

WEBSITE

4.1 WHAT IS THE WORLD WIDE WEB?

- The World Wide Web (WWW) is most often called **the Web**.
- The Web is a network of computers **all over the world**.
- All the computers in the Web can **communicate with each other**.
- All the computers use a **communication standard called HTTP**.

4.2 HOW DOES THE WWW WORK?

- Web information is stored in documents called Web pages.
- Collection of such web pages is called Website
- Web pages are files stored on computers called Web servers.
- Computers reading the Web pages are called Web clients.
- Web clients view the pages with a program called a Web Browser
- Popular browsers are Internet Explorer and Netscape Navigator

4.3 WHAT IS A WEBSITE?

A site (location) on the World Wide Web is called a website. Each Website contains a home page, which is the first document users see when they enter the site. The site might also contain additional documents and files. Each site is owned and managed by an individual, company or organization. We can define a Web site more technically as a uniquely-addressable Internet destination supporting HTTP (the HyperText Transfer Protocol) whose purpose is to provide content and functionality supplied by the entity that maintains the site, within the bounds of the security restrictions defined by that entity for the site. With this definition in mind, we can assert that anyone who wants to create and maintain a Web site must answer three questions:

- How will visitors get to my site?
- Who will be allowed to visit my site?
- What will visitors see and do when they get there?

A website is designed to cater these questions

4.4 HOW TO DESIGN A WEBSITE?

Designing anything takes thought and planning to be successful. Websites provide an even greater challenge with their dynamic combination of application programming and graphic interface design. Designing Web sites needs careful thinking and a lot of planning. The most important thing is to KNOW YOUR AUDIENCE. The two basic skills needed to begin designing personal or business websites are function and beauty.

There are two types of websites – **Static and Dynamic**

A Website that is **static** can only supply information that is written into the HTML and this information will not change unless the change is written into the source code. When a Web browser requests the specific static Web page, a server returns the page to the browser and the user only gets whatever information is contained in the HTML code.

In contrast, a **dynamic** Web page contains content that a user can interact with, such as information that is tied to a database. The user can request the information, such as ticket availability or airline flight data, to be retrieved from a database. Static Website is developed using Hyper Text Markup Language (HTML). Nowadays several softwares are also available for designing a website. For example Microsofts Frontpage, Macromedia Dreamweaver etc.

For Dynamic websites various scripting languages like Perl, PHP, JSP etc. are used.

4.5 WHAT IS A WEB SERVER?

To share online content it is placed on a web server. This web server caters to the request made by the client's web browser. Web server listens at Port 80. Every computer on the Internet that contains a Web site must have a Web server program.

4.6 HOW DOES IT WORK?

At the most basic level possible, the following diagram shows the steps that brought that page to your screen:

Your browser forms a connection to a Web server, requested a page and receives it. If you want to get into a bit more detail, here are the basic steps that occurred behind the scenes:

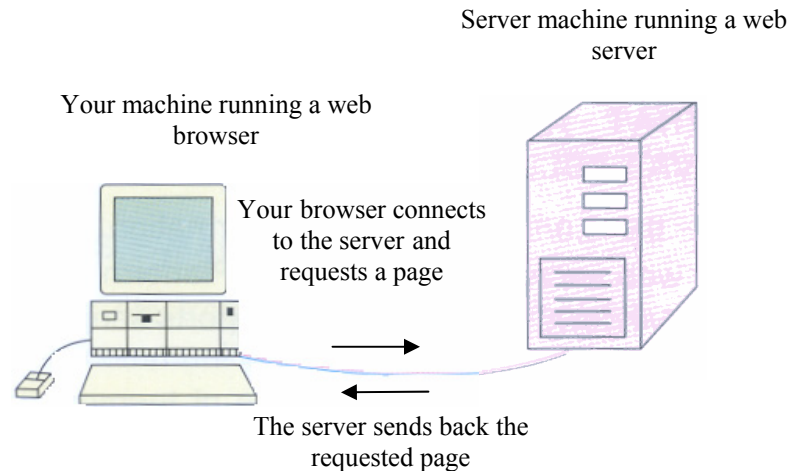


Fig. 1

The browser splits the URL (Universal Resource Locator) into three parts:

- The protocol (“http”)
- The server name (“www.abc.ernet.in”)
- The file name (“index.htm”)
- The browser then forms a connection to the server at that IP address on port 80.
- Following the HTTP protocol, the browser sends a GET request to the server, asking for the file *http://www.eis.ernet.in/index.htm*.
- The server then sends the HTML text for the Web page to the browser.
- The browser reads the HTML tags and formats the page on the client computer.

4.7 WHAT ARE THE VARIOUS WEB-SERVER AVAILABLE FOR VARIOUS PLATFORMS?

- **IIS 4.0/IIS 5.0** (Internet Information Server) This web server runs on Windows Platform (Win NT 4.0/ Windows 2000 Server). It supports scripts like ASP, Perl, JSP.
- **Iplanet or Netscape Enterprise Server:** This is a web server which runs on Unix/Linux/Windows. It does not support ASP pages.
- **Apache Web server** runs on Unix/Linux platform. It is a General Purpose Licence (GPL) software. It supports scripts like Perl, PHP, JSP.

MAIL SERVER

5.1 WHAT IS E-MAIL?

E-mail is an electronic format of mail, through which a person can communicate with another person by sending text & attachment in electronic format. It has become an extremely popular communication tool. All that we need is an e-mail server for the client to connect to.

5.2 WHAT ARE THE COMPONENTS OF MAIL SYSTEM?

➤ MTA (Mail Transfer Agent)

A mail transfer agent (MTA) is a program responsible for receiving, routing, and delivering e-mail messages. MT As receive e-mail messages and recipient addresses from local users and remote hosts, perform alias creation and forwarding functions, and deliver the messages to their destinations. An MTA is sometimes called a mail transport agent, a mail router, an Internet mailer, or a mail server program. Commonly used MTAs include sendmail, qmail, and MS Exchange Server.

➤ MDA (Mail delivery Agent)

The Mail Delivery Agent (MDA) receives the messages from the Mail Transport Agent (Sendmail, Qmail, etc) and saves it into the user mailbox verifying that the disk quotas are not exceeded and also performing additional tasks action such as processing the message rules, sending notifications and forwarding the e-mails.

MDA is usually integrated with the MTA.

➤ MUA (Mail User Agent)

The program that allows the user to compose and read electronic mail messages. The MUA provides the interface between the user and the Message Transfer Agent. Outgoing mail is eventually handed over to an MTA for delivery while the incoming messages are picked up from where the MTA left it (although MUA's running on single-user machines may pick up mail using POP).

MTA (Mail Transfer Agent) available for various Platforms

➤ Send Mail (Linux /unix)

- Lotus Notes (Linux /unix/Windows)
- MS Exchange (Windows)
- NMS- Netscape Messaging Server (Unix/Windows)

MUA (Mail User Agent) available at various platform

- MS Outlook (Windows client uses POP3 & SMTP)
- Pegasus (Windows client uses POP & SMTP)
- Mozilla Mail (Linux client uses POP3, IMAP4 & SMTP)
- EDURA (Windows)

5.3 Configuring Send mail on Linux

Assumptions:

- Latest Redhat Linux Installed and patched up with the relevant patches
- FQDN (Fully Qualified Domain Name) configured.
- Correct IP and subnet mask configured.
- Basic network connectivity like PING should be verified before proceeding to later steps.

Software Package for configuration:

- Sendmail-8.12.9.x
- Squirrelmail (if webmail is required)
- Imap (if POP3 or IMAP4 is required)
- Pine (to provide users basic telnet based MUA)

Process to Configure

- Install the relevant RPM packages using the **rpm** command. e.g. **# rpm -ivh <packagename>**
One needs root privileges to do this.
- Verify if packages have been installed properly using the **rpm** command.
e.g. **# rpm -q <packagename>**
- To accept mails for the domains **ABC.ERNET.IN & XYZ.ERNET.IN.**, open the file **/etc/mail/access** and make the following entries.

```

ABC.ERNET.IN      RELAY
XYZ.ERNET.IN      RELAY
Localhost         RELAY
127.0.0.1         RELAY

```

my.public.ip.mc RELAY

- To reflect the changes execute the following command:
makemap hash access < access
This creates a file called access.db

Note: Create appropriate system accounts so as to allow email delivery to users

How do I start Sendmail?

- To start or stop service use the following commands.
- # service sendmail start (to start the service).
- # service sendmail stop (to stop the service).
- # service sendmail restart (to restart the service).
- # service sendmail status (to see the status of the service).

How do I see the mail queue?

#mailq

This command displays the mail queue. The physical location of mail queue is */var/spool/mqueue*, this directory may be looked into in case of problems.

How do I see the email statistics?

#Mailstats

This command displays the email statistics, the incoming and outgoing email counts and the total number of bytes transferred etc.

How do I verify if sendmail is working?

telnet localhost 25

This displays a greeting message like this 220 hostname.domainname.com
ESMTP

This verifies that sendmail is up and ready to accept connections.

Where do I see the logs?

/var/log/maillog

Create appropriate system accounts so as to allow email delivery to users.
Email delivery should now start delivering to the user mail accounts.

PROCEDURE OF ERNET INDIA FOR WEB HOSTING FOR UGC INFONET

There will be two categories of UGC-Info net Universities

I. Universities already having their Website

ERNET will Mirror the website for universities already having their website. Mirroring of website means replica of an already existing site, used to reduce network traffic (hits on a server) or improve the availability of the original site. Mirror sites are useful when the original site generates too much traffic for a single server to support. Mirror sites also increases the speed with which files or Web sites can be accessed. Users can download files more quickly from a server that is topologically closer to them. For example, if a busy Mumbai Web site sets up a mirror site in Delhi, users in North India can access the mirror site faster than the original site in Mumbai. As ERNET will Mirror websites of different Universities, it becomes technically unfeasible to mirror databases too. Besides this University needs to point their URL to ERNET Server in their DNS.

Also if the University is using Firewall/router for security in their network, they need to open port 873 for ERNET's webserver on which mirroring will be done. The IP of the machine will be informed to the Universities once the process is started technically.

For Mirroring a utility called Rsync is used. Rsync is a program that is intended for synchronizing files between two locations. It's strength lies in detecting, which files have been changed, and only sending the parts of the files that have changed. This makes it especially suited for transferring files over the internet, particularly if you are on a slow connection. Additionally, rsync knows how to preserve time stamps, file permissions, and symbolic links. Rsync runs as a Daemon on a machine, which acts as a server i.e, from which files are pulled (Machine/ server at University End) and as a client on another machine, which pulls the files (ERNET machine/Server).

Procedure for mirroring on Linux and Windows Platform, Configuring Apache Web server on Linux and IIS web server on Windows is given at Annexure I.



Fig. 2. Original Website on University Server



Fig. 3. Mirrored Website on ERNET Server

II. Universities not having their website

ERNET will develop and maintain website for the universities, which do not have a web site. The format of the web site is shown in Fig 3. Inputs for the web site are to be provided in the format given at Annexure II. The required Inputs for making website of an university need to be sent electronically as well as hard copy along with the images to be put on the website. The content should not exceed more than 5 MB. The site will be maintained by ERNET. Updates will be provided by the University from time to time in

electronic format. To run the website ERNET will register a domain under .ernet.in for these universities.

For example for Kannada University URL will be

http://www.kannadauniv.ernet.in

The design of the website will be same for all the universities under this category and will look like the one shown in fig 4.

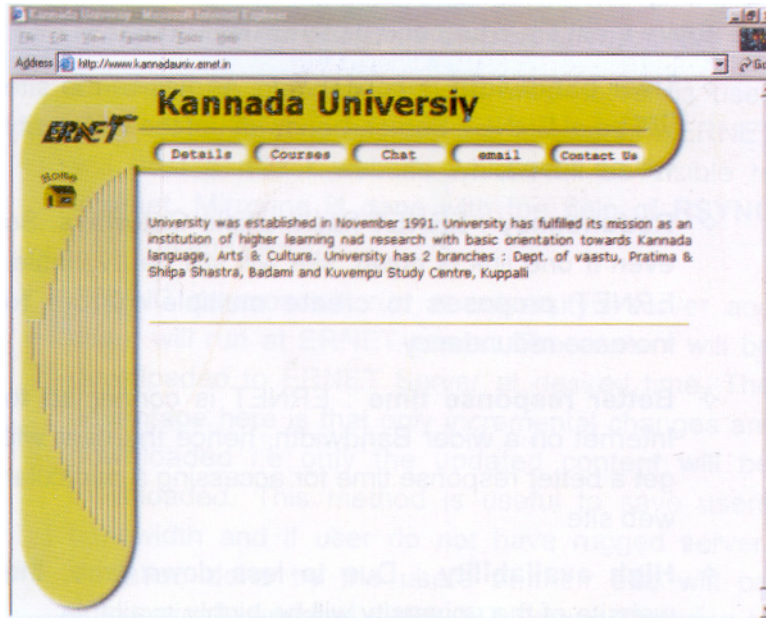


Fig. 4. Format of the website designed

BENEFITS

Following are the benefits to the universities of adopting the above mentioned procedures by ERNET India :

- **User bandwidth** is conserved: As hits of the site will be at ERNET Server, bandwidth of the University will be saved.
- **Redundancy: ERNET** has multiple Gateways. So even if one link is down, site will still be available. **ERNET** proposes to create multiple mirrors to increase redundancy.
- **Better response time: ERNET** is connected to Internet on a wider Bandwidth, hence the user will get a better response time for accessing a particular web site.
- **High availability:** Due to less down time, the website of the university will be highly available
- **Regular server maintenance:** All servers in ERNET are maintained regularly and hence giving better services.
- **Reliability** : ERNET's Server rooms are environmentally and technically controlled and hence more reliable.

GUIDELINES FOR WEBSITE MIRRORING

1. HOW TO DO MIRRORING UNDER LINUX/UNIX

Under linux platform, Apache web server is used (Linux and Apache servers are freewares). ERNET will host a mirror website which will be visible to internet. Mirroring is done with the help of RSYNC daemon and client.

RSYNC daemon will run at university's server and client will run at ERNET server. The content will be downloaded to ERNET Server at desired time. The advantage here is that only incremental changes are downloaded i.e only the updated content will be downloaded. This method is useful to save users bandwidth and if user do not have rugged server. Updation done by the users at their end will be automatically at ERNET server. Mirroring of websites of different universities will be done on one server by doing Software Virtual Hosting i.e hosting of many website on single IP.

1.1 How to Configure Apache server

System Requirement

1. Prerequisites
 - Latest Redhat Linux Installed, Patched up with the latest patches
 - FQDN (Fully Qualified Domain Name)
 - Correct IP and subnet mask configured.
 - Basic network connectivity should be verified before proceeding to later steps.
2. The following Packages are required: (The packages are available with standard linux distribution)
httpd-2.0.40-X
3. Install the relevant package using the rpm command.
E.g. # **rpm -ivh httpd-2.0.40-X**
One needs root privileges to do this.
4. Verify if packages have been installed properly using the **rpm** command.
E.g. # **rpm -q httpd-2.0.40-X**
5. Place the appropriate HTML files in /var/www/html/
6. Place the appropriate scripts in /var/www/cgi-bin/
7. The default path, for the configuration file for Apache is /etc/httpd/conf/httpd.conf
This is a well-documented file, self-explanatory and by default is configured enough to run the default site.
8. Restart the Apache daemon by the following command.
service httpd restart.

Scripts supported by Apache Server are:

- PHP
- Java Scripts
- Perl
- JSP
- CGI

Scripts are used for running dynamic web pages like online forms, transactions etc.

1.2 Installing RSYNC on Linux

- Install the relevant package of rsync.X.rpm from the redhat website www.redhat.com.
- Install it using the command
rpm -ivh rsync.X.rpm
Verify if the package is installed, using the following command.
rpm -q rsync.X.rpm
This will display the relevant version number. (eg rsync-2.5.5-4 is the latest version). If package is not installed, the above command will echo “package not installed”
- To enable the service in runlevel 3 & 5 use the following command.
chkconfig rsync on
- Reboot the server.
- To verify if the rsync service is up and running telnet to port 873 using the following command.
telnet localhost 873
- When using rsync us daemon mode, it uses a single configuration file, which is by default /etc/rsyncd.conf, The rsyncd.conf file controls authentication, access, logging and available modules.
- Create an empty file using the command
touch /etc/rsyncd.conf
Below is a sample rsync configuration file.
motd file = /etc/rsyncd.motd
log file = /var/log/rsyncd.log
pid file = /var/run/rsyncd.pid
lock file - /var/run/rsync.lock
[simple_path_name]
 path = /rsync_files_here
 comment = My Very Own Rsync Server

```
uid = nobody
gid = nobody
read only = no
list = yes
auth users = username
secrets file = /etc/rsyncd.scr
```

- Various options that you would modify right from the start are the areas in italics in the sample above.

What the sample above does us setup a single “pth for rsync transfers to that machine.

- Starting at the top are four lines specifying files and their paths for rsync running in daemon mode.
- The next block of lines is specific to a “path” that rsync uses. The options contained therein have effect only within the block (they’re local, not global options). Start with the “path” name. It serves as an “rsync area nickname” of sorts. It’s a short, easy to remember (and type!) name that you assign to a try filesystem path with all the options you specify. Here are the things you need to set up first and foremost:

- **Path** – this is the actual filesystem path to where the files are rsync’ed from and/or to.
- **Comment** – a short, descriptive explanation of what and where the path points to for listing.
- **Auth users** – you really should put this in to restrict access to only a pre-defined user that you specify in the following secrets file – does not have to be a valid system users.
- **Secrets file** – the file containing plaintext key/value pairs of usernames and passwords.

LAUNCHING THE RSYNC DAEMON

The rsync daemon is launched by specifying the `– daemon` option to rsync. It will be launch from an rsync client i.e from ERNET Server via a remote shell using port 873 as follows: `rsync –avz ugc.ac.in::wwwroot/ugc/data/ugc` this would recursively transfer all files from the directory `wwwroot/ugc` on the machine `ugc.ac.in` into the `/data/ugc` directory on the local machine. The files are transferred in “archive” mode, which ensures that symbolic links, devices, attributes, permissions, ownerships etc are preserved in the transfer. Additionally, compression will be used to reduce the size of data portions of the transfer.

2. HOW TO DO MIRRORING ON WINDOWS PLATFORM

Just like in Unix platform Rsync is used in Windows platform also to do mirroring of the websites.

2.1 Configuring IIS on Windows

- Option pack should be installed along with the operating system (Windows NT 4.0 or Windows 2000 server).
- Got to Start>>Settings>>Control Panel>>Administrative Tools>>IIS

Following window opens, which displays the default web & ftp site.

- Right click on the default web site and go to properties.
- Enter the IP address in the specified place.
- Enter the path where you want to keep the content of the website.
- The default page (file) can be added to the already given list of files.
- How to stop/start the IIS server.

Now IIS is fully configured and the website should open by typing <http://localhost> in Internet explorer of the machine.

2.2 Installing RSYNC on Windows 2000/NT.

- Packages/Files required:

From Cygwin:

- cygpopt-0.dll
- cygwin1.dll
- rsync.exe

These are available from <http://www.cygwin.com> form the Windows NT of 2000 Resource Kit.

- instsrv.exe
- srvany.exe
- Follow the following instructions to run an rsync service on your windows machine.
- Place rsync where you want to run it from. (I usually use C:\program files\rsync)
- Put the two dll's anywhere in the path, usually C:\winnt\system32.
- From a shell running in the directory say winkit, containing instsrc and srvany type: instsrc Rsync "C:\winkit\srvany.exe"

- You should now have a new service called Rsync and you can verify by looking in Start>Control Panel>Services DON'T START IT YET!
- To run rsync in daemon mode you will need a configuration file called **rsync.conf** and place it in the same directory as rsync (C:\Program files\rsync\rsyncd.conf)
 - use chroot = false
 - strict modes = false
 - [BackupArea]
 - path = C:\rsync\
 - read only = no

The first two lines are important for rsync to work on windows

- To make it work download the reg file rsync param.reg and run it to merge it into your registry
- Now rsync daemon can run from the client side i.e from ERNET server as follows:

rsync -avz server::BackupArea d:\data\ugc

Where server is the name of the server running the rsync daemon. BackupArea is the nickname for the path of the directory from which files has to be pulled.

Irrespective of the platform besides the above steps Also ERNET will not do mirroring for databases.

The configuration file **rsyncd.conf** used for running rsync daemon can be made either by University itself with ERNET coordination or it can be prepared at ERNET and send to the university.

Annexure II

BASIC INPUTS REQUIRED FOR PREPARING WEBSITE

1. Name of the Institution
2. Address
3. E-mail Address & URL of the Institution
4. Telephone Numbers
5. Institution Fax No.
6. Name of Chancellor/Director
Name of Vice-Chancellor
Name of Dean
Name of Registrar
7. Brief Description of the Institution (200 words)

8. Year of Establishment
9. Does the Institute have any Branches? Yes No
If Yes, Please mention the No. of Branches with details.

Branch Name	Address	Other Details
1.		
2.		
3.		
4.		

10. List of Courses conducted by the Institution

Course Name	Eligibility Intake	Annual	Duration & Subjects Covered
-------------	--------------------	--------	-----------------------------

11. Admission Details:

Course Name	Admission Dates	Free Structure (in details)	Availability of Adm. Forms/ Prospectus
-------------	-----------------	-----------------------------	--

12. Facilities Available in the Institution (400 Words)

13. The Total strength of your institutions in number of students divided among the different branches of education.

Branch of Education	No of Students
---------------------	----------------

14. Other Information's (Like Scholarships available):

15. Suggest keywords for search engine. (min-4/max-8, refer to sample questionnaires)

- | | | | |
|-----|-----|-----|-----|
| (a) | (b) | (c) | (d) |
| (e) | (f) | (g) | (h) |

16. Details of enclosures & Literature (If any).
(Photographs of Institute, Faculty, Cultural activities etc.)

- | | | |
|-----|--------------------|---------------------|
| (a) | No. of Photographs | Photographs Details |
| (b) | Faculty List | |

17. Any other information on which institution desires to host on the Web.