

Chapter 21 - Web Servers (IIS, PWS and Apache)

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21.1 Introduction

- Web server
 - Specialized software that responds to client requests by providing resources
 - When users enter URL into Web browsers, they request specific documents from Web server
 - Maps URL to file on server and returns requested document to client
 - Communicates with client using HTTP
 - Protocol for transferring requests and files over the Internet
- Introduce three Web servers (Fig. 21.1)
 - Internet Information Services (IIS), Personal Web Server (PWS) and Apache Web Server



21.1 Introduction

	IIS	PWS	Apache
Company	Microsoft Corporation	Microsoft Corporation	Apache Software Foundation
Version	5.0	4.0	1.3.20
Released	2/17/00	12/4/97	5/21/01
Platforms	Windows 2000	Windows 95/98/ Millennium Edition (Me)/NT	UNIX, Windows NT/2000, experimentally supports Windows 95/98
Brief description	The most popular Web server for Windows 2000.	A basic Web server for publishing personal Web pages.	Currently the most popular Web server.
Price	Included with Windows 2000.	Freeware. Packaged with Microsoft IIS in NT 4.0 Option Pack. Also included in Windows 98.	Freeware.

Fig. 21.1 Web servers discussed in this chapter.



21.2 HTTP Request Types

- Also known as request methods
- Most popular are *get* and *post*
 - Retrieve and send client form data to Web server
 - *get* request
 - Sends form content as part of URL
 - Retrieves appropriate resource from Web server
 - Limits query to 1024 characters
 - *post* request
 - Updates contents of Web server (posting new messages to forum)
 - Has no limit for length of query
 - Not part of URL and cannot be seen by user



21.2 HTTP Request Types

- Posts data to server-side form handler
- Browsers cache (save on disk) Web pages
 - Allows for quick reloading
 - Cache responses to *get* request
 - Do not cache responses to *post* request



21.3 System Architecture

- Web server part of multi-tier application
 - Divide functionality into separate tiers
 - Logical groupings of functionality
 - Can reside on same computer or on different computers
- Following diagrams illustrates 3-tier application



21.3 System Architecture

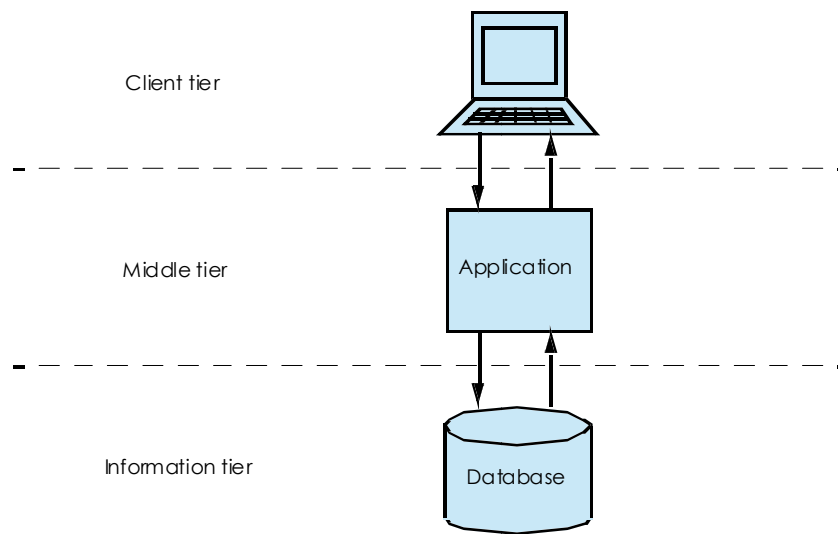


Fig. 21.2 Three-tier application model.



21.3 System Architecture

- Information tier
 - Referred to as data tier or bottom tier
 - Maintains data for application
 - Stores data in relational database management system
- Middle tier
 - Implements business logic and presentation logic
 - Controls interactions between application clients and application data
 - Acts as intermediary between data in information tier and application clients



21.3 System Architecture

- Middle tier, cont.
 - Controller logic
 - Processes client requests from top tier
 - Retrieves data from database
 - Presentation logic
 - Processes data from information tier
 - Presents content to client
 - Business logic
 - Enforces business rules
 - Dictates how clients can access application data and how applications process data
 - Ensures data validity before updating database



21.3 System Architecture

- Client tier
 - Referred to as top tier
 - Application's user interface
 - Users interact with application through user interface
 - Interacts with middle tier to make requests and to retrieve data from information tier
 - Displays data to user



21.4 Client-Side Scripting versus Server-Side Scripting

- Client-side scripting
 - Validates user input
 - Accesses the browser
 - Enhances Web pages with ActiveX® controls, applets, etc.
 - Manipulates browser documents
- Client-side validation
 - Reduces number of requests that need to be passed to server
- Client-side scripting limitations
 - Browser dependency
 - Viewable to users through **View Source** command
- JavaScript most popular client-side script



21.4 Client-Side Scripting versus Server-Side Scripting

- Server-side scripts
 - Provides programmers greater flexibility
 - Generates custom responses for clients
 - Contains greater programmatic capabilities than client-side equivalents
 - Has access to server-side software that extend server functionality



21.5 Accessing Web Servers

- Requesting documents
 - Must know machine name on which Web server resides
 - Through local Web servers or remote Web servers
 - Through domain name or Internet Protocol (IP) address
- Local Web server
 - Resides on users' machines
 - Requests documents in two ways
 - Machine name
 - **localhost**
 - Host name that references local machine



21.5 Accessing Web Servers

- Remote Web server
 - Resides on different machines
- Domain name
 - Represents group of hosts on Internet
 - Combines with how name (**www**) and top-level domain to form fully qualified host name
- Top-level domain (TLD)
 - Describes type of organization that owns domain name
 - **.com** or **.org**
- Fully qualified host name
 - Provides user friendly way to identify site on Internet



21.5 Accessing Web Servers

- IP address
 - Unique address for locating computers on Internet
- Domain name server (DNS)
 - Maintains database of host names and corresponding IP addresses
 - Translates fully qualified host name to IP address
 - Known as DNS lookup



21.6 Microsoft Internet Information Services (IIS)

- IIS 5.0
 - Enterprise-level Web server
 - Included with Windows 2000
 - Allows computer to serve documents
- Internet Services Manager (Fig. 21.3)
 - Open **Control Panel**, double click **Administrative Tools** icon, then double click **Internet Services Manager** icon
 - Administration program for IIS
 - Place documents to be requested in default directory or virtual directory
 - Default: **C:\Inetpub\Wwwroot**
 - Virtual: alias for existing directory on local machine



21.6 Microsoft Internet Information Services (IIS)

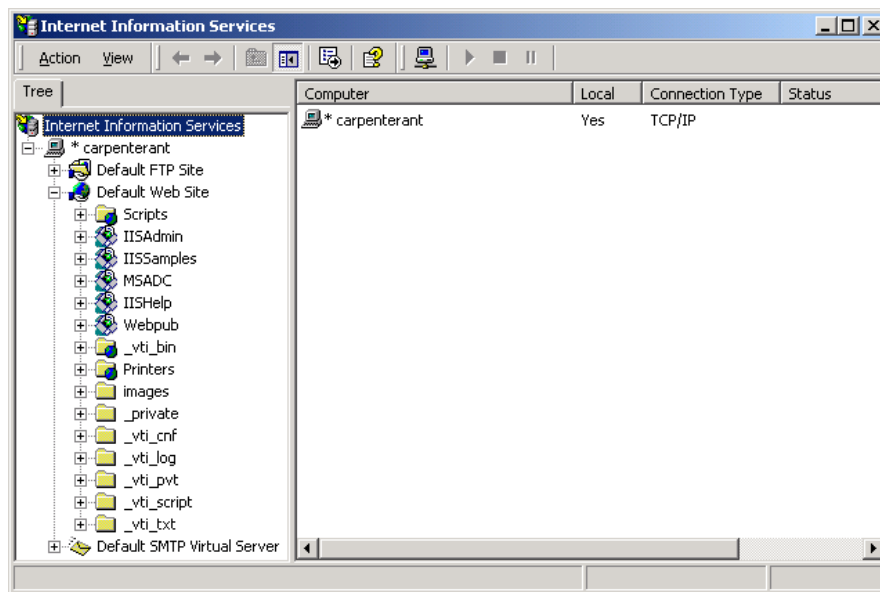


Fig. 21.3 Internet Services Manager dialog.



21.6 Microsoft Internet Information Services (IIS)

- **Default FTP Site and Default Web Site**
 - Permit transferring documents between computer and server
 - HTTP used frequently to request documents
- **Default SMTP Virtual Server**
 - Allows for creation of mail server
- Create virtual directory in **Default Web Site**
 - Most Web documents reside in **Webpub** directory
 - Right click **Webpub**, select **New**, then **Virtual Directory**
 - Initiates **Virtual Directory Creation Wizard** (Fig. 21.4)
 - Guides user through virtual directory creation process



21.6 Microsoft Internet Information Services (IIS)



Fig. 21.4 **Virtual Directory Creation Wizard** welcome dialog.



21.6 Microsoft Internet Information Services (IIS)

- **Virtual Directory Alias** (Fig. 21.5)
 - Enter name for virtual directory
 - Name should not conflict with an existing virtual directory
- **Web Site Content Directory** (Fig. 21.6)
 - Enter path of directory containing Web documents
- **Access Permissions** (Fig. 21.7)
 - Presents security level choices
 - Select access level appropriate for Web document



21.6 Microsoft Internet Information Services (IIS)

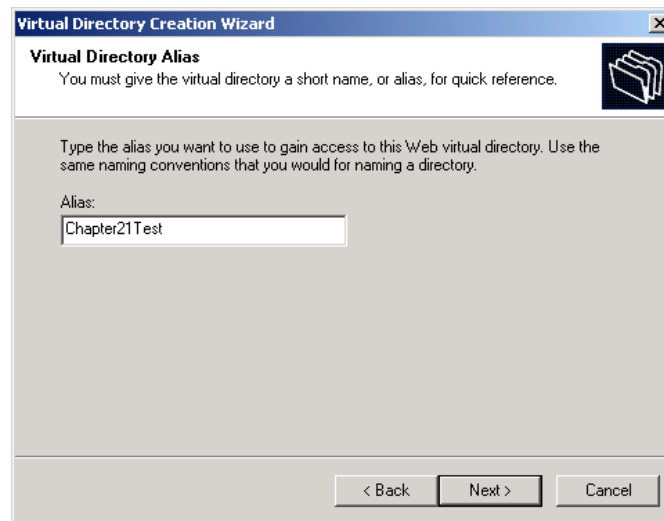


Fig. 21.5 Virtual Directory Alias dialog.



21.6 Microsoft Internet Information Services (IIS)

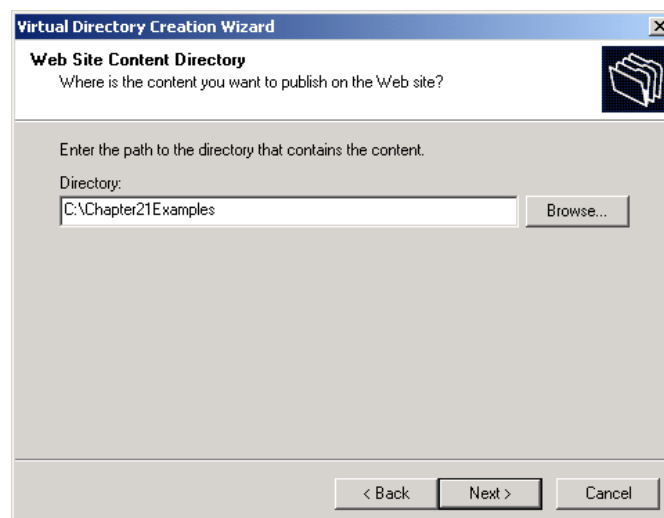


Fig. 21.6 Web Site Content Directory dialog.



21.6 Microsoft Internet Information Services (IIS)

- **Access Permissions** (Fig. 21.7)
 - Presents security level choices
 - Select access level appropriate for Web document
 - **Read** allows users to read and download files
 - **Run Scripts** allows scripts to run in directory
 - **Execute** allows applications to run in directory
 - **Write** allows Web page to accept user input
 - **Browse** allows users to navigate between documents
 - **Read** and **Run Scripts** selected by default



21.6 Microsoft Internet Information Services (IIS)

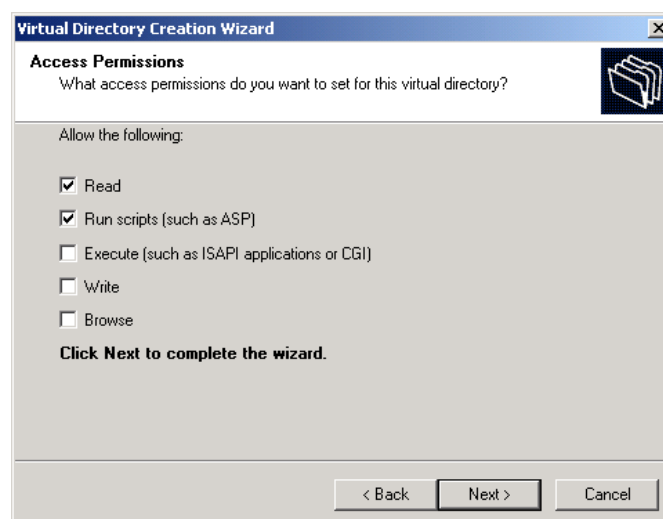


Fig. 21.7 **Access Permissions** dialog.



21.7 Microsoft Personal Web Server (PWS)

- PWS
 - Scaled-down version of IIS
 - Intended for personal computers (PC)
 - Ideal for educational institutions, small businesses and individuals
 - Does not require PC to be used exclusively as Web server
- **Personal Web Manager** (Fig. 21.8)
 - Administration program for PWS
 - Place documents to be requested in default directory or virtual directory
 - Default: **C:\Inetpub\Wwwroot**
 - Virtual: alias for existing directory on local machine



21.7 Microsoft Personal Web Server (PWS)



Fig. 21.8 **Personal Web Manager** dialog.



21.7 Microsoft Personal Web Server (PWS)

- **Edit Directory** (Fig. 21.9)
 - **Directory** field
 - Enter directory path that contains Web documents
 - **Alias** field
 - Enter name to virtual directory
 - **Access** section
 - Select security level for virtual directory
 - **Read** allows users to read and download files
 - **Execute** allows applications to run in directory
 - **Scripts** allows scripts to run in directory
 - **Read** and **Scripts** selected by default



21.7 Microsoft Personal Web Server (PWS)

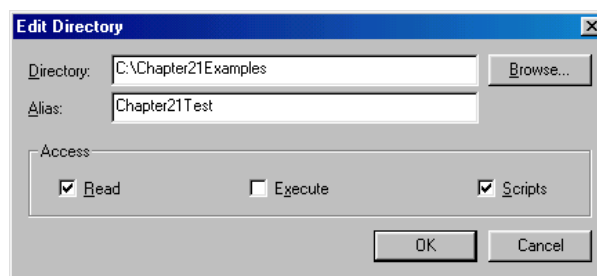


Fig. 21.9 Creating a virtual directory in PWS in **Edit Directory**.



21.8 Apache Web Server

- Apache
 - Maintained by Apache Software Foundation
 - Currently most popular Web server
 - Stable
 - Efficient
 - Portable
 - Successively select **Start**, **Programs**, **Apache httpd Server**, **Control Apache Server** and **Start** (Fig. 21.10)



21.8 Apache Web Server



Fig. 21.10 Starting the Apache Web server. (Courtesy of The Apache Software Foundation.)



21.9 Requesting Documents

- Demonstrate requesting five different documents
 - XHTML, Active Server Pages (ASP), Perl, Python and PHP
 - Discuss serving these documents using IIS, PWS and Apache



21.9.1 XHTML

- IIS, PWS and Apache support XHTML
- IIS or PWS
 - Copy **test.html** into directory that references virtual directory (**C:\Chapter21Examples**)
 - Cannot copy file into a virtual directory (**Chapter21Test**)
 - Launch Internet Explorer and enter XHTML document's location in **Address** field (Figs. 21.11 and 21.12)
- Apache
 - Copy **test.html** to **htdocs** directory (default directory)
 - Launch Internet Explorer and enter XHTML document's location in **Address** field (Fig. 21.13)



21.9.1 XHTML

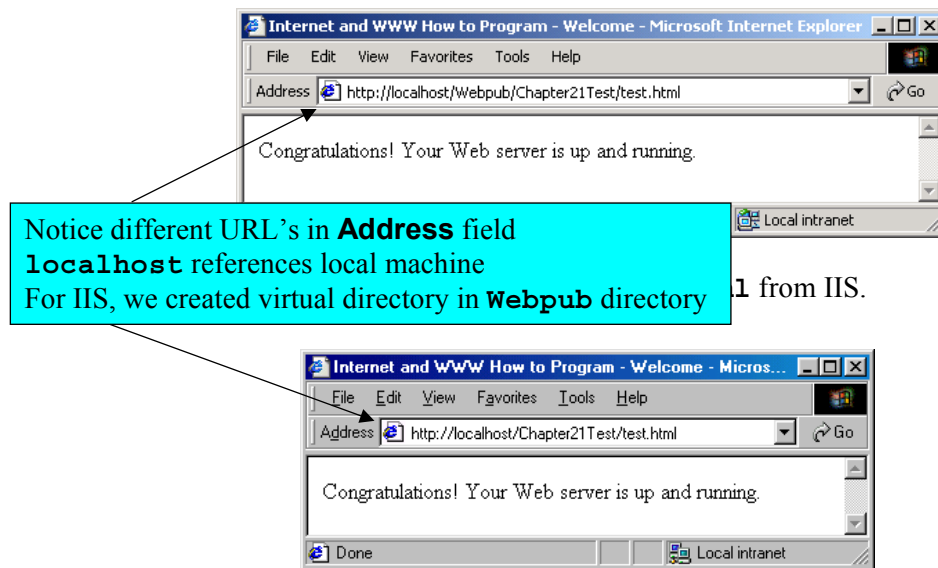


Fig. 21.12 Requesting **test.html** from PWS.



21.9.1 XHTML

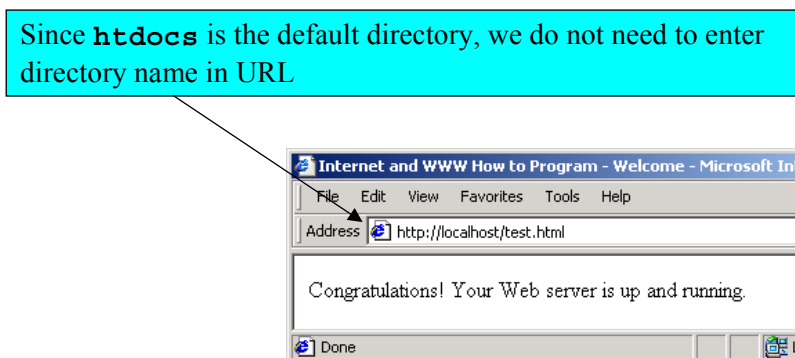


Fig. 21.13 Requesting **test.html** from Apache.



21.9.2 ASP

- IIS and PWS support ASP documents
- IIS and PWS
 - Copy **test.asp** into directory that references virtual directory (**C:\Chapter21Examples**)
 - Launch Internet Explorer and enter ASP document's locations in **Address** field (Figs. 21.14 and 21.15)
- Apache
 - Does not support ASP documents



21.9.2 ASP

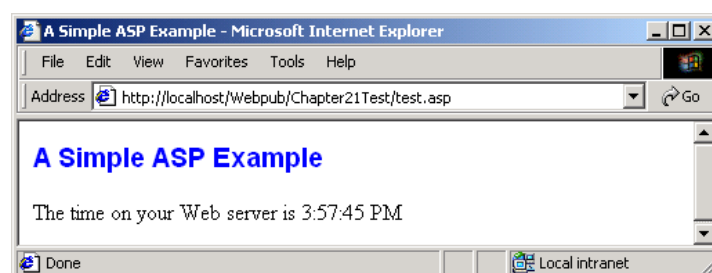


Fig. 21.14 Requesting **test.asp** from IIS.

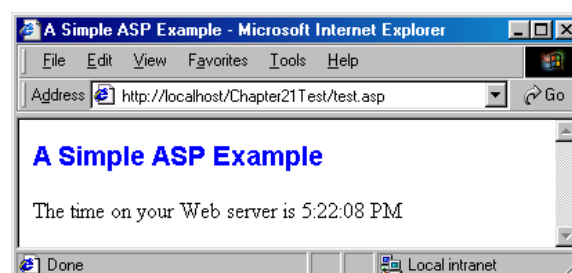


Fig. 21.15 Requesting **test.asp** from PWS.



21.9.3 Perl

- IIS, PWS and Apache support Perl documents
- IIS and PWS
 - Copy **test.pl** into directory that references virtual directory (**C:\Chapter21Examples**)
 - Launch Internet Explorer and enter Perl document's location in **Address** field (Figs. 21.16 and 21.17)
- Apache
 - Copy **test.pl** to **cgi-bin** directory
 - Perl documents must reside in this directory
 - Launch Internet Explorer and enter Perl document's location in **Address** field (Fig. 21.18)



21.9.3 Perl

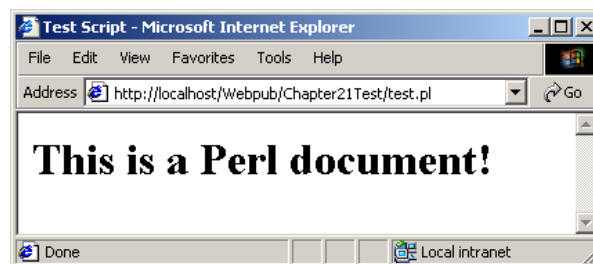


Fig. 21.16 Requesting **test.pl** from IIS.

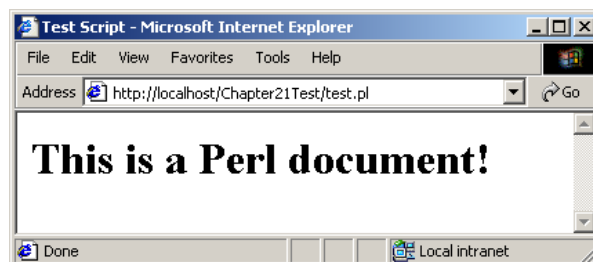


Fig. 21.17 Requesting **test.pl** from PWS.



21.9.3 Perl

cgi-bin is required in URL; it is not default directory

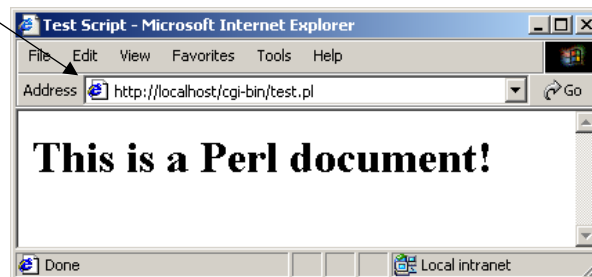


Fig. 21.18 Requesting **test.pl** from Apache.



21.9.4 Python

- IIS, PWS and Apache support Python documents
- IIS and PWS
 - Copy **test.py** into directory that references virtual directory (**C:\Chapter21Examples**)
 - Launch Internet Explorer and enter Python document's location in **Address** field (Figs. 21.19 and 21.20)
- Apache
 - Copy **test.py** to **cgi-bin** directory
 - Python documents must reside in this directory
 - Launch Internet Explorer and enter Python document's location in **Address** field (Fig. 21.21)



21.9.4 Python

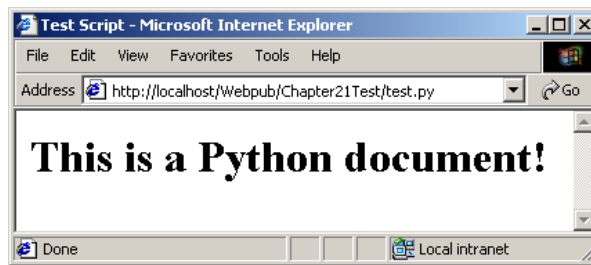


Fig. 21.19 Requesting `test.py` from IIS.

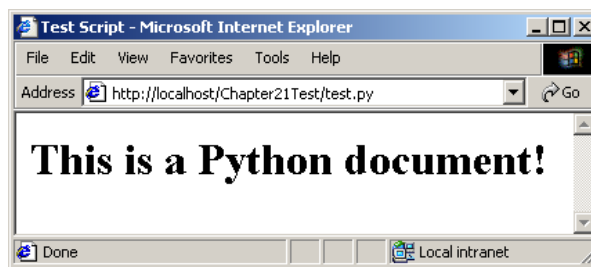


Fig. 21.20 Requesting `test.py` from PWS.



21.9.4 Python

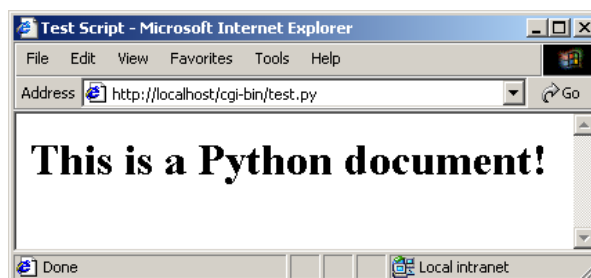


Fig. 21.21 Requesting `test.py` from Apache.



21.9.5 PHP

- IIS, PWS and Apache support PHP documents
- IIS and PWS
 - Copy **test.php** into directory that references virtual directory (**C:\Chapter21Examples**)
 - Launch Internet Explorer and enter PHP document's location in **Address** field (Figs. 21.22 and 21.23)
- Apache
 - Copy **test.php** to **htdocs** directory
 - Launch Internet Explorer and enter PHP document's location in **Address** field (Fig. 21.24)



21.9.5 PHP

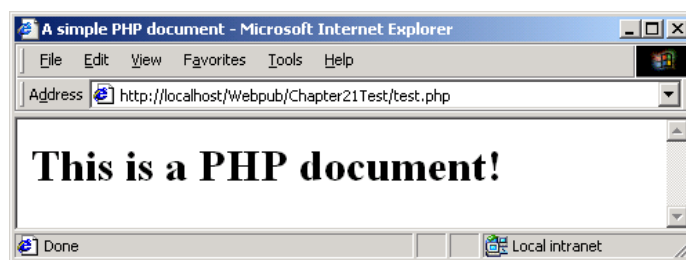


Fig. 21.22 Requesting **test.php** from IIS.

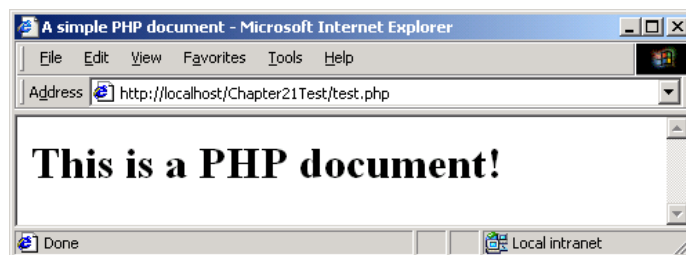


Fig. 21.23 Requesting **test.php** from PWS.



21.9.5 PHP

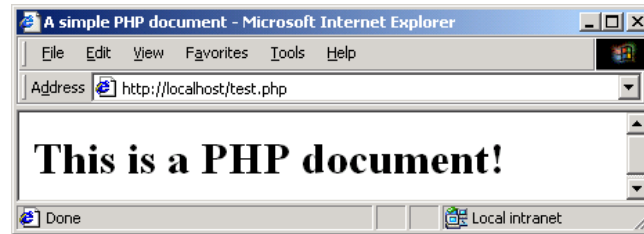


Fig. 21.24 Requesting `test.php` from Apache.

