SHRI SHANKARACHARYA
TECHNICAL CAMPUS

Managed by Shri Gangajali Education Society, Bhilai
Approved by AICTE and Affiliated to CSVTU, Bhilai
An ISO 9001:2008 Certified Institution

PROJECT REPORT ON SSTC SERVER SYSTEM

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Section B

Routers:

A **router** is a networking that forwards data packets between computer networks Routers perform the "traffic directing" functions on the Internet. A data packet is typically forwarded from one router to another through the networks that constitute the internetwork until it reaches its destination node.

Stateful Firewall:

SPI (Stateful Packet Inspection), also known as a "Stateful Firewall", would be the next step up in router security. This is something you now see on virtually every consumer and mid-range router these days, giving you a bit more protection than basic NAT itself. SPI.

Hardware Firewall:

A **hardware firewall**, on the other hand, is a physical box that sits between your network and the Internet. So the "bad" traffic it filters never even touches the reaches the network, let alone the actual computers. There is also no software to slow down your computer, giving you better system performance

A hardware firewall also won't interfere with LAN traffic.
Its only concern is with the traffic passing through it.
Depending on the firewall, however, you could possibly see
a reduction in Internet throughput.

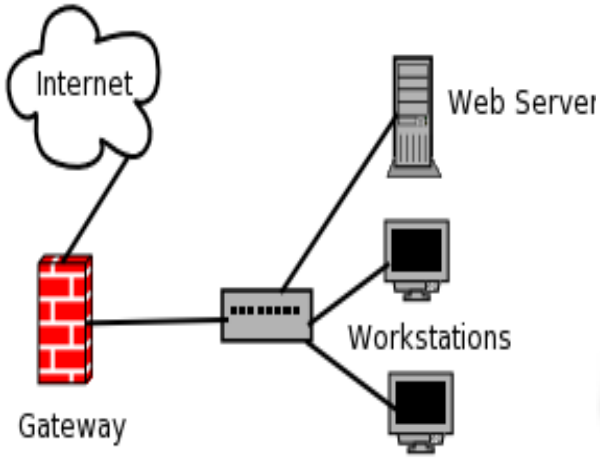
Firewall+router:

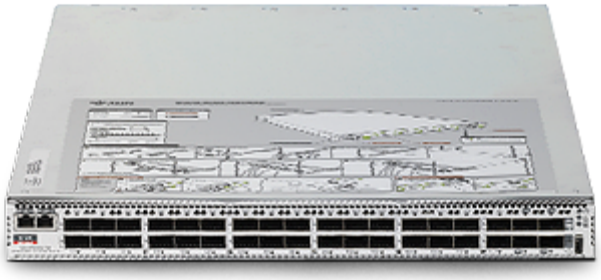
Quarti.net is a server maintained by 4 different servers. The Quartinet manufactures firewalls with inbuilt routing facility. Placed along with network management switch in our college. Network management have function to manage transmission of packets. This is placed in rack along with other components.

Gateways:

A network node equipped for interfacing with another network that uses different communication protocols. Gateways also called protocol converters, can operate at any network layer.

A network gateway can be implemented completely in software, completely in hardware, or as a combination of both. Depending on the types of they support, network gateways can operate at any level of the OSI model.





Types of Gateways:

1. IBM Host Gateways:

   Allows workstations attached to LANs to connect with IBM mainframe systems.

2. LAN Gateways:

   LAN Gateways are used when joining networks that use different protocols, such as when a backbone network provides an interconnection for all the networks attached to it.

3. Proxy service:

   With a proxy service, the packet generated by an internal user never goes out over the internet. Instead, the proxy service read the packet and creates its own to send out over the network.

4. Firewall:

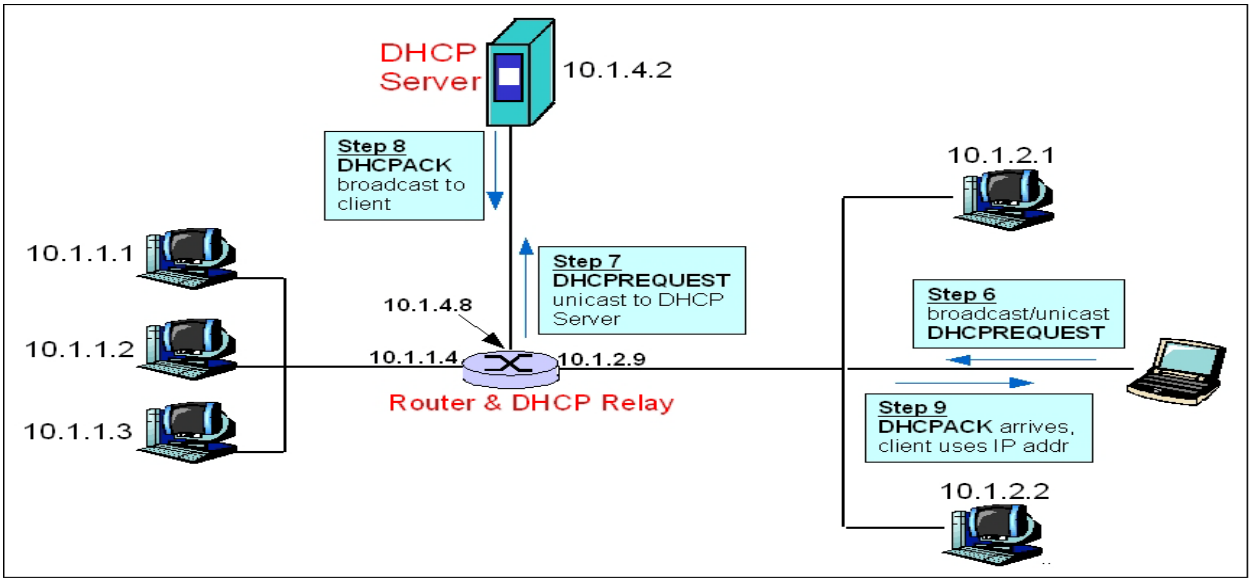
   A firewall is a device that allows internal network users to access the internet while blocking internet users form accessing the internal network. A full-featured firewall provides advances screening, authentication , and proxy services to keep hackers and attackers from reaching vulnerable internal systems.

DHCP Protocol:

DHCP (Dynamic Host Configuration Protocol) is a communications protocol that network administrators use to centrally manage and automate the network configuration of devices attaching to an Internet Protocol (IP) network.

DHCP allows devices needing an IP address to request one when they are starting up, for example, rather than an address pre assigned and manually configured on each device. With DHCP, if a device is moved from place to place, it will be assigned a new address in each location.

Without DHCP, network administrators must not only manually configure each device with a valid IP address, but also reconfigure the device with a new IP address if it moves to a



new location on the network. DHCP exists for both IPv4 and IPv6 (Internet Protocol version 6).

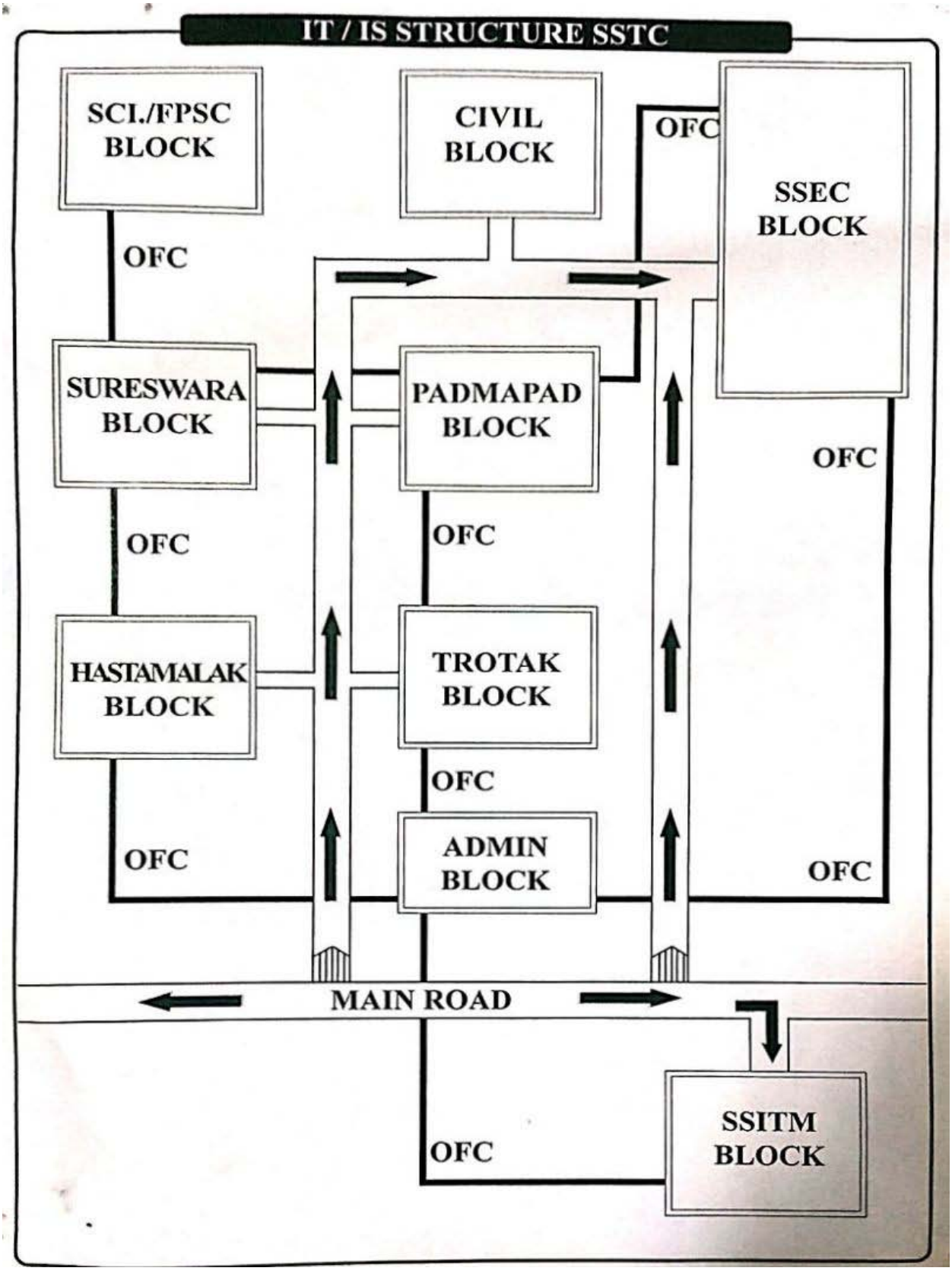
Devices reach out to the local network to discover any available DHCP server and request network configuration information. Servers manage pools of valid addresses and assign addresses out of those pools. DHCP uses the concept of leasing the amount of time a given IP address will be valid for a device.

The lease time can vary depending on how long a user is likely to require the Internet connection at a particular location. Devices release addresses when their leases expire and request a renewal from the DHCP server if they are staying online.

The DHCP server may assign them a new address rather than renewing an old one. The protocol also supports static addresses for computers like Web servers that need a permanent IP address.

Our Campus Structure.

Our campus structure consists of a main block called Admin block. In Admin block the central



server is placed. All the blocks were connected with OFC cables following ring topology to ensure that if any building get disconnected to one channel may use other route for transmission.

This OFC cables lead to the distribution switches of each block. Distribution switches are also used as core switch which are managed switches, most of the ports are configured or truncated. Their policies are being defined .

Other type switches are unmanaged switches which are used as network LANs or system connectivity. Most of our college labs used unmanaged switches for connecting different ports.

Switches which are used in college 8-port, 24-port , 32-port and 64-port. Practically we can implement switches as a Gateway. Most of the switches are CISCO managed switches.

Total 4 gateways are in our college one for each block.

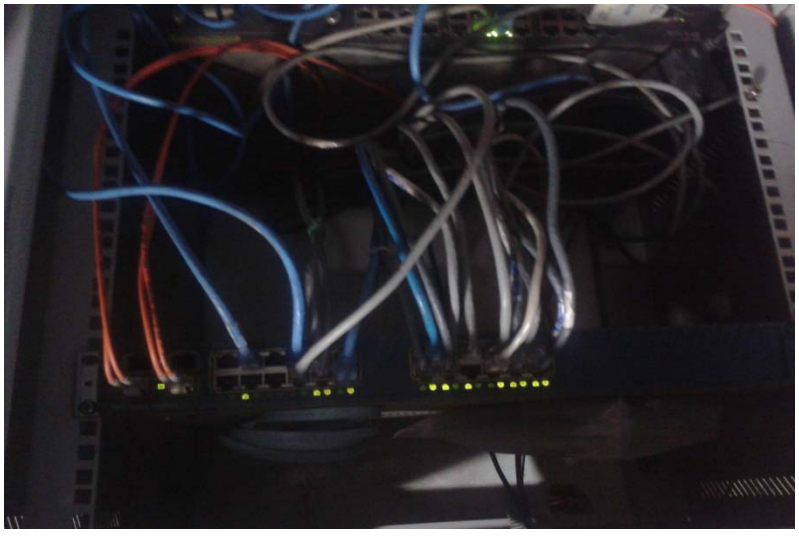
CISCO switches are smart and managed can help secure network from the inside out . for example,

CISCO 300 Small Business Series Managed Switches support IEEE 802.1x port security for tightly controlling access to by requiring authentication.

300 series also offers security mechanisms that protect your network from invalid configurations or malicious intent as well as ensuring that a switch will continue to process management traffic.

Gateway:

Desinged to provide infinband and Ethernet services for application clusters comprised of CISCO servers and storage systems. The CISCO Network Gateway switches carries all data, storage, and communication traffic over a converged I/O infrastructure.



Topology:

In our college star with topology is implement practically. Each machine in our lab is connected with each other in star topology and each lab is connected with each other in tree topology.

Working:

All buildings are marked on VLANs. This bifurcates the traffic and helps for request identification.

The transmission between Gateway and network management switch is in 100Gb of speed. For quick transmission.

Protocol:

The protocol is being used in our college is Dynamic Host Configuration Protocol(DHCP). Since, the IPs provided by ISPs is single static global IP. This ip is Open For All i.e 0.0.0.0. this means any user other than dedicated path may use this IP. To eliminate this we can use router and firewalls to make them local to us.

The IP Block assigned for out college is from 192. 168.0.0 to 192. 168. By applying subnetting to this IP block we give IP Addresses for each machine.

Since our network is infrastructure based network, we have divided the blocks named them differently.

Sureshwara Block is the oldest building hence provided the IP Address form 192.168.0.0 to 192.168.7.255.

Padmapad Block from 192.168.8.0 to 192.168.15.255. Hastamalak Block from 192.168.16.0 to 192.168.23.. 255Trotak Block from 192.168.24.0 to 192.168.31.255

Since, Approx 3500 systems and 825 switches in our college and other machines this range is sufficient for fluent working of the internet in our campus.

192.168.0.1, and which is first ip and similar ip are used as IP of default gateway which is a distribution switch.

192.168.0.255 and similar is also for gateway.

Since, IPs range is defined for each block, provided with one gateway to each. As we implemented DHCP when a user starts the computer and switch to internet, this information is send to distribution switch or gateway which have the responsibility to send the message to the core switch (central switch), which releases the IP for this particular machine.