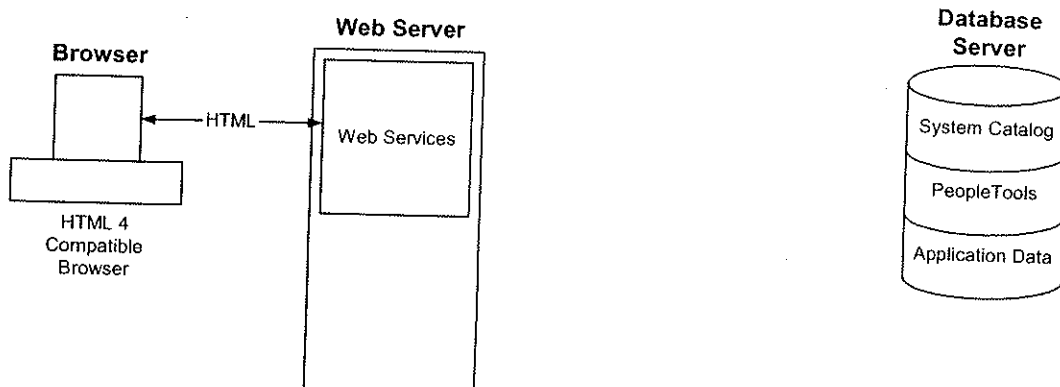


## Web Servers

A Web server acts as the front end of PIA, as illustrated in the following diagram.



### Browser and Web server interaction

When a client connects to the server, the system displays a sign-in screen, sent to the browser in HTML. Web services software manages communication with the browser.

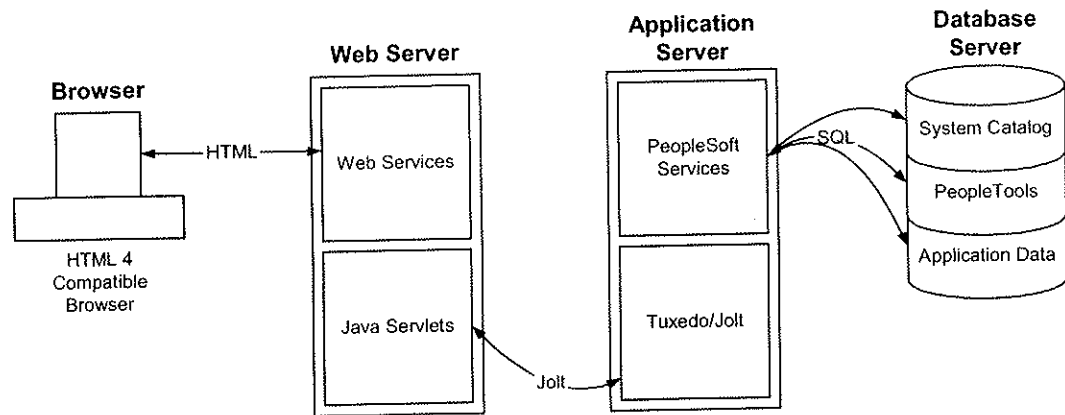


PeopleTools 8.4 supports Web services products from BEA (WebLogic) and IBM (WebSphere). Other Web services solutions, such as Microsoft IIS and Apache, can work as proxy servers. For more information, see course 471, *PeopleSoft Server Administration*.

Web services software displays HTML, but the HTML has to exist first. The database server has definitions stored in tables, but not HTML pages. We need one more piece to complete the PIA puzzle.

## Application Servers

If you worked with PeopleSoft 7, you might be familiar with the application server. This system is the workhorse at the center of the environment. In PeopleSoft 8, there is added functionality and a very tight association with the Web server, as shown in the following diagram.



### The application server's position in the PIA system

When a user navigates through a PeopleSoft application using a browser, a number of things happen under the covers. Below we follow a path that takes a request for a page of data about a student, Mark Larsen, from the database to the browser.

#### 1. PeopleTools tables

All the raw data required to assemble the student data page is contained in PeopleTools tables. This includes definitions of the component, page, fields, navigation, and other elements. This raw data is sent to the application server for assembly.

#### 2. Application data tables

The information about Mark Larsen is retrieved and sent to the application server.

#### 3. PeopleSoft services

There are dozens of individual processes running here. One (PSAPPSRV) takes the PeopleTools data and application data about Mark Larsen and assembles it into HTML for display.

#### 4. BEA Tuxedo and Jolt

BEA Tuxedo manages the multiple connections to the database. Jolt is a Java-based communication protocol. The assembled HTML is sent to the Web server.

#### 5. Java servlets

Individual programs manage the state of each user session, including a buffer that allows the use of the browser Back button. Servlets pass the HTML to Web services for display.

## Development Considerations for PIA

There are considerable advantages to developing applications that appear in a browser without a requirement for local code. We covered some of these advantages earlier in this chapter.

There are also disadvantages to this approach. Since data processing is done on a central application server, any time a user does something that requires processing, a new screen has to be generated on the application server and then passed to the Web server for display.

### Earlier PeopleTools Versions

Before PeopleSoft 8, much of the processing that created the user interface was performed on the client system. Because performance was not a problem, it was common to find PeopleCode attached to fields that would execute on simple actions such as changing focus from one field to the next.

With PeopleSoft 8, these practices must be reexamined. If screens have to be regenerated on the application server every time a user presses TAB, performance can slow to a crawl.

### Strategies for Limiting Server Trips

Two strategies limit the number of times user actions cause a trip to the application server for processing.

#### *Deferred Processing*

When enabled, all actions that the user takes are stored, and processing is batched as a single command when a page is saved.

This is an effective method for limiting server trips, but it should be weighed against the user experience. If a user action results in an immediate change on the screen, deferred processing may not be a good approach.

An additional feature, expert entry, allows power users to override processing and send all pending processing requests to the application server. In this way they can refresh the screen at will.

#### *Multi-Row*

When entering data into a grid, the standard approach is to insert data into the application data table at the completion of each row. With multi-row users can select the number of rows they wish to enter and then enter all of them without interim trips to the database server.



In this class, we discuss these topics at a conceptual level. We won't be concerned with either deferred processing or multi-row processing in the applications we build in Tools I. The Tools II class covers both subjects from the development point of view.

## Using the Development Environment

Users of PeopleSoft applications do their work in a browser. As a developer, you don't have that option. A development workstation requires Microsoft Windows and PeopleSoft software.

This section discusses:

- Requirements for a development workstation
- Requirements for testing development efforts

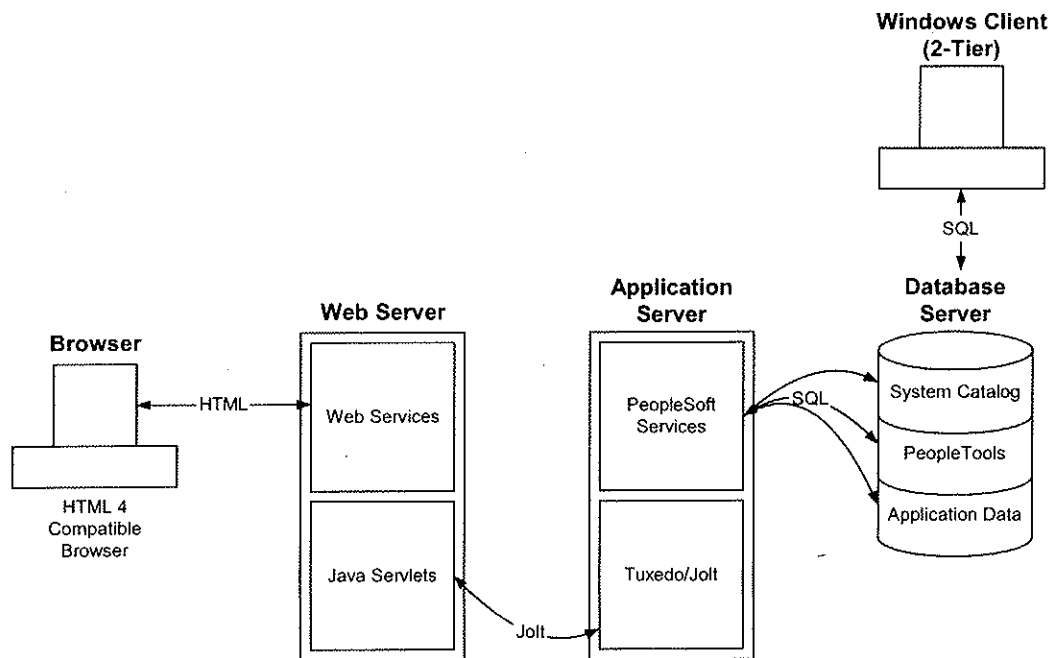
### Development Workstation Requirements

The vast majority of development work is done with a Microsoft Windows-based tool called PeopleSoft Application Designer. This tool is installed with PeopleTools.

### Two-Tier Connections

As a developer, you manipulate data directly in the database. As you create definitions in PeopleSoft Application Designer, the result is rows of data in PeopleTools tables.

If you make a two-tier connection, you are using database connectivity software to connect to the database directly, as shown in the following illustration.

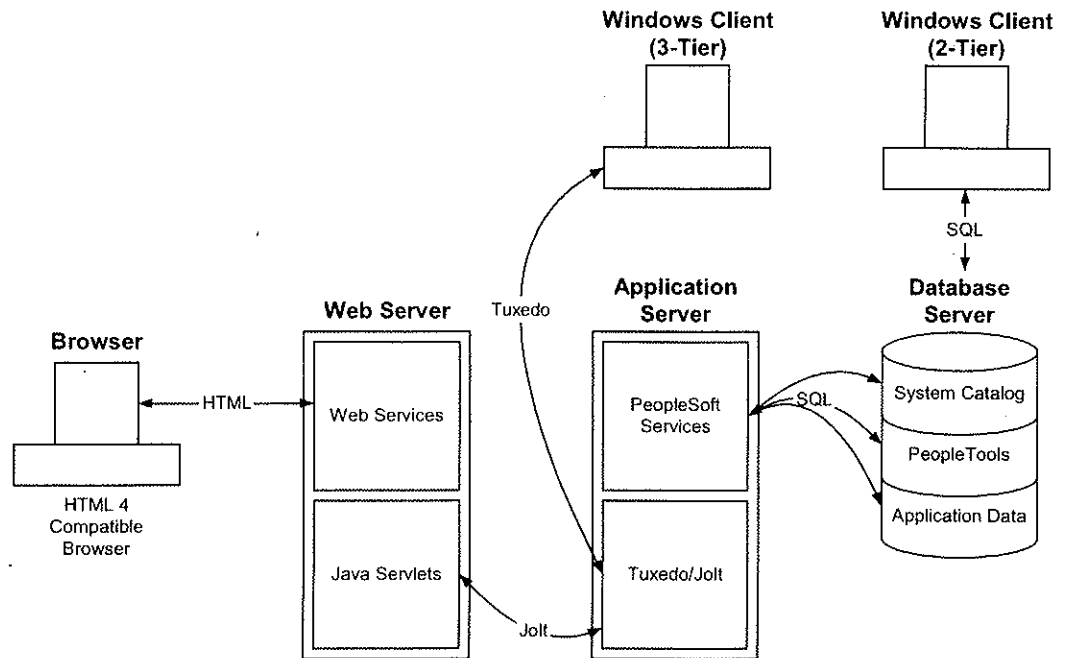


Two-tier connection with a Microsoft Windows client

### Three-Tier Connections

The three-tier client uses BEA Tuxedo and an application server to manage the database connection. This speeds performance over wide area network (WAN) connections and makes for a thinner client because no database client software is required.

This system requires Microsoft Windows and the PeopleSoft client software. The connection to the application server requires the TCP/IP protocol. The following diagram shows both types of connections.



Two-tier and three-tier connections

The following table contrasts two-tier and three-tier connections.

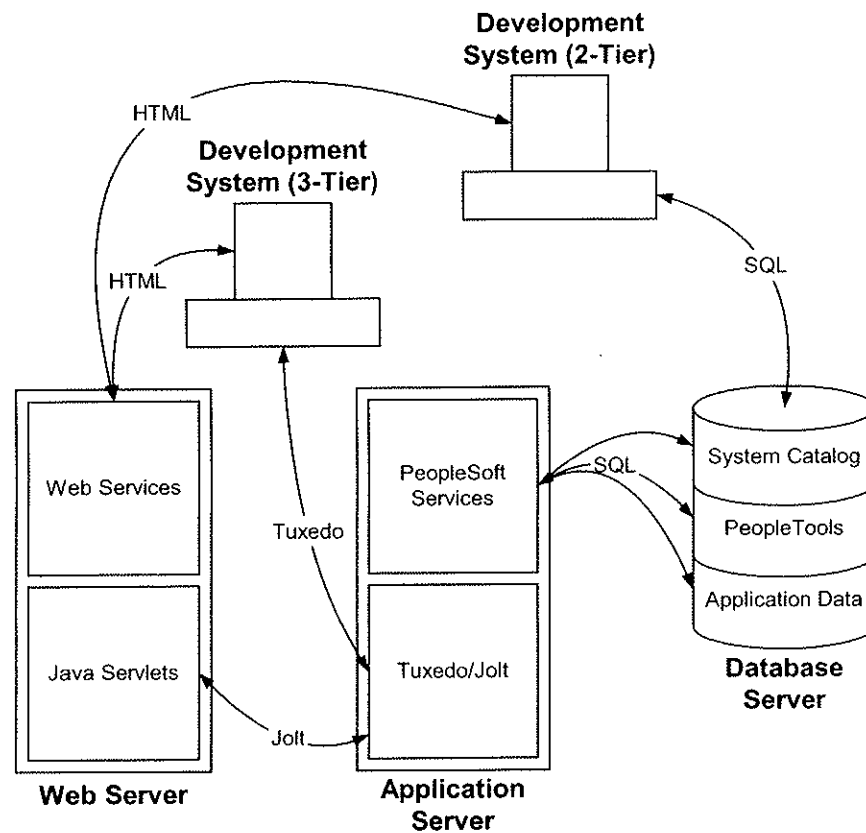
Connection Type	Communication Protocol	Security	Connection Management	Simplicity	Functionality
Two-tier	SQL is inefficient except when connected to a fast local network.	Direct database connectivity is required. There is potential for hacking.	This is handled by the database server, which can slow performance when multiple connections are made.	The setup is simple. You point to the database.	Handles all tasks.
Three-tier	BEA Tuxedo and TCP/IP are fast, especially over a WAN.	The connection is managed by the application server. There is less exposure to hacking.	This is handled by the application server; the database server only has to manage the connection to the application server.	Application server configuration is required.	Does not handle Data Mover and PeopleSoft Application Designer upgrades.

## Requirements for Testing

In previous releases of PeopleSoft, the user interface was delivered on a Windows workstation. Even in early releases of PeopleSoft 8, a Windows workstation could be used for basic testing.

With the release of PeopleTools 8.4, user client software is removed from the PeopleTools installation. Developers must use a browser and Web server for testing-a full PIA setup, as shown in the following diagram.

This is a major change for PeopleSoft developers.



### Required system elements for testing



In diagrams, we depict systems as separate machines. While you can set them up this way, many developers install multiple elements on a single development workstation. For example, a developer's workstation can include a browser, Web server, application server, and PeopleTools installation. The only external element in this case is the database.