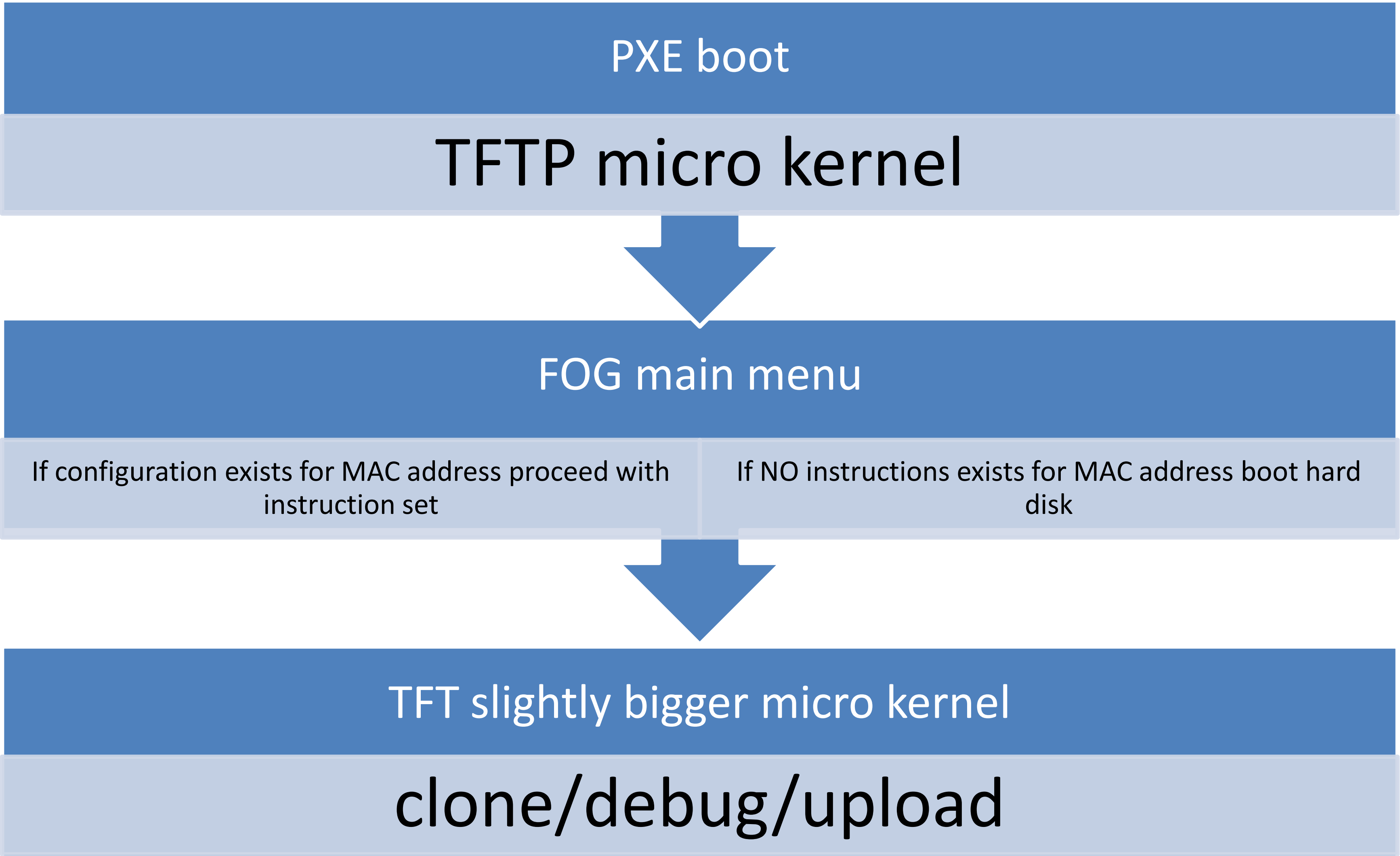
# FOG

“without the source you don’t have shit” – ESJ on open source technology

# fog



PXE boot

TFTP micro kernel

FOG main menu

If configuration exists for MAC address proceed with instruction set

If NO instructions exists for MAC address boot hard disk

TFT slightly bigger micro kernel

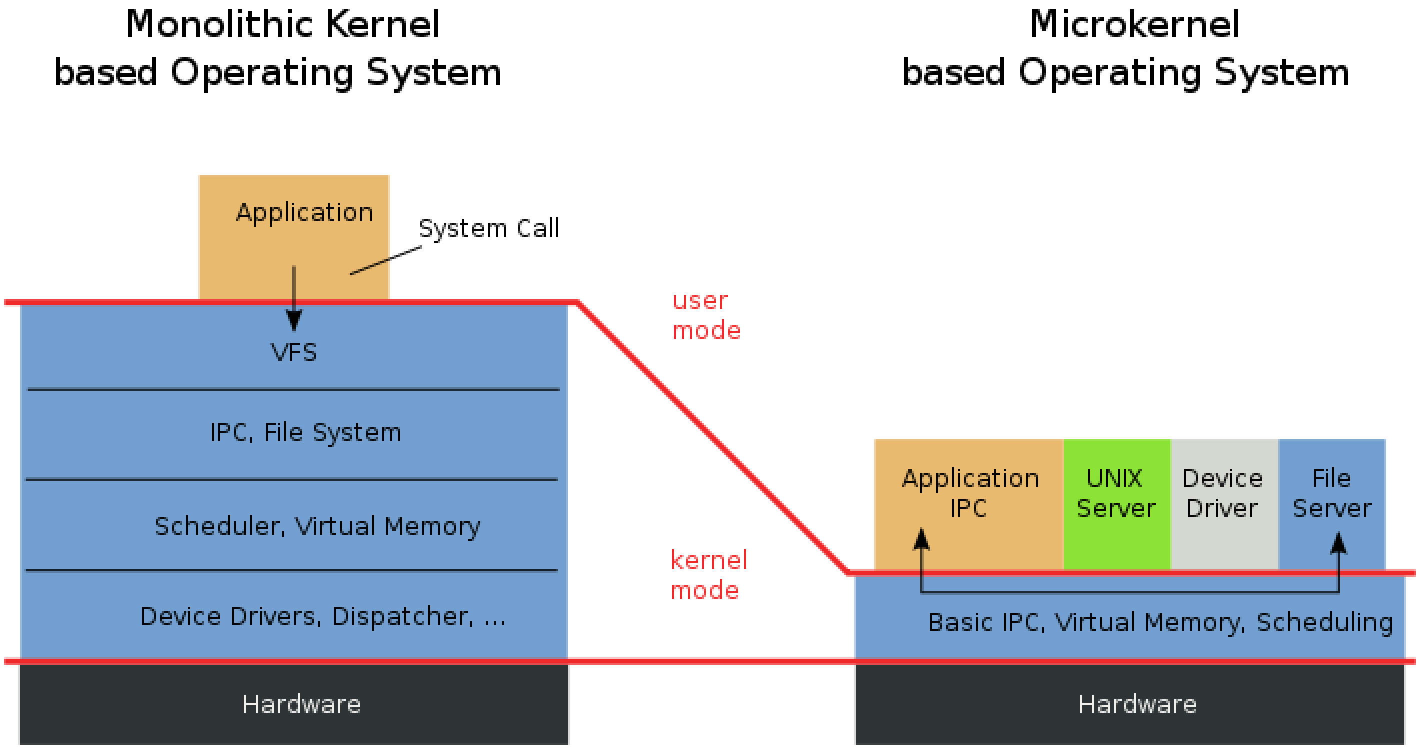
clone/debug/upload

# PXE

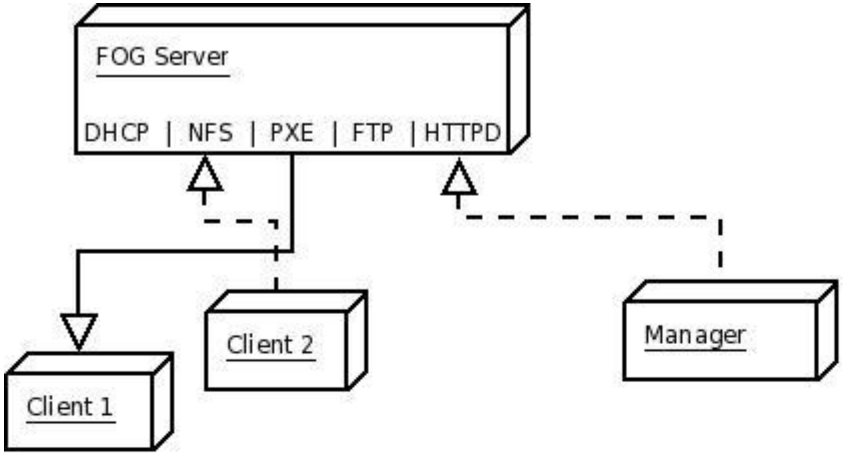
- The **Preboot eXecution Environment** (**PXE**, also known as 'pixie') is an environment to boot computers using a network interface independently of available data storage devices (like hard disks) or installed operating systems.

- The firmware on the client tries to locate a PXE redirection service on the network (Proxy DHCP) in order to receive information about available PXE boot servers. After parsing the answer, the firmware will ask an appropriate boot server for the file path of a network bootstrap program (NBP), download it into the computer's Random Access Memory (RAM) using TFTP, possibly verify it, and finally execute it. If only one NBP is used among all PXE clients it could be specified using BOOTP without any need of a proxy DHCP, but a TFTP boot server is still required

# micro kernel



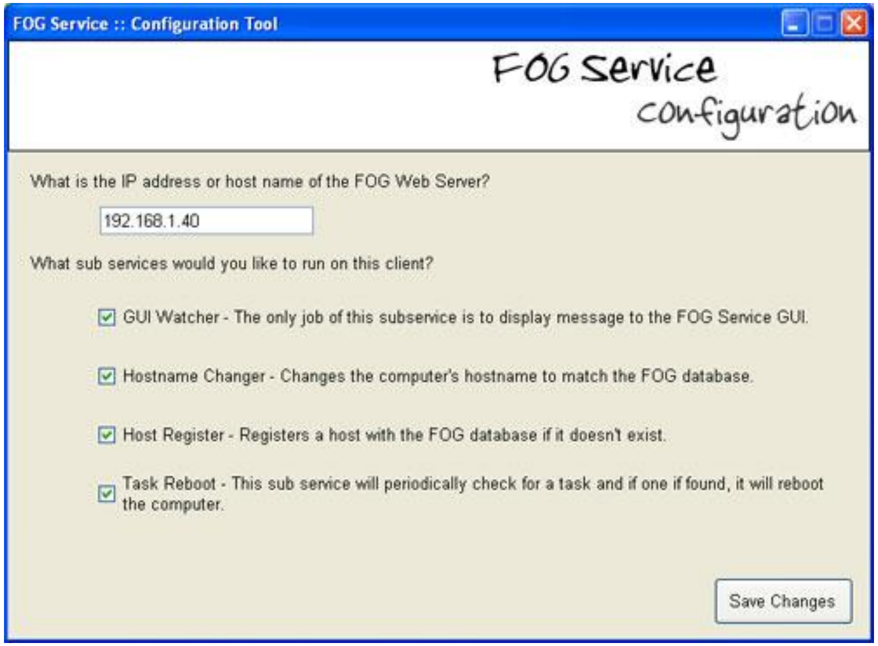
# fog components



- •HTTPD for management (php/mysql backend)
- •NFS for downloading/uploading images
- •DHCP and PXE for booting micro kernel
- •FTP and TFTP for copying micro kernels and instructions

# fog service for clients

- Auto Log Off
- Hostname Changes
- Active Directory Integration
- Directory Cleaner
- Display Manager
- Green FOG
- Host registration Task Restarting
- Snapin Installation
- User Tracker
- Printer Manager
- User Cleanup
- Client Updater User Tracker



What is the IP address or host name of the FOG Web Server?

192.168.1.40

What sub services would you like to run on this client?

☑ GUI Watcher - The only job of this subservice is to display message to the FOG Service GUI.

☑ Hostname Changer - Changes the computer's hostname to match the FOG database.

☑ Host Register - Registers a host with the FOG database if it doesn't exist.

☑ Task Reboot - This sub service will periodically check for a task and if one if found, it will reboot the computer.

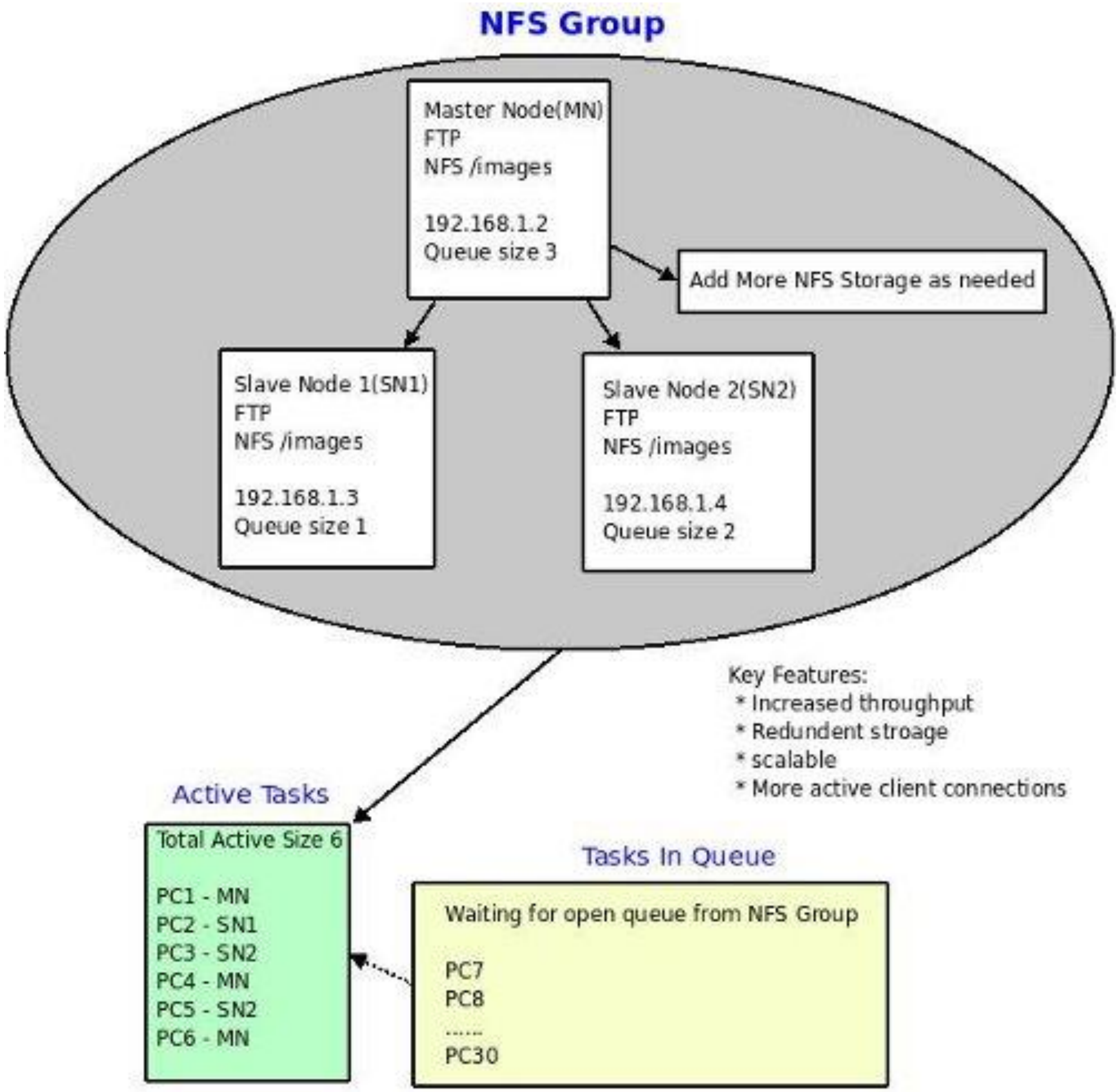
# How it works

- A computer is registered either using the pxe boot menu or the web interface
- Information about that computer is saved in a database
- A task is assigned to that computer via web interface such as, upload/download image or debug
- A configuration file for the MAC address is put into a directory where the PXE boot image loads the parameters for the assigned task
- The computer is booted, linux micro kernel is loaded where a bash script does some neat stuff, including bringing up the NFS mount for image storage
- In case of an image upload gzip/tar compress and create an image file which is uploaded and displayed using a fancy shell script
- In case of mass distributing an image, shell script gzip/tar uncompress' the image and distributes it using udp-sender/reciver a multicasting application.

# benefits

- Scalable
- Open source
- Easy to maintain and backup
- Runs on relatively crappy hardware

# Single NFS groups



NFS Group

Master Node(MN)
FTP
NFS /images

192.168.1.2
Queue size 3

Add More NFS Storage as needed

Slave Node 1(SN1)
FTP
NFS /images

192.168.1.3
Queue size 1

Slave Node 2(SN2)
FTP
NFS /images

192.168.1.4
Queue size 2

Key Features:
- * Increased throughput
- * Redundent stroage
- * scalable
- * More active client connections

Active Tasks

Total Active Size 6

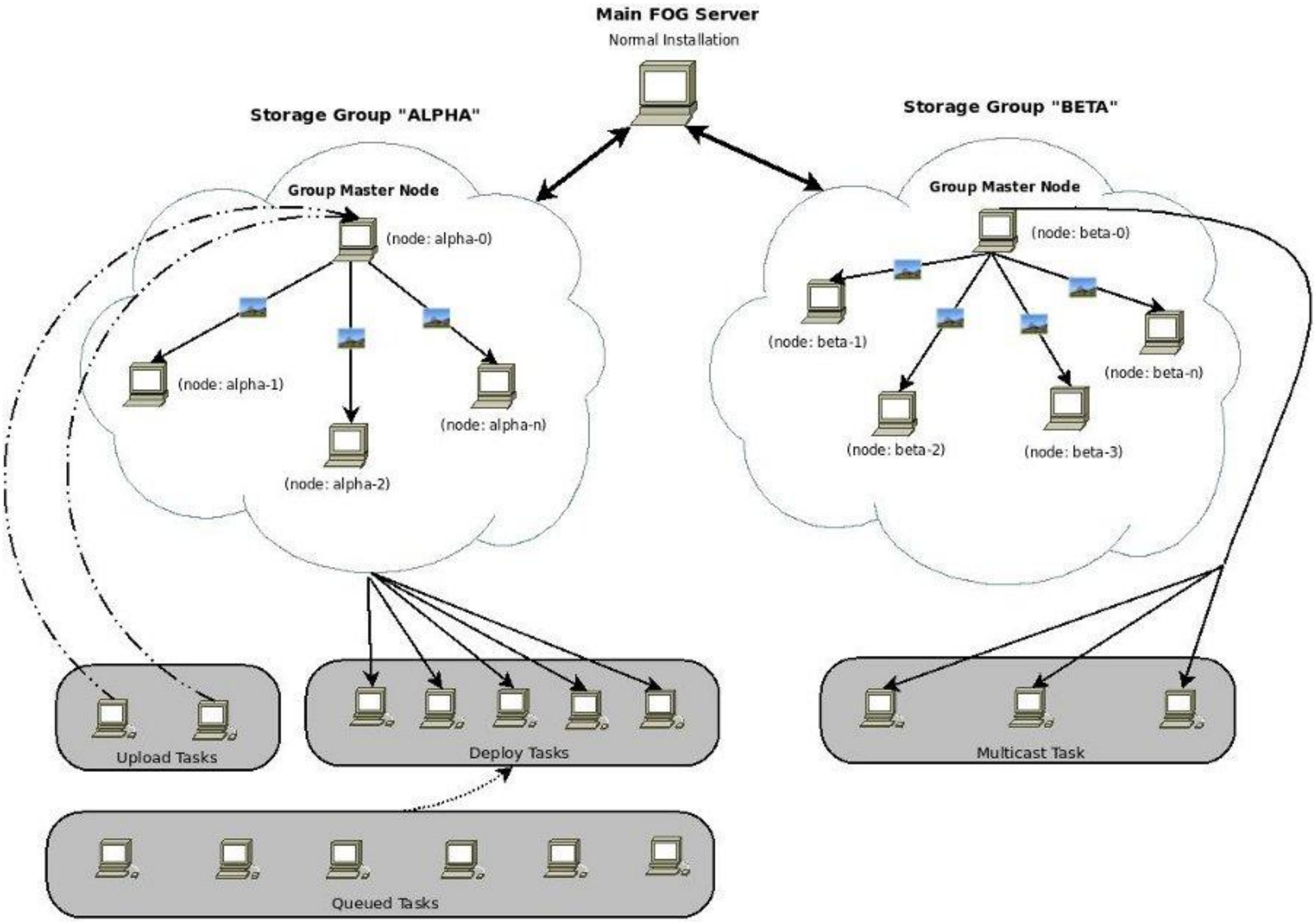
PC1 - MN
PC2 - SN1
PC3 - SN2
PC4 - MN
PC5 - SN2
PC6 - MN

Tasks In Queue

Waiting for open queue from NFS Group

PC7
PC8
......
PC30

# multi storage node array



# multicasting

- IP multicast is a technique for one-to-many communication over an IP infrastructure. It scales to a larger receiver population by not requiring prior knowledge of who or how many receivers there are. Multicast uses network infrastructure efficiently by requiring the source to send a packet only once, even if it needs to be delivered to a large number of receivers. The nodes in the network take care of replicating the packet to reach multiple receivers only when necessary. The most common low-level protocol to use multicast addressing is User Datagram Protocol (UDP).

Detailed information available at :

http://www.cisco.com/en/US/docs/internetworking/technology/handbook/IP-Multi.html

# END