

**EL01**  
**Student Guide**  
**A V5R2 Look at the HTTP Server**  
**(powered by Apache)**



**ITSO iSeries Technical Forum 2003**



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## Lab 1. HTTP Server (powered by Apache) introduction

Welcome to the A V5R2 Look at the HTTP Server (powered by Apache) lab. This lab will give you a hands-on experience with the HTTP server (powered by Apache) on the iSeries at V5R2 and V5R1 (minus the FRCA support which is V5R2 only). Figure 1 shows you a high-level view of your lab environment.

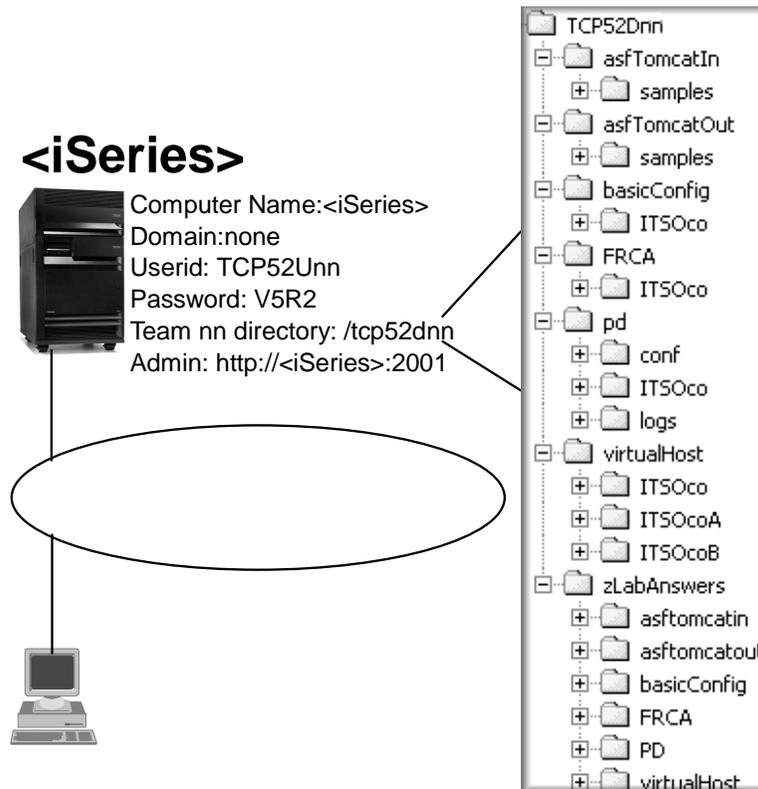


Figure 1. Your team nn's lab environment

### Objectives

You will learn how to:

- Use the Web-based GUI for HTTP server configuration and administration
- Create an IBM HTTP Server (powered by Apache) on iSeries from scratch
- Get a Web site running on an HTTP server (powered by Apache)
- Start a HTTP server (powered by Apache)
- Configure common features of the HTTP server (powered by Apache) (see the Table of Contents for a list)
- Display your Web site to visually see how configuration changes affect your Web site
- Manage your HTTP server (powered by Apache)
- Identify problems with your HTTP server (powered by Apache)

This lab does not intend to:

- Teach you how to create HTTP Servers (original)
- Teach HTML or how to create HTML files

- Teach Web browser skills
- Teach designing of Web sites
- Provide education on TCP/IP

Each team will create and use their own HTTP Server (powered by Apache). Each team has their own set of Web sites (located in /tcp52dnn directory on the iSeries).

Underneath the lab root directory, there are several subdirectories as shown in Figure 1 on page 1.

Each team will be assigned a unique team number. This number is attached to your PC. Usually the numbers are between 01 and 30. You will use your team number in your server name and port number to maintain uniqueness between teams doing this lab.

In the following list and table, the team number will be referred to as 'nn'. Use these values as requested during your lab.

**Your lab userid** TCP52U**nn**  
**Your lab password** V5R2

Table 1. List of all the tasks, objectives, HTTP server name, Server root and IP address: port

Objectives	HTTP Server Name	Server root (/tcp52dnn/..)	IP address and Port
Create server, Start server, Net.Data , Basic Authentication, SSL, FRCA local file, Create module	PBABASIC <b>nn</b>	basicConfig	All: 80 <b>nn</b> All: 443 <b>nn</b> (SSL)
Problem determination	PBAPD <b>nn</b>	PD	All: 81 <b>nn</b>
IP based virtual host	PBAVHOST <b>nn</b>	vhost	xxx.xxx.xxx.xxx :82 <b>nn</b> yyy.yyy.yyy.yyy :82 <b>nn</b>
ASF Tomcat in-process	PBATMCIN <b>nn</b>	asfTomcatIn	All: 83 <b>nn</b>
FRCA proxy cache	PBAFRCA <b>nn</b>	FRCA	All: 86 <b>nn</b>

In this lab, basically we will alternate between configuring one feature and then have you test before and after so you can see the difference. But in the tasks for virtual host, ASF Tomcat, problem determination, we will use each independent configuration file for ease of understanding.

### Lab Setup

1. Bring up an iSeries 5250 terminal session by double-clicking on the <iSeries> icon on your PC desktop.

There may be more than one iSeries icons on your desktop. Ensure you bring up the correct iSeries that is being used for this lab.

- \_\_\_ 2. Sign on using your lab userid and password. During the lab you will be instructed when to use iSeries commands.
- \_\_\_ 3. Bring up a Web browser (Internet Explorer is preferred) by double-clicking on the icon on your PC desktop.

This Web browser session will be used for configuring your HTTP server.
- \_\_\_ 4. Bring up a second Web browser.

This Web browser session will be used for testing your HTTP server by displaying the Web site.
- \_\_\_ 5. Make sure caching on the browser you will use for testing.

This is allow the same Web page to be tested multiple times without an old version of the page coming from the browser cache.

  1. On Internet Explorer: **Tools** -> **Internet Options**. Under Temporary Internet Files, click **Delete Files**.
  2. Click **Settings**, select **Every visit to the page**, change the **Amount of disk space to use** to the lowest settings.

**Notes:**

- Begin with Task 1: HTTP server configuration and administration GUI and continue on through all lab exercises. Work at your own pace. If you have questions, raise your hand to get the instructor's attention.
- If the Web page you want is already being displayed, click Reload or Shift-Reload.
- The lab exercises are designed to be done in the order in which they are documented. If you are not successful with a lab do not continue to the next without talking to your instructor first.
- When filling out configuration forms during the labs, you will be asked to click **Apply** after filling out each form. After clicking **Apply**, the form will be refreshed and a message will be shown in the message area at the bottom. The message should say that the action was successfully completed.

If instead it shows an error, try to determine what might be wrong. If necessary, notify the instructor of the error. Do not continue with other lab exercises until the error condition is solved.
- When filling out forms, if you are not explicitly told to change a field, do not change its current setting.
- Have fun. Ask questions. Do not be afraid to try different ways to solve the same problem.

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## Task 1: HTTP server configuration and administration GUI

The IBM HTTP Server for iSeries has a Web based GUI that allow Webmasters to remotely configure and work with their HTTP servers. These Web pages offer easy-to-use wizards and forms for performing the server configuration. In addition, a Web-based help facility is provided which contains help for each form.

- \_\_\_ 1. Display the iSeries Tasks Web page by entering this URL in your Web browser:

`http://<iSeries>:2001`

\_\_ 2. Enter your lab userid and password when prompted. Click **OK**.



The image shows a Windows-style dialog box titled "Enter Network Password". It contains a key icon and the text "Please type your user name and password." Below this, there are fields for "Site:" (as20.itsoroch.ibm.com), "Realm:" (HTTP Admin), "User Name:" (tcp52unn), and "Password:" (masked with asterisks). There is a checkbox for "Save this password in your password list" which is unchecked. At the bottom right are "OK" and "Cancel" buttons.

The iSeries Tasks Web page should now appear. This page shows the IBM Internet products installed on this iSeries system which can be administered using Web pages. (There are other IBM Internet products that are not installed on this iSeries system and thus do not appear on this page.)

\_\_ 3. Click on **IBM HTTP Server for iSeries** or the icon to the left of the link. You may be asked to enter your lab userid and password again.

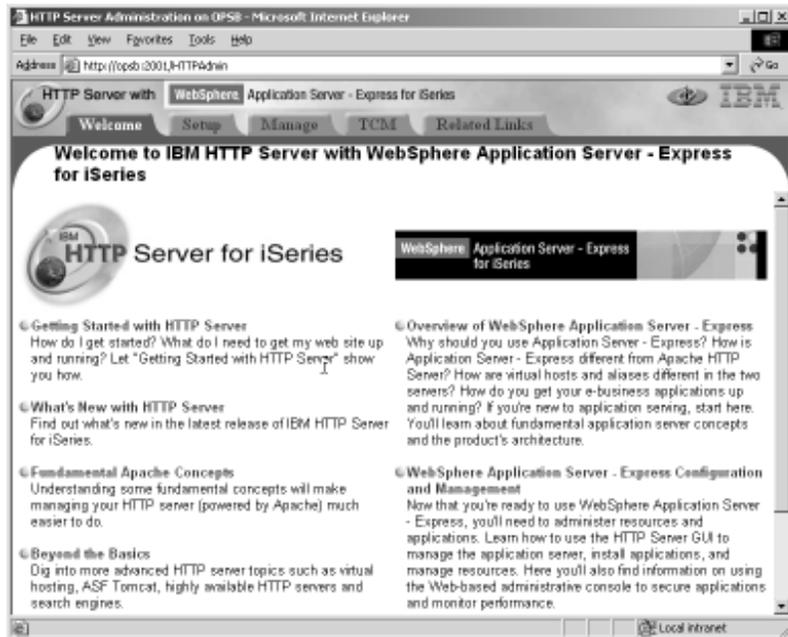


The image shows the "iSeries Tasks" web page. It features the IBM logo and "AS20.ITSOROCH.IBM.COM" in the top left and right corners. The main heading is "iSeries Tasks". Below the heading, there is a list of five items, each with a small icon and a link:

- IBM HTTP Server for iSeries**: Configure the iSeries HTTP Server and SSL
- IBM WebSphere Commerce Suite, Pro Edition for iSeries**: Configure the Commerce Suite server
- Digital Certificate Manager**: Create, distribute, and manage Digital Certificates
- IBM IPP Server for iSeries**: Configure the IBM IPP Server
- 4758 Cryptographic Coprocessor**: Configure the 4758 coprocessor

The IBM HTTP Server for iSeries Welcome page should now appear. This page provides a set of links to other related information. Some of these links are on the Internet and may not be accessible during this lab.

**Note:** The new V5R2 GUI will *remember* where you were last time - so you may not see the Welcome page. You can always click on the Welcome tab to get here.



- \_\_\_ 4. Spend some time familiarizing yourself with the tabs across the top (Welcome, Setup, Manage, TCM, Related Links) and major links within.



- \_\_\_ 5. Follow some of the links to find then click on some help icons:



- \_\_\_ 6. See if you can find out how to Manage all the HTTP Servers (Original and powered by Apache).

---

## Task 2: Create your HTTP Server (powered by Apache)

On the iSeries, multiple HTTP servers (powered by Apache and original) can coexist. Each team will be creating their own HTTP server.

The Create New HTTP Server will start a wizard that will walk you through a series of Web pages.

Each page in the series will provide brief information and will ask you to answer a question. The objective of the wizard is to prompt you for the necessary information required to easily get a basic HTTP Server (powered by Apache) configured.

Use the information in Table 2 to complete the wizard.

Table 2. Each team will create their own HTTP Server (powered by Apache) with these values

Parameter	Value
Which type of server do you want to create?	HTTP server (powered by Apache) - recommended
Server name?	PBABASICnn (where nn equals your team number)
Would you like to configure your new server based on the configuration of an existing server?	No
Which directory would you like to use for your server root?	/tcp52dnn/basicConfig (where nn equals your team number)
What directory would you like to use for your document root?	/tcp52dnn/basicConfig/ITSOCO (where nn equals your team number)
On which IP address and TCP/IP port would you like your server to listen?	All addresses and Port 80nn
Do you want your new server to use an access log?	Yes

Your path through the wizard will vary depending on how you answer the questions.

OK, let's get started.

- Using your admin GUI, select the **Setup** tab and click **Create New HTTP Server**.



This will start a wizard that will walk you through a series of Web pages.

- The first Web page asks which type of HTTP server you want to create. This wizard allows you to create either a Powered by Apache or original HTTP server.
- You are asked for the name you would like to give your HTTP server. This name will uniquely identify the server from the other servers on the system. In the future, you will use the name to identify the server you want to configure. Customers of your Web site will not know or use this name.
- The next question asks whether you want your new Apache server configured based on an existing Original server.

If you have no need to migrate your original server, you should always answer No.

If you select Yes, you have the chance to migrate the configuration of an existing original HTTP server and have that equivalent configuration used by the new HTTP server (powered by Apache). If you answer No, the remaining questions will step you through the basic configuration setup.

- \_\_\_ 5. You will need to specify a parent directory where you want your server's configuration and logging information stored.

This is referred to as your server root. A default of /www/PBABASICnn is displayed for your consideration.

- \_\_\_ 6. A document root needs to be specified next.

The document root is the directory that contains your documents and Web pages to be served by your HTTP server (powered by Apache) when customers use your Web site.

A default directory is provided. Change this to your directory and click **Next**.

- \_\_\_ 7. The HTTP server must be told which of the IP addresses on the iSeries system to look for HTTP requests on.

For this lab, pick all IP addresses.

A unique port must be used by each server application that runs concurrently on the system. The port tells the system which server application handles the requests coming in on that port. For this lab your port number is 80nn. Each server created with this lab is using a unique server name and port number.

- \_\_\_ 8. Specify the type of logging you want for your web server

Most Web sites keep an audit trail of what their HTTP server is doing. Configuring your HTTP Server (powered by Apache) server to log every request made to the server allows you to know which Web pages are being accessed via your server and which users are accessing those pages.

To answer the question on the Web page 'Do you want your new server to use an access log?', which will enable both access and error logging. We will take a look at the contents of these log files later in the lab after your Web server is running and you have viewed your Web site pages.

- \_\_ 9. You will be presented with a summary of the initial configuration for your Powered by Apache server. Click the **Finish** button to create your server. It should look something like:

## Create New HTTP Server

When you click Finish, your new HTTP server (powered by Apache) will be created with the following properties:

**Server name:** PBABASIC00  
**Server root:** /tcp52d00/basicconfig  
**Document root:** /tcp52d00/basicconfig/itsoco  
**IP address:** All addresses  
**Port:** 8000  
**Log directory:** /tcp52d00/basicconfig/logs  
**Access log file:** access\_log  
**Error log file:** error\_log

- \_\_ 10. The final Web page directs you to either start your server or do further configuration. Click **Manage newly created server**

## Create New HTTP Server

Congratulations! You have successfully created a new HTTP server (powered by Apache) named PBABASIC00.

You may further configure your new server, review the properties set up by the wizard, or start your new server by managing it. Or, you may set up and create another new server.

- ➔🔴 Manage newly created server
- ➔🔴 Create another server

The base URL for your new server is <http://AS20:8000>.

- \_\_\_ 11. Congratulations! You have created an HTTP Server (powered by Apache). You will “Start your server” on page 9.



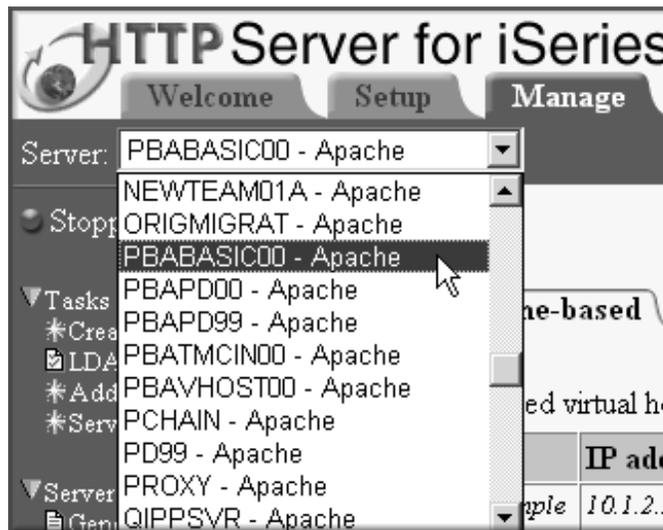
#### Apache Config Examples

If you wish, a sample configuration file can be found in “End Task 2 Configuration File” on page 47.

### Task 3: Start your server

You will now start your server to see if it works.

- \_\_\_ 1. If you are not already on the Manage HTTP Servers form, click the **Manage** tab and select your server **PBABASICnn** from the Server pull down list.



- \_\_\_ 2. Click **Start** as shown below.



- \_\_\_ 3. Wait a moment, and then click the **Refresh** button once or twice to refresh the status of your server.  
It should stay **Running**.

To verify the server is running and functioning correctly test the Web site's home page.

- \_\_\_ 4. On your test browser enter the following URL:

http://<iSeries>:80nn

You should see your ITSOco home page:



- \_\_\_ 5. Click **Product** on the left and click **Product List** on the next window.

This page gives an error. This is because these pages are generated from Net.Data macros which are a special kind of CGI program. You will configure for Net.Data in “Enable CGI Programs and Net.Data” on page 16.

## Task 4: Problem Determination

In this exercise, you will experience some problems with an httpd.conf configuration file that we have provided for you. You will determine the problems with some tools and correct them to make your HTTP server work.

The following table shows you the HTTP server configuration you will use in this task.

Parameter	Value
Server name	PBAPDnn
Server root	/tcp52dnn/PD
Document root	/tcp52dnn/PD/ITSOco
IP address	All
Port	81nn

First, you will use the Create New HTTP Server wizard to create a new HTTP server named PBAPDnn.

The wizard will work like normal - until the point at which you will specify the Server root of /tcp52dnn/PD. At this point the wizard will recognized that an httpd.conf file already exists and we will simply skip the rest of the wizard. Follow the steps:

1. Using your admin GUI, select the **Setup** tab and click **Create New HTTP Server**.



This will start a wizard that will walk you through a series of Web pages.

2. The first Web page asks which type of HTTP server you want to create. Create Powered by Apache. Click **Next**.
3. You are asked for the name you would like to give your HTTP server. Specify **PBAPDnn**. Click **Next**.
4. The next question asks whether you want your new Apache server configured based on an existing Original server. Answer **No**. Click **Next**.
5. You will need to specify a parent directory where you want your server's configuration and logging information stored. Enter for your server root /TCP52Dnn/PD. Click **Next**.
6. A message will be displayed indicating that there is already a file by that name. This is good.

Select **Use the existing file for this server configuration without change**. Click **Next**.

## Create New HTTP Server

There is already a file named `/tcp52d00/pd/conf/httpd.conf` where the wizard must save the new configuration.

You may specify a different server root, replace the existing file, or choose to use the existing file as your configuration file.

Rename the existing file before using the specified name for this server configuration

Use the existing file for this server configuration without change

Use a different server root

Server root

**Note:** If the server root directory does not exist, the wizard will create it for you.

\_\_\_ 7. You will be presented an abbreviated confirmation screen. Click **Finish**.

## Create New HTTP Server

When you click **Finish**, your new HTTP server (powered by Apache) will be created with the following properties:

**Server name:** PBAPD00

**Server root:** /tcp52d00/pd

Now, onto problem determination. Try to start this server.

\_\_\_ 8. Start the HTTP server named `PBAPDnn` using admin GUI.

\_\_\_ 9. Click the **Refresh** button to update the status. You will find this server will not stay running.

\_\_\_ 10. Let's take a look at the joblog of the failing HTTP server named `PBAPDnn`. We will use the Work with Output Queue (WRKOUTQ) command from a 5250 command line:

```
WRKOUTQ QEZJOBLOG
```

\_\_\_ 11. Find the latest joblog of your HTTP server `PBAPDnn` and open it typing option 5=Display. For your convenience, use **F18** key to reach the bottom of the joblog entries.

The joblog should show you some error messages with description, and may show you how it be recovered. As an example:

Cause . . . . . : The syntax for directive Listen is not correct. The HTTP server did not start. Recovery . . . : Correct the directive statement and start the HTTP server again. Technical description . . . . . : See the HTTP server documentation on configuration and administration for more information.

and...

Cause . . . . . : HTTP Server instance PBAPD00 failed because of a configuration error on line 2 in configuration file /tcp52d00/pd/conf/httpd.conf. Note: If the specified directive is either a container directive (e.g. <Directory>), or a directive within a container, the line number identified above may not be correct. In that case, you will need to verify that all directives in the container, and the container itself do not have configuration errors. Recovery . . . : See previous job log messages. Correct the problem and start the server again.

Next action is to look at the configuration file using admin GUI. Specifically, you should be very interested in Listen directive on line 2!

\_\_ 12. Click **Manage** tab and select your server PBAPDnn from Server pull down box.

\_\_ 13. Click **Display Configuration File** on the left pane.

You should see the directive in red color and the message saying **Value '81nn' is not a valid integer.**

### Display Configuration File

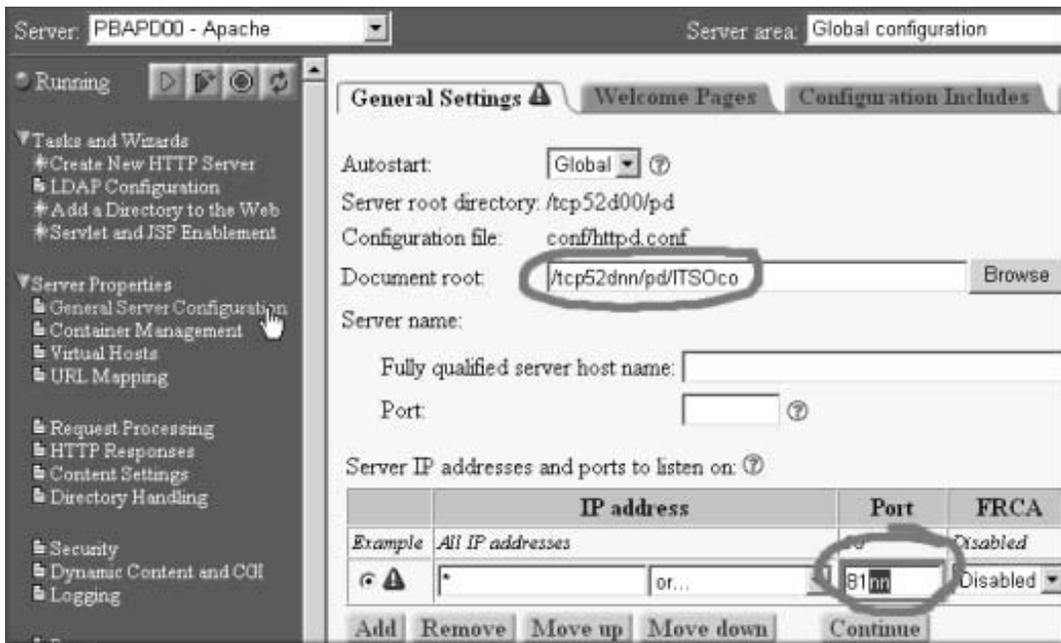
**HTTP server:** PBAPD00  
**Selected file:** /tcp52d00/pd/conf/httpd.conf

```
1 # Configuration originally created by Apache Setup Wizard Mon Apr 01
2 Listen *:81nn
   Value '81nn' is not a valid integer.
```

Next, you will want to fix this problem.

\_\_ 14. You can either click **Edit Configuration File** to directly update the port number or click **General Server Configuration** (as shown below) and update the port number there

Fix the port number.



\_\_\_ 15. Another bug. Change the:

DocumentRoot /tcp52dnn/pd/ITSOco

to reflect your team number (nn) as shown above. Save your configuration file.

\_\_\_ 16. Start your server PBAPDnn.

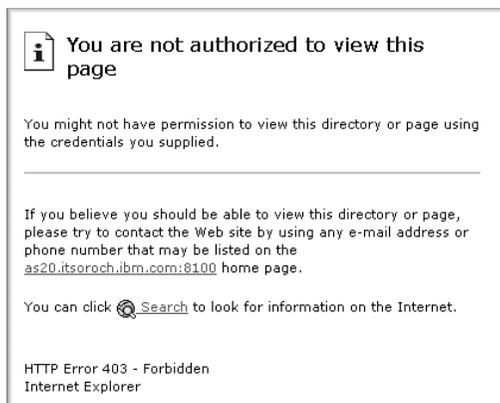
You will see the server can start up this time.

Next, you will see another problem and find it using server logs.

\_\_\_ 17. Type this URL in your browser and submit the request.

http://<iSeries>:81nn

The welcome page won't be displayed and you will see HTTP Error 403.



Then, you will look at the error log and find the problem.

\_\_\_ 18. Using 5250 screen, enter the command below.

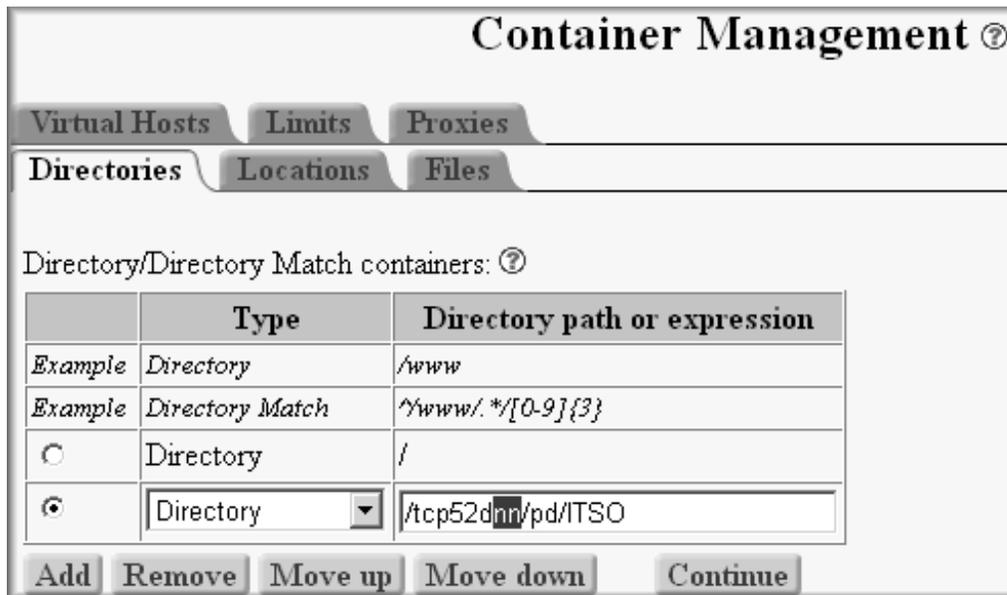
WRKLNK '/tcp52dnn/pd/logs'

- \_\_\_ 19. Using option 5=display, open the **logs** subdirectory and then display **basic\_error\_log** file.

You should see an error message that says ZSRV\_MSG0362: Client denied by server configuration: /tcp52dnn/pd/ITSOco/.

This means the client request was denied when accessing the directory /tcp52dnn/pd/ITSOco. You have to look at the configuration file and make sure the Directory directive is specified correctly.

- \_\_\_ 20. Using admin GUI, select your server **PBAPDnn**. Make sure you are in the Server area: Global configuration.
- \_\_\_ 21. Click **Container Management**.
- \_\_\_ 22. Click **Directories** tab.
- \_\_\_ 23. Make sure the <Directory> directive specifies the directory /tcp52dnn/pd/ITSOco correctly. If you find some mistakes, correct them.



- \_\_\_ 24. Click **OK** to save your configuration changes.

Now, start the server and see if it works correctly.

- \_\_\_ 25. **Stop** and **Start** Server.
- \_\_\_ 26. **Refresh** until it stays running.
- \_\_\_ 27. Enter the URL:

http://<iSeries>:81mn

This time, you should see the welcome page. If not, keep debugging! Sometimes ending and restarting your Web browser session can help.

### Apache Config Examples

If you wish, a sample configuration file can be found in “End Task 4 Configuration File” on page 47.

## Task 5: Enable CGI Programs and Net.Data

This exercise will show you how to enable your server to support dynamically generated Web pages.

The following table shows you the HTTP server configuration you will use in this task.

Parameter	Value
Server name	PBABASICnn
Server root	/tcp52dnn/basicConfig
Document root	/tcp52dnn/basicConfig/ITSOco
IP address	All
Port	80nn

The first thing we need to do is to give the server permission to serve CGI programs in a certain directory.

1. Using your Admin browser, select the **Manage** tab.
2. Select your server PBABASICnn from the Server pull down list.

Always make sure the server you are configuring is your own (PBABASICnn)!

First, you need to create an alias to the library on the iSeries system which contains the CGI program for Net.Data. This alias is used in the URLs so the library structure and physical names of directories and files are not revealed to end users of your Web site.

3. Click **URL mapping** on the left pane.



4. Click **Aliases** tab and click **Add** to add an entry to the table.

*Be careful! URL path and directory or file name are case sensitive.*

**Alias Type** Pull down for **Script Alias**

**URL path** /cgi-bin/

**Host directory or file** /QSYS.LIB/TCP52LMAST.LIB/DB2WWW.PGM/

Your input to the form should look something like:

### URL Mapping ?

URL to host file system mappings: ?

	Alias Type	URL path	Host directory or file
<i>Example</i>	<i>Alias</i>	<i>/icons</i>	<i>/QIBM/ProdData/HTTP/icons</i>
<i>Example</i>	<i>Script Alias</i>	<i>~/cgi-bin(.*)</i>	<i>/www/webserver1/cgi-bin/\$1</i>
<input type="radio"/>	Script Alias	/cgi-bin/	/QSYS.LIB/TCP52LMAS

Click **Continue**, then **OK** at the bottom of the form.

Next you need to tell your server that it is allowed to run CGI programs from this directory. One of the ways to do this is to create a new context (container) for this directory in which you will place directives allowing access to the CGI program (DB2WWW.PGM).

\_\_\_ 5. Click **Container Management** on the left pane and click **Directories** tab

Under the Directory/Directory Match containers you will see two entries in the table. The first was created automatically when the server was created using the create wizard.

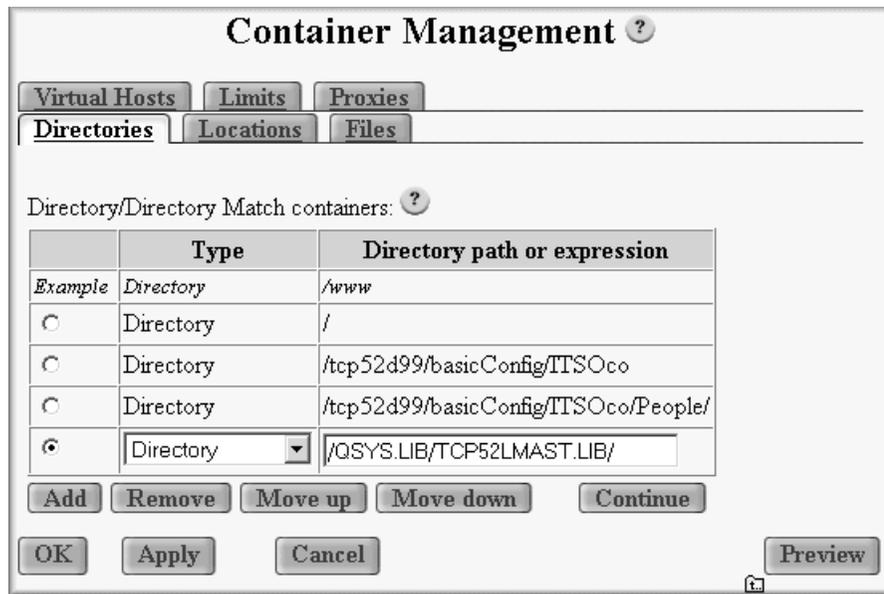
The root directory / is secured by default.

The second entry was also added during the create wizard and it allows the server to serve the home page, other public Web pages and image files.

1. Under the Directory/Directory Match containers, click **Add** to add an entry to the table. Enter:

/QSYS.LIB/TCP52LMAS.LIB/

This is the physical path of the library containing the CGI programs. In this case it is the program DB2WWW.PGM, which is Net.Data. For security reasons your instructor has moved the DB2WWW.PGM program to this library to support the lab environment.



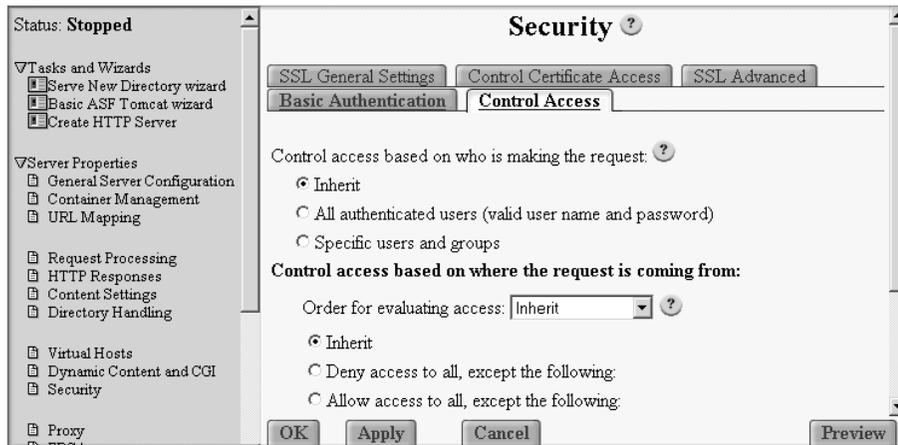
2. Click **Continue** to save this in the config file. Click **OK** to get back to the list of forms.

Now we need to tell the server who is allowed to access the CGI programs.

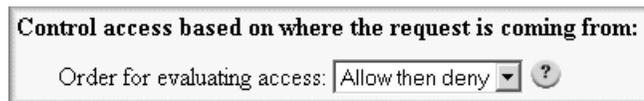
6. Select **Directory /QSYS.LIB/TCP52LMAST.LIB/** from the Server area pull down list to identify which directory we want to control access to.



7. Then, click **Security** on the left, and click **Control Access** tab.



1. Under Control access based on where the request is coming from:, pull down for **Allow then deny**.



2. Select **Specifically allow and deny access** and click **Add** under Specific allowed client hosts. Enter:

**Domain Name or IP Address**    all  
**Subnet Mask**                    (leave blank)

Control access based on where the request is coming from:

Order for evaluating access:  ?

Inherit  
 Deny access to all, except the following:  
 Allow access to all, except the following:  
 Specifically allow and deny access:

Specific allowed client hosts: ?

	Domain name or IP address	Subnet mask
<i>Example</i>	<i>www.mycompany.com</i>	
<i>Example</i>	<i>10.0.1.16</i>	
<i>Example</i>	<i>10.1.0.0</i>	<i>255.255.255.0</i>
<input checked="" type="radio"/>	<input type="text" value="all"/>	<input type="text"/>

This combination will allow all users (whether authenticated or not) to run the CGI programs.

3. Click **Continue**.
4. Click **Apply**, then **OK**.

Next you need to tell your server that it is allowed to run CGI programs.

- \_\_\_ 8. Make sure you are still selecting the **Directory /QSYS.LIB/TCP52LMAS.T.LIB/**:

Server area:

- \_\_\_ 9. Click **Dynamic Content and CGI** on the left pane and click **General Settings** tab.

- Virtual Hosts
- Dynamic Content and CGI
- Security

- \_\_\_ 10. Select **Enabled** from Allow CGI scripts to be run pull down list.

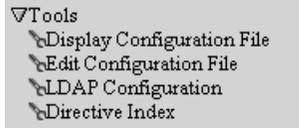
**Dynamic Content and CGI** ?

Allow CGI scripts to be run:  ?

- \_\_\_ 11. Click **Apply**. Click **OK**.

### Apache Config Examples

Now would be a good time to display the configuration file for your PBABASICnn server. Under Tools on the left pane, select **Display Configuration File**.



It is a very good idea, while you are learning the Apache directives, to keep looking at the changes to the configuration file that the GUI is making each time you click **Apply** and **OK**.

If you wish, a sample configuration file can be found in “End Task 5 Configuration File” on page 48.

Let us stop and start your server to re-read the new configuration changes you have just made.

- \_\_\_ 12. Select **All servers** from Server pull down list.
- \_\_\_ 13. **Select** your server PBABASICnn in the list.
- \_\_\_ 14. Click **Stop**.

**Refresh** until it is stopped.

- \_\_\_ 15. Click **Start**.

**Refresh** until it is started.

Let us test these changes to ensure your HTTP server is properly running CGI scripts. Enter `http://<iSeries>:80nn` from your browser.

- \_\_\_ 16. On the ITSOco home page click **Products** on the left.
- \_\_\_ 17. Click **Product list**.

You should now see the Web page. This Web page is created by the running of a Net.Data macro as a CGI script.

---

## Task 6: Using Basic Authentication to protect a directory

On the ITSOco home page, click on the **People** link. This page is shown to you but really should be protected so only the right people can access these information.

The following table shows you the HTTP server configuration you will use in this task.

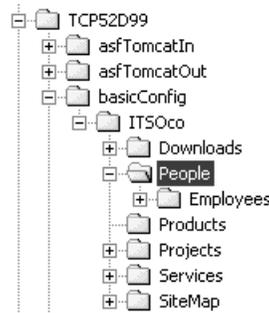
Parameter	Value
Server name	PBABASICnn
Server root	/tcp52dnn/basicConfig

Parameter	Value
Document root	/tcp52dnn/basicConfig/ITSOco
IP address	All
Port	80nn

The first thing that should be done is to change the authorities of the actual directory or file to limit it to just our lab students.

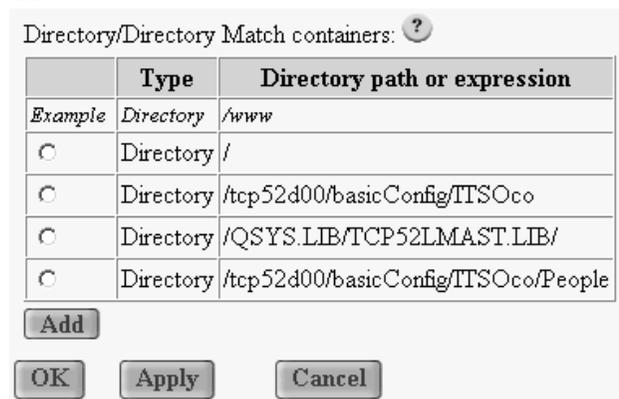
However, for ease of this lab we will skip that step.

Also, for ease this Web page and the image it uses are stored in a directory by itself. This makes it convenient for controlling access for the web server. It is in **/tcp52dnn/basicConfig/ITSOco/People** directory.



- \_\_\_ 1. Make sure **PBABASICnn** in the Server box and **Global configuration** in the Server area box are shown.
- \_\_\_ 2. Click **Container Management** on the left pane.
- \_\_\_ 3. Click **Directories** tab and click **Add**.
- \_\_\_ 4. Under Directory path or expression, type in as follows:  

/tcp52dnn/basicConfig/ITSOco/People
- \_\_\_ 5. Click **Continue**. Click **OK**.



Let's allow everyone who has an iSeries user profile on this particular lab system, access to this employees web page. This might be similar to allowing only people within your company to have access to the Web page containing the list of employee names.

- \_\_\_ 6. Select **Directory /tcp52dnn/basicConfig/ITSOco/People** from the Server area pull down list.
- \_\_\_ 7. Click **Security** on the left pane and click **Basic Authentication** tab. Specify as follows:
  1. User authentication method: select **Use OS/400 profile of client**.
  2. Enter Authentication name or realm as: OS400user
  3. OS/400 user profile to process requests: select from the pull down menu **User profile of the client** which will use the user profile that you enter in the user ID and password prompt. You will see %%CLIENT%% automatically filled in for you.

- 4. Click **Apply**.
- \_\_\_ 8. Then click **Control Access** tab.
  1. Select **All authenticated users (valid user name and password)**

- 2. Click **Apply**. Click **OK**.

Let's test this new configuration

- \_\_\_ 9. **Stop** and **Start Server**
- \_\_\_ 10. **Refresh** until it is started.

Once you have your PBABASICnn server started, go back to the ITSOco home page, click on **People** and you should see a window prompting for your iSeries user profile and password. Enter your **lab userid** and **password**. After clicking **OK** you should then see the People page.

### Apache Config Examples

If you wish, a sample configuration file can be found in “End Task 6 Configuration File” on page 49.

## Task 7: Configure Name based virtual host

In this task, you will create two Name based virtual hosts in your HTTP server configuration.

- \_\_\_ 1. Create a new HTTP server configuration using the information in the following table.

Parameter	Value
Server name	PBAVHOSTnn
Server root	/tcp52dnn/virtualHost
Document root	/tcp52dnn/virtualHost/docs
IP address	<IPAddr>
Port	82nn

- \_\_\_ 2. After you created the configuration, start this server and type the following URL in your browser to make sure how it works now.

http://<iSeries>:82nn

Now you should see the sample home page of your server.

Tue Apr 02 20:21:44 GMT+00:00 2002

### This is the sample home page for the PBAVHOST00 server

If you want to serve additional pages using PBAVHOST00, place them in the /tcp52d00/virtualHost/docs directory. To serve a different home page than this one, replace the index.html file in that directory.

Additional HTTP servers can be created and configured by pointing your Web browser to the 2001 port of your *iSeries*. You will need to make sure the \*ADMIN Server is started.

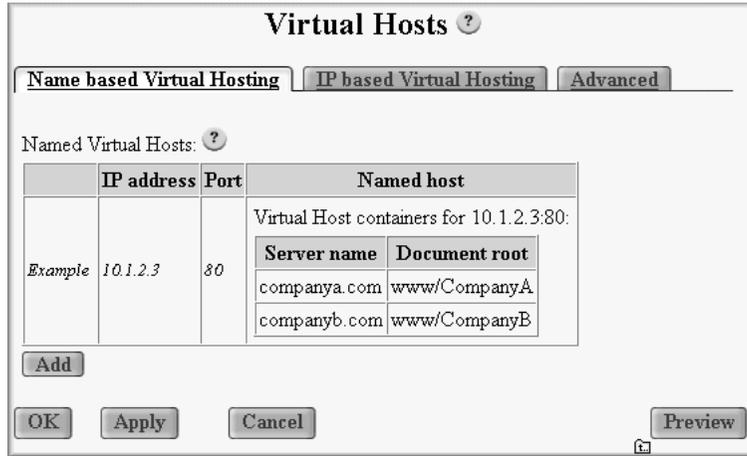
To learn more, please refer to the list of documentation available on the [HTTP server documentation page](#).

Next, you will change this configuration to support two virtual hosts using the basic resources below.

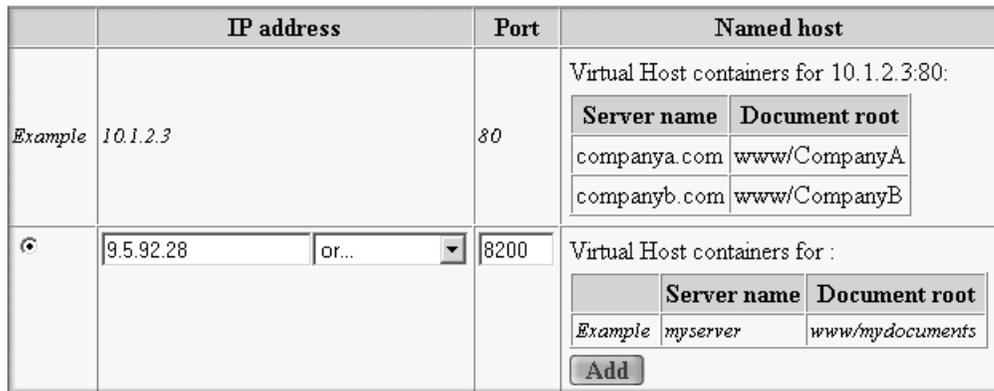
ServerName	<iSeries>	<iSeries>b
IP address:port	<IPAddr>:82nn	<IPAddr>:82nn
DocumentRoot	/tcp52dnn/virtualHost/ITSOcoA	/tcp52dnn/virtualHost/ITSOcoB
Welcome page	index.html	index.html

The first thing to do here is to make two virtual host contexts for the Name based virtual hosts.

- \_\_\_ 3. Start the admin GUI, and click the **Manage** tab.
- \_\_\_ 4. Select the server **PBAVHOSTnn** in the Server list box. Then make sure that you can see **Global configuration** in the Server area list box.
- \_\_\_ 5. Click **Virtual Hosts** on the left pane.



- \_\_\_ 6. Click **Name based Virtual Hosting** tab and click **Add** on this window.
- \_\_\_ 7. Add entry to the table as follows:  
**IP address** <IPAddr> (or use the pull down)  
**Port** 82nn
- \_\_\_ 8. Click **Add** below Virtual Host containers for on the right of the window.



- \_\_\_ 9. Add entry to the table as follows:  
**Server name** <iSeries>  
**Document root** /tcp52dnn/virtualHost/ITSOcoA
- \_\_\_ 10. Click **Continue** and then click **Add** again.
- \_\_\_ 11. Add entry to the table as follows:  
**Server name** <iSeries>**b**  
**Document root** /tcp52dnn/virtualHost/ITSOcoB

Virtual Host containers for 9.5.92.28:8200:

	Server name	Document root
<i>Example</i>	<i>myserver</i>	<i>www/mydocuments</i>
<input type="radio"/>	as20.itsoroch.ibm.com	/tcp52d00/virtualHost/ITSOcoA
<input checked="" type="radio"/>	as20b.itsoroch.ibm.com	/tcp52d00/virtualHost/ITSOcoB

\_\_ 12. Click **Continue** and then click **OK**.

The next step is to create directory contexts inside the virtual host.

\_\_ 13. Select the upper **Virtual Host <IPaddr>:82nn** in the Server area pull down list.

Global configuration

Global configuration

- Directory /
- Directory /tcp52d00/virtualHost/docs
- Virtual Host 9.5.92.14:8300
  - Directory /tcp52d00/virtualHost/ITSOco
- Virtual Host 9.5.92.28:8200**
- Virtual Host 9.5.92.28:8200

\_\_ 14. Click **Container Management** on the left pane.

\_\_ 15. Click **Directories** tab and click **Add** on this window.

\_\_ 16. Enter the directory path you use for this virtual host.

**Directory path or expression** /tcp52dnn/virtualHost/ITSOcoA

	Type	Directory path or expression
<i>Example</i>	<i>Directory</i>	<i>/www</i>
<input checked="" type="radio"/>	Directory <input type="button" value="v"/>	/tcp52d00/virtualHost/ITSOcoA

\_\_ 17. Click **Continue**. And click **OK**.

\_\_ 18. Select the lower **Virtual Host <IPaddr>:82nn** in the Server area list box..

Virtual Host 9.5.92.28:8200

Global configuration

- Directory /
- Directory /tcp52d00/virtualHost/docs
- Virtual Host 9.5.92.14:8300
  - Directory /tcp52d00/virtualHost/ITSOco
- Virtual Host 9.5.92.28:8200
- Virtual Host 9.5.92.28:8200**

\_\_ 19. Click **Container Management** on the left pane.

\_\_ 20. Click **Directories** tab and click **Add** on this window.

\_\_ 21. Enter the directory path you use for this virtual host.

**Directory path or expression** /tcp52dnn/virtualHost/ITSOcoB.

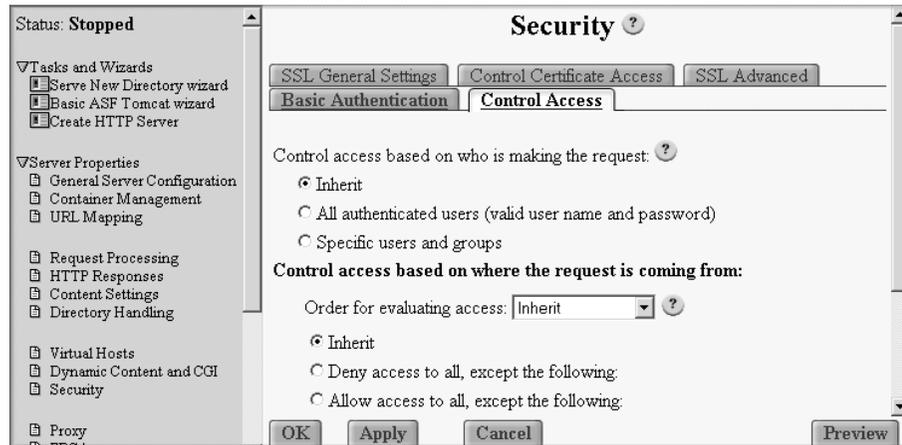
	Type	Directory path or expression
<i>Example</i>	<i>Directory</i>	<i>/www</i>
<input checked="" type="radio"/>	Directory <input type="button" value="v"/>	/tcp52d00/virtualHost/ITSOcoB

\_\_\_ 22. Click **Continue** and then click **OK**.

Next, you need to tell the server who is allowed to access this directory.

\_\_\_ 23. Select **Directory /tcp52dnn/virtualHost/ITSOcoA** in the Server area pull down list.

\_\_\_ 24. Then, click **Security** on the left, and click **Control Access** tab.

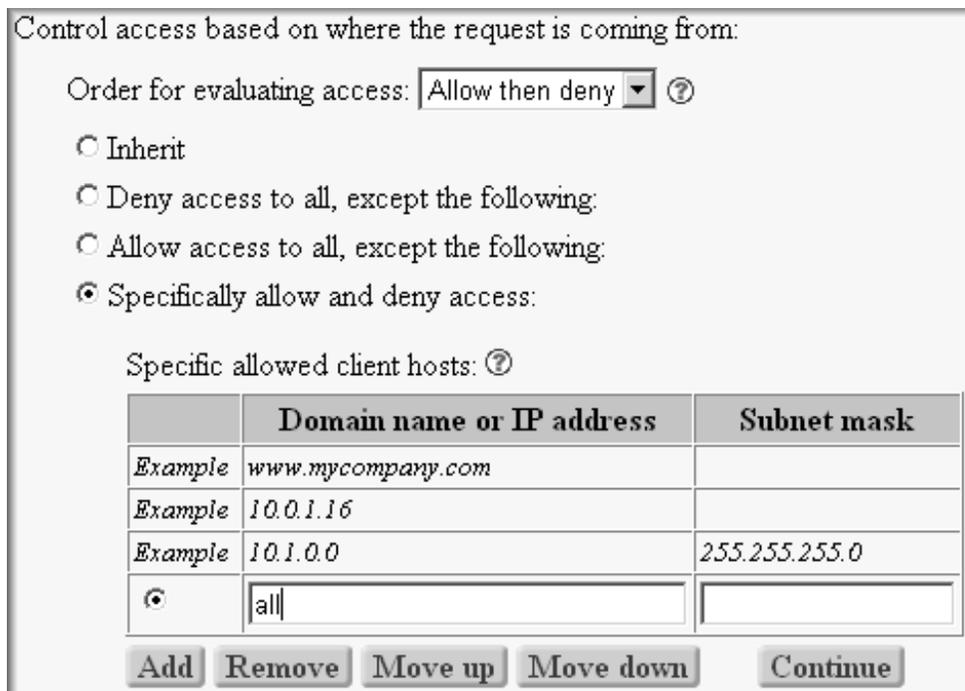


1. Under Control access based on where the request is coming from:, pull down for **Allow then deny**.



2. Select **Specifically allow and deny access** and click **Add** under Specific allowed client hosts. Enter:

**Domain Name or IP Address**    all  
**Subnet Mask**                    (Leave this blank)



3. Click **Continue**.
4. Click **Apply**, then **OK**.

\_\_ 25. Next, select **Directory /tcp52dnn/virtualHost/ITSOcoB** in the Server area pull down list, and do the same thing as you did in previous step.

Now you completed the Name based virtual hosts configuration. Let's start the server and see how they work.

\_\_ 26. Select your server PBAVHOSTnn from Manage HTTP Servers window of the admin GUI.

\_\_ 27. Click **Stop** to end the server if your server is now running, and click **Refresh** to make sure it stopped. Then click **Start**.

\_\_ 28. Enter the URL from your browser:

http://<iSeries>:82nn

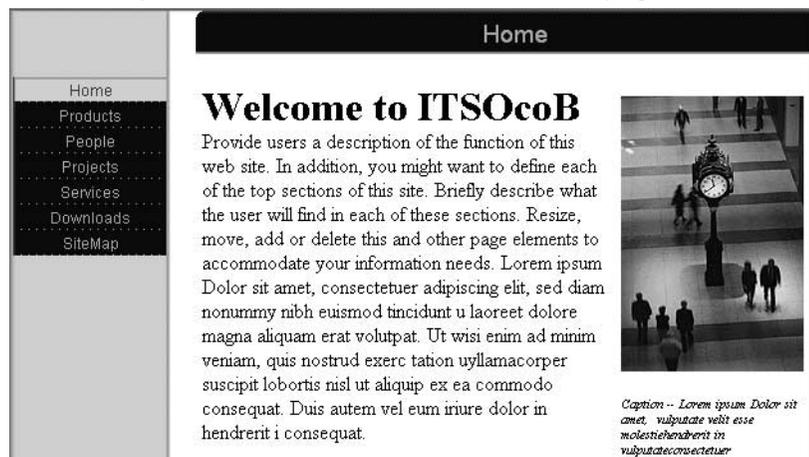
You should see the welcome page like this.



\_\_ 29. Next, enter the URL as follows:

http://<iSeries>b:82nn

This time, you should see the different welcome page like:



## Task 8: Secure Your Web Site Using SSL/TLS

In this exercise you will enable your server for network privacy using SSL/TLS. Essentially what you are doing is configuring your server so it can use SSL/TLS, and then you specify which pages are allowed to be requested using SSL.

The following table shows you the HTTP server configuration you will use in this task.

Parameter	Value
Server name	PBABASICnn
Server root	/tcp52dnn/basicConfig
Document root	/tcp52dnn/basicConfig/ITSOco
IP address	All
Port	80nn 443nn (for SSL)

The first thing you have to do is to create a virtual host that serves a request comes to the SSL port. The *https:* request from your browser will be served by this virtual host and it can be secured by SSL.

- \_\_\_ 1. Using admin GUI, click **Manage** tab and select your **PBABASICnn** server. And make sure now you can see Global configuration in the Server area list box.
- \_\_\_ 2. Select **General Server Configuration**.
  1. Under **Server IP address and ports to listen on**, click **Add**.
  2. Enter **All** or \* (asterisk) for the IP Address and **443nn** for the port.

	IP address or hostname	Port	FRCA
<i>Example</i>	<i>All IP addresses</i>	<i>80</i>	<i>Disabled</i>
<input type="radio"/>	9.5.92.28	8000	Disabled
<input checked="" type="radio"/>	* <input type="text"/> or... <input type="text"/>	443000	Disabled <input type="text"/>

3. Click **Continue**. Click **OK**.
- \_\_\_ 3. Click **Virtual hosts** on the left pane.
  1. Select the **IP based Virtual Hosting** tab and click **Add**
  2. Enter the IP address and secure port number in this form: \*:443nn

### Virtual Hosts ?

Name based Virtual Hosting
**IP based Virtual Hosting**
Advanced

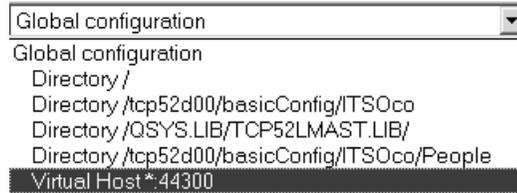
Virtual Host containers: ?

	IP address or hostname	Port	Server name	Document root
<i>Example</i>	<i>10.1.2.3</i>	<i>80</i>	<i>myserver</i>	<i>www/mydocuments</i>
<input checked="" type="radio"/>	* <input type="text"/> or... <input type="text"/>	443000	<input type="text"/>	<input type="text"/>

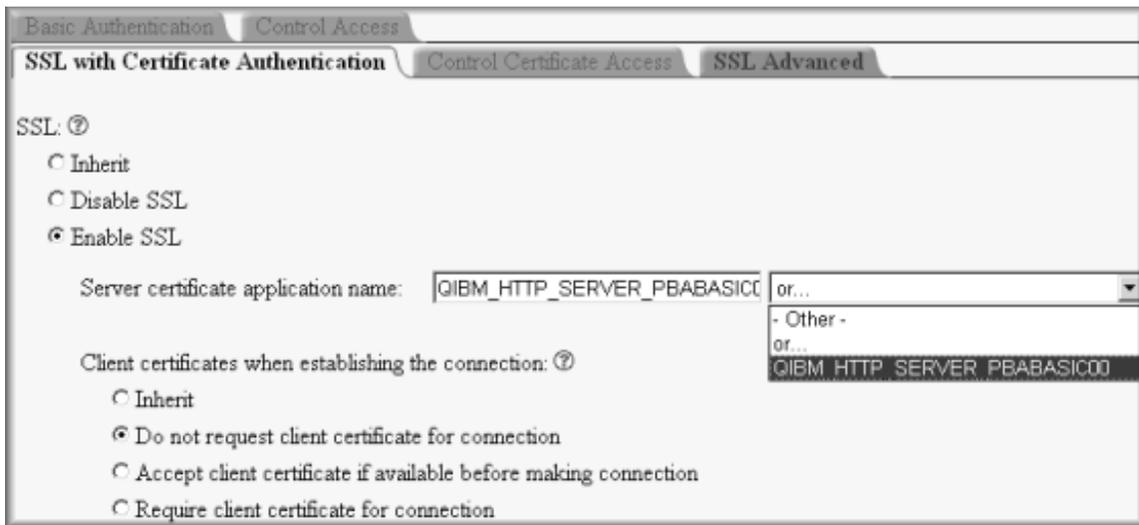
Add
Remove
Move up
Move down
Continue

3. Click **Continue**. Click **OK**.

- \_\_\_ 4. Select the virtual host that was just created from the Server area pull down list.



- \_\_\_ 5. Click **Security** on the left pane.
- \_\_\_ 6. Select **SSL with Certificate Authentication** tab.



1. Select **Enable SSL**.
2. Use the pull down for the Application name.  
This is the name that will be registered with the Digital Certificate Manager so your server is a known secure application on the system.
3. Select **Do not request client certificate for connection**.
4. Click **Apply**. Click **OK**.

This will enable SSL/TLS on the server and will also register your HTTP Server as a known secure application with the Digital Certificate Manager.

However, more steps need to be performed before browsers can send secure requests to your HTTP server instance (using the SSL port). You will now proceed to assign a server digital certificate with your application.

- \_\_\_ 1. Open a new Web browser for your work with DCM.
- \_\_\_ 2. Goto the iSeries Tasks page  
<http://<iSeries>:2001>
- \_\_\_ 3. From there select the **Digital Certificate Manager**.



**Digital Certificate Manager**  
Create, distribute, and manage Digital Certificates

First thing we want to do is to select the Certificate Store in which your instructor has already created and placed a valid server certificate.

\_\_ 4. In the left navigation bar, **Select a Certificate Store**.



\_\_ 5. Select Certificate Store: **\*System**.

\_\_ 6. Certificate Store Password: **password**.

Next, you need to assign to your application a server certificate. There are many paths through the DCM to do this, but let's use the Fast Path.

\_\_ 7. In the left navigation bar, pull down the **Fast Path**, then **Work with server applications**.

You will be presented with a long list of server applications that have already been registered with the DCM. When you enabled SSL for your PBABASICnn server, the GUI automatically registered your Apache server with the DCM. By default the application id that was used was:

SSLAppName QIBM\_HTTP\_SERVER\_PBABASICnn

You can confirm this by displaying your Apache server configuration file and finding the SSLAppName directive.

\_\_ 8. Select your application, then click **Work with Application**.

\_\_ 9. Select **Update Certificate Assignment**.

**Certificate Assigned:** *(None assigned)*



\_\_ 10. Select the ITSOservercert (that has been created for you by your instructor) and **Assign New Certificate** to your server application..

Select the certificate that you want to assign to the application.

	<b>Certificate</b>	<b>Common name</b>
<input checked="" type="radio"/>	ITSOservercert	ITSOco
<input type="radio"/>	VPNSvrCert00	VPNServer00
<input type="radio"/>	DEFAULT	forum02.fscjapan.ibm.com

**Note:** Anytime you change certificate selections, you may need to end your server and start it again to have the change take effect.



\_\_ 11. Confirm that you get the message that the certificate was assigned to the application.

Message The certificate was assigned to the application.

Now you will test your server by accessing it using the HTTPS protocol.

\_\_ 1. **Stop** and **Start** Server.

**Refresh** until it is started.

\_\_ 2. Enter the URL:

https://<iSeries>:443nn

*Attention! It's not http but https!*

You should see a Security Alert message pop up. This has to do with how the server certificate was created on this lab system.



\_\_ 3. Do you want to proceed? First, click **View Certificate**. It is interesting to see the details behind the certificate. You might want to go back to DCM to see the same information from the iSeries DCM's point of view.

\_\_ 4. Do you want to proceed? Click **Yes**.

You will notice the security icon at the bottom of your Web browser:



#### Apache Config Examples

If you wish, a sample configuration file can be found in "End Task 8 Configuration File" on page 51.



---

## Lab 2. Advanced Study

If you have finished all the lab tasks and still have some time at the end here are some suggestions for some additional things you could try to configure for your HTTP Server (powered by Apache) server.

For these labs you will need to be more self-guided.

These advanced study labs are:

- Task 9: “Using ASF Tomcat (in-process)” on page 33.
- Task 10: “Using FRCA local file cache” on page 35.
- Task 11: “Using FRCA proxy cache” on page 40.
- Task 12: “Create your own module using the Apache Portable Runtime (APR)” on page 43.

---

### Task 9: Using ASF Tomcat (in-process)

The ASF Tomcat servlet engine can be configured to run in-process or out-of-process. In this task, we are going to make the in-process configuration.

Using the in-process approach, what we have to do is just create the "virtual" link between the HTTP server and the servlet engine of the ASF Tomcat.

\_\_ 1. Create a new HTTP server using the information in the following table.

Parameter	Value
Server name	PBATMCINnn
Server root	/tcp52dnn/asfTomcatIn Note: the last two letters in the asfTomcatIn directory are In (opposite of <b>out</b> -of-process).
Document root	/tcp52dnn/asfTomcatIn/htdocs Note: the last two letters in the asfTomcatIn directory are In (opposite of <b>out</b> -of-process).
IP address	All addresses
Port	83nn

\_\_ 2. After you created the new server, select the **Manage** tab and choose the server now you created using Server box, and make sure the Server area box is showing **Global configuration**.

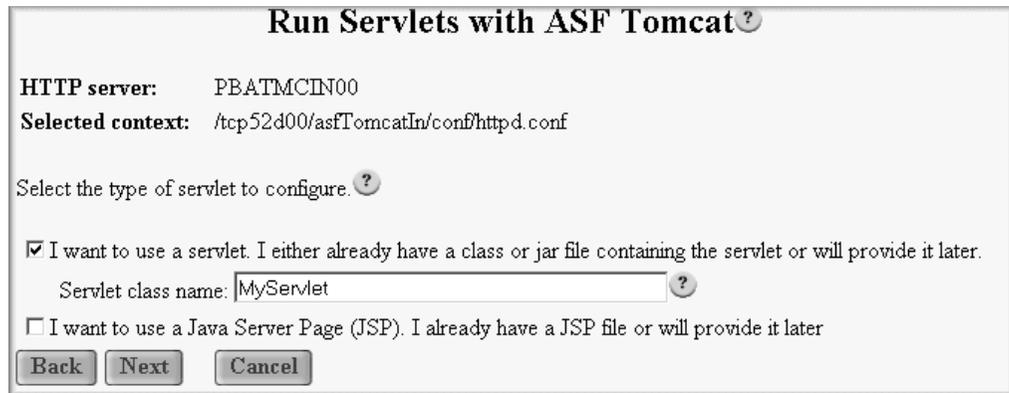
\_\_ 3. Click **Servlet and JSP Enablement** on the left pane.



\_\_ 4. Click **Next**.

\_\_ 5. Select **I want to use a servlet or Java Server Page (JSP), and I either already have them or will provide them later** and click **Next**.

- \_\_\_ 6. Select **I want to use a servlet. I either already have a class or jar file containing the servlet or will provide it later.** Then **Server class name** field appears.



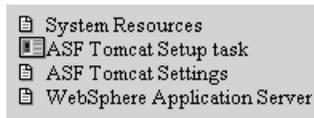
- \_\_\_ 7. Enter the name of the sample servlet class replacing *MyServlet*.

**Server class name**    CalculatorExample

- \_\_\_ 8. Click **Next**.
- \_\_\_ 9. On the next page, click **Finish**.
- \_\_\_ 10. Click **OK** on the next page.

Next, to make the servlet name simpler than CalculatorExample, you will change the name to invoke the servlet.

- \_\_\_ 11. Select **ASF Tomcat Setup Task** on the left pane.



- \_\_\_ 12. Click **Next** till you find **In-Process Application Context Definition** page.
- \_\_\_ 13. At the bottom of the page, you will find the **Application contexts** part. Click **Configure** on the entry of /app1.

Application contexts: ?

	URL path	Application base directory	Reloadable	Configure application
Example	/myapp	webapps/app1		
<input type="radio"/>	/servlet	webapps/ROOT		
<input type="radio"/>	/app1	webapps/app1		<input type="button" value="Configure"/>

Then the **ASF Tomcat Application Configuration** page comes up.

- \_\_\_ 14. Click the radio button on the left of *CalculatorExample*.
- \_\_\_ 15. Enter the servlet path to invoke this servlet replacing */CalculatorExample*.  
**URL patterns**    /calc
- \_\_\_ 16. Click **OK** at the bottom.
- \_\_\_ 17. Click **Next** and click **Finish** on the next page.
- \_\_\_ 18. Click **OK** on the next page.

Now you have finished the setting of ASF Tomcat in the configuration file. Next step is to put a servlet class file in a directory.

- \_\_\_ 19. You will find the *CalculatorExample.class* file in the /tcp52dnn/asfTomcatIn/samples/classes directory. Copy this file to the /tcp52dnn/asfTomcatIn/webapps/app1/WEB-INF/classes directory.

Next, you start the HTTP server and run the servlet.

- \_\_\_ 20. Start your server now you created from the **Manage HTTP Servers** window.

- \_\_\_ 21. Enter the URL from your browser:

`http://<iSeries>:83nn/app1/calc`

**Note:** If you would start reading it after the port number 83nn it would be: "slash app one slash calc"

Now you will see the servlet working.

---

## Task 10: Using FRCA local file cache

FRCA is a new, very powerful cache mechanism introduced by OS/400 V5R2. You can accelerate the file serving performance of the HTTP server (powered by Apache) using FRCA, and can reduce CPU time.

In this exercise, you will see how to configure the HTTP server to have your files cached by FRCA. And then, see how it works. Since FRCA is a mechanism for performance improvement, you may need performance comparison if you want to see how it really works. This is difficult in this lab environment.

One of the ways that we can tell if FRCA local cache is working is to note the difference of authorization behavior between the FRCA and non-FRCA environments. Remember, FRCA does not check user authentication... so if FRCA is working - anybody can see the directory!

Another way is a special header that FRCA local cache will write:

```
*....E...*J...@...*...*P"...*...*
*...*P...-...HTTP/1.1 200 OK..DA*
*TE: SAT, 03 AUG 2002 13:15:54 GM*
*T...SERVER: APACHE/2.0.43(FRCA)..*
*ACCEPT-RANGES: BYTES..CONNECTION*
*: KEEP-ALIVE..LAST-MODIFIED: SAT*
*, 03 AUG 2002 13:15:48 GMT..CONT*
*ENT-TYPE: TEXT/HTML..CONTENT-LEN*
*GTH: 971..X-CACHE: HIT FROM APAC*
*HE/2.0.43(FRCA)...<HTML>..FRI AU*
```

As compared to the same index.html page served from the HTTP Server (powered by Apache):

```
*....E...*G...@...*K...*...*P"...*...*
*...*P...DN..HTTP/1.1 200 OK..DA*
*TE: SAT, 03 AUG 2002 13:15:47 GM*
*T...SERVER: APACHE..LAST-MODIFIED*
*: SAT, 03 AUG 2002 01:37:39 GMT.*
*.ETAG: "4B33-3CB-C07A7EC0"..ACCE*
```

```
*PT-RANGES: BYTES..CONTENT-LENGTH*
*: 971..KEEP-ALIVE: TIMEOUT=15, M*
*AX=100..CONNECTION: KEEP-ALIVE..*
*CONTENT-TYPE: TEXT/HTML; CHARSET*
*=ISO-8859-1....<HTML>.FRI AUG 02*
```

In this lab we will use Start Communications Trace (STRCMNTRC) to gather information that you can use to determine if a file has been served by FRCA.

The following table shows you the HTTP server configuration you will use in this task.

Parameter	Value
Server name	PBABASICnn
Server root	/tcp52dnn/basicConfig
Document root	/tcp52dnn/basicConfig/ITSOco
Directory to be cached by FRCA local cache	/tcp52dnn/basicConfig/ITSOco/SiteMap/*
IP address	All
Port	80nn (FRCA Enabled) 443nn (for SSL)

Now, let's get started.

FRCA cache can be enabled for each Listen port. So, the first thing to do is enable FRCA for the port.

- \_\_\_ 1. Select **Manage** tab and make sure your server **PBABASICnn** is selected in the Server box and **Global configuration** is selected in the Server area box.
- \_\_\_ 2. Click **General Server Configuration** on the left pane.
- \_\_\_ 3. Click the radio button on the left of the entry that has value of 80nn under Port.
- \_\_\_ 4. Under FRCA, select **Enabled** using pull down menu.

Server IP addresses and ports to listen on: ?

	IP address	Port	FRCA
<i>Example</i>	<i>All IP addresses</i>	<i>80</i>	<i>Disabled</i>
<input checked="" type="radio"/>	* <input type="text"/> or... <input type="text"/>	8000	Enabled
<input type="radio"/>	*	44300	Disabled

Add Remove Move up Move down Continue

- \_\_\_ 5. Click **Continue**. And click **OK**.

At this time, your configuration file has been changed like:

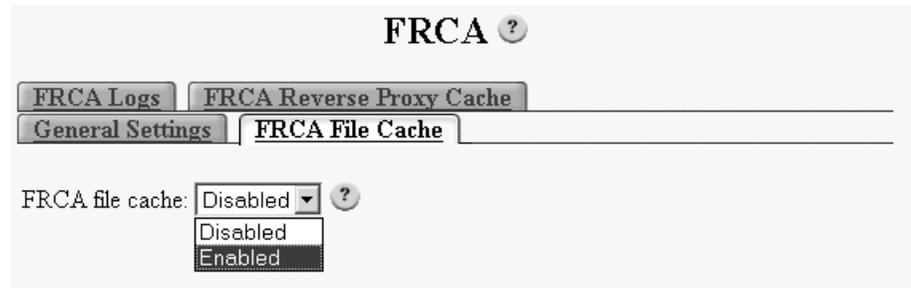
```
4 Listen *:8000 FRCA
5 Listen *:44300
```

Next, you will enable local file cache function of FRCA and specify which file you want to be cached.

\_\_ 6. Click **FRCA** on the left pane.



\_\_ 7. Select **FRCA File Cache** tab and select **Enable** from the FRCA file cache pull down list.



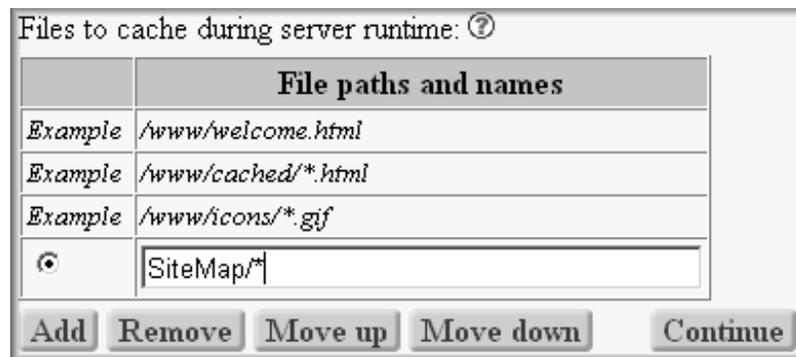
\_\_ 8. Specify these parameters.

**Maximum cache size:** 2048 (kilobytes)  
**Maximum file size to cache:** 100 (kilobytes)

\_\_ 9. Click **Add** under **Files to cache during server runtime** and specify File paths and names as:

SiteMap/\*

This setting makes the files in this directory (relative to DocumentRoot) to be cached after the first time the files are requested from the web browser.



\_\_ 10. Click **Continue** and click **OK**.

At this moment, you should see the directives for FRCA in your HTTP server like:

```
FRCAEnableFileCache On
FRCACacheLocalSizeLimit 2048
FRCACacheLocalFileSizeLimit 102400
FRCACacheLocalFileRunTime SiteMap/*
```

Now, start the server and see how it works.

- \_\_\_ 11. **Stop** and **Start** server.
- \_\_\_ 12. **Refresh** until it is started.

Next, let's prepare the web browser that will be used to access the SiteMap and cause the FRCA cache to be used. As the Internet Explorer (IE) client likes to cache things internally we must take some extra steps to make sure IE is clean.

- \_\_\_ 13. On your web browser enter the URL:

`http://<iSeries>:80nn`

- \_\_\_ 14. From the IE menu of options select **Tools** -> **Internet Options**. On the General tab click **Delete Files** to delete all the temporary Internet files that have been cached on the client. Click **OK** to confirm the delete. Click **Cancel** to exit the Internet Options panel.

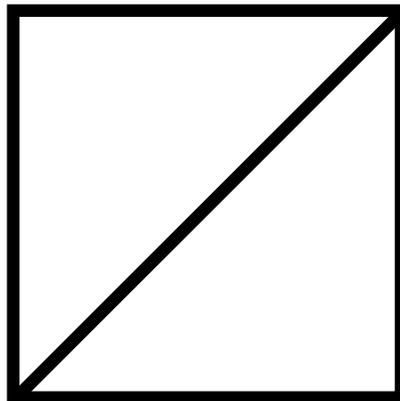
We will test to see if FRCA local cache is working by accessing the SiteMap in our web application while we have a communications trace running. Since only one communication trace can be active on the system at one time your lab manager will manage a board controlling access to this function.

This is the symbol you will use to indicate your team is IN a restricted area.

#### Comm Trace - Use the Board

You **MUST** use the board to wait your turn to access the Comm Trace area!

This symbol means my team is IN - and everybody else must be OUT.



OK, your server is running and waiting and your client is ready and waiting. Now, let us start communications trace to capture the get requests and the responses from the Apache server and the FRCA local cache.

- \_\_\_ 15. From a 5250 session start the communications trace:

```
STRCMNTRC CFGOBJ(<CFGOBJ>) CFGTYPE(*LIN) MAXSTG(2M) USRDTA(*MAX)
TEXT('Team nn')
```

- \_\_\_ 16. On your web browser client select **SiteMap** in the left hand nav bar.
- \_\_\_ 17. Again, from the IE menu of options select **Tools** -> **Internet Options**. On the General tab click **Delete Files** to delete all the temporary Internet files

that have been cached on the client. Click **OK** to confirm the delete. Click **Cancel** to exit the Internet Options panel.

\_\_ 18. Again, on your web browser client select **SiteMap** in the left hand nav bar.

**Important note!!!**

The reason you must do this twice is that no matter how FRCA is configured (either with the startup or runtime options) the first request of the object is processed like a cache-miss. The second and subsequent will be treated as cache-hits.

\_\_ 19. From a 5250 session end the communications trace:

```
ENDCMNTRC CFGOBJ(<CFGOBJ>) CFGTYPE(*LIN)
```

\_\_ 20. And then print the communications trace:

```
PRTCMNTRC CFGOBJ(<CFGOBJ>) CFGTYPE(*LIN) CODE(*ASCII) FMTBCD(*NO)
```

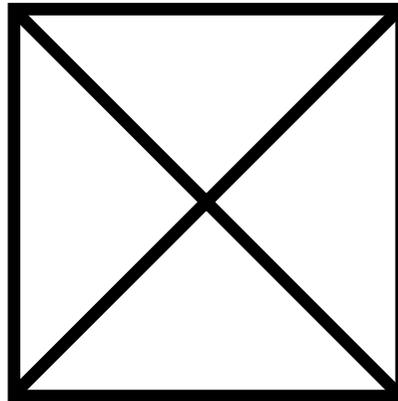
\_\_ 21. And then delete the communications trace to allow the next team to start a new one:

```
DLTCMNTRC CFGOBJ(<CFGOBJ>) CFGTYPE(*LIN)
```

**Comm Trace - Use the Board**

You **MUST** use the board to leave the Comm Trace area!

This symbol means my team is **OUT** - let the next team that is in queue know.



Now we will examine the contents of the communications trace that was spooled to your job.

\_\_ 22. From a 5250 session enter Work with Job (WRKJOB):

```
wrkjob
```

\_\_ 23. Select option 4. Work with spooled files.

\_\_ 24. Find the last spool file that will look something like this:

```
QPCSMPT      QPRINT                      RDY          79
```

\_\_ 25. Use 5=Display to view its contents.

Search for FRCA (F16 (Shift-F4) will repeat the find). This will show you all the places where the FRCA local cache served the file instead of the Apache server. Once you have found the string

```
SERVER: APACHE/2.0.43(FRCA)
```

then page up a bit to see the correlation between the original GET request from the web browser and the response from FRCA.

Another search might be for APACHE. This will show you all the HTTP/1.1 200 OK responses - both the ones served by Apache and those served by FRCA local cache FOR ALL THE ACTIVE SERVERS.

---

## Task 11: Using FRCA proxy cache

In this exercise, you will learn how to configure the FRCA proxy cache and see how it works. The proxy cache is one of the functions of FRCA cache and it enables the dynamic contents to be cached. These dynamic contents can be served by other remote servers or same iSeries server using CGI, web application server, or some other ways. FRCA proxy cache can be used not only for the cache but just for the proxy to pass the request to another server.

First, create a new HTTP server configuration using the information in this table.

Parameter	Value
Server name	PBAFRCAAnn
Server root	/tcp52dnn/FRCA
Document root	/tcp52dnn/FRCA/ITSOco
IP address	All addresses
Port	86nn

After you created the configuration, start this server and type the following URL in your browser to make sure it works.

```
http://<iSeries>:86nn
```

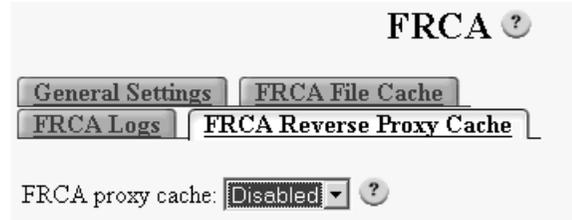
Now, let's start FRCA proxy configuration.

The first thing to do is to enable FRCA for the port.

- \_\_\_ 1. Select **Manage** tab and make sure your server **PBAFRCAAnn** is selected in the Server box and **Global configuration** is selected in the Server area box.
- \_\_\_ 2. Click **General Server Configuration** on the left pane.
- \_\_\_ 3. Under Server IP address and ports to listen on, select the entry that has port 86nn.
- \_\_\_ 4. Under FRCA, select **Enabled** from pull down list.
- \_\_\_ 5. Click **Continue**. And click **OK**.

Next, you will enable proxy cache function and specify what request you want to be cached.

- \_\_\_ 6. Select **Manage** tab and make sure your server **PBAFRCAnn** is selected in the Server box and **Global configuration** is selected in the Server area box.
- \_\_\_ 7. Click **FRCA** on the left pane.
- \_\_\_ 8. Select **FRCA Reverse Proxy Cache** tab.



- \_\_\_ 9. Select **Enable** from the FRCA proxy cache pull down list and specify these parameters.

**Maximum proxy cache size:** 10240 (kilobytes)  
**Maximum proxy response size to cache:** 1024 (kilobytes)

- \_\_\_ 10. Click **Add** under Proxy requests to remote servers and specify as follows: (case sensitive)

**Local Virtual Path** /cgi-bin/MACRO1.MBR/  
**Remote Server URL** http://<iSeries>:80nn/cgi-bin/MACRO1.MBR/

Proxy requests to remote servers: ?

	Local Virtual Path	Remote Server URL
<i>Example</i>	/local/path	http://www.myserver.com
<input type="radio"/>	/cgi-bin/MACRO1.MBR/	http://ISERIES_HOST:80nn/cgi-bin/MACRO1.MBR/

By this setting, the request for CGI is passed to the specified URL. In this task, the target server is PBABASICnn you created before.

- \_\_\_ 11. Click **Continue**.
- \_\_\_ 12. Click **Add** under Document refresh policies: and specify as:

**Match URL** /cgi-bin/MACRO1.MBR/  
**Period** 300 (seconds)

This parameters specify the period that the cached content expires. If zero is specified in the Period parameter, the content is not cached and it works just as a proxy.

- \_\_\_ 13. Click **Continue**. Click **OK**.

The directives for FRCA proxy should be seen like this in the server configuration:

```
20 FRCAEnableProxy On
21 FRCAProxyCacheSizeLimit 10240
22 FRCAProxyCacheEntitySizeLimit 1048576
23 FRCAProxyPass /cgi-bin/MACRO1.MBR/ http://opsl:8000/cgi-bin/MACRO1.MBR/
24 FRCAProxyCacheRefreshInterval /cgi-bin/MACRO1.MBR/ 300
```

Now, start the server and see how it works.

- \_\_ 14. **Stop** and **Start** Server.
- \_\_ 15. **Refresh** until it is started.
- \_\_ 16. Start PBABASICnn server if it's not started.
- \_\_ 17. Type the URL and display the welcome page.

http://<iSeries>:86nn

This port number should be of PBAFRCAnn.

- \_\_ 18. Click **Products** on the left and then click **Product list**.

Now you should see the window that is served by the CGI program.

- \_\_ 19. Enter WRKACTJOB command from the command line of 5250 screen.
- \_\_ 20. Enter 12 on the left of your HTTP server's CGI job that shows *PGM-QZSRCGI* under Function.

```

Work with Active Jobs                                RCHASM20
                                                    04/03/02 11:35:44
CPU %:      3.1      Elapsed time:  01:03:48      Active jobs:   212

Type options, press Enter.
 2=Change   3=Hold   4=End   5=Work with   6=Release   7=Display message
 8=Work with spooled files 13=Disconnect ...

Opt  Subsystem/Job  User      Type  CPU %  Function      Status
---  ---            ---      ---   ---   ---            ---
   1  ADMIN          QTMHHTTP  BCI   .0    PGM-QYUNLANG  TIMW
   2  PBABASIC00     QTMHHTTP  BCH   .0    PGM-QZHBHTTP  SIGW
   3  PBABASIC00     QTMHHTTP  BCI   .0    PGM-QZSRLOG   SIGW
   4  PBABASIC00     QTMHHTTP  BCI   .0    PGM-QZSRLOG   SIGW
   5  PBABASIC00     QTMHHTTP  BCI   .0    PGM-QZSRHTTP  SIGW
   6  PBABASIC00     QTMHHTTP  BCI   .0    PGM-QZSRHTTP  SIGW
  12  PBABASIC00     QTMHHTTP  BCI   .0    PGM-QZSRCGI   TIMW
   8  PBAFRC000      QTMHHTTP  BCH   .0    PGM-QZHBHTTP  SIGW
   9  PBAFRC000      QTMHHTTP  BCI   .0    PGM-QZSRLOG   SIGW
More...
Parameters or command
===>

```

- \_\_ 21. Watch the value of Total CPU on Work with Threads window while you click Refresh button on your browser.

```

Work with Threads                                System:  RCHASM20
Job:  PBABASIC00      User:  QTMHHTTP      Number:  054897
Type options, press Enter.
 3=Hold   4=End   5=Display attributes  6=Release   10=Display call stack
 11=Work with thread locks  14=Work with thread mutexes

Opt  Thread      Status      Total      Aux      Run
   1  00000004    TIMW       .517      193      25

```

You should see the CPU time won't be changed if you submit URL request using refresh button. This shows you that the CGI program is not working because the content is being served from the FRCA cache.

For comparison, send a CGI request directory to the server PBABASICnn and watch the Work with Threads screen. You will see the Total CPU changes.

## Task 12: Create your own module using the Apache Portable Runtime (APR)

In this exercise, you will create a module that will add text at a start of a Web page.

The following table shows you the HTTP server configuration you will use in this task.

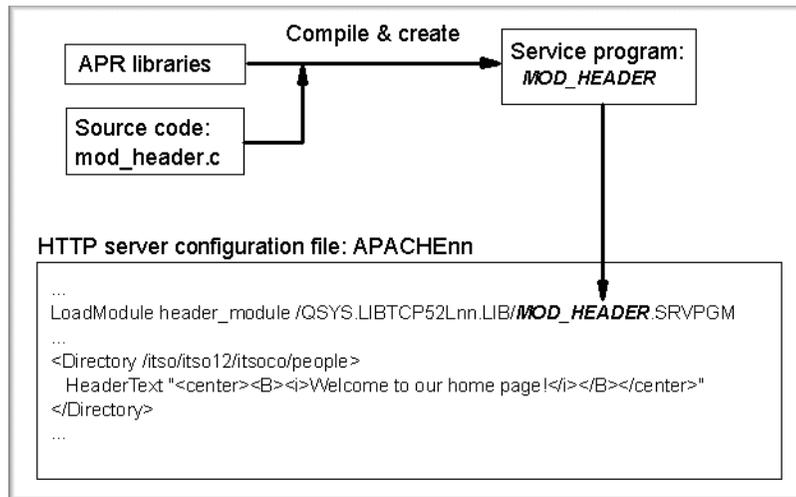
Parameter	Value
Server name	PBABASICnn
Server root	/tcp52dnn/basicConfig
Document root	/tcp52dnn/basicConfig/ITSOco
IP address	All
Port	80nn 443nn (for SSL)

It will do so only within the context(s) in which we define an output filter handler. That is, we will make use of the very same way that all Apache directives can inherent and/or override the settings of directives found above this context. This, in effect, gives us private storage for our module. One per directory context.

The features of the module you will create are presented here.

Feature	How is it defined or used
DocumentRoot	/tcp52dnn/basicConfig/ITSOco
HeaderFilter active in context	<Directory /tcp52dnn/basicConfig/ITSOco/People>
Define the text that will be added to just before the start of the <html> tag with all pages sent from within the active context.	HeaderText "<center><B><i>Listen to all the people</i></B></center>"
Cause the header_module module to be loaded	LoadModule header_module /QSYS.LIB/TCP52Lnn.LIB/MOD_HEADER.SRVP GM

What you are going to do is described in this figure.



Now, let's get started.

The first thing to do is to write the source code for your module. In this lab, the C language source code is provided for you. This source code can be found in:

**Library** TCP52Lnn  
**Source file** QCSRC  
**Member** MOD\_HEADER

Next, you have to create a source code that exports the service program. In this lab, this source code is also provided and can be found in:

**Library** TCP52Lnn  
**Source file** QSRVSRC  
**Member** MOD\_HEADER

which contains:

```

STRPGMEXP PGMlvl(*CURRENT)
EXPORT SYMBOL("header_module")
ENDPGMEXP
  
```

Let us start by compiling the C language source code and creating the service program. We have written a small CL program for you to save time.

**Library** TCP52Lnn  
**Source file** QCLSRC  
**Member** CRTMODHDR

This CL program contains:

```

PGM
MONMSG CPF0000
        CRTCMOD  MODULE(TCP52Lnn/MOD_HEADER) +
                SRCSTMF(' /QSYS.LIB/TCP52Lnn.LIB/QCSRC.FILE/+
                MOD_HEADER.MBR') DEFINE(AS400) +
                LOCALETYPE(*LOCALE) +
                INCDIR(' /QIBM/PRODDATA/HTTPA/INCLUDE')
        CRTSRVPGM SRVPGM(TCP52Lnn/MOD_HEADER) +
                MODULE(TCP52Lnn/MOD_HEADER) +
  
```

```
EXPORT(*SRCFILE) +
SRCFILE(TCP52Lnn/QSRVSR) +
SRCMBR(MOD_HEADER) +
BNDSRVPGM(QHTTSPVR/QZSRAPR +
QHTTSPVR/QZSRCORE QHTTSPVR/QZSRXMLP +
QHTTSPVR/QZSRSDBM)
```

ENDPGM

- \_\_\_ 1. Edit the CRTMODHDR CL program to replace all the 'nn's with your team number. Make sure you are in your TCP52Lnn library!
- \_\_\_ 2. Compile the CRTMODHDR CL program.
- \_\_\_ 3. Run the CRTMODHDR CL program:

```
CALL PGM(TCP52Lnn/CRTMODHDR)
```

**Please**

Make sure the compile of the service program was successful by examining your job log.

Next, you will edit your HTTP server configuration file to activate the module now created.

- \_\_\_ 4. Click **Manage** tab and select your configuration file **PBABASICnn** from the Server pull down list.
- \_\_\_ 5. Click **Edit Configuration File** on the left pane.
- \_\_\_ 6. Add the LoadModule directive as below. This causes the module header\_module to be loaded by the HTTP Server (powered by Apache) at server start up time.

```
LoadModule header_module /QSYS.LIB/TCP52Lnn.LIB/MOD_HEADER.SRVPGM
```

- \_\_\_ 7. Add the directives for this module to be executed within the Directory context <Directory /tcp52dnn/basicConfig/ITSOco/People> like:

```
<Directory /tcp52dnn/basicConfig/ITSOco/People>
```

```
...
```

```
HeaderText "<center><B><i>Listen to all the people</i></B></center>"
</Directory>
```

HeaderText is a directive that defines the HTML text that will be added to the start of any HTML page within this context.

Now you can see how it works.

- \_\_\_ 8. **Stop** and **Start** Server.
- \_\_\_ 9. **Refresh** until it is started.
- \_\_\_ 10. Type the URL and display the welcome page.

```
http://<iSeries>:80nn
```

- \_\_\_ 11. Click **People** on the left and input your user ID and password.

Then, you will see the People page and notice some words added on the top.

*Listen to all the people*

People

- Home
- Products
- People
- Projects
- Services
- Downloads
- SiteMap
- ▶ Employees

### People Overview

Include brief biographies about key department contacts, in addition to a basic directory of the current employees. Resize, move, add or delete this and other page elements to accommodate your information needs.

#### Main Contacts

Provide information about how to contact key people. Resize, move, add or delete this and other page elements to accommodate your information needs.

Contact Name  
 Department Name  
 Email: [name@company.com](mailto:name@company.com)  
 Phone: (000) 555-1234  
 Fax: (000) 555-1235

#### Employees

Use the data list below to link to stacked pages. Resize, move, add or delete this and other page elements to accommodate your information needs.

First Name	Last Name
▶ <a href="#">First Name</a>	<a href="#">Last Name</a>

#### IE client warning

Internet Explorer really likes to cache pages. If your "Listen to all the people" message does not show up clear the IE cache:

**Tools** -> **Internet Options...** On the General tab, click **Delete Files...** Then click **OK** to delete all the files and **Cancel** to exit the Internet Options.

---

## Lab 3. Configuration Files

After many of the lab exercises you will have made a number of changes to the configuration file for your web site. If something does not work the way you expect it to, you may look to these configuration files to possibly find the problem and how to fix it.

### **End Task 2 Configuration File**

Here is a sample configuration file for Team 00. This 'snap shot' was taken at the end of "Create your HTTP Server (powered by Apache)" on page 5.

```
HTTP server:    PBABASIC00
Selected file:  /tcp52d00/basicConfig/conf/httpd.conf

1  # Configuration originally created by Apache Setup Wizard Wed Jul 03
14:33:31 GMT+00:00 2002
2  Listen *:8000
3  DocumentRoot /tcp52d00/basicconfig/itsoco
4  ServerRoot /tcp52d00/basicconfig
5  DefaultType text/plain
6  Options -ExecCGI -FollowSymLinks -SymLinksIfOwnerMatch -Includes
-IncludesNoExec -Indexes -MultiViews
7  ErrorLog logs/error_log
8  LogLevel Warn
9  DirectoryIndex index.html
10 LogFormat "%h %l %u %t \"%r\" %>s %b \"%{Referer}i\" \"%{User-Agent}i\""
combined
11 LogFormat "%{Cookie}n \"%r\" %t" cookie
12 LogFormat "%{User-agent}i" agent
13 LogFormat "%{Referer}i -> %U" referer
14 LogFormat "%h %l %u %t \"%r\" %>s %b" common
15 CustomLog logs/access_log combined
16 SetEnvIf "User-Agent" "Mozilla/2" nokeepalive
17 SetEnvIf "User-Agent" "JDK/1\.0" force-response-1.0
18 SetEnvIf "User-Agent" "Java/1\.0" force-response-1.0
19 SetEnvIf "User-Agent" "RealPlayer 4\.0" force-response-1.0
20 SetEnvIf "User-Agent" "MSIE 4\.0b2;" nokeepalive
21 SetEnvIf "User-Agent" "MSIE 4\.0b2;" force-response-1.0
22 <Directory />
23     Order Deny,Allow
24     Deny From all
25 </Directory>
26 <Directory /tcp52d00/basicconfig/itsoco>
27     Order Allow,Deny
28     Allow From all
29 </Directory>
```

### **End Task 4 Configuration File**

Here is a sample configuration file for Team 00. This 'snap shot' was taken at the end of "Problem Determination" on page 10.

```
HTTP server:    PDBPD00
Selected file:   /tcp52d00/pd/conf/httpd.conf

1  # Configuration originally created by Apache Setup Wizard Mon Apr 01
20:30:01 GMT+00:00 2002
2  Listen *:8100
```

```

3 DocumentRoot /tcp52d00/pd/ITSOco
4 Options -ExecCGI -FollowSymLinks -SymLinksIfOwnerMatch -Includes
-IncludesNoExec -Indexes
5 ErrorLog logs/basic_error_log
6 AccessFileName .htaccess
7 LogFormat "%h %l %u %t \"%r\" %>s %b \"%{Referer}i\" \"%{User-Agent}i\""
combined
8 LogFormat "%{Cookie}n \"%r\" %t" cookie
9 LogFormat "%{User-agent}i" agent
10 LogFormat "%{Referer}i -> %U" referer
11 LogFormat "%h %l %u %t \"%r\" %>s %b" common
12 CustomLog logs/access_log combined
13 BrowserMatch "Mozilla/2" nokeepalive
14 BrowserMatch "JDK/1\.0" force-response-1.0
15 BrowserMatch "Java/1\.0" force-response-1.0
16 BrowserMatch "RealPlayer 4\.0" force-response-1.0
17 BrowserMatch "MSIE 4\.0b2;" nokeepalive force-response-1.0
18 IndexOptions -DescriptionWidth -FancyIndexing -FoldersFirst -IconHeight
-IconsAreLinks -IconWidth -IgnoreClient -NameWidth -NameMinWidth
-ScanHTMLTitles -SelectiveDirAccess -ShowOwner -SuppressColumnSorting
-SuppressDescription -SuppressHTMLPreamble -SuppressIcon -SuppressLastModified
-SuppressRules -SuppressSize -TrackModified -VersionSort
19 DirectoryIndex index.html
20 <Directory />
21     deny from all
22 </Directory>
23 <Directory /tcp52d00/pd/ITSOco>
24     order Allow,Deny
25     allow from all
26 </Directory>

```

### End Task 5 Configuration File

Here is a sample configuration file for Team 00. This 'snap shot' was taken at the end of "Enable CGI Programs and Net.Data" on page 16.

**Note:** The important items that are new or changed from the previous configuration 'snap shot' have been highlighted.

```

HTTP server:    PBABASIC00
Selected file:  /tcp52d00/basicConfig/conf/httpd.conf

1 # Configuration originally created by Apache Setup Wizard Tue Apr 02
23:37:47 GMT+00:00 2002
2 Listen *:8000
3 DocumentRoot /tcp52d00/basicConfig/ITSOco
4 Options -ExecCGI -FollowSymLinks -SymLinksIfOwnerMatch -Includes
-IncludesNoExec -Indexes -MultiViews
5 ErrorLog logs/basic_error_log
6 LogFormat "%h %l %u %t \"%r\" %>s %b \"%{Referer}i\" \"%{User-Agent}i\""
combined
7 LogFormat "%{Cookie}n \"%r\" %t" cookie
8 LogFormat "%{User-agent}i" agent
9 LogFormat "%{Referer}i -> %U" referer
10 LogFormat "%h %l %u %t \"%r\" %>s %b" common
11 CustomLog logs/access_log combined
12 BrowserMatch "Mozilla/2" nokeepalive
13 BrowserMatch "JDK/1\.0" force-response-1.0
14 BrowserMatch "Java/1\.0" force-response-1.0

```

```

15 BrowserMatch "RealPlayer 4\.0" force-response-1.0
16 BrowserMatch "MSIE 4\.0b2;" nokeepalive force-response-1.0
17 ScriptAlias /cgi-bin/ /QSYS.LIB/TCP52LMAST.LIB/DB2WWW.PGM/
18 <Directory />
19     deny from all
20 </Directory>
21 <Directory /tcp52d00/basicConfig/ITSOCO>
22     order Allow,Deny
23     allow from all
24 </Directory>
25 <Directory /QSYS.LIB/TCP52LMAST.LIB/>
26     Order Allow,Deny
27     Allow from all
28     Options +ExecCGI
29 </Directory>

```

### **End Task 6 Configuration File**

Here is a sample configuration file for Team 00. This 'snap shot' was taken at the end of "Using Basic Authentication to protect a directory" on page 20.

**Note:** The important items that are new or changed from the previous configuration 'snap shot' have been highlighted.

```

1  # Configuration originally created by Apache Setup Wizard Wed Jul 03
14:33:31 GMT+00:00 2002
2  ScriptAlias /cgi-bin/ /QSYS.LIB/TCP52LMAST.LIB/DB2WWW.PGM/
3  Listen *:8000
4  DocumentRoot /tcp52d00/basicconfig/itsoco
5  ServerRoot /tcp52d00/basicconfig
6  Options -ExecCGI -FollowSymLinks -SymLinksIfOwnerMatch -Includes
-IncludesNoExec -Indexes -MultiViews
7  LogFormat "%h %l %u %t \"%r\" %>s %b \"%{Referer}i\" \"%{User-Agent}i\""
combined
8  LogFormat "%{Cookie}n \"%r\" %t" cookie
9  LogFormat "%{User-agent}i" agent
10 LogFormat "%{Referer}i -> %U" referer
11 LogFormat "%h %l %u %t \"%r\" %>s %b" common
12 CustomLog logs/access_log combined
13 SetEnvIf "User-Agent" "Mozilla/2" nokeepalive
14 SetEnvIf "User-Agent" "JDK/1\.0" force-response-1.0
15 SetEnvIf "User-Agent" "Java/1\.0" force-response-1.0
16 SetEnvIf "User-Agent" "RealPlayer 4\.0" force-response-1.0
17 SetEnvIf "User-Agent" "MSIE 4\.0b2;" nokeepalive
18 SetEnvIf "User-Agent" "MSIE 4\.0b2;" force-response-1.0
19 <Directory />
20     Order Deny,Allow
21     Deny From all
22 </Directory>
23 <Directory /tcp52d00/basicconfig/itsoco>
24     Order Allow,Deny
25     Allow From all
26 </Directory>
27 <Directory /QSYS.LIB/TCP52LMAST.LIB/>
28     Order Allow,Deny
29     Allow From all
30     Options +ExecCGI

```

```

31 </Directory>
32 <Directory /tcp52d00/basicconfig/itsoco/people>
33     PasswdFile %%SYSTEM%%
34     UserID %%CLIENT%%
35     AuthType Basic
36     AuthName os400user
37     Require valid-user
38 </Directory>

```

### End Task 7 Configuration File

Here is a sample configuration file for Team 00. This 'snap shot' was taken at the end of "Configure Name based virtual host" on page 23.

```

HTTP server:    PBAVHOST00
Selected file:  /tcp52d00/virtualhost/conf/httpd.conf

```

```

1  # Configuration originally created by Apache Setup Wizard Wed Jul 03
19:15:25 GMT+00:00 2002
2  Listen <IPaddr>:8200
3  DocumentRoot /tcp52d00/virtualhost/docs
4  ServerRoot /tcp52d00/virtualhost
5  Options -ExecCGI -FollowSymLinks -SymLinksIfOwnerMatch -Includes
-IncludesNoExec -Indexes -MultiViews
6  NameVirtualHost <IPaddr>:8200
7  LogFormat "%h %l %u %t \"%r\" %>s %b \"%{Referer}i\" \"%{User-Agent}i\""
combined
8  LogFormat "%{Cookie}n \"%r\" %t" cookie
9  LogFormat "%{User-agent}i" agent
10 LogFormat "%{Referer}i -> %U" referer
11 LogFormat "%h %l %u %t \"%r\" %>s %b" common
12 CustomLog logs/access_log combined
13 SetEnvIf "User-Agent" "Mozilla/2" nokeepalive
14 SetEnvIf "User-Agent" "JDK/1\.0" force-response-1.0
15 SetEnvIf "User-Agent" "Java/1\.0" force-response-1.0
16 SetEnvIf "User-Agent" "RealPlayer 4\.0" force-response-1.0
17 SetEnvIf "User-Agent" "MSIE 4\.0b2;" nokeepalive
18 SetEnvIf "User-Agent" "MSIE 4\.0b2;" force-response-1.0
19 <Directory />
20     Order Deny,Allow
21     Deny From all
22 </Directory>
23 <Directory /tcp52d00/virtualhost/docs>
24     Order Allow,Deny
25     Allow From all
26 </Directory>
27 <VirtualHost <IPaddr>:8200>
28     ServerName <iSeries>
29     DocumentRoot /tcp52d00/virtualhost/itsocoa
30     <Directory /tcp52d00/virtualhost/itsocoa>
31         Order Allow,Deny
32         Allow From all
33     </Directory>
34 </VirtualHost>
35 <VirtualHost <IPaddr>:8200>
36     ServerName <iSeries>b
37     DocumentRoot /tcp52d00/virtualhost/itsocob
38     <Directory /tcp52d00/virtualhost/itsocob>

```

```
39         Order Allow,Deny
40         Allow From all
41     </Directory>
42 </VirtualHost>
```

### **End Task 8 Configuration File**

Here is a sample configuration file for Team 00. This 'snap shot' was taken at the end of "Secure Your Web Site Using SSL/TLS" on page 28.

**Note:** The important items that are new or changed from the previous configuration 'snap shot' have been highlighted.

```
HTTP server:    PBABASIC00
Selected file:  /tcp52d00/basicconfig/conf/httpd.conf

1  # Configuration originally created by Apache Setup Wizard Wed Jul 03
14:33:31 GMT+00:00 2002
2  LoadModule ibm_ssl_module /QSYS.LIB/QHTTPSVR.LIB/QZSRVSSL.SRVPGM
3  ScriptAlias /cgi-bin/ /QSYS.LIB/TCP52LMAST.LIB/DB2WWW.PGM/
4  Listen *:8000
5  Listen *:44300
6  DocumentRoot /tcp52d00/basicconfig/itsoco
7  ServerRoot /tcp52d00/basicconfig
8  Options -ExecCGI -FollowSymLinks -SymLinksIfOwnerMatch -Includes
-IncludesNoExec -Indexes
9  AccessFileName .htaccess
10 LogFormat "%h %l %u %t \"%r\" %>s %b \"%{Referer}i\" \"%{User-Agent}i\""
combined
11 LogFormat "%{Cookie}n \"%r\" %t" cookie
12 LogFormat "%{User-agent}i" agent
13 LogFormat "%{Referer}i -> %U" referer
14 LogFormat "%h %l %u %t \"%r\" %>s %b" common
15 CustomLog logs/access_log combined
16 SetEnvIf "User-Agent" "Mozilla/2" nokeepalive
17 SetEnvIf "User-Agent" "JDK/1\0" force-response-1.0
18 SetEnvIf "User-Agent" "Java/1\0" force-response-1.0
19 SetEnvIf "User-Agent" "RealPlayer 4\0" force-response-1.0
20 SetEnvIf "User-Agent" "MSIE 4\0b2;" nokeepalive
21 SetEnvIf "User-Agent" "MSIE 4\0b2;" force-response-1.0
22 DirectoryIndex index.html
23 <Directory />
24     Order Deny,Allow
25     Deny From all
26 </Directory>
27 <Directory /tcp52d00/basicconfig/itsoco>
28     Order Allow,Deny
29     Allow From all
30 </Directory>
31 <Directory /QSYS.LIB/TCP52LMAST.LIB/>
32     Order Allow,Deny
33     Allow From all
34     Options +ExecCGI
35 </Directory>
36 <Directory /tcp52d00/basicconfig/itsoco/people>
37     PasswdFile %%SYSTEM%%
38     UserID %%CLIENT%%
39     AuthType Basic
40     AuthName os400user
```

```

41     Require valid-user
42 </Directory>
43 <VirtualHost *:44300>
44     SSLEnable
45     SSLAppName QIBM_HTTP_SERVER_PBABASIC00
46     SSLClientAuth None
47 </VirtualHost>

```

### **End Task 9 Configuration File**

Here is a sample configuration file for Team 00. This 'snap shot' was taken at the end of "Using ASF Tomcat (in-process)" on page 33.

**Note:** The important items that are new or changed from the previous configuration 'snap shot' have been highlighted.

```

HTTP server:    PBATMCIN00
Selected file:  /tcp52d00/asftomcatin/conf/httpd.conf

```

```

1  # Configuration originally created by Apache Setup Wizard Wed Jul 03
20:08:17 GMT+00:00 2002
2  LoadModule jk_module /QSYS.LIB/QHTTPSVR.LIB/QZTCJK.SRVPGM
3  Listen *:8300
4  DocumentRoot /tcp52d00/asftomcatin/htdocs
5  ServerRoot /tcp52d00/asftomcatin
6  Options -ExecCGI -FollowSymLinks -SymLinksIfOwnerMatch -Includes
-IncludesNoExec -Indexes -MultiViews
7  HotBackup Off
8  LogFormat "%h %l %u %t \"%r\" %>s %b \"%{Referer}i\" \"%{User-Agent}i\""
combined
9  LogFormat "%{Cookie}n \"%r\" %t" cookie
10 LogFormat "%{User-agent}i" agent
11 LogFormat "%{Referer}i -> %U" referer
12 LogFormat "%h %l %u %t \"%r\" %>s %b" common
13 CustomLog logs/access_log combined
14 SetEnvIf "User-Agent" "Mozilla/2" nokeepalive
15 SetEnvIf "User-Agent" "JDK/1\.0" force-response-1.0
16 SetEnvIf "User-Agent" "Java/1\.0" force-response-1.0
17 SetEnvIf "User-Agent" "RealPlayer 4\.0" force-response-1.0
18 SetEnvIf "User-Agent" "MSIE 4\.0b2;" nokeepalive
19 SetEnvIf "User-Agent" "MSIE 4\.0b2;" force-response-1.0
20 JkWorkersFile /tcp52d00/asftomcatin/conf/workers.properties
21 JkLogFile /tcp52d00/asftomcatin/logs/jk.log
22 JkLogLevel Error
23 JkMount /app1/* inprocess
24 JkMount /servlet/* inprocess
25 <Directory />
26     Order Deny,Allow
27     Deny From all
28 </Directory>
29 <Directory /tcp52d00/asftomcatin/htdocs>
30     Order Allow,Deny
31     Allow From all
32 </Directory>

```

### **End Task 10 Configuration File**

Here is a sample configuration file for Team 00. This 'snap shot' was taken at the end of "Using FRCA local file cache" on page 35.

**Note:** The important items that are new or changed from the previous configuration 'snap shot' have been highlighted.

```
HTTP server:    PBABASIC00
Selected file:  /tcp52d00/basicConfig/conf/httpd.conf

1 # Configuration originally created by Apache Setup Wizard Tue Apr 02
23:37:47 GMT+00:00 2002
2 LoadModule ibm_ssl_module /QSYS.LIB/QHTTPSVR.LIB/QZSRVSSL.SRVPGM
3 Listen *:8000 FRCA
4 Listen *:44300
5 DocumentRoot /tcp52d00/basicConfig/ITSOco
6 Options -ExecCGI -FollowSymLinks -SymLinksIfOwnerMatch -Includes
-IncludesNoExec -Indexes -MultiViews
7 ErrorLog logs/basic_error_log
8 LogFormat "%h %l %u %t \"%r\" %>s %b \"%{Referer}i\" \"%{User-Agent}i\""
combined
9 LogFormat "%{Cookie}n \"%r\" %t" cookie
10 LogFormat "%{User-agent}i" agent
11 LogFormat "%{Referer}i -> %U" referer
12 LogFormat "%h %l %u %t \"%r\" %>s %b" common
13 CustomLog logs/access_log combined
14 BrowserMatch "Mozilla/2" nokeepalive
15 BrowserMatch "JDK/1\.0" force-response-1.0
16 BrowserMatch "Java/1\.0" force-response-1.0
17 BrowserMatch "RealPlayer 4\.0" force-response-1.0
18 BrowserMatch "MSIE 4\.0b2;" nokeepalive force-response-1.0
19 ScriptAlias /cgi-bin/ /QSYS.LIB/TCP52LMAST.LIB/DB2WWW.PGM/
20 FRCAEnableFileCache On
21 FRCACacheLocalSizeLimit 2048
22 FRCACacheLocalFileSizeLimit 102400
23 FRCACacheLocalFileRunTime SiteMap/*
24
25 <Directory />
26     deny from all
27 </Directory>
28 <Directory /tcp52d00/basicConfig/ITSOco>
29     order Allow,Deny
30     allow from all
31 </Directory>
32 <Directory /QSYS.LIB/TCP52LMAST.LIB/>
33     Order Allow,Deny
34     Allow from all
35     Options +ExecCGI
36 </Directory>
37 <Directory /tcp52d00/basicConfig/ITSOco/People>
38     PasswdFile %%SYSTEM%%
39     UserId %%CLIENT%%
40     AuthType Basic
41     AuthName OS400user
42     Require valid-user
43 </Directory>
44 <VirtualHost *:44300>
45     SSLAppName QIBM_HTTP_SERVER_PBABASIC00
46     SSLEnable
```

```
47 SSLCacheDisable
48 </VirtualHost>
```

### **End Task 11 Configuration File**

Here is a sample configuration file for Team 00. This 'snap shot' was taken at the end of "Using FRCA proxy cache" on page 40.

**Note:** The important items that are new or changed from the previous configuration 'snap shot' have been highlighted.

```
HTTP server:      PBAFRCA00
Selected file:    /tcp52d00/FRCA/conf/httpd.conf

1 # Configuration originally created by Apache Setup Wizard Wed Apr 03
16:55:57 GMT+00:00 2002
2 Listen *:8500 FRCA
3 DocumentRoot /tcp52d00/FRCA/ITSoco
4 Options -ExecCGI -FollowSymLinks -SymLinksIfOwnerMatch -Includes
-IncludesNoExec -Indexes -MultiViews
5 ErrorLog logs/basic_error_log
6 AccessFileName .htaccess
7 LogFormat "%h %l %u %t \"%r\" %>s %b \"%{Referer}i\" \"%{User-Agent}i\""
combined
8 LogFormat "%{Cookie}n \"%r\" %t" cookie
9 LogFormat "%{User-agent}i" agent
10 LogFormat "%{Referer}i -> %U" referer
11 LogFormat "%h %l %u %t \"%r\" %>s %b" common
12 CustomLog logs/access_log combined
13 BrowserMatch "Mozilla/2" nokeepalive
14 BrowserMatch "JDK/1\.0" force-response-1.0
15 BrowserMatch "Java/1\.0" force-response-1.0
16 BrowserMatch "RealPlayer 4\.0" force-response-1.0
17 BrowserMatch "MSIE 4\.0b2;" nokeepalive force-response-1.0
18 DirectoryIndex index.html
19 IndexOptions -DescriptionWidth -FancyIndexing -FoldersFirst -IconHeight
-IconsAreLinks -IconWidth -IgnoreClient -NameWidth -NameMinWidth
-ScanHTMLTitles -SelectiveDirAccess -ShowOwner -SuppressColumnSorting
-SuppressDescription -SuppressHTMLPreamble -SuppressIcon -SuppressLastModified
-SuppressRules -SuppressSize -TrackModified -VersionSort
20 FRCAEnableProxy On
21 FRCAProxyCacheSizeLimit 10240
22 FRCAProxyCacheEntitySizeLimit 1048576
23 FRCAProxyPass /cgi-bin/MACRO1.MBR/
http://as20.itsoroch.ibm.com:8000/cgi-bin/MACRO1.MBR/
24 FRCAProxyCacheRefreshInterval /cgi-bin/MACRO.MBR/ 300
25 <Directory />
26     deny from all
27 </Directory>
28 <Directory /tcp52d00/FRCA/ITSoco>
29     order Allow,Deny
30     allow from all
31 </Directory>
```

### **End Task 12 Configuration File**

Here is a sample configuration file for Team 00. This 'snap shot' was taken at the end of "Create your own module using the Apache Portable Runtime (APR)" on page 43.

**Note:** The important items that are new or changed from the previous configuration 'snap shot' have been highlighted.

HTTP server: PBABASIC00  
Selected file: /tcp52d00/basicConfig/conf/httpd.conf

```
1 # Configuration originally created by Apache Setup Wizard Tue Apr 02
23:37:47 GMT+00:00 2002
2 LoadModule ibm_ssl_module /QSYS.LIB/QHTTSPVR.LIB/QZSRVSSL.SRVPGM
3 LoadModule header_module /QSYS.LIB/TCP52L00.LIB/MOD_HEADER.SRVPGM
4 Listen *:8000 FRCA
5 Listen *:44300
6 DocumentRoot /tcp52d00/basicConfig/ITSOCO
7 Options -ExecCGI -FollowSymLinks -SymLinksIfOwnerMatch -Includes
-IncludesNoExec -Indexes -MultiViews
8 ErrorLog logs/basic_error_log
9 AccessFileName .htaccess
10 LogFormat "%h %l %u %t \"%r\" %>s %b \"%{Referer}i\" \"%{User-Agent}i\""
combined
11 LogFormat "%{Cookie}n \"%r\" %t" cookie
12 LogFormat "%{User-agent}i" agent
13 LogFormat "%{Referer}i -> %U" referer
14 LogFormat "%h %l %u %t \"%r\" %>s %b" common
15 CustomLog logs/access_log combined
16 BrowserMatch "Mozilla/2" nokeepalive
17 BrowserMatch "JDK/1\.0" force-response-1.0
18 BrowserMatch "Java/1\.0" force-response-1.0
19 BrowserMatch "RealPlayer 4\.0" force-response-1.0
20 BrowserMatch "MSIE 4\.0b2;" nokeepalive force-response-1.0
21 ScriptAlias /cgi-bin/ /QSYS.LIB/TCP52LMAST.LIB/DB2WWW.PGM/
22 DirectoryIndex index.html
23 IndexOptions -DescriptionWidth -FancyIndexing -FoldersFirst -IconHeight
-IconsAreLinks -IconWidth -IgnoreClient -NameWidth -NameMinWidth
-ScanHTMLTitles -SelectiveDirAccess -ShowOwner -SuppressColumnSorting
-SuppressDescription -SuppressHTMLPreamble -SuppressIcon -SuppressLastModified
-SuppressRules -SuppressSize -TrackModified -VersionSort
24 FRCAEnableFileCache On
25 FRCACacheLocalSizeLimit 2048
26 FRCACacheLocalFileSizeLimit 102400
27 FRCACacheLocalFileStartUp /tcp52d00/basicConfig/ITSOCO/People/*
28 FRCACacheLocalFileRunTime /tcp52d00/basicConfig/ITSOCO/People/Employees/*
29 <Directory />
30     deny from all
31 </Directory>
32 <Directory /tcp52d00/basicConfig/ITSOCO>
33     order Allow,Deny
34     allow from all
35 </Directory>
36 <Directory /QSYS.LIB/TCP52LMAST.LIB/>
37     Order Allow,Deny
38     Allow from all
39     Options +ExecCGI
40 </Directory>
41 <Directory /tcp52d00/basicConfig/ITSOCO/People>
42     PasswdFile %%SYSTEM%%
43     UserId %%CLIENT%%
44     AuthType Basic
45     AuthName OS400user
```

```
46     Require valid-user
47     HeaderText "<center><B><i>Listen to all the people</i></B></center>"
48 </Directory>
49 </VirtualHost *:44300>
50     SSLAppName QIBM_HTTP_SERVER_PBABASIC00
51     SSLEnable
52     SSLCacheDisable
53 </VirtualHost>
```