Hunan University of Arts and Science

Networking Theory & Applications

CIS 291

2019 – 2020

Windows Server® 2012

Part 2

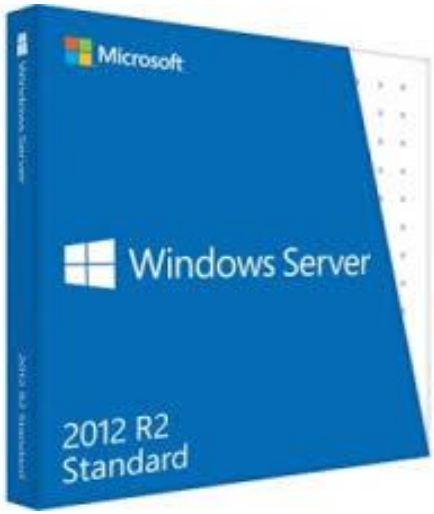
Chapter 2
Configuring server roles and features
配置服务器角色和功能

Objectives in this chapter: 本章的目标

1- Configure file and share access

2-`Configure print and document services

3- Configure servers for remote management



Objective 2.3: Configure print and document services

1- Deploying (install) a print server

Installing, sharing, monitoring, and managing multiple network print devices is a very large tasks.

A- Understanding the Windows print architecture

Printing in Microsoft Windows typically involves the following four components:

Print device: The actual hardware that produces hard-copy documents on paper or other print media. (Local – Network)

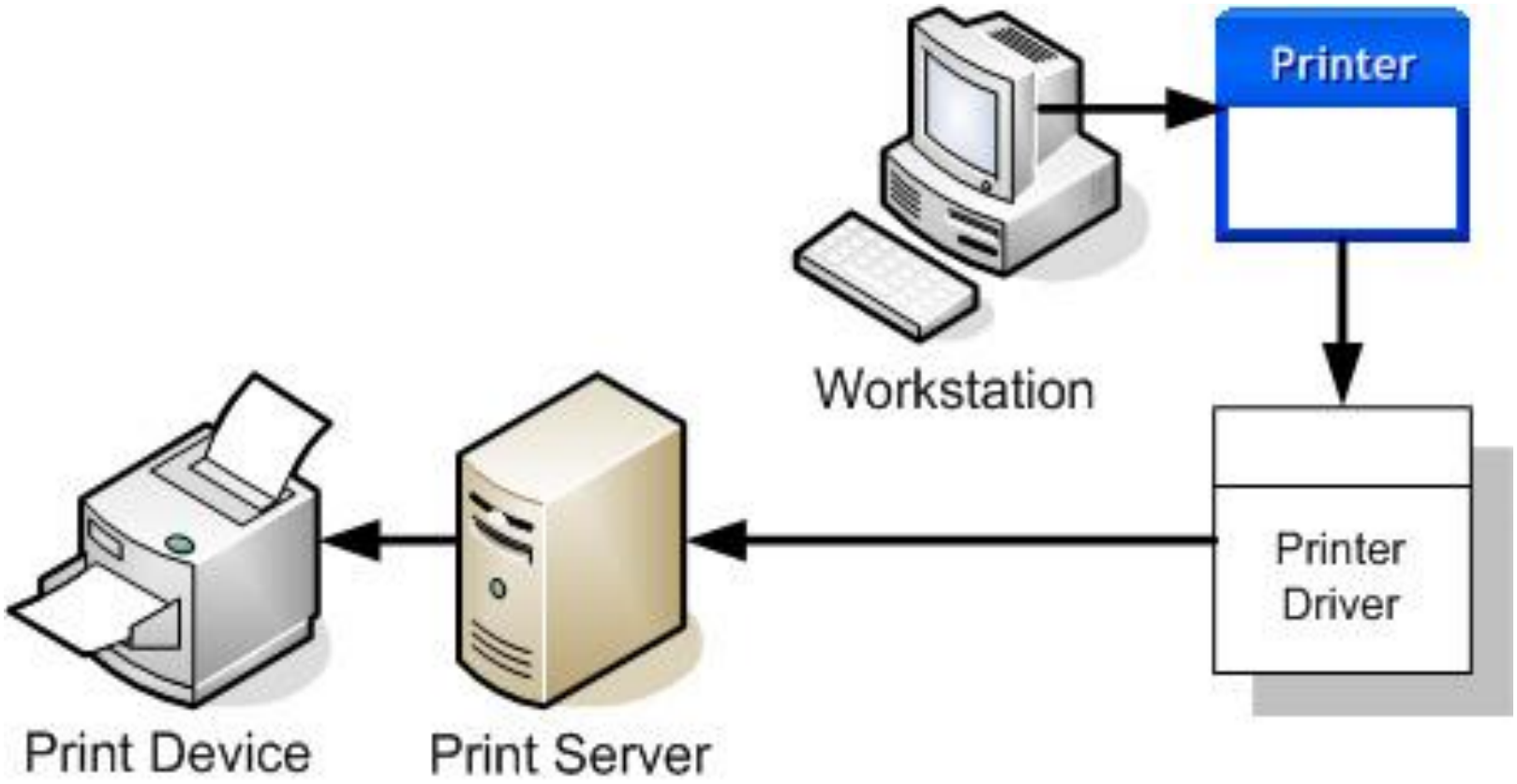
Printer: The software interface through which a computer communicates with a print device.

Print server: A computer (or standalone device) that receives print jobs from clients and sends them to print devices that are either locally attached or connected to the network.

Printer driver: A device driver that converts the print jobs generated by applications into an appropriate string of commands for a specific print device.

Each printer model has his private special driver

B- Understanding the Windows printing



The Windows Print Architecture

- To install a printer in Windows, you must do the following:
  1. Select the print device's specific manufacturer and model.
  2. Specify the port (or other interface) the computer will use to access the print device.
  3. Supply a printer driver specifically created for that print device.
- When you print a document in an application, you select the printer that will be the destination for the print job.
- The printer driver enables you to configure the print job to use the various capabilities of the print device.
- After the printer processes a print job, it stores the job in a print queue, known as a *spooler*.
- The spooled jobs might be in PCL (printer control language)format, ready to go to the print device, or in an interim format, in which case the printer driver must process the spooled jobs into the PCL format before sending them to the device.

C- Windows printing flexibility

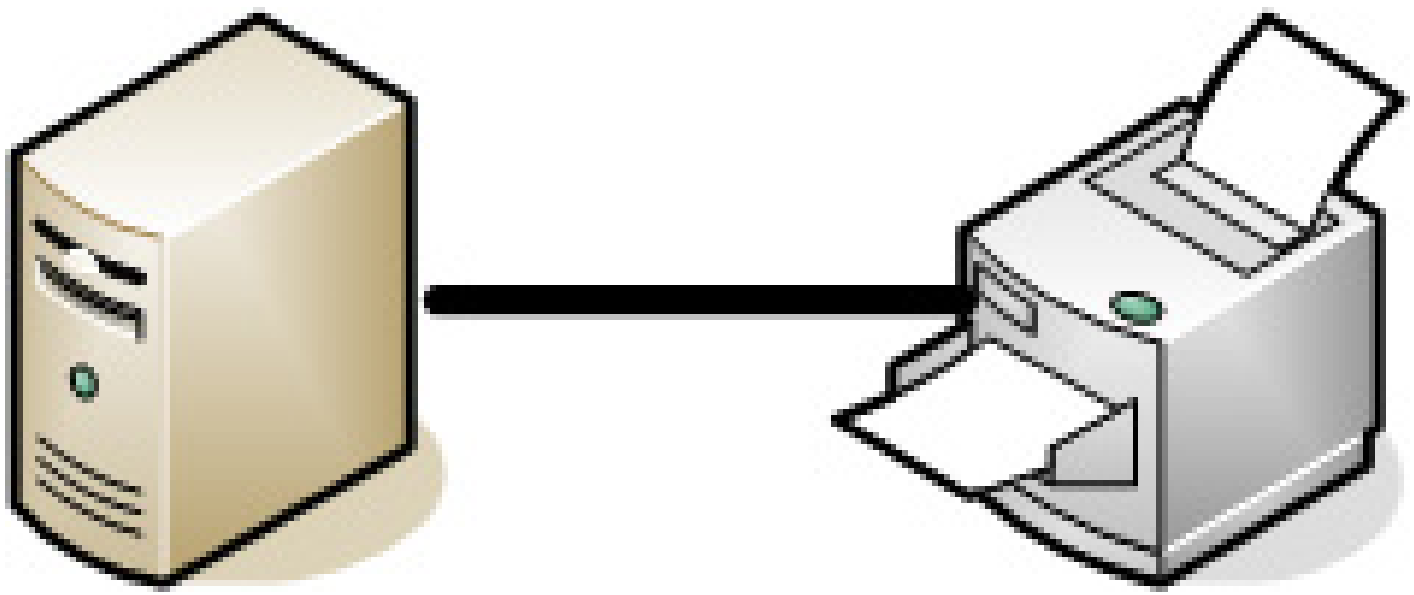
- A single computer can perform the roles of all printing components (except the print device), or they can be distributed across the network.

- There are four fundamental configurations:
    1. Direct printing
    2. Locally attached printer sharing
    3. Network-attached printing
    4. Network-attached printer sharing

1- Direct printing

- Consists of one print device connected to one computer, also known as a locally attached print device.

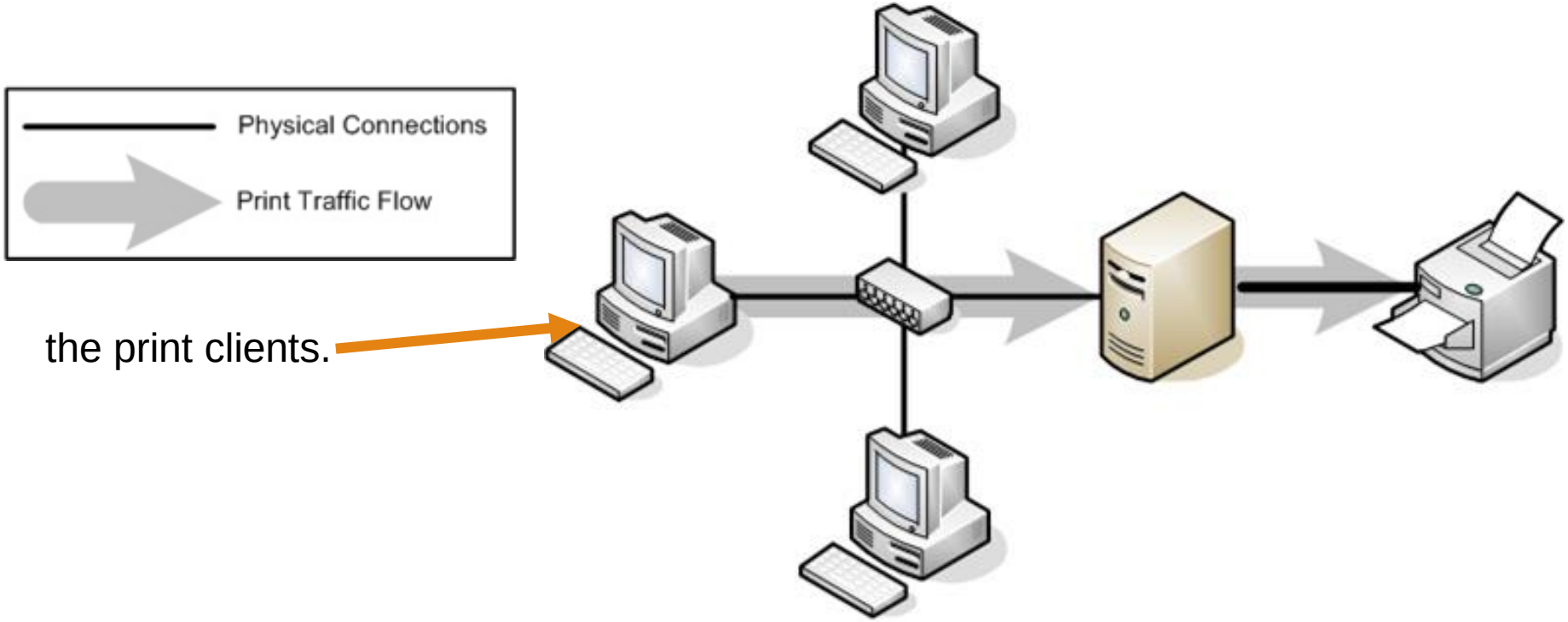
- When you connect a print device directly to a WS 2012 R2, the computer supplies the printer, printer driver, and print server functions.



A locally attached print device

2-Locally Attached Printer Sharing

In addition to printing from an application running on that computer, you can also share the printer (and the print device) with other users on the same network. In this arrangement, the computer with the locally attached print device functions as a print server

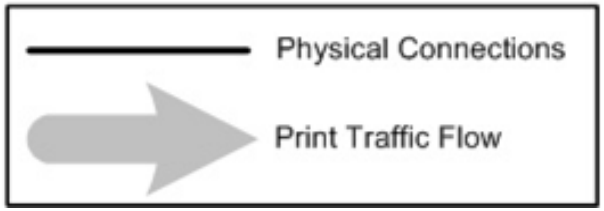


Sharing a locally attached printer

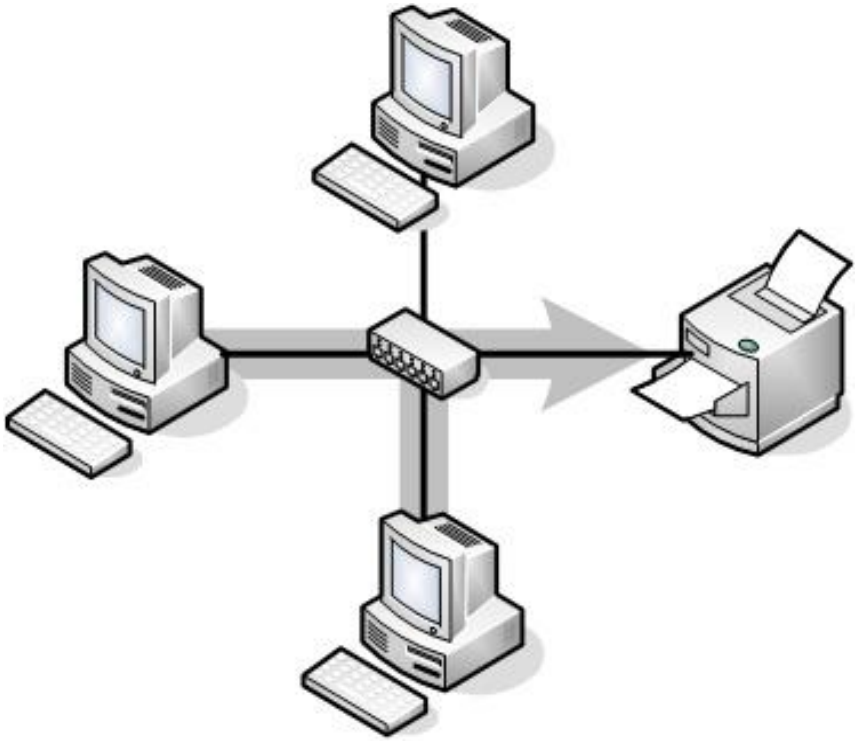
3- Network-Attached Printing

- With network-attached print devices, the primary deployment decision the administrator must make is to decide which computer will function as the print server. One simple option is to let each print client function as its own print server.

- Each client processes and spools its own print jobs, connects to the print device by using a TCP (Transmission Control Protocol) port, and sends the jobs directly to the device for printing.



A network-attached print device with multiple print servers



Disadvantages to Network-Attached Printing

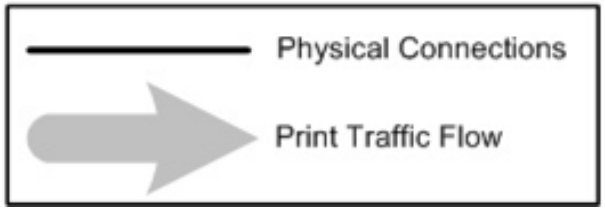
1. Users examining the print queue see only their own jobs, not the jobs of other users.
2. Users have no way of knowing what other jobs have been sent to the print device, or how long it will be until the print device completes their jobs.
3. Administrators have no way of centrally managing the print queue, because each client has its own print queue.
4. Administrators cannot implement advanced printing features, such as printer pools or remote administration.
5. Error messages appear only on the computer that originated the job the print device is currently processing.
6. All print job processing is performed by the client computer, rather than being partially offloaded to an external print server.

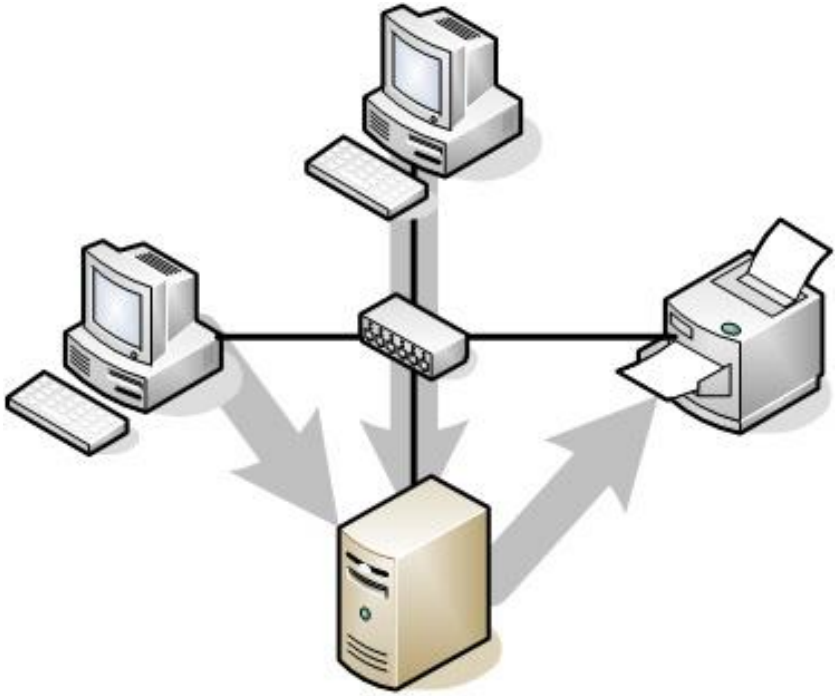
For these reasons, this arrangement is suitable only for small workgroup networks that do not have dedicated administrators supporting them.

4- Network-Attached Printer Sharing

designate one computer as a print server and use it to service all the print clients on the network.

the physical configuration is the same as in the previous arrangement, but the logical path the print jobs take on the way to the print device is different. Instead of going straight to the print device, the jobs go to the print server, which spools them and sends them to the print device in order.





A network-attached Printer Sharing

Advantages to Network-Attached Printer Sharing

1. All of the client jobs are stored in a single print queue, so that users and administrators can see a complete list of the jobs waiting to be printed.
2. Part of the job supplying load is shifted to the print server, returning control of the client computer to the user more quickly.
3. Administrators can manage all queued jobs from a remote location.
4. Print error messages appear on all client computers.
5. Administrators can implement printer pools and other advanced printing features.
6. Administrators can manage security, auditing, monitoring, and logging functions from a central location.

2- Sharing a Printer

LAB practice

- If a computer is to support heavy printer use, the following hardware upgrades might be needed:

  1. Additional system memory
  2. Additional disk space (for queued print jobs)
  3. Make one computer a dedicated print server

- A printer can be shared during the installation or any time after.

- To install a printer:

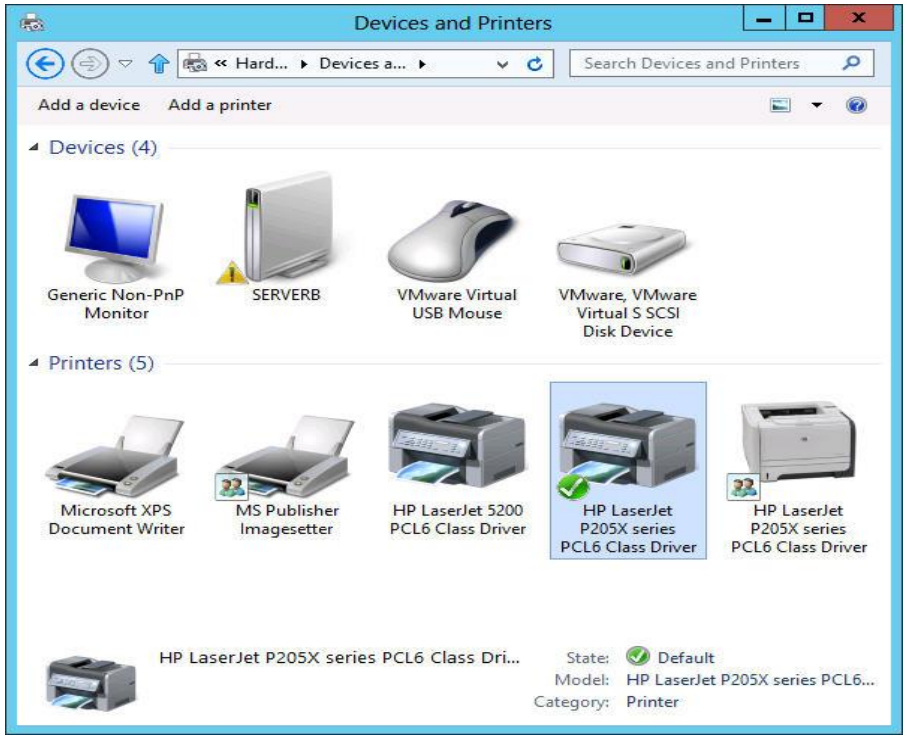
  USB: Upon connection and power up, a driver will automatically be installed, unless Windows does not have a driver.

  Network-attached printers: An installation program supplied with the device will locate, install, and configure.

- For network-attached print devices, an installation program supplied with the product locates the print device on the network, installs the correct drivers, creates a printer on the computer, and configures the printer with the proper IP address and other settings.

- After the printer is installed on the Windows Server 2012 R2 computer that will function as your print server, you can share it with your network clients by using the following procedure:

1. Open the Devices and Printers control panel. The Devices and Printers window appears.

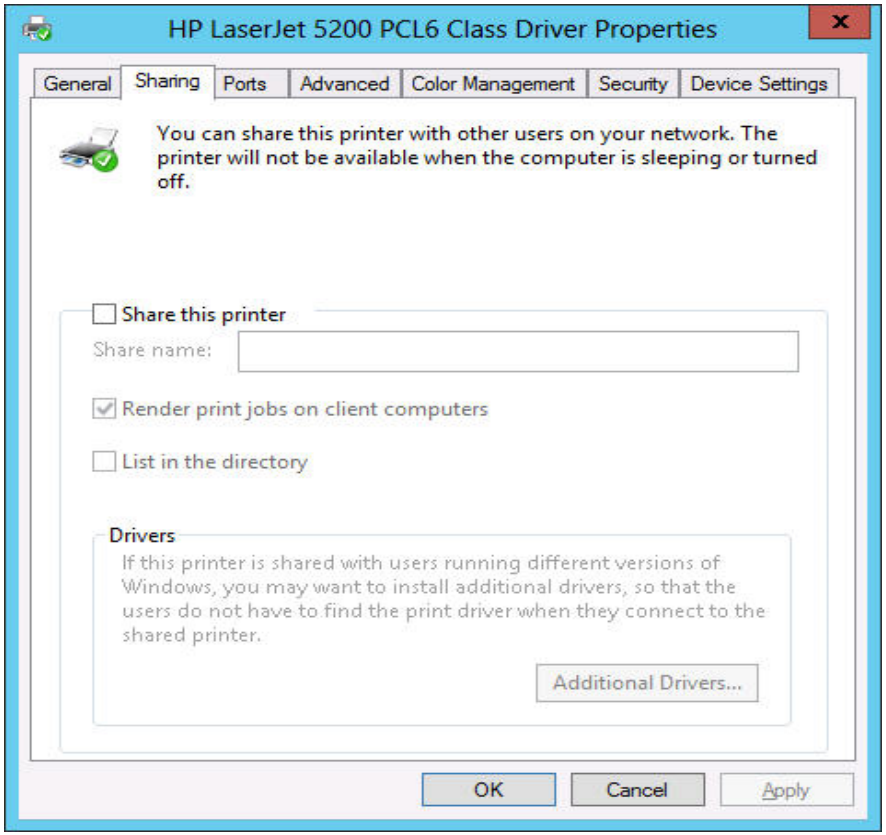


The Devices and Printers window

2. Right-click the icon for the printer you want to share and, from the shortcut menu, select Printer Properties. The printer's Properties sheet appears.
3. Click the Sharing tab.
4. Select the Share This Printer check box. The printer name appears in the Share Name text box. You can accept the default name or supply one of your own.
5. Select one or both of the following optional check boxes:

■ **Render Print Jobs On Client Computers**
Minimizes the resource utilization on the print server by forcing the print clients to perform the bulk of the print processing.

■ **List In The Directory**
Creates a new printer object in the Active Directory Domain Services (AD DS) database, enabling domain users to locate the printer by searching the directory. This option appears only when the computer is a member of an AD DS domain.



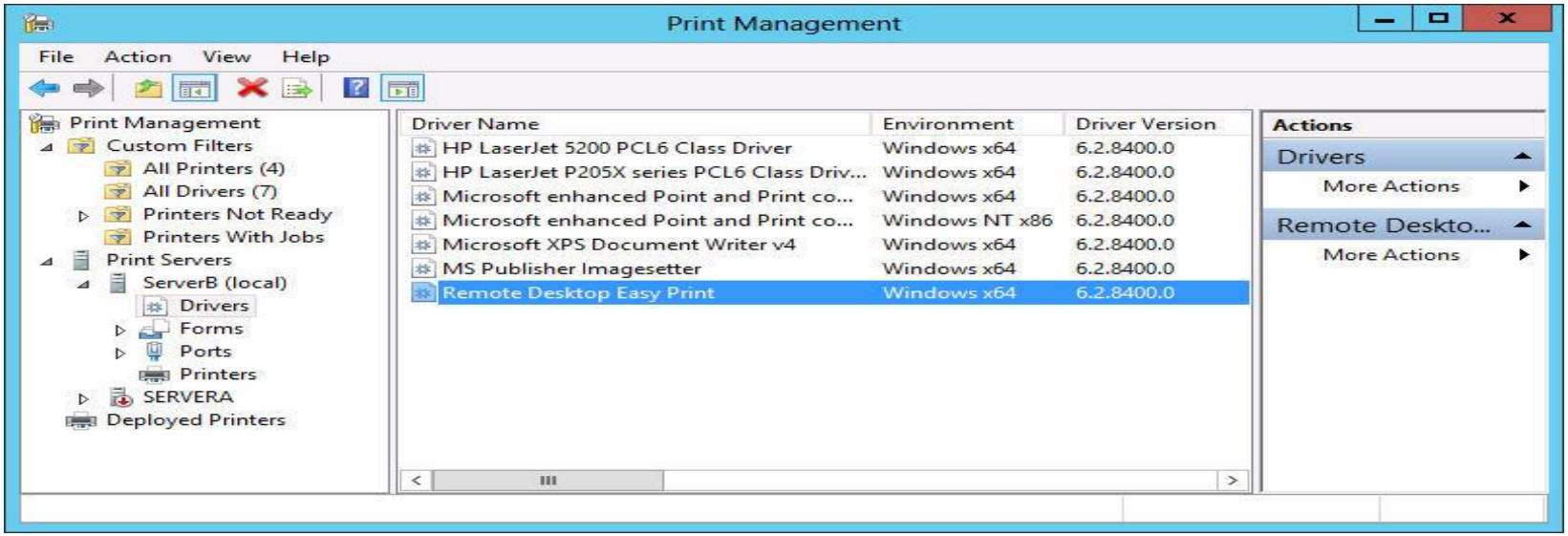
6. Click OK to close the Properties sheet for the printer.
The printer icon in the Printers control panel now includes a symbol indicating that it has been shared.

A- Managing Printer Drivers

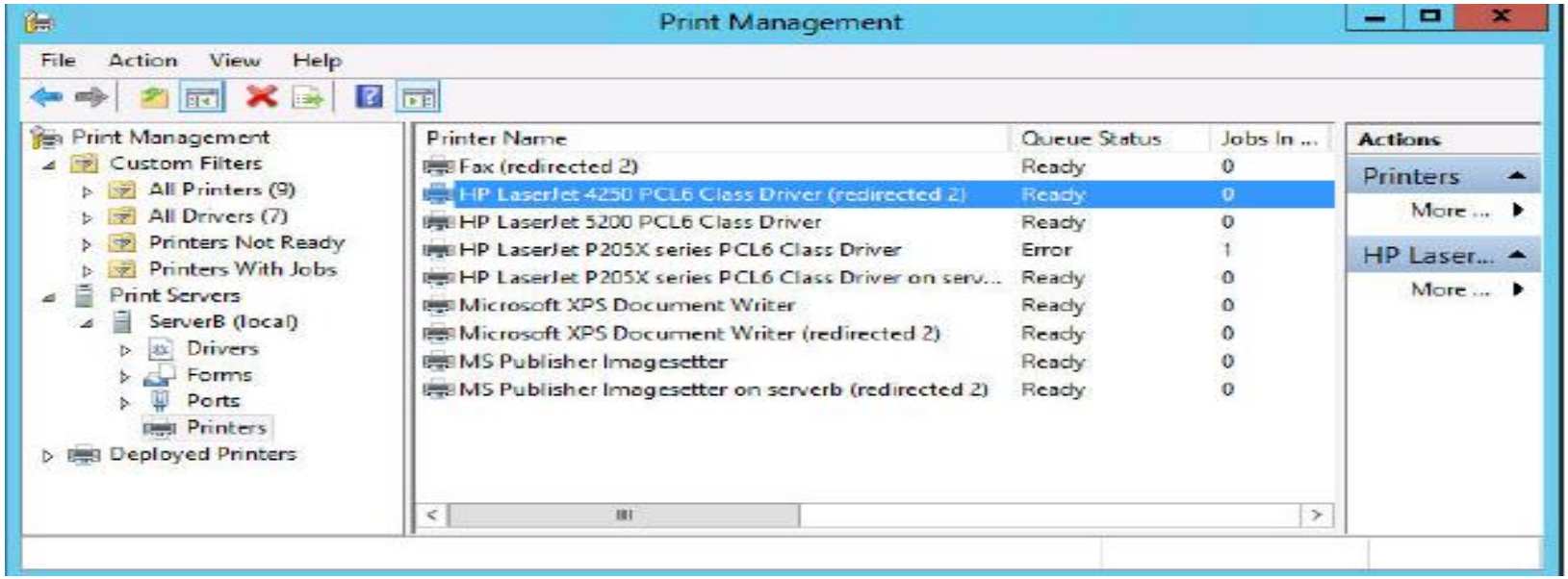
- Point and Print allows a client on a workstation to select a printer from the server, and Windows will automatically install the driver for the client.
- The drivers installed on WS 2012 are generally the same drivers used on the client workstations.
- Using the Additional Drivers dialog box, you can install drivers for client workstations that require different drivers, such as 32-bit versus 64-bit drivers, or drivers for older operating systems.

B- Using remote access Easy Print

- The component that enables Remote Desktop clients to print to their local print devices is called *Easy Print*.
- Easy Print takes the form of a printer driver that is installed on the server along with the Remote Desktop Session Host role service.
- Enables Remote Desktop clients to print to their local print devices.
- The driver functions as a redirector, enabling the server to access the printers on the connected clients.



The Remote Desktop Easy Print driver on a Remote Desktop Services server



Printers redirected by Easy Print on a Remote Desktop server

LAB practice

C-Configuring printer security

- Like folder shares, clients must have the proper permissions to access a shared printer.

- Much simpler than NTFS permissions:
  - Use the printer.
  - Manage documents submitted to printer.
  - Manage the properties of the printer.

D- Assign Printer Permissions

1. Open Control Panel and select Hardware, Devices and Printers. The Devices and Printers window appears.
2. Right-click one of the printer icons in the window and, from the shortcut menu, select Printer Properties. The printer's Properties sheet appears.
3. Click the Security tab. The top half of the display lists all the security principals currently possessing permissions to the selected printer. The bottom half lists the permissions held by the selected security principal.

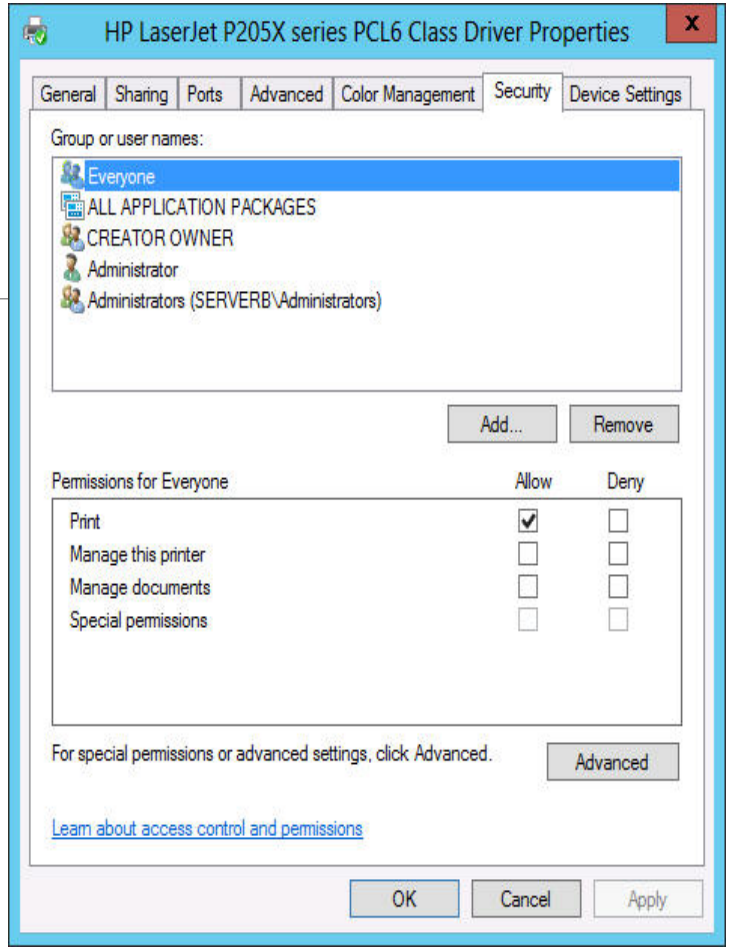
4. Click Add. The Select Users, Computers, Or Groups dialog box appears.

5. In the Enter The Object Names To Select text box, type a user or group name and click OK. The user or group appears in the Group Or User Names list.

6. Select the security principal you added and select or clear the check boxes in the bottom half of the display to Allow or Deny the user any of the basic permissions.

7. Click OK to close the Properties sheet.

8. Close Control Panel.

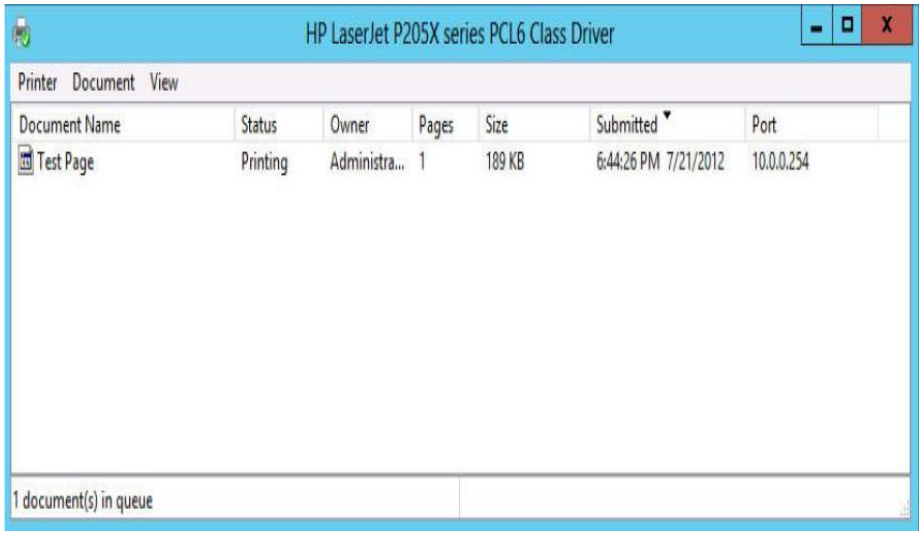


Like NTFS permissions, there are two types of printer permissions: basic and advanced.

3- Managing documents

- By default everyone can print and manage their own documents
- Allow Manage Documents permission allows users to manager other user's documents
- Managing refers to how to manage documents that are currently waiting in a print queue.
  - Pausing
  - Resuming
  - Restarting
  - Canceling
- To manage documents, use the following procedure:

1- Open Control Panel and select Hardware, Devices and Printers.
2- The Devices and Printers window appears.
3- Right-click one of the printer icons and, from the shortcut menu, select See What's Printing.
4- A print queue window named for the printer appears.



4- Managing printers

Managing a printer refers to adjust the operational parameters that affect all users and controlling access to the printer.

Typical configuration tasks include:

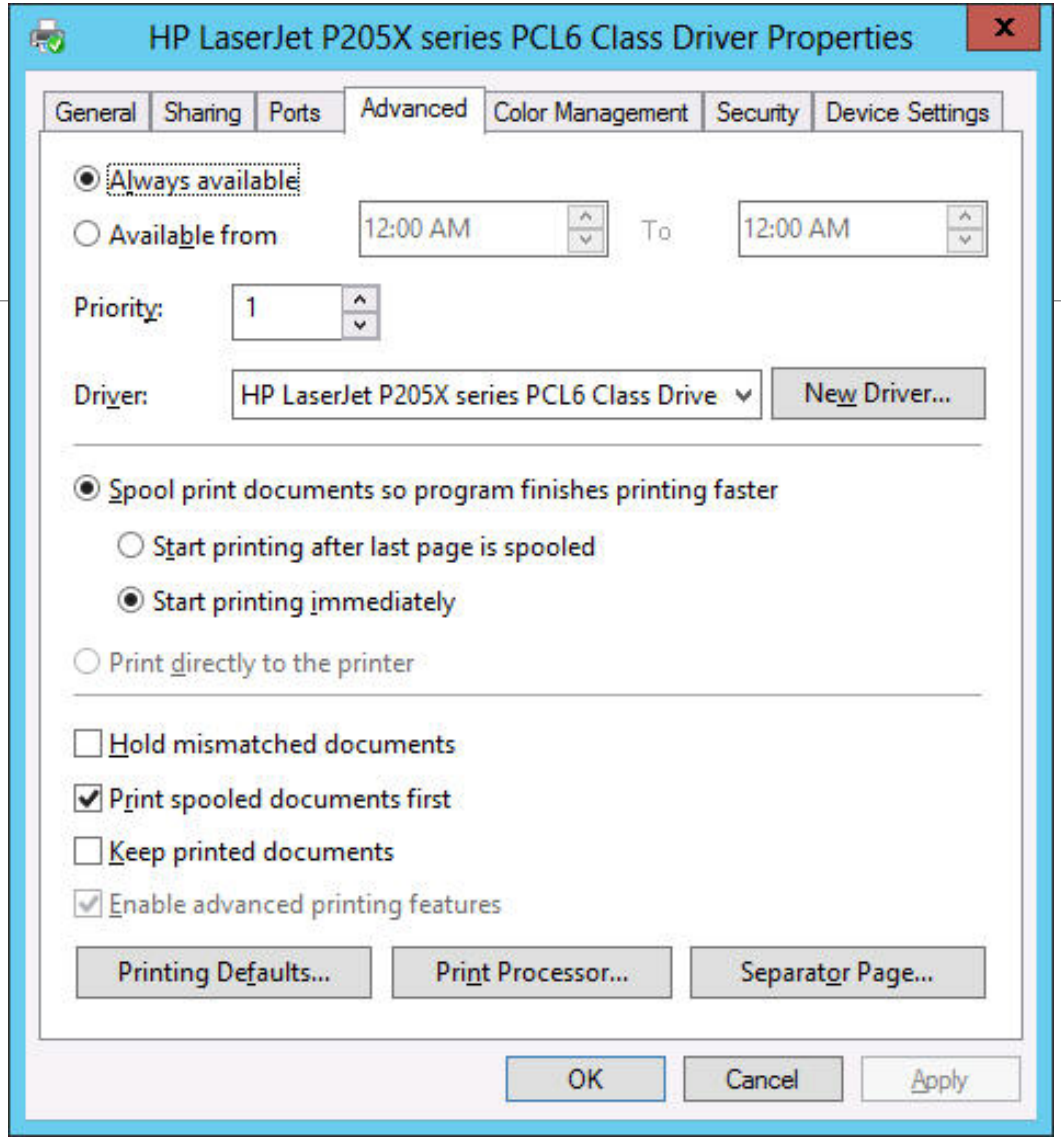
Setting printer priorities: Multiple printers connected to the same print device to allow certain users' print jobs to print before others.

Scheduling printer access: Multiple printers connected to the same print device with different time schedules for availability.

Creating a printer pool: One printer connected to multiple print devices to increase throughput and provide fault tolerance.

A printer pool increases the production capability of a single printer by connecting it to multiple print devices. When you create a printer pool, the print server sends each incoming job to the first print device it finds that is not busy. This effectively distributes the jobs among the available print devices, providing users with more rapid service. It can be done by Ports tab in the printer's properties.

LAB practice



The Advanced tab of a printer's Properties sheet

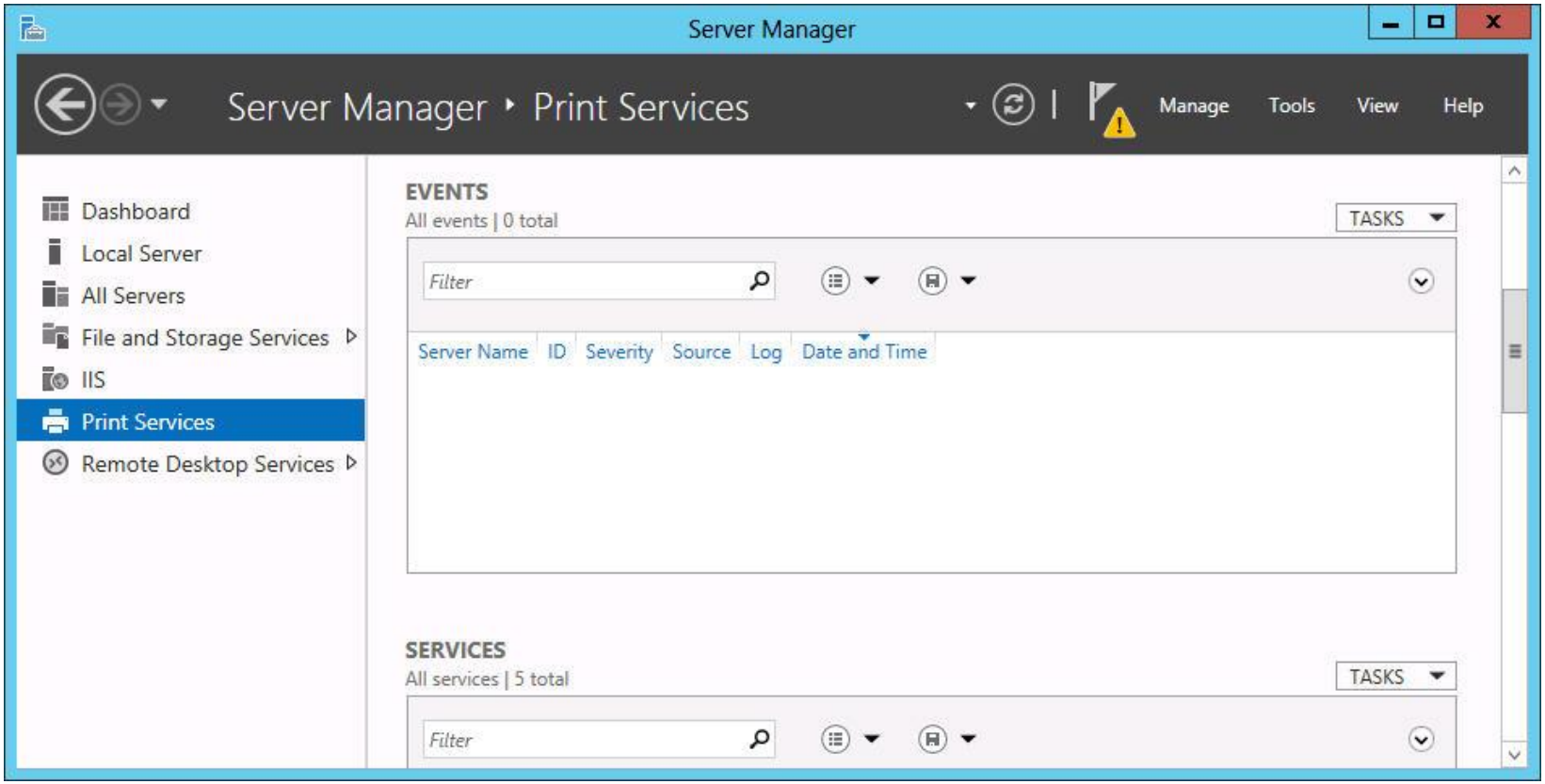
5- Using the Print and Document Services Role

- The Windows Server 2012 default installation configuration makes available all printer sharing and management capabilities discussed in the previous sections.
- For administrators involved with enterprise network printing, installing the Print and Document Services role on the computer provides additional tools that are particularly useful.

When you install the Print And Document Services role by using Server Manager's Add Roles And Features Wizard, a Select Role Services page appears, enabling you to select from the following options:

Role Service	***Wizard Pages Added***	***System Services Installed***	***Description***
Print Server	[None]	Print Spooler (Spooler)	Installs the Print Management console for Microsoft Management Console (MMC), which enables administrators to deploy, monitor, and manage printers throughout the enterprise. This is the only role service that is required when you add the Print Services role.
Distributed Scan Server	[None]	Distributed Scan Server (ScanServer)	Enables the computer to receive documents from network-based scanners and forward them to the appropriate users.
Internet Printing	[None]	World Wide Web Publishing Service (w3svc) IIS Admin Service (iisadmin)	Creates a website that enables users on the Internet to send print jobs to shared Windows printers.
LPD Service	[None]	TCP/IP Print Server (LPDSVC)	Enables UNIX clients running the LPR (line printer remote) program to send their print jobs to Windows printers.

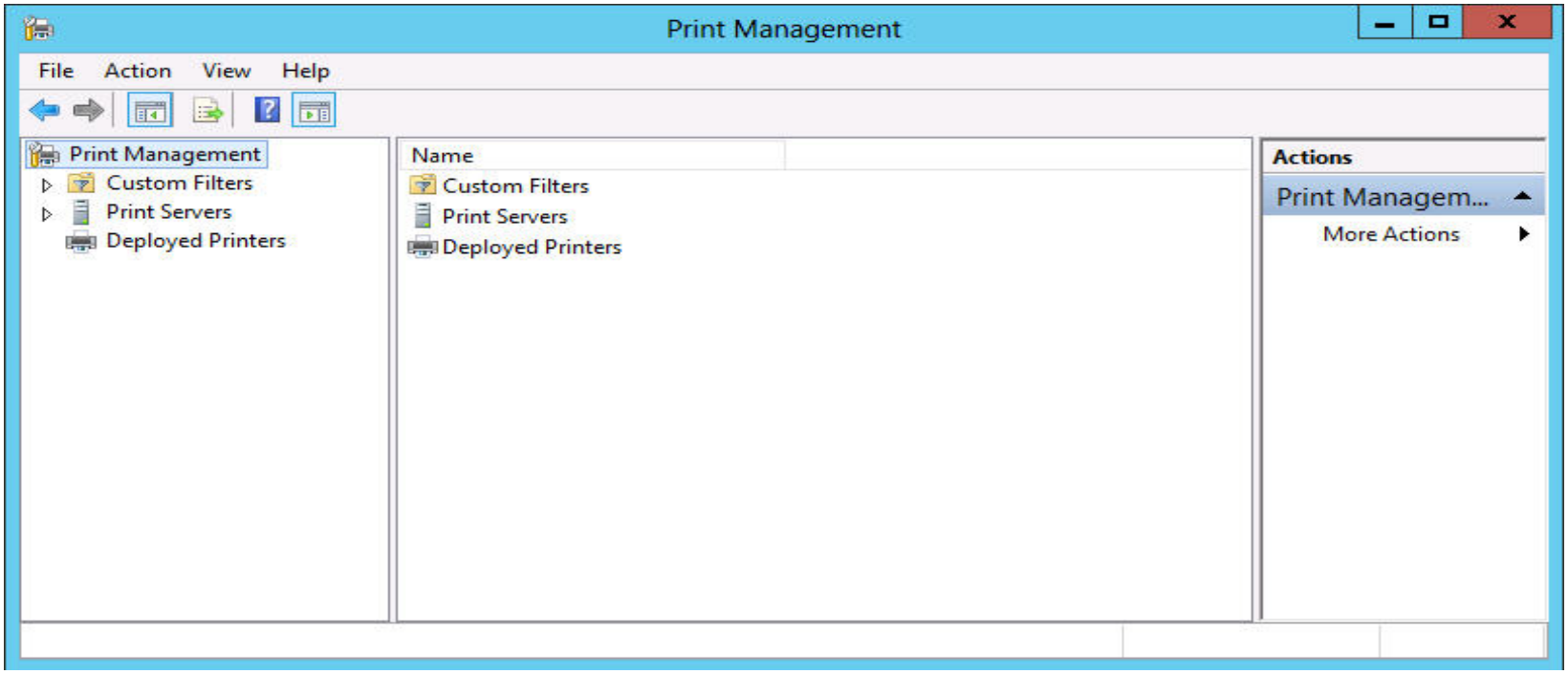
WS 2012 R2 adds a new icon to the Server Manager navigation pane when you install a role. The Print Services home page contains a filtered view of print-related event log entries, a status display for the role-related system services and role services, and performance counters.



The Print Services node in Server Manager

Using the Print Management Console

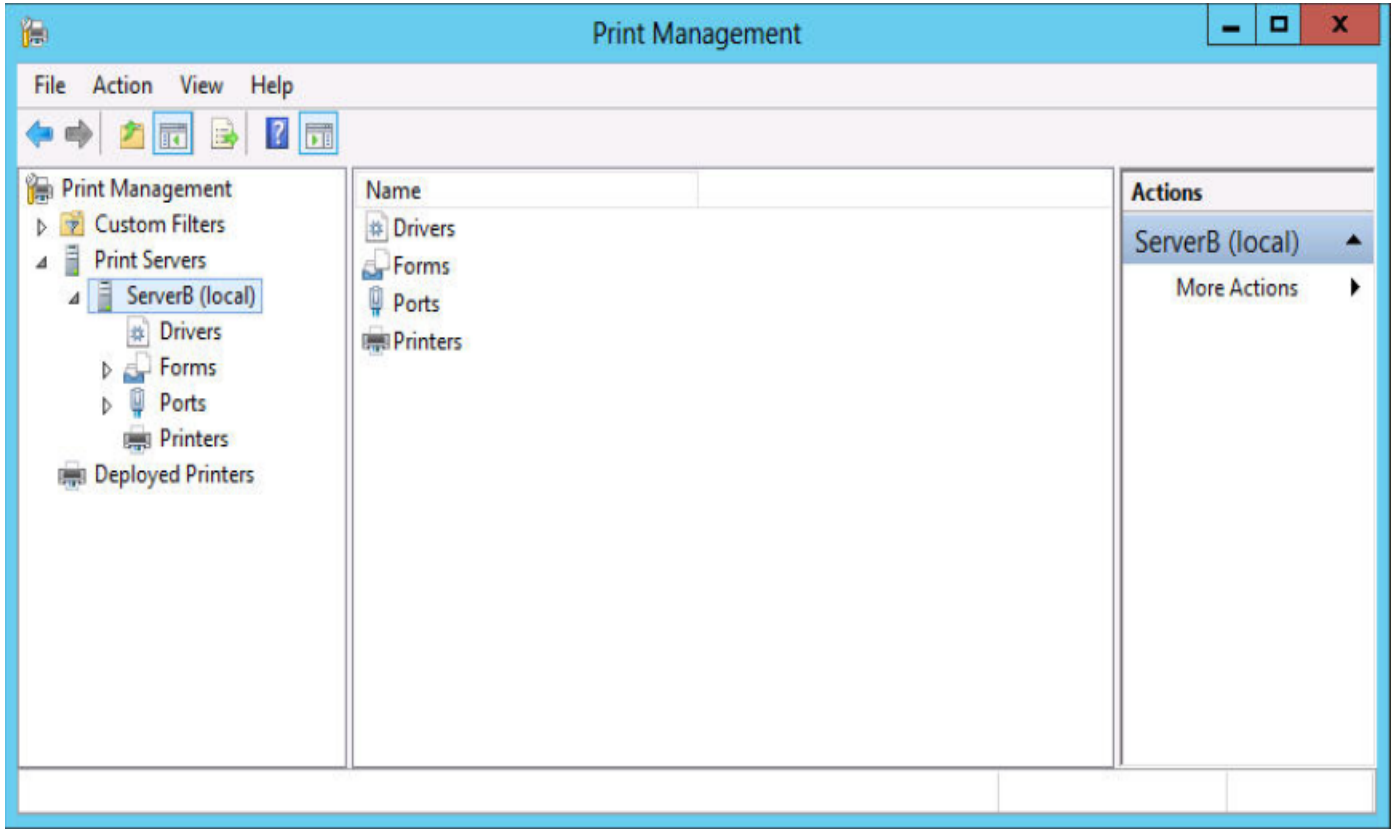
The Print Management console, an administrative tool, combines the controls for the printing components throughout the enterprise into a single console. By using this tool, you can access the print queues and Properties sheets for all the network printers in the enterprise, deploy printers to client computers by using Group Policy, and create custom views that simplify the process of detecting print devices that need attention due to errors or used up consumables.



The Print Management console

A- Adding Print Servers

By default, the Print Management console displays only the local machine in its list of print servers. Each print server has four nodes beneath it



A print server displayed in the Print Management console

To manage other print servers and their printers, you must add them to the console by using the following procedure:

1. In Server Manager, click Tools and then click Print Management to open the Print Management console.
2. Right-click the Print Servers node and, from the shortcut menu, click Add/Remove Servers to open the Add/Remove Servers dialog box.
3. In the Specify Print Server box, click Browse. The Select Print Server dialog box opens.
4. Select the print server you want to add to the console and click Select Server. The server you selected appears in the Add Server text box in the Add/Remove Servers dialog box.
5. Click Add To List. The server you selected appears in the Print Servers list.
6. Click OK. The server appears under the Print Servers node.
7. Close the Print Management console.

B - Viewing printers

- On large enterprise networks, administrators must keep track of dozens or hundreds of print devices. all in frequent use and all needing attention on a regular basis(a major repair, an ink or toner replenishment, or a paper tray refill)
- The Print Management console provides a multitude of ways to view the printing components by applying filters to the complete list of printers.
- There are four default filters (All Printers, All Drivers, Printers Not Ready, and Printers With Jobs)
- Views such as Printer Not Ready are a useful way for administrators to identify printers that need attention without having to browse individual print servers or search through a long list of every printer on the network. And you can also create custom filters.

C- Managing Printers and Print Servers

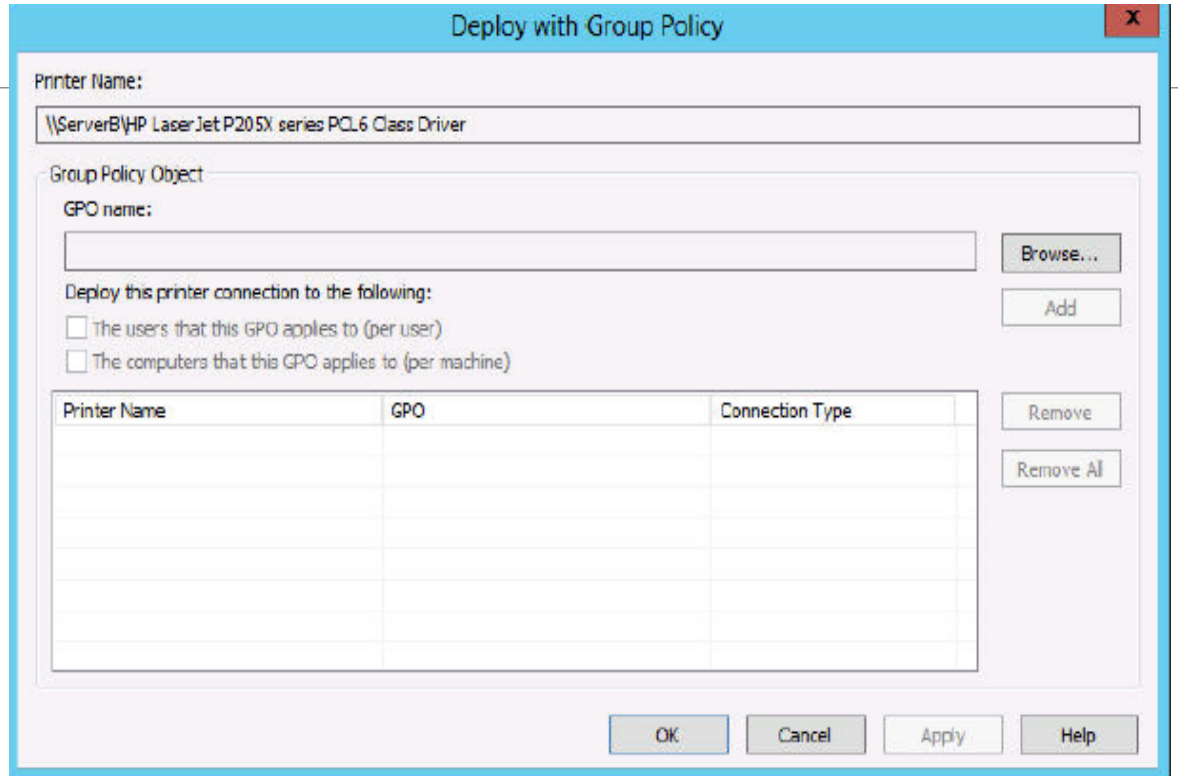
- The Print Management console also enables administrators to access the configuration interface for any printer or print server appearing in any of its displays.
- Administrators can then configure printers and print servers without having to travel to the site of the print server or establish a Remote Desktop connection to the print server.

6- Install printers with Group Policy

- Configuring a print client to access a shared printer is a simple matter of browsing the network or the AD DS tree and selecting the printer. However, when you have to configure hundreds or thousands of print clients, the task becomes more complicated.
- AD DS helps simplify the process of deploying printers to large numbers of clients.
- Administrators can search for printers in the AD DS database by name, location, or model.
- To create a printer object in the AD DS database, you can either select the List In The Directory check box while sharing the printer or right-click a printer in the Print Management console and, from the shortcut menu, select List In Directory.
- To use AD DS to deploy printers to clients, you must configure the appropriate policies in a Group Policy object (GPO). You can link a GPO to any domain, site, or organizational unit (OU) in the AD DS tree. When you configure a GPO to deploy a printer, all the users or computers in that domain, site, or OU will receive the printer connection by default when they log on.

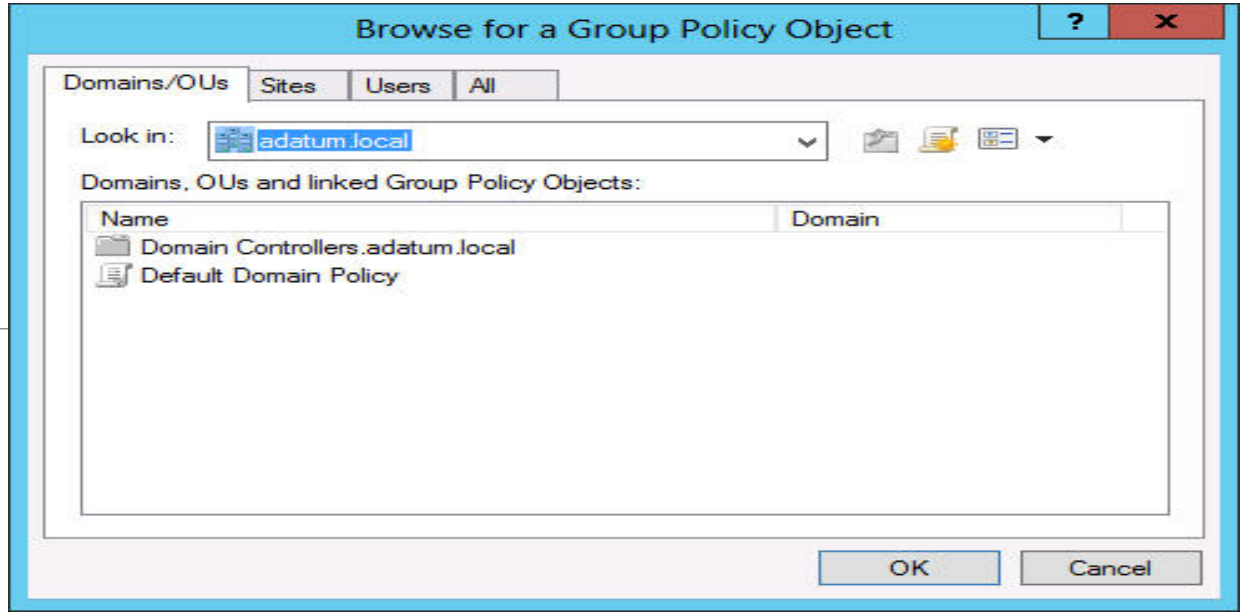
To deploy printers with Group Policy, use the following procedure:

1- In the Print Management console, right-click a printer in the console's scope pane and, from the shortcut menu, select Deploy With Group Policy.



2- Click Browse to open the Browse For A Group Policy Object dialog box.
3- Select the GPO you want to use to deploy the printer and click OK. The GPO you selected appears in the GPO Name field.

The Browse for a Group Policy Object dialog box



4- Select the appropriate check box to select whether to deploy the printer to the users associated with the GPO, the computers (or both) and click Add. The new printer GPO associations appear in the table.

5- Click OK. A Print Management message box appears, informing you that the operation has succeeded.

6- Click OK and then click OK again to close the Deploy With Group Policy dialog box.

The next time the users running Windows Server 2008 or later and Windows Vista or later who are associated with the GPO refresh their policies or restart, they will receive the new settings and the printer will appear in the Devices and Printers control panel.

Questions review: Homework :

1- Objective review P111,P112.
2- Thought experiment p110