Technology, eISSN: 2319-1163 | pISSN: 2321-7308
- [3] Swarnalata Bollavarapu and Ruchita Sharma, Data Security using Compression and Cryptography Techniques.
- [4] Manoj Patil, Prof. Vinay Sahu, A Survey of Compression and Encryption Techniques for SMS.
- [5] Bobby Jasuja and Abhishek Pandya, Crypto-Compression System: An Integrated Approach using Stream Cipher Cryptography and Entropy Encoding.
- [6] MoniNaor and Adi Shamir, “Visual Cryptography”, advances in cryptology, Euro crypt, pp 1-12, 1995.
- [7] J. B. Feng, H. C. Wu, C. S. Tsai, Y. F. Chang, and Y. P. Chu. “Visualecret sharing for multiple secrets” Pattern Recognition, 41:3572 {3581, 2008.
- [8] O. Kafri and E. Keren. “Image encryption by multiple random grids” Optics Letters, 12(6):377{379, 1987.
- [9] Young-Chang Hou and Zen-Yu Quan “Progressive Visual Cryptography with Unexpanded Shares” IEEE TRANSACTIONS ON CIRCUITS AND SYSTEMS FOR VIDEO TECHNOLOGY, VOL. 21, NO. 11, NOVEMBER 2011
- [10] Wang, R.Z.[Ran-Zan], “Region Incrementing Visual Cryptography”, SP Letters (16), No. 8, August 2009, pp. 659662.
- [11] Ran-Zan Wang and Shuo-Fang Hsu,” Tagged Visual Cryptography:, IEEE Signal Processing Letters, Vol. 18, No. 11, November 2011 627
- [12] Z. M. Wang, G. R. Arce, and G. Di Crescenzo, “Halftone visual cryptography via error diffusion,” IEEE Trans. Inf. Forensics Security, vol. 4 pp 383–396, Sep.
- [13] S. J. Shyu, “Image encryption by random grids,” Patt. Recognitions, vol. 40, no. 3, pp. 1014– 1031, 2007
- [14] Xiao-qing Tan, “Two Kinds of Ideal Contrast Visual Cryptography Schemes”, International Conference on Signal Processing Systems, pp. 450-453, 2009.
- [15] Chin-Chen Chang, Jun-Chou Chuang, Pei-Yu Lin, “Sharing A Secret Two-Tone Image in Two Gray