

Deploying a Printer Server in an Active Directory Environment Using GPO

This project demonstrates centralized printer deployment using Windows Server, Print Management, and Group Policy in an Active Directory environment. The main objective is to automatically deploy printers to domain users based on their department and group membership, reducing the need for manual printer installation on individual computers and ensuring that users receive only the printers relevant to their role or location.

Centralized printing is essential because it simplifies administration and improves efficiency. Instead of installing and configuring printers on each workstation separately, a single print server is used to manage printer drivers, sharing, and deployment through Group Policy. By assigning printers based on departments and Active Directory security groups, the organization can ensure accurate printer distribution, reduce configuration errors, and enhance security. This approach also makes troubleshooting easier, as all printer settings and access controls are managed from one central location.

Why Centralized Printing Matters



Simplified Printer Management

Centralized printing consolidates printer management to one location, reducing configuration time and errors.

Enhanced Security and Compliance

Central control of access and permissions ensures secure printing and easier compliance monitoring.

Improved Troubleshooting Efficiency

Administrators can diagnose and fix issues from a single point without visiting each device physically.

Scalability and Uniformity

Centralized systems automatically configure new devices, ensuring consistent settings across large networks.

Server Manager → Add Roles and Features

Select Print and Document Services → Print Serve

Install Printer Driver via Printer.everestitt.com

Add Printer and Enable Sharing

Deploy via Group Policy (Employees OU)

Verify in Active Directory

gpupdate /force → Printer appears on domain PCs

Install Print and Document Services



Access Server Manager

Open Server Manager on your domain controller or designated server to begin the installation process.

Add Roles and Features

Navigate to 'Manage' and select 'Add Roles and Features' to open the installation wizard.

Select Print and Document Services

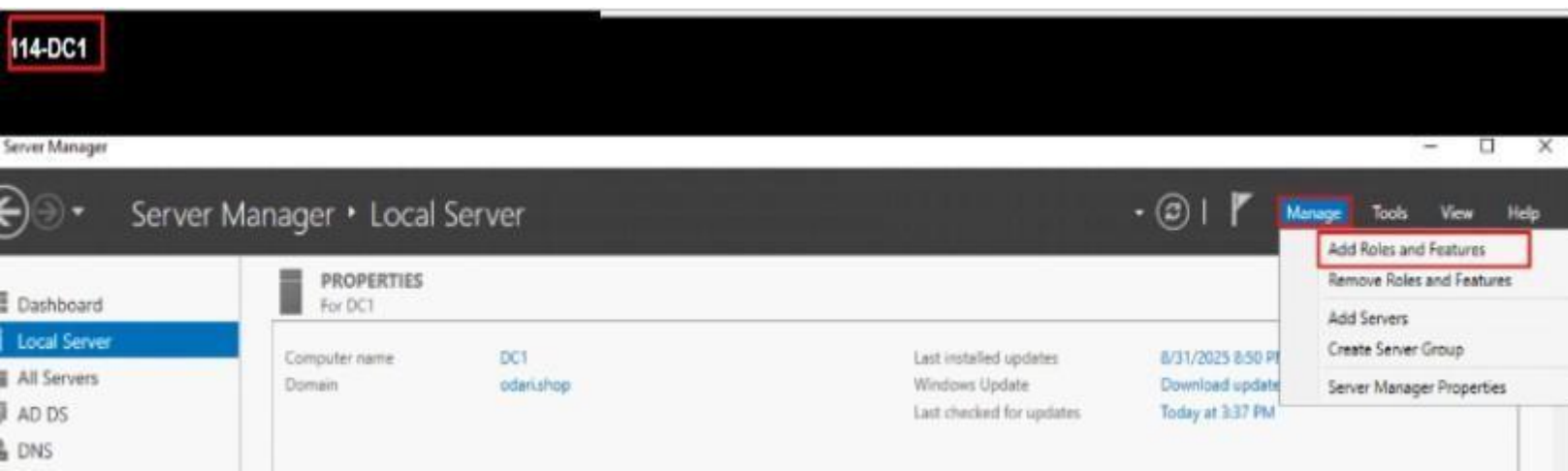
Choose 'Print and Document Services' under Server Roles to enable centralized print management.

Verify Installation

Ensure the role is installed and active in Server Manager for further printer configuration.

➤ Step 1: Open Server Manager on your Domain Controller or Server.

➤ Step 2: Go to Manage > Add Roles and Features.



Add Roles and Features Wizard

DESTINATION SERVER
DC1.odari.shop

Before you begin

Before You Begin

Installation Type

Server Selection

Server Roles

Features

Confirmation

Results

This wizard helps you install roles, role services, or features. You determine which roles, role services, or features to install based on the computing needs of your organization, such as sharing documents, or hosting a website.

To remove roles, role services, or features:
Start the [Remove Roles and Features Wizard](#)

Before you continue, verify that the following tasks have been completed:

- The Administrator account has a strong password
- Network settings, such as static IP addresses, are configured
- The most current security updates from Windows Update are installed

If you must verify that any of the preceding prerequisites have been completed, close the wizard, complete the steps, and then run the wizard again.

To continue, click Next.

☐ Skip this page by default

< Previous **Next >** Install Cancel

Add Roles and Features Wizard

DESTINATION SERVER
DC1.odari.shop

Select installation type

Before You Begin

Installation Type

Server Selection

Server Roles

Features

Confirmation

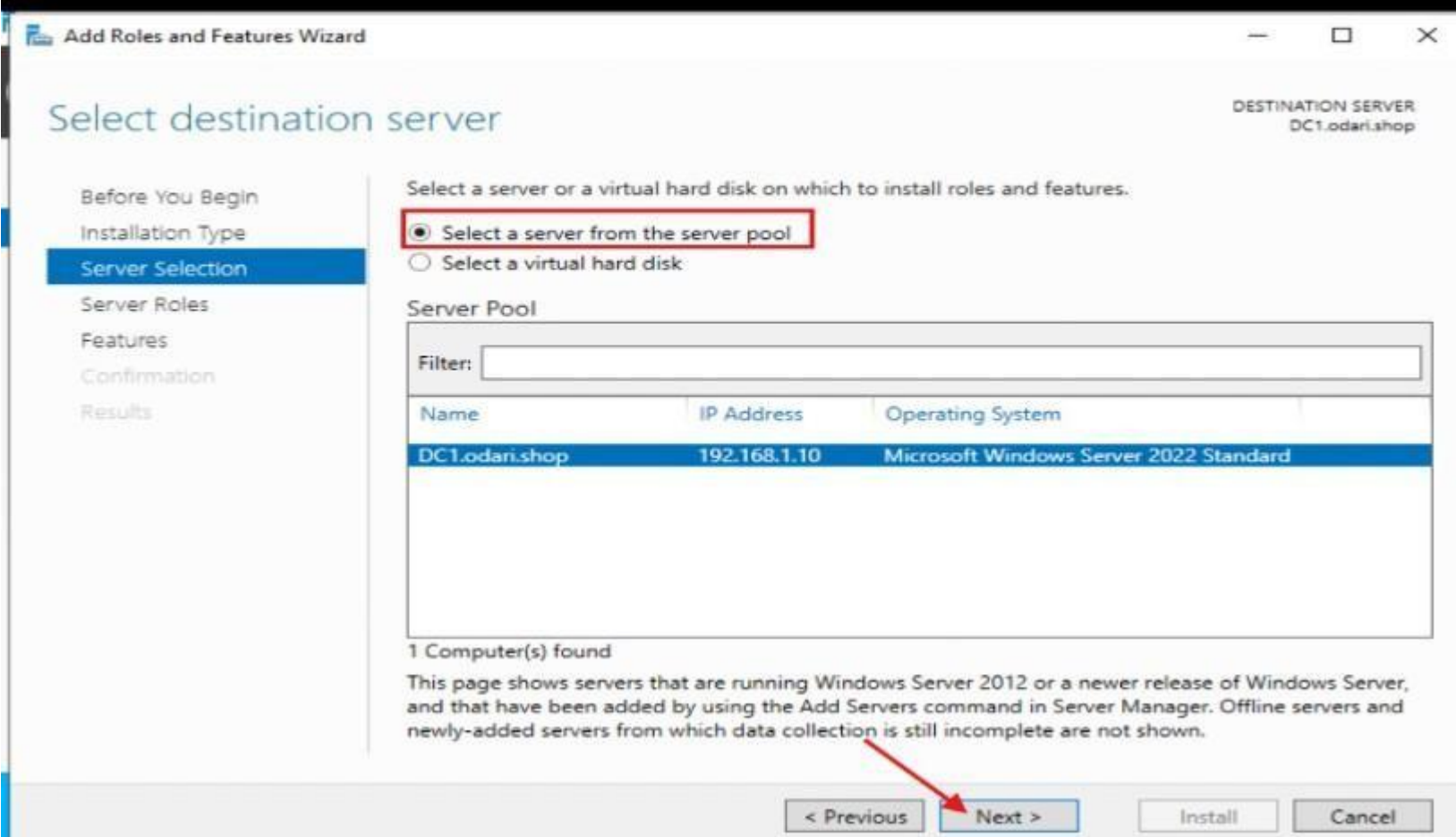
Results

Select the installation type. You can install roles and features on a running physical computer or virtual machine, or on an offline virtual hard disk (VHD).

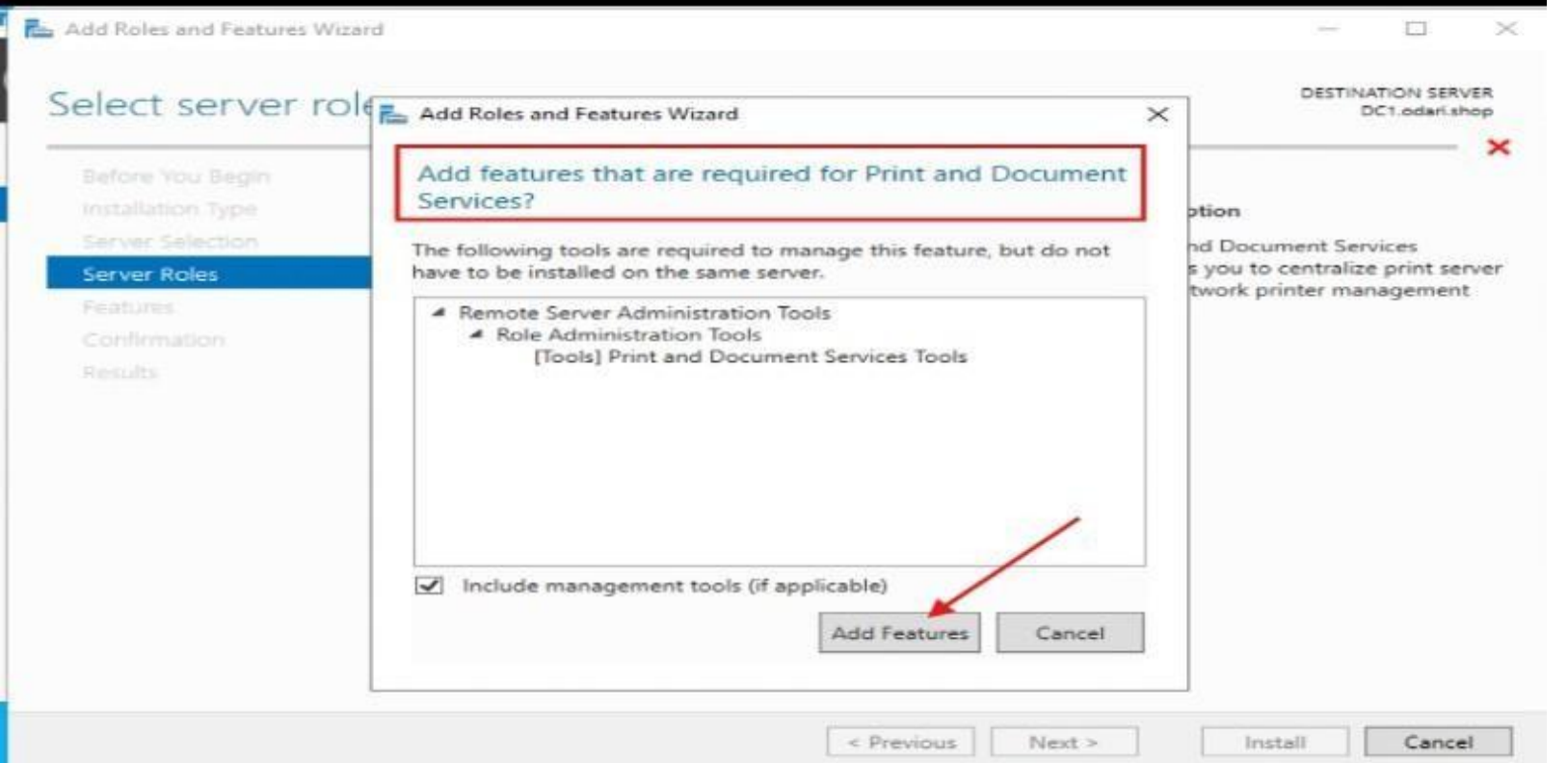
☒ **Role-based or feature-based installation**
Configure a single server by adding roles, role services, and features.

☐ **Remote Desktop Services installation**
Install required role services for Virtual Desktop Infrastructure (VDI) to create a virtual machine-based or session-based desktop deployment.

< Previous **Next >** Install Cancel

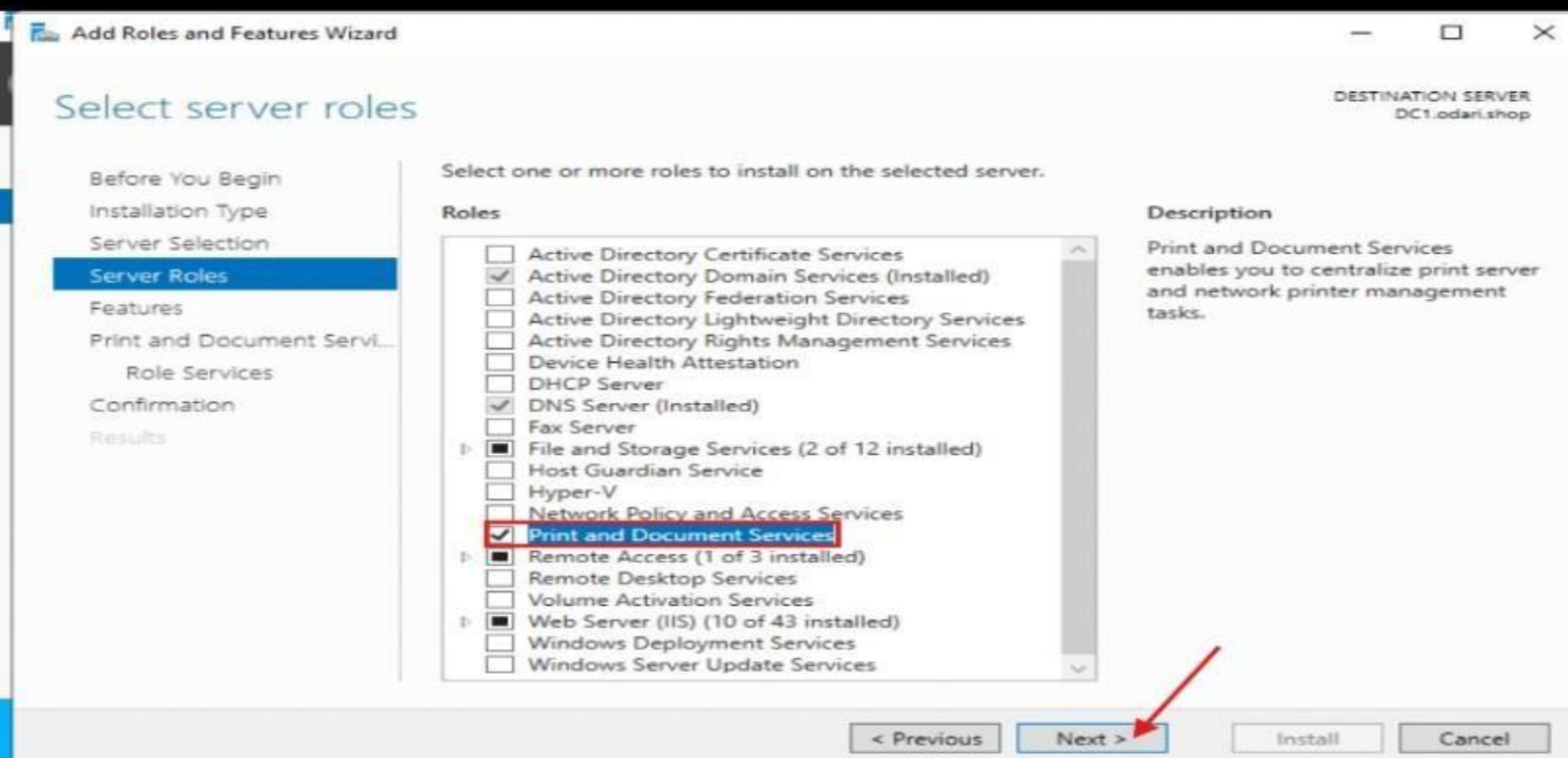


➤ Step 3: Select 'Print and Document Services' under Server Roles and click Next.

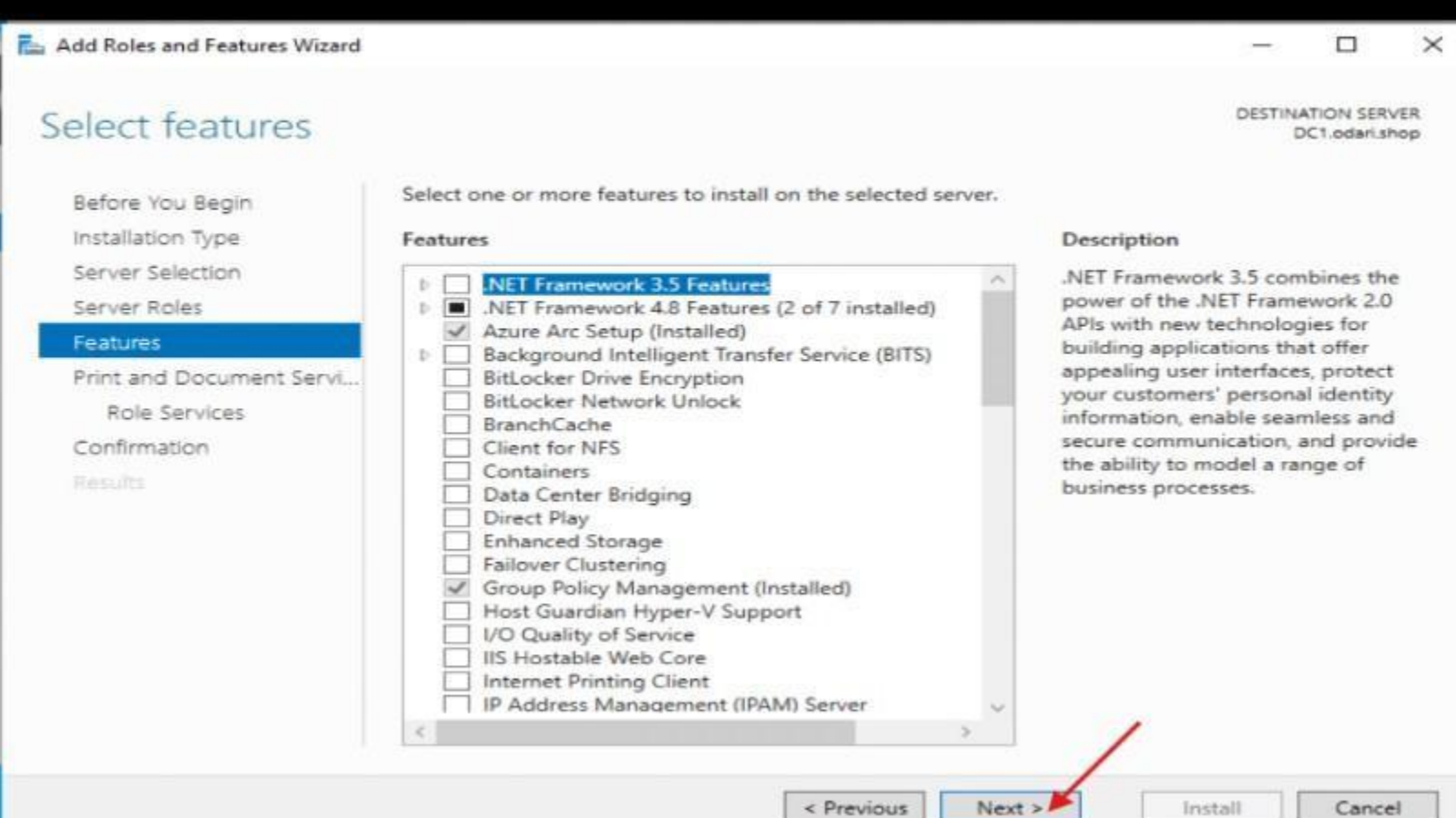


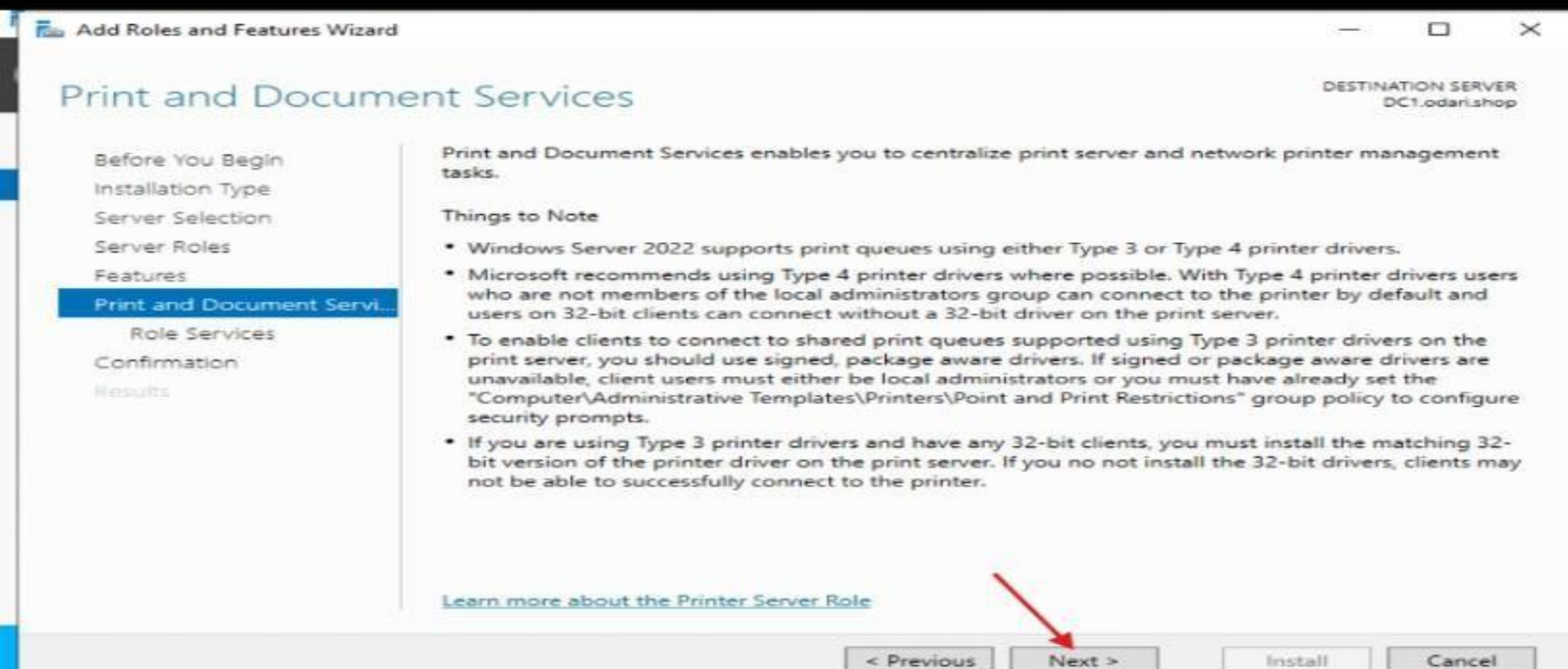
➤ This Add Roles and Features Wizard where I selected Print and Document Services on the server 114-DC1. By choosing this role and clicking Next, I am installing the print server feature that allows the Windows Server to centrally manage printers, drivers, and print jobs for all users on the network instead of setting them up manually on each computer.

114-DC1

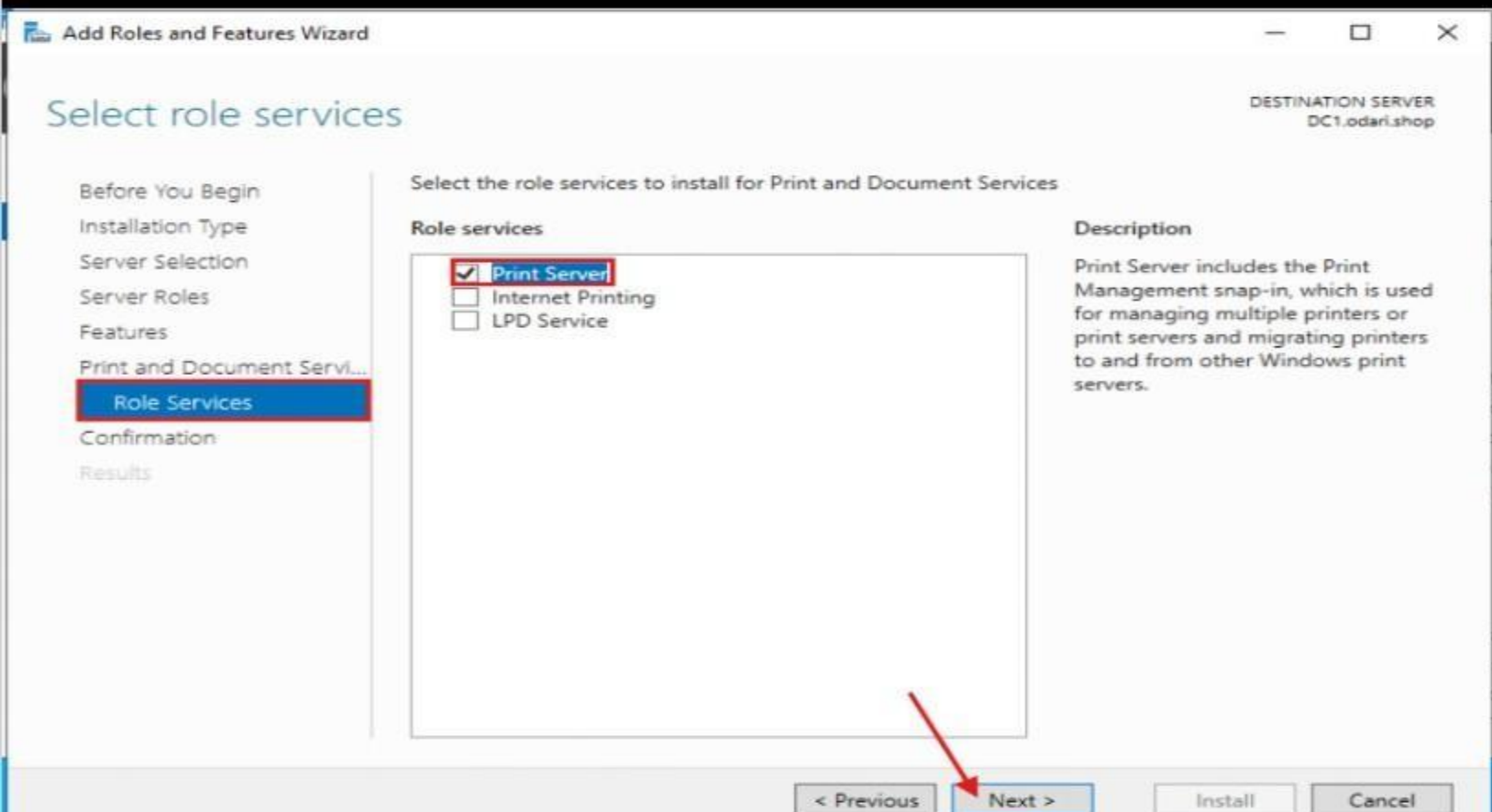


114-DC1

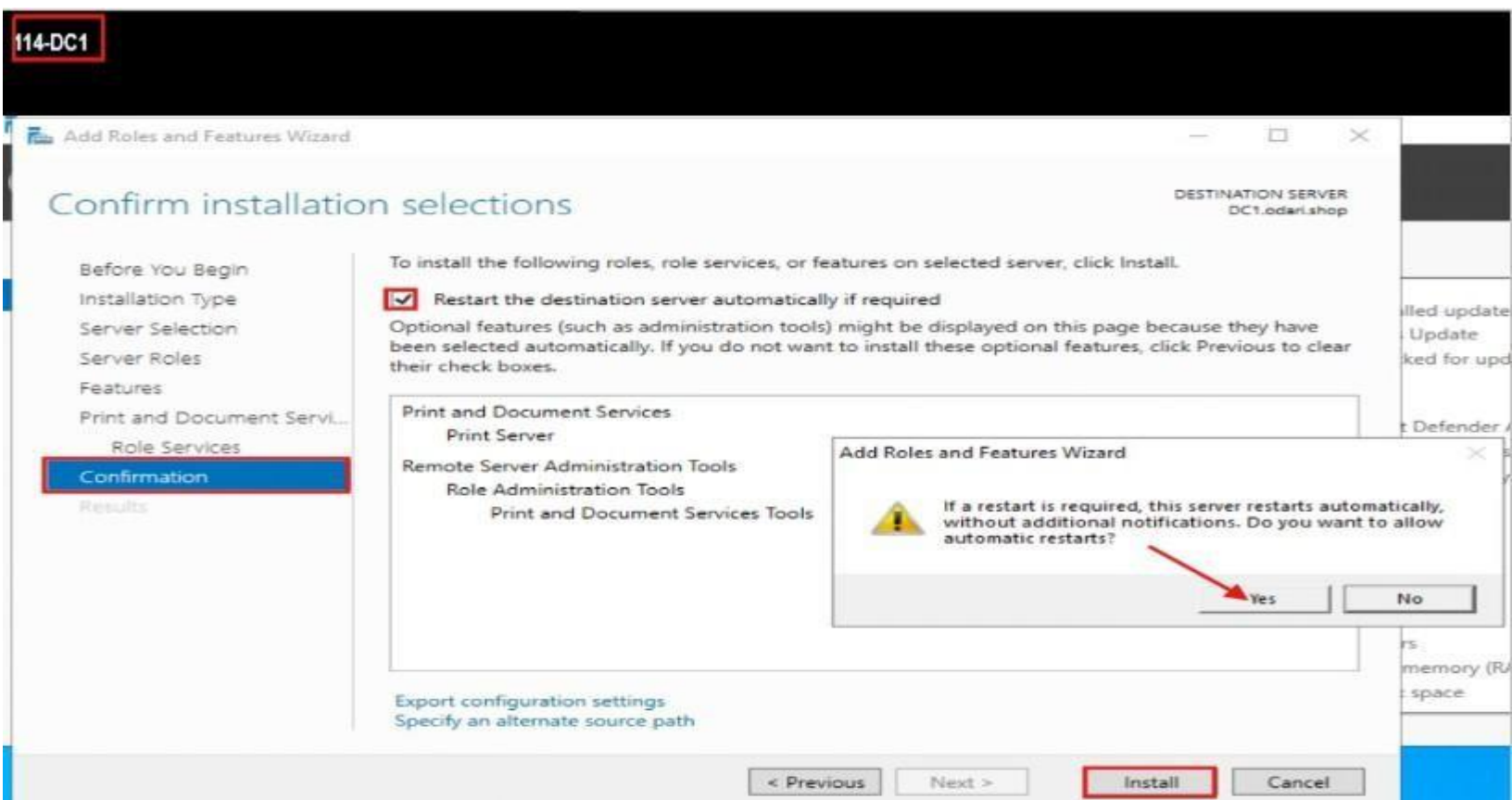




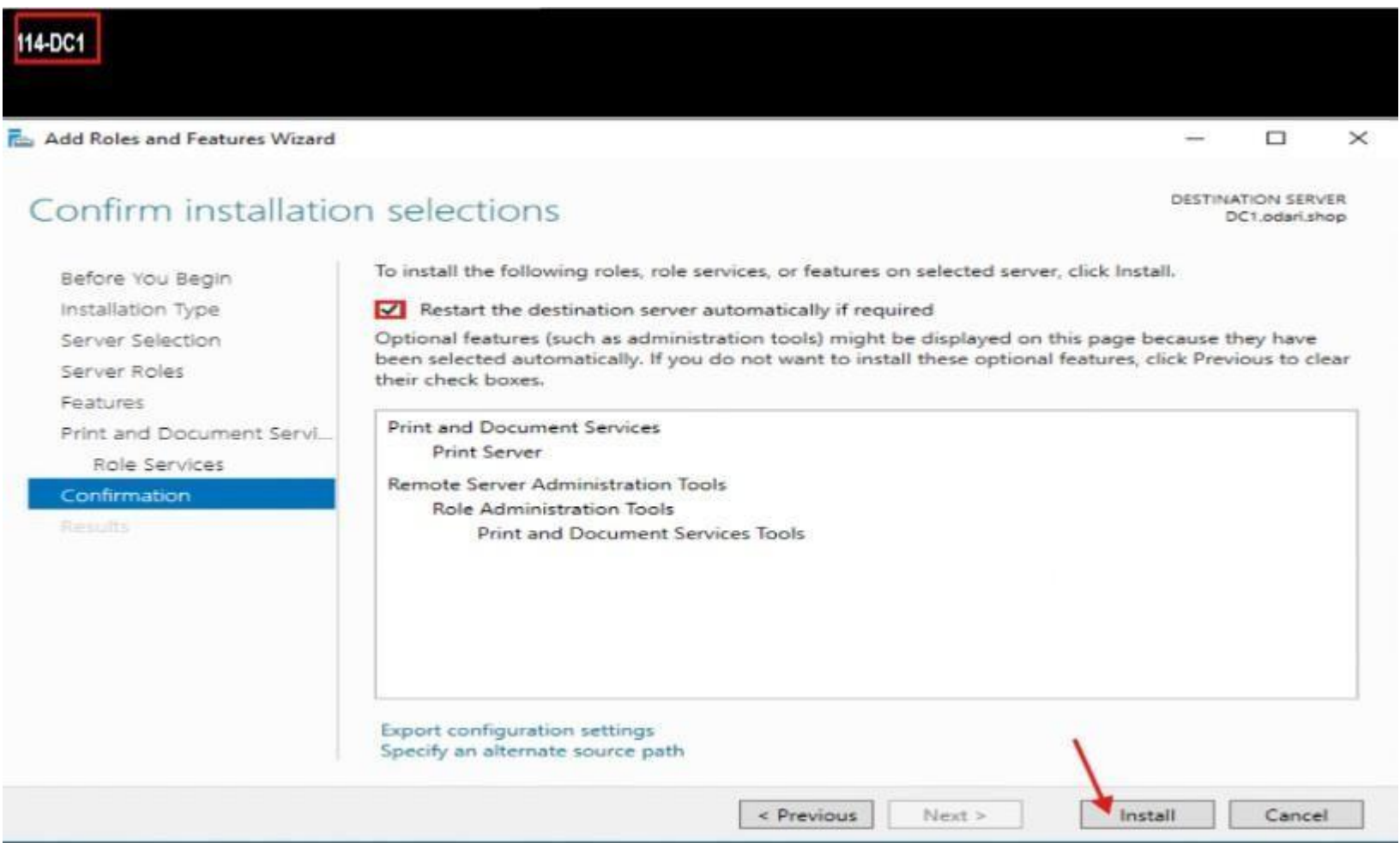
- This shows the Role Services selection for **Print and Document Services**. Here, I selected Print Server, which installs the main service needed to manage network printers from one central server. This allows the server to handle printer sharing, drivers, and print jobs for all users on the domain, making printer setup and management easier and more efficient across the organization.



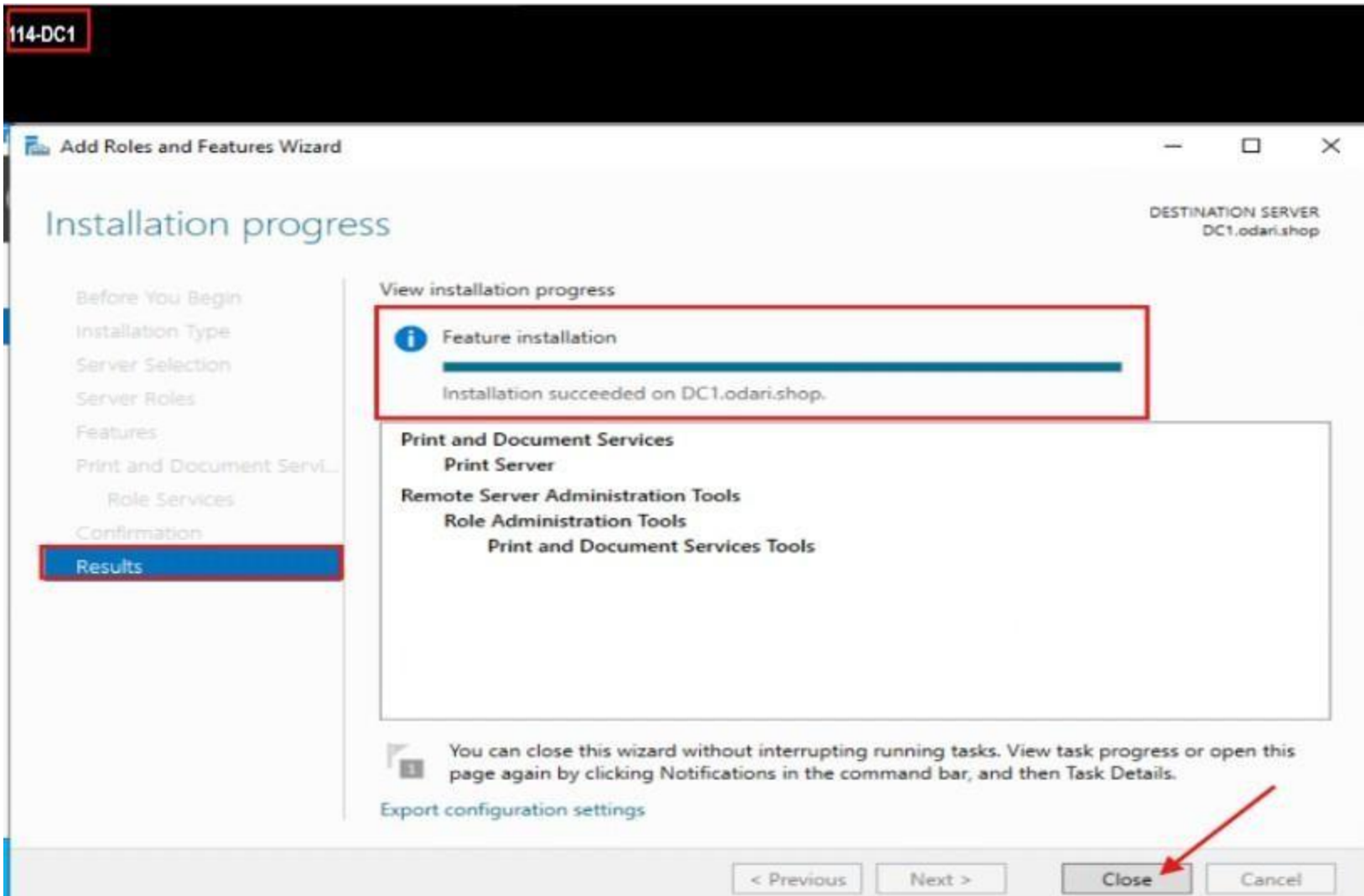
- Confirms the selected Print Server role and starts the installation, allowing the server to restart automatically if required to complete the setup.



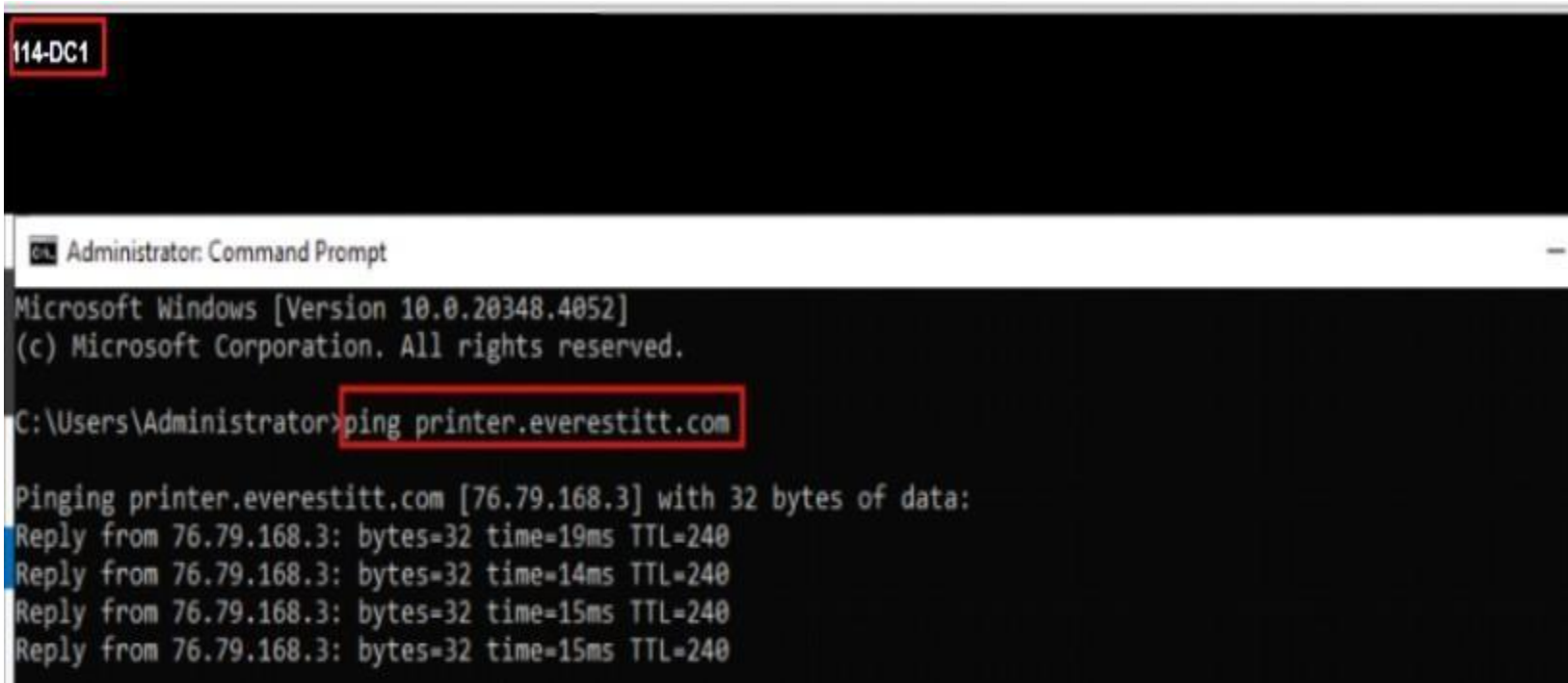
- Step 4: On Role Services tab, check 'Print Server' and click Next, then Install.



➤ Step 5: After installation, click Close.



❖ The ping test to `printer.everestitt.com` was successful, meaning the address is correct and the printer (or its server) is reachable. All packets were received with 0% loss and an average response time of 15ms, showing a stable and active connection.



➤ Step 6: Open a browser and type printer name to find the printer model.

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HP Color LaserJet MFP M283cdw x +

Not secure printer.everestitt.com

HP Color LaserJet MFP M283cdw NPI527E11 172.16.32.87

Home System Print Fax Scan Copy Networking

HP Web Services

Device Status

Supplies Status

Device Configuration

Network Summary

Reports

Color Usage Log

Event Log

Open Source Licenses

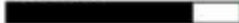



Device Status

Shop for Supplies Support

English Français Deutsch Italiano Español Svenska Dansk Norsk Nederlands Suomi
Português Türkçe Polski Русский Čeština Magyar Català Română Hrvatski Slovenščina
Slovenčina Ελληνικά Bhs Indonesia 繁體中文 العربية 繁體中文 한국어 עברית עברית

Status: Sleep mode is on.

Supplies Summary

Black Cartridge Order 206A (W2110A)	80%	Cyan Cartridge Order 206A (W2111A)	70%	Magenta Cartridge Order 206A (W2113A)	80%	Yellow Cartridge Order 206A (W2112A)	80%
							

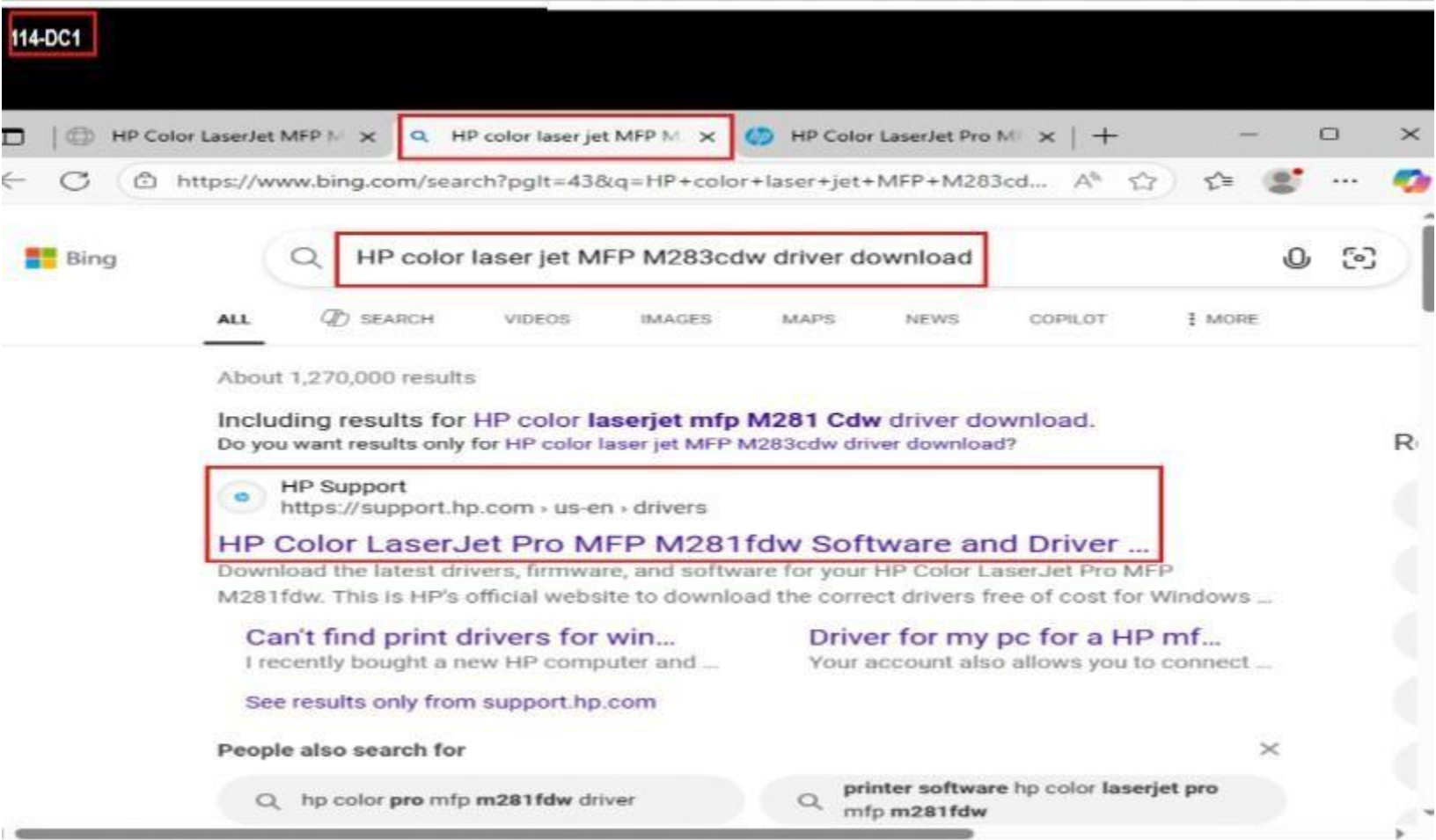
* Approximate only; varies depending on types of documents printed and other factors.

Supplies Detail

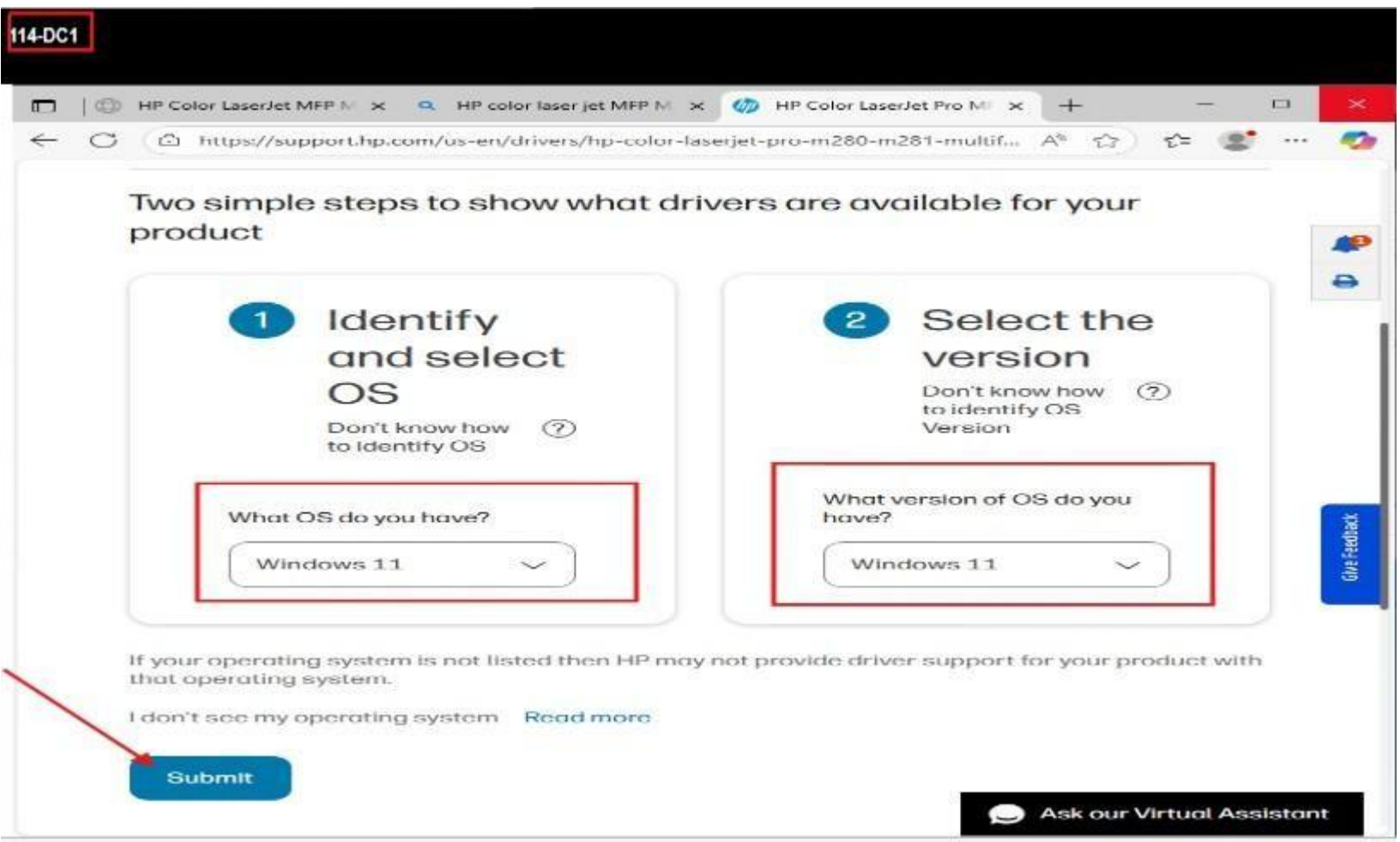
Type here to search

Windows taskbar icons: File Explorer, Edge, Store, Settings, Task View

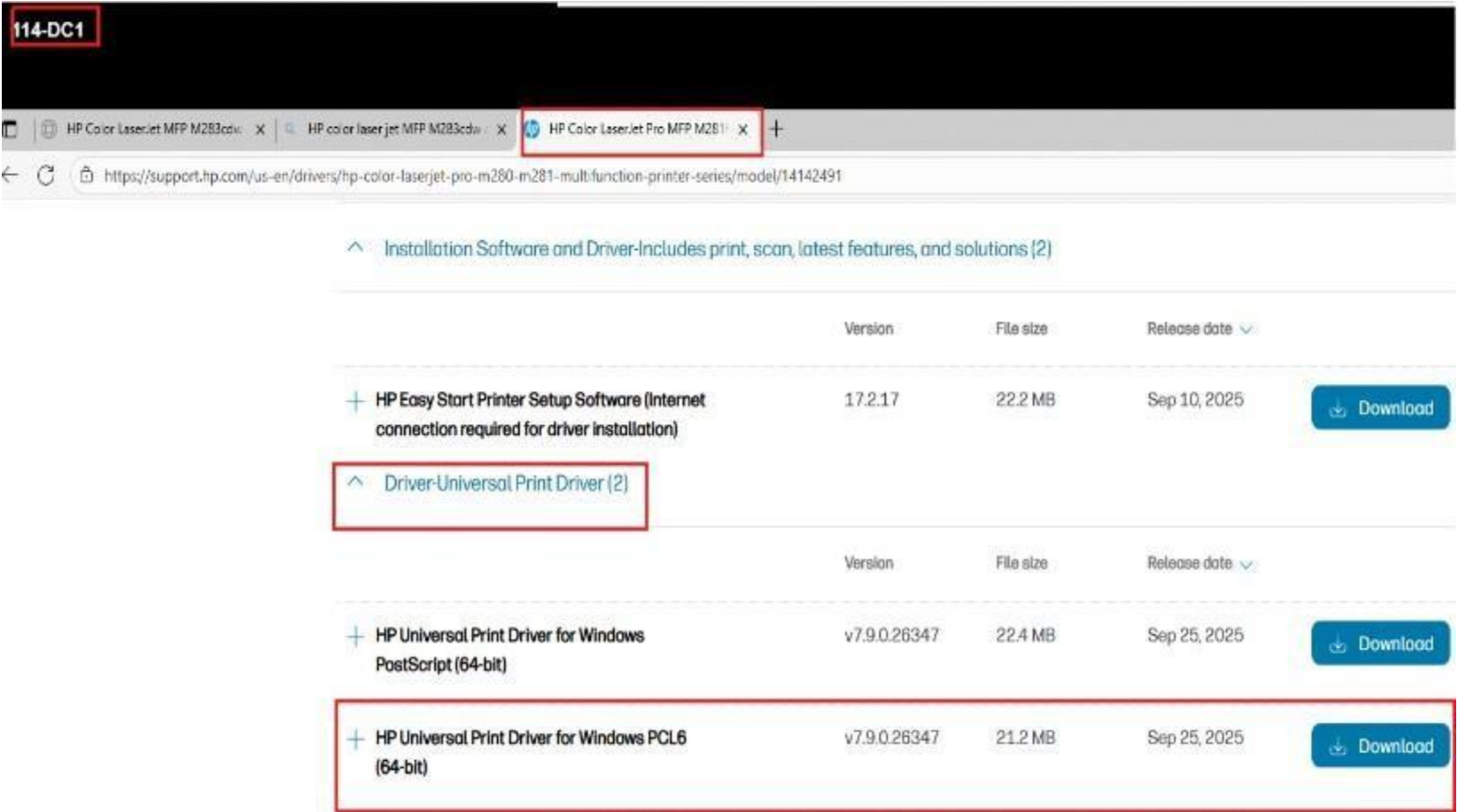
❖ Search for the printer model (HP Color LaserJet MFP M283cdw) in the browser and click the official HP Support link to download the correct driver. This ensures the printer works properly with Windows and avoids compatibility issues. Always choose the official HP site for safety and reliability.



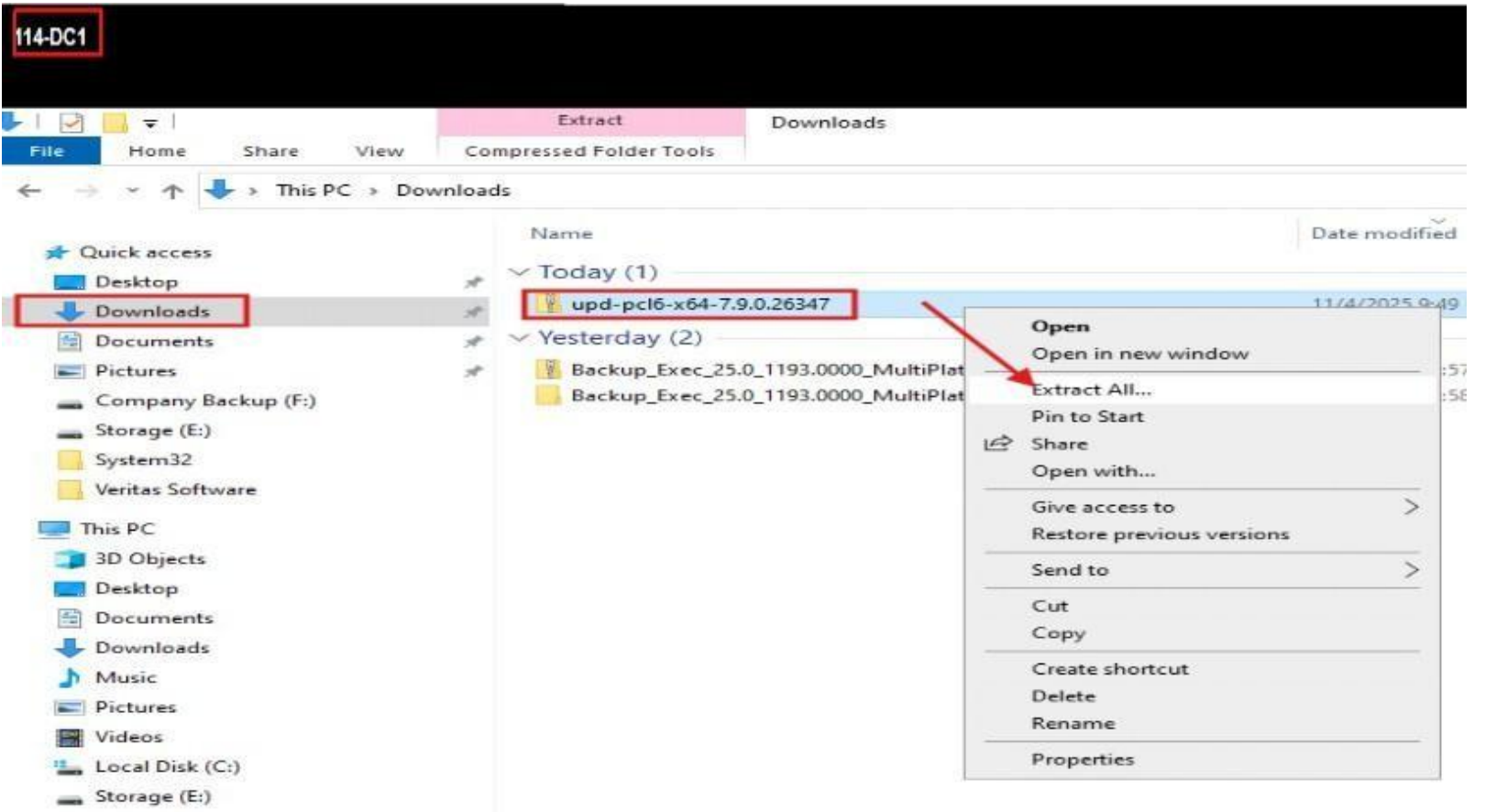
Step 7: Download the printer driver for Windows 11 and extract it to a folder on Desktop.



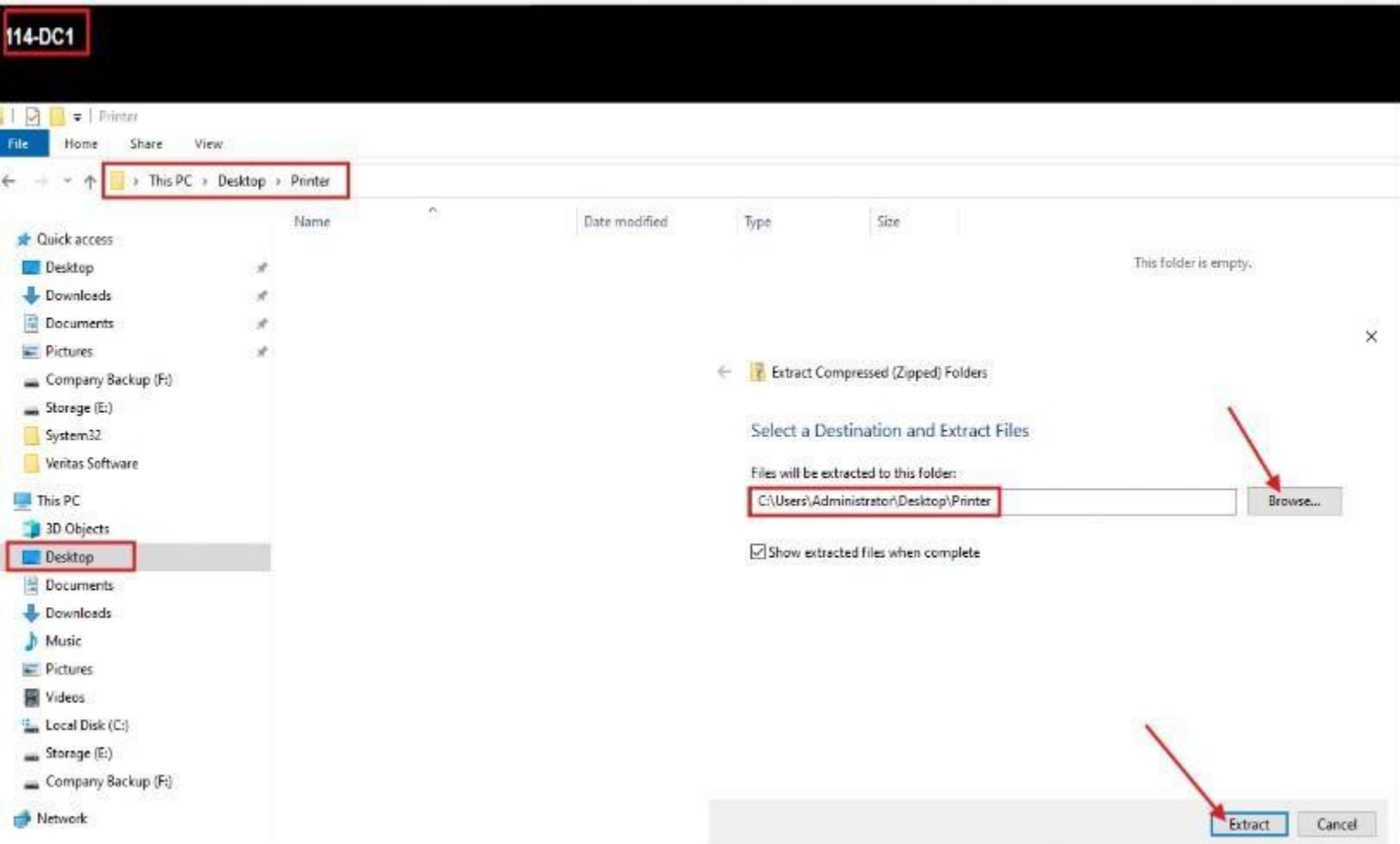
❖ Click “HP Universal Print Driver for Windows PCL6 (64-bit)” to download the right driver for your HP Color LaserJet printer.



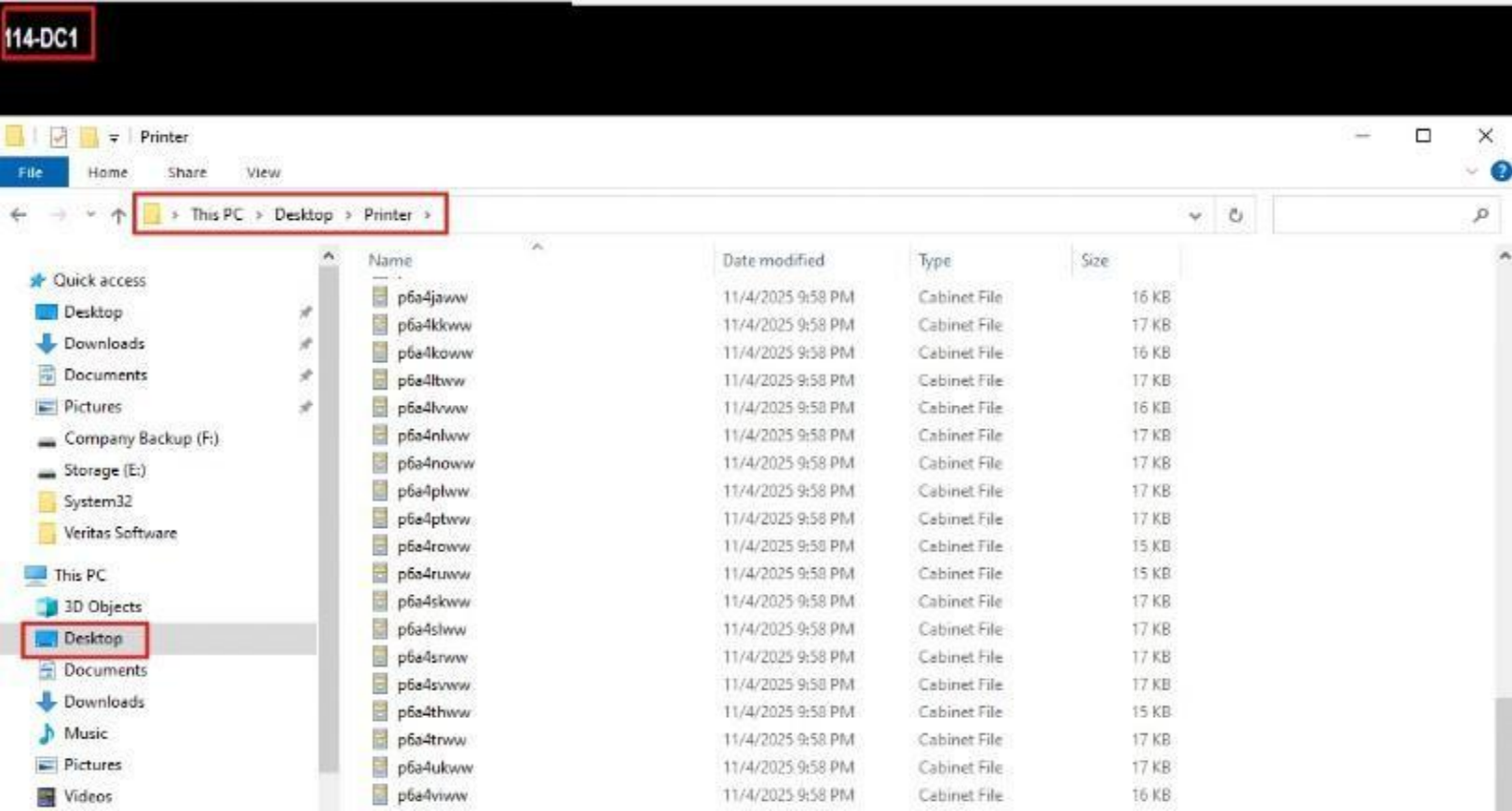
The downloaded printer driver file is being extracted from a ZIP folder, so the driver files are ready to be used for installation on the print server.



❖ I am saving the extracted printer driver files in a folder named “Printer” on the Desktop for easy access during installation.



❖ Folder is ready for installation through Print Management.



➤ Step 8: Open Print Management (Server Manager > Tools > Print Management).

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Server Manager

Server Manager ▸ Dashboard

Manage Tools View Help

Dashboard

- Local Server
- All Servers
- AD DS
- DNS
- File and Storage Services ▸
- IIS
- Print Services
- Remote Access

WELCOME TO SERVER MANAGER

1 Configure this local server

2 Add roles and features

3 Add other servers to manage

4 Create a server group

5 Connect this server to cloud services





QUICK START

WHAT'S NEW

LEARN MORE

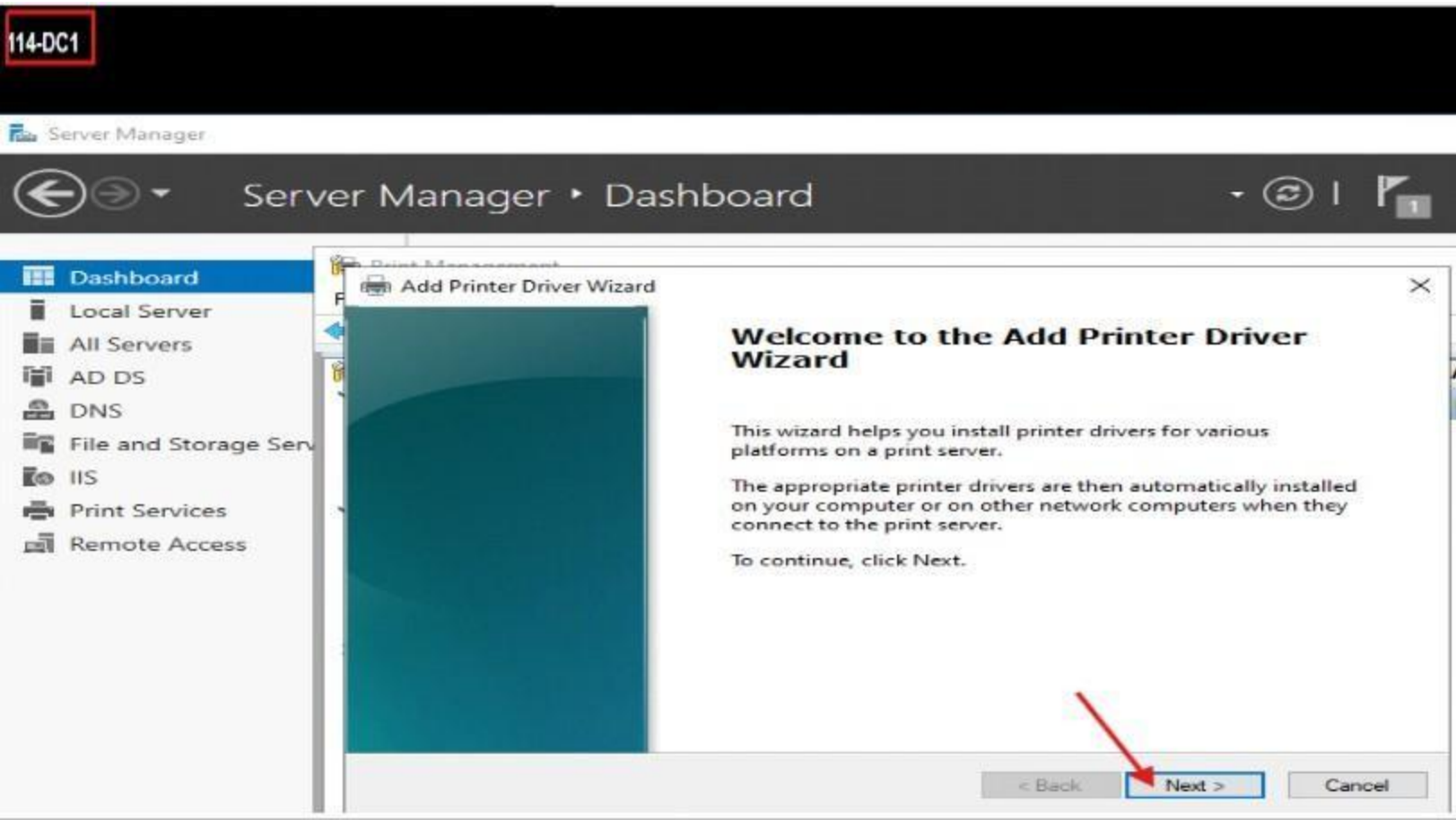
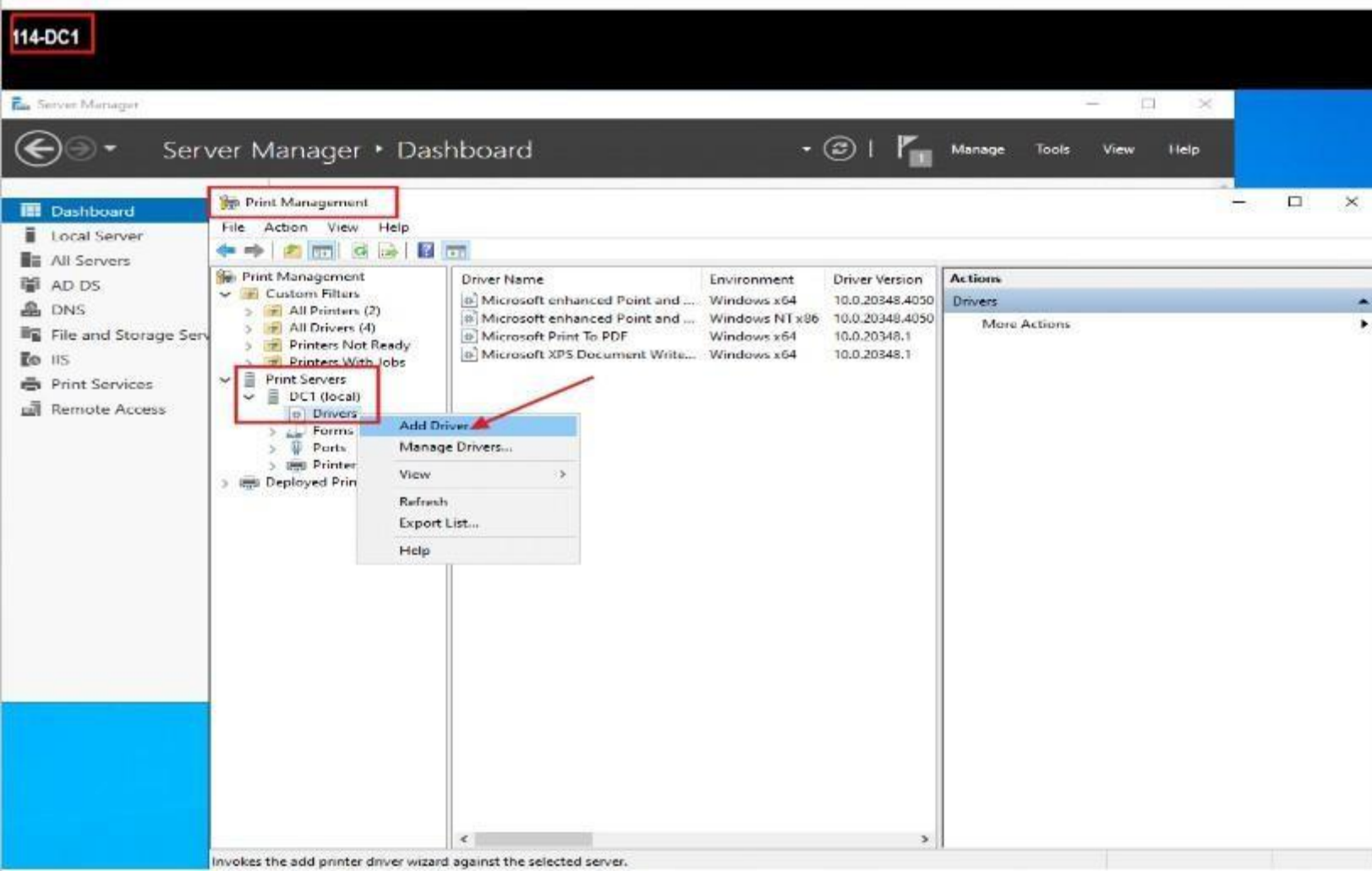
ROLES AND SERVER GROUPS

Roles: 6 | Server groups: 1 | Servers total: 1

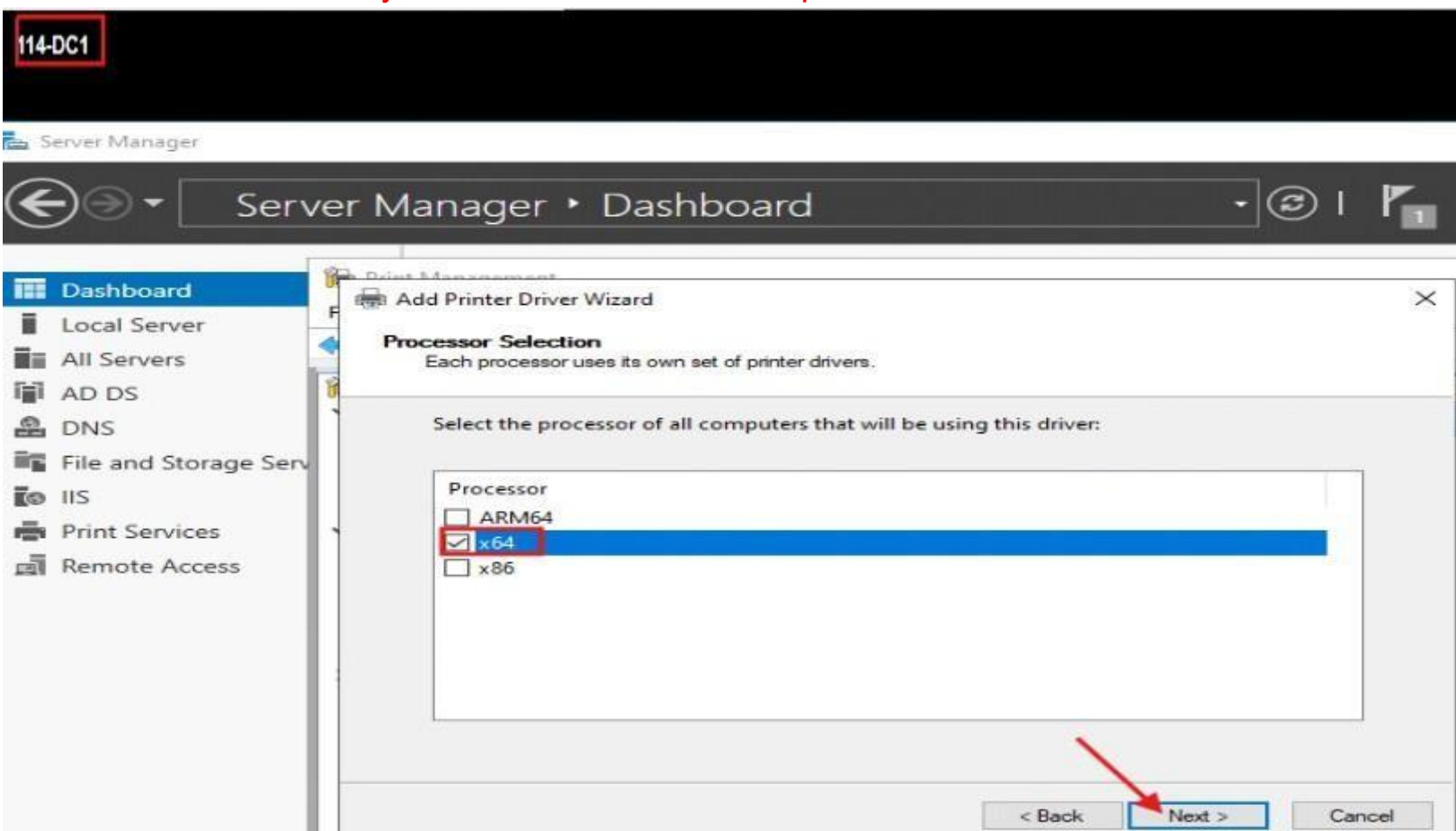
 AD DS 1	 DNS 1
 Manageability	 Manageability
Events	Events
Services	Services

- Active Directory Administrative Center
- Active Directory Domains and Trusts
- Active Directory Module for Windows PowerShell
- Active Directory Sites and Services
- Active Directory Users and Computers
- ADSI Edit
- Component Services
- Computer Management
- Connection Manager Administration Kit
- Defragment and Optimize Drives
- Disk Cleanup
- DNS
- Event Viewer
- Group Policy Management
- Internet Information Services (IIS) Manager
- iSCSI Initiator
- Local Security Policy
- Microsoft Azure Services
- Network Policy Server
- ODBC Data Sources (32-bit)
- ODBC Data Sources (64-bit)
- Performance Monitor
- Print Management**
- Recovery Drive
- Registry Editor

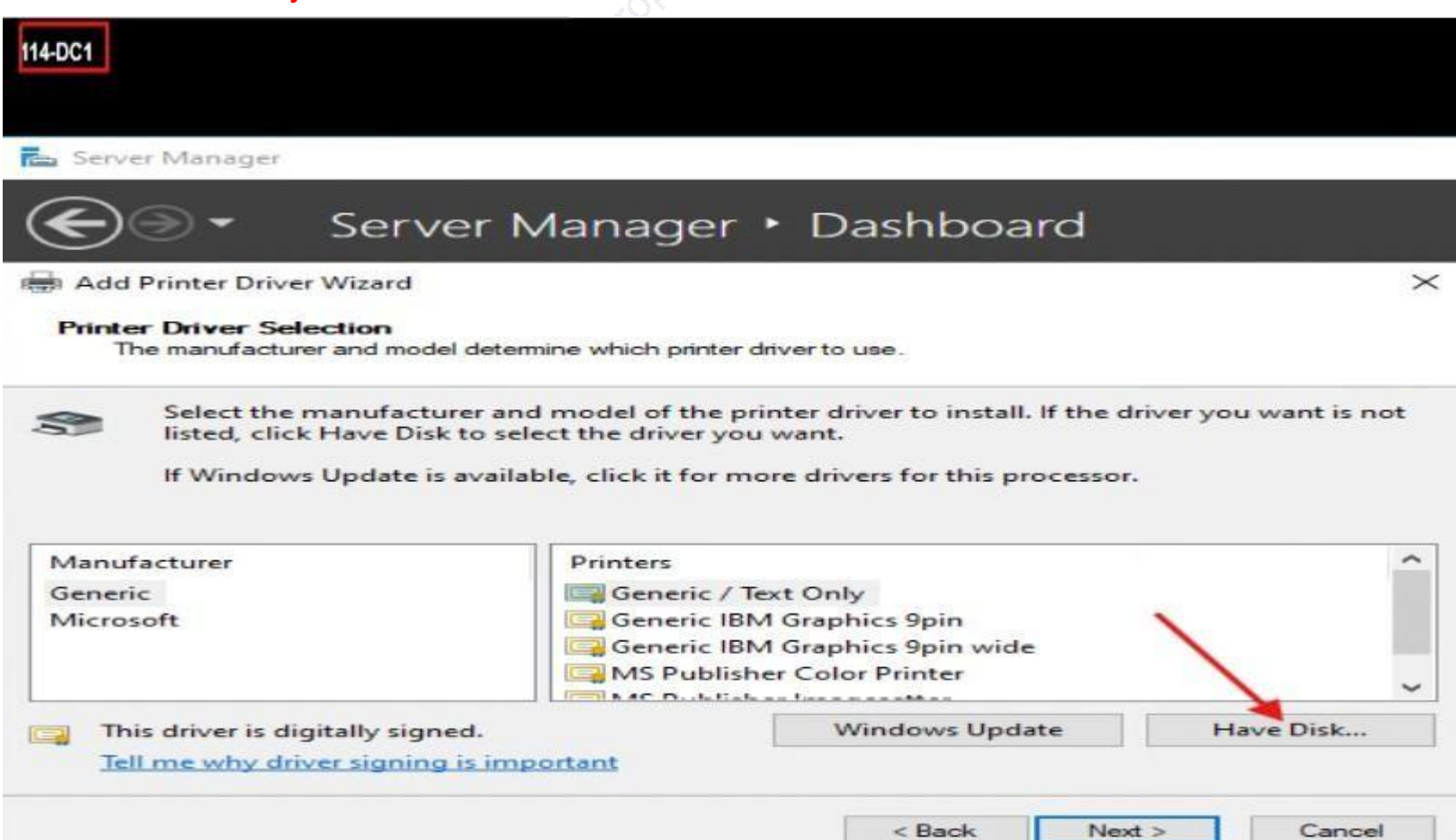
➤ Step 9: Go to Print Server > Drivers and add the downloaded driver using 'Have Disk' option.



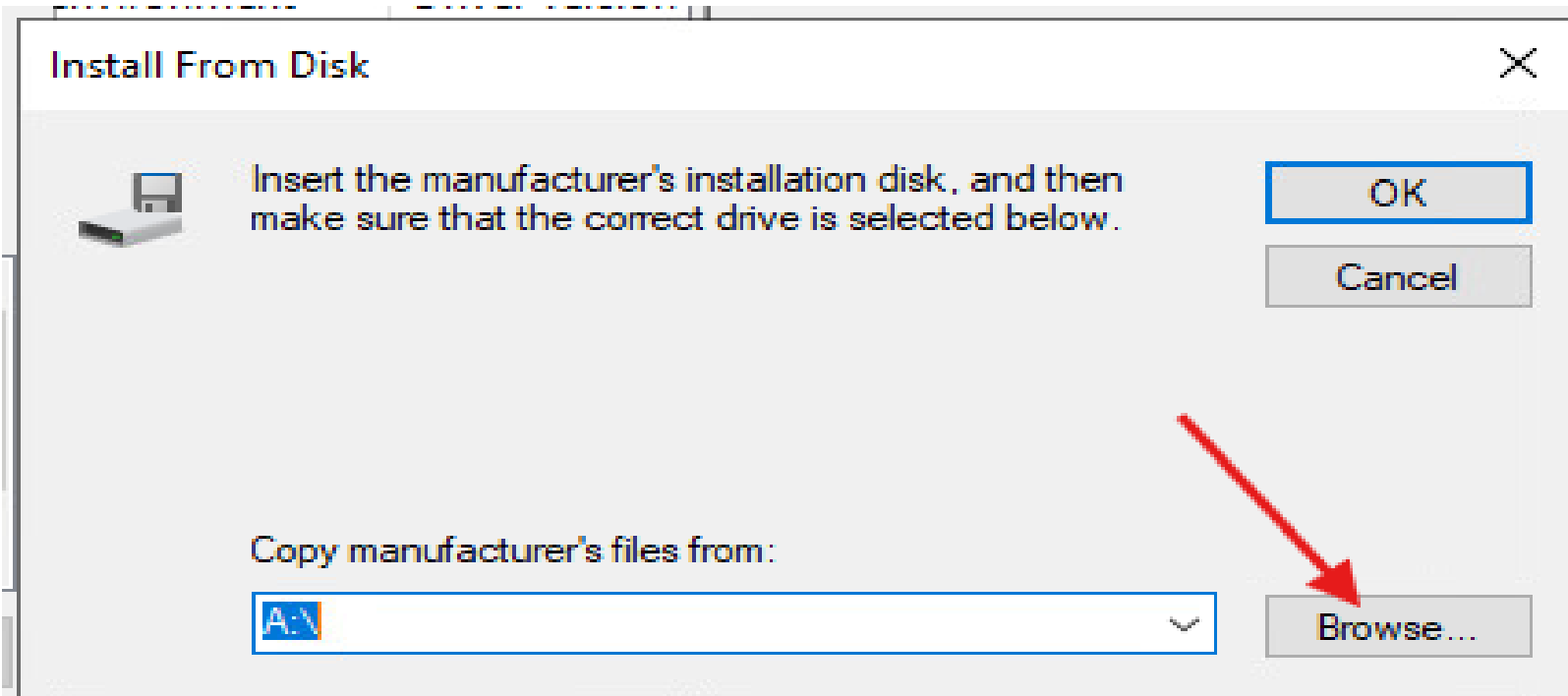
- Selecting the x64 (64-bit) processor option while adding the printer driver, ensuring the driver works correctly for all 64-bit Windows computers on the network.



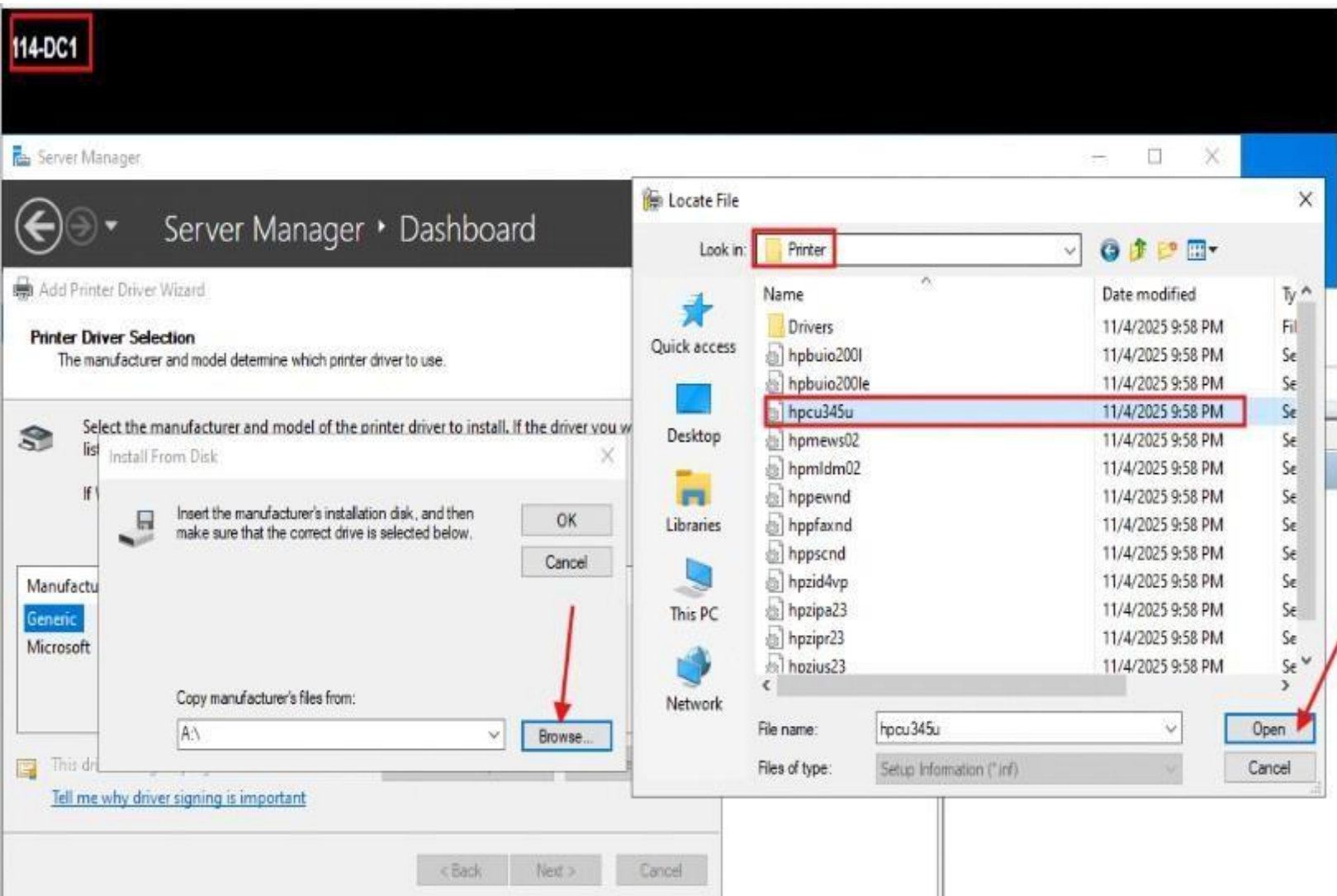
- This shows choosing "Have Disk" to manually load the downloaded printer driver when it is not listed by default in the Printer Driver Selection wizard.



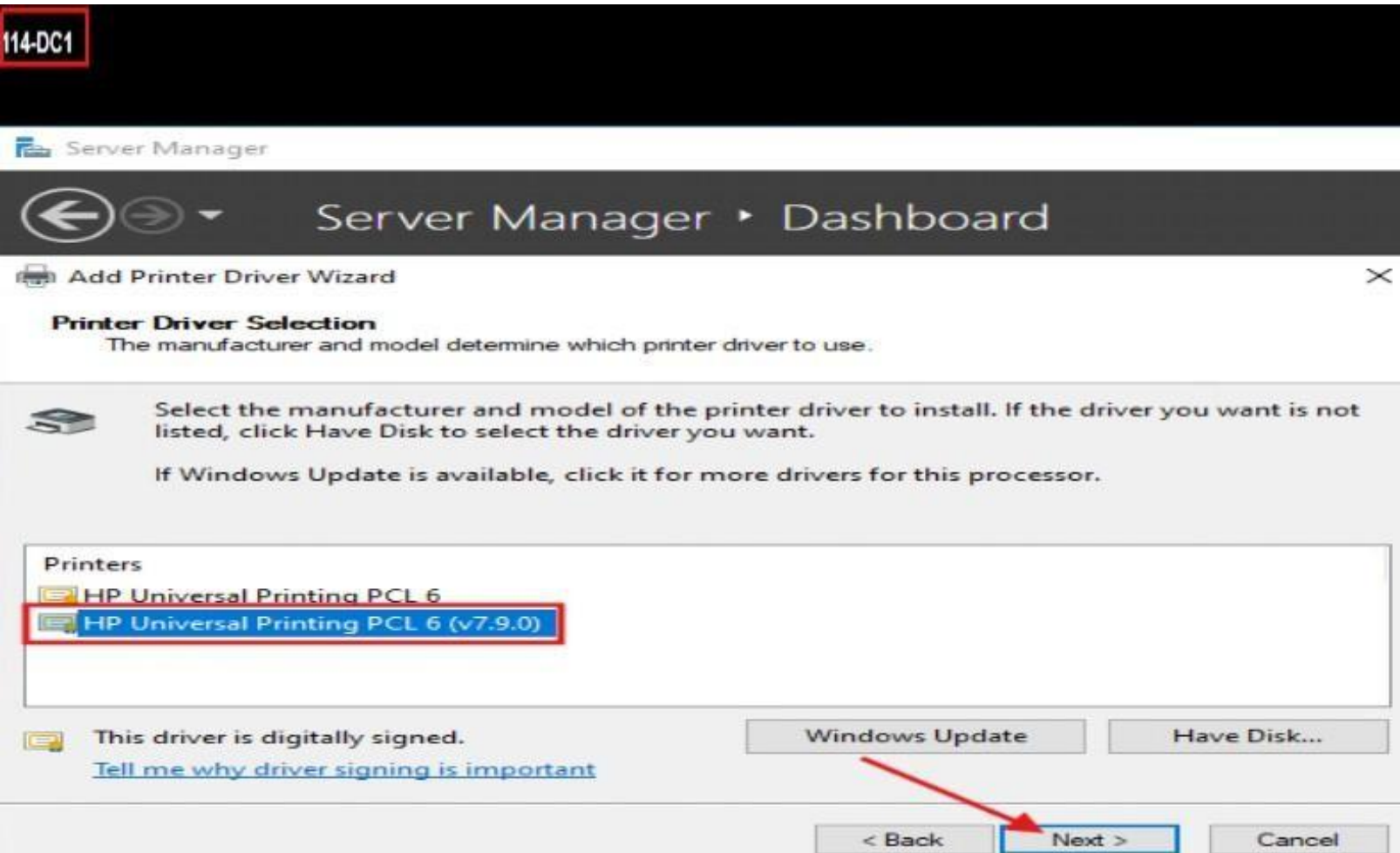
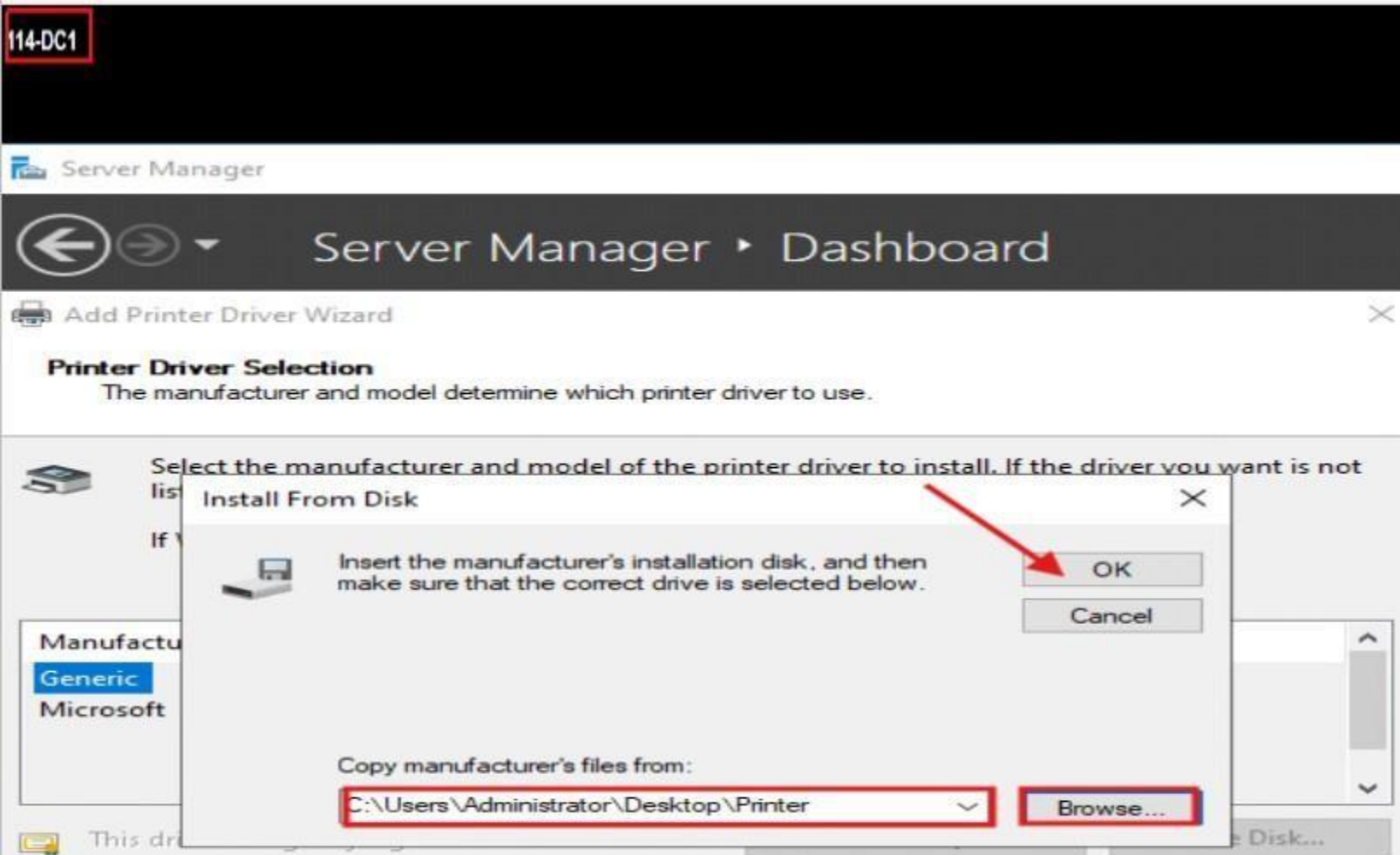
- This screen allows you to browse and select the downloaded printer driver files from your computer so Windows can install the correct printer driver from that location.



- I'm selecting the correct printer driver file (hpcu345u) from the extracted "Printer" folder after choosing the 'Have Disk' option in Print Management to install the driver.



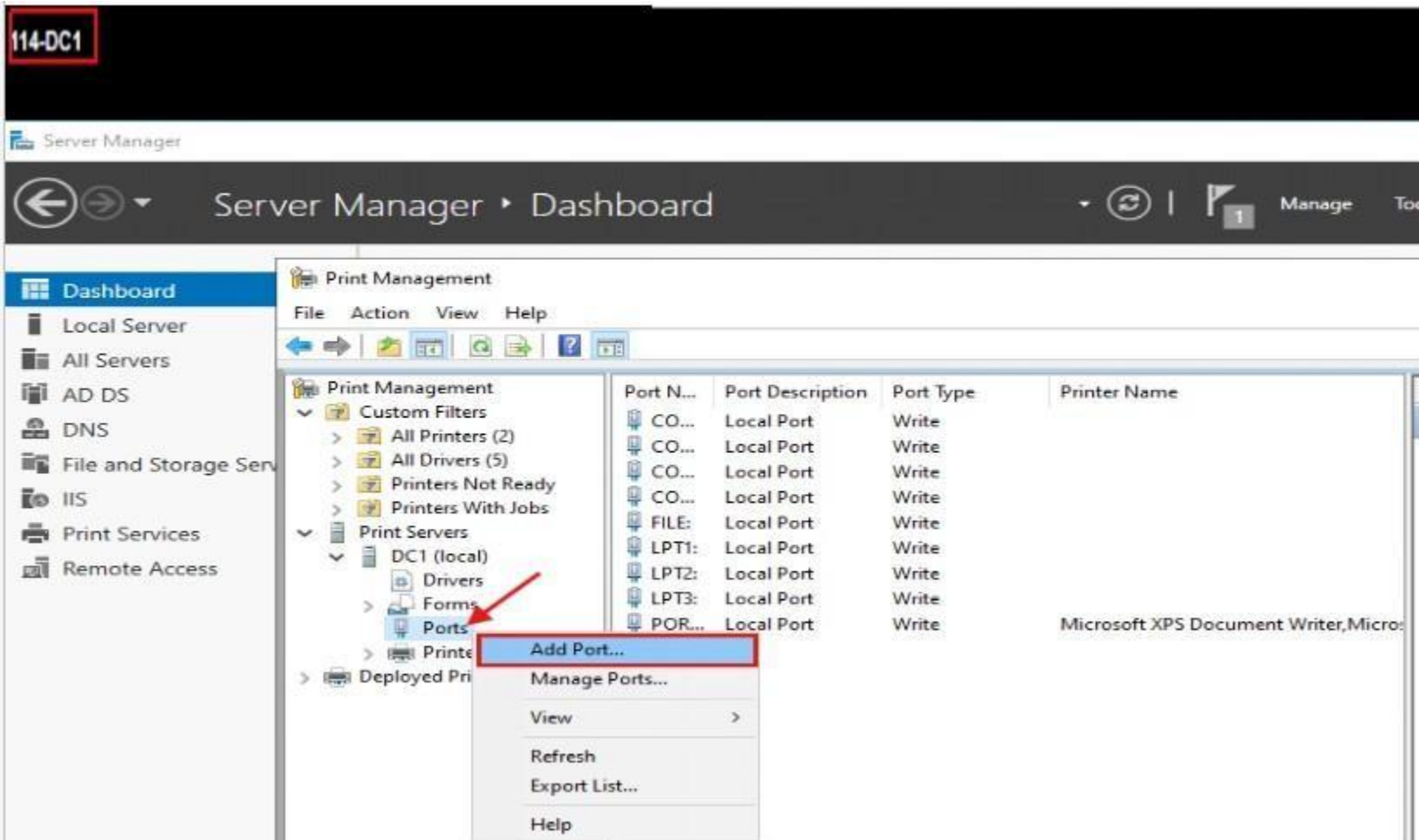
- Confirms the printer driver folder path selected from the Desktop and proceeds to install the printer driver files by clicking OK.



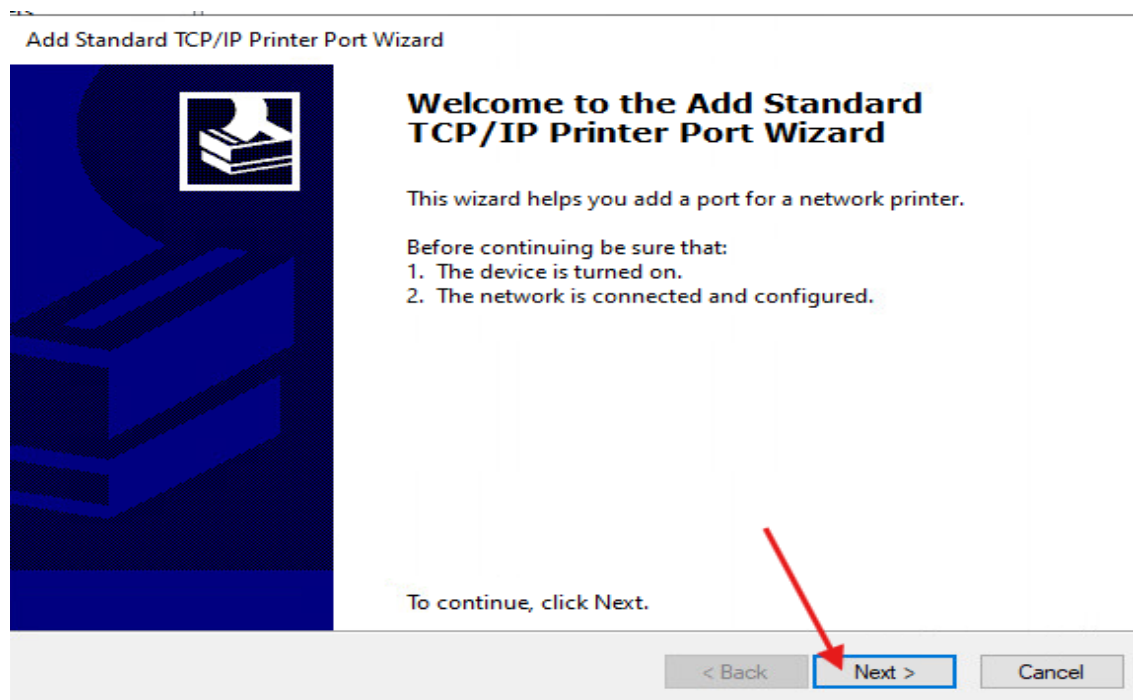
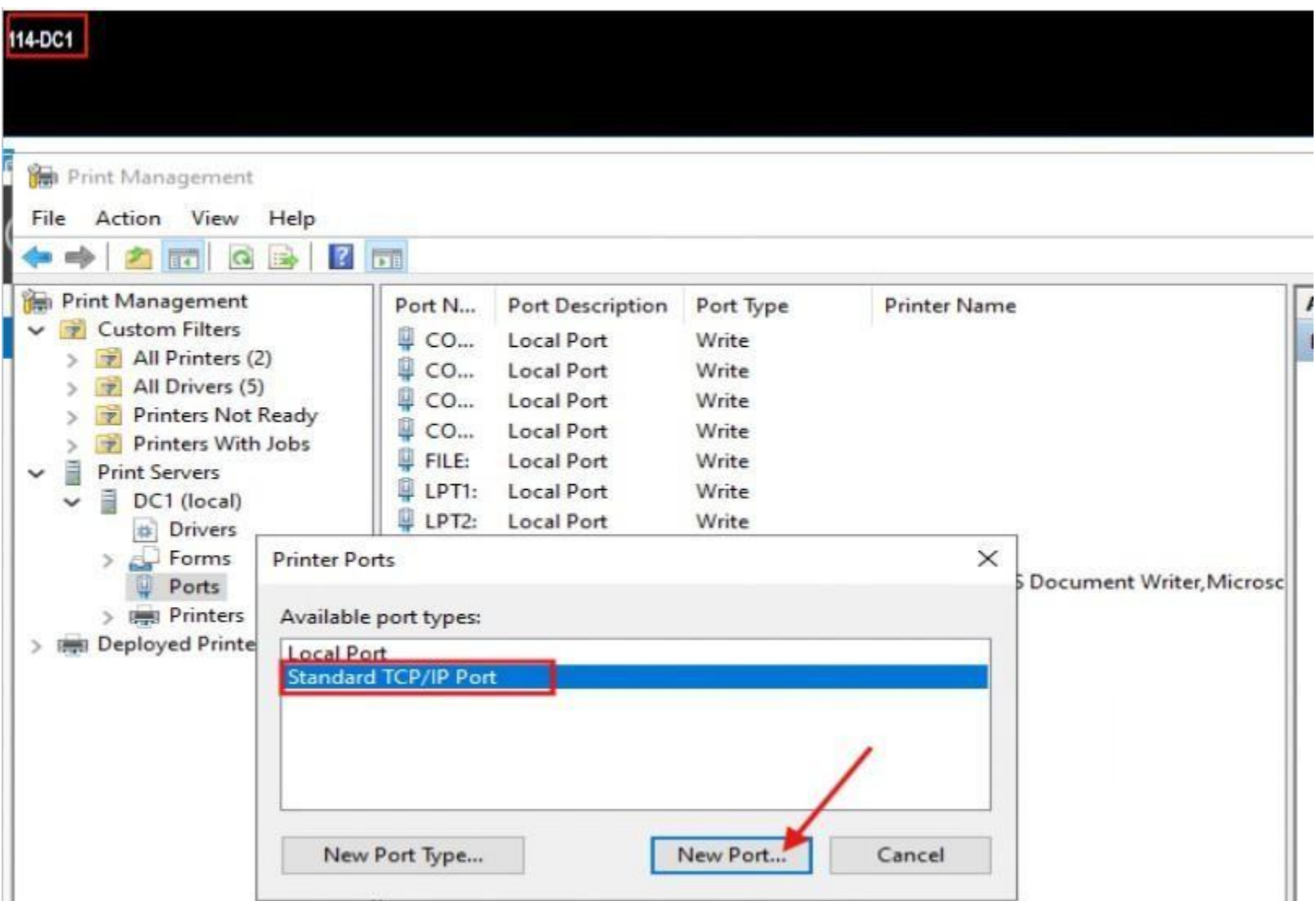
- Confirm that the HP Universal Printing PCL 6 driver has been successfully installed on the server and completes the Add Printer Driver Wizard by clicking Finish.



- Step 10: Create a new TCP/IP port using printer name as the hostname.



- ❖ I selected “Standard TCP/IP Port” and clicked “New Port” to add a network port for the printer in Print Management.



- This shows creating a Standard TCP/IP printer port by entering the printer's hostname, allowing the server to connect to and communicate with the network printer.

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Add Standard TCP/IP Printer Port Wizard

Add port
For which device do you want to add a port?

Enter the Printer Name or IP address, and a port name for the desired device.

Printer Name or IP Address:

Port Name:

< Back **Next >** Cancel

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❖ Printer TCP/IP port created successfully and ready to use

Server Manager

- Dashboard
- Local Server
- All Servers
- AD DS
- DNS
- File and Storage
- IIS
- Print Services
- Remote Access

Print Management

File Action View Help

Add Standard TCP/IP Printer Port Wizard

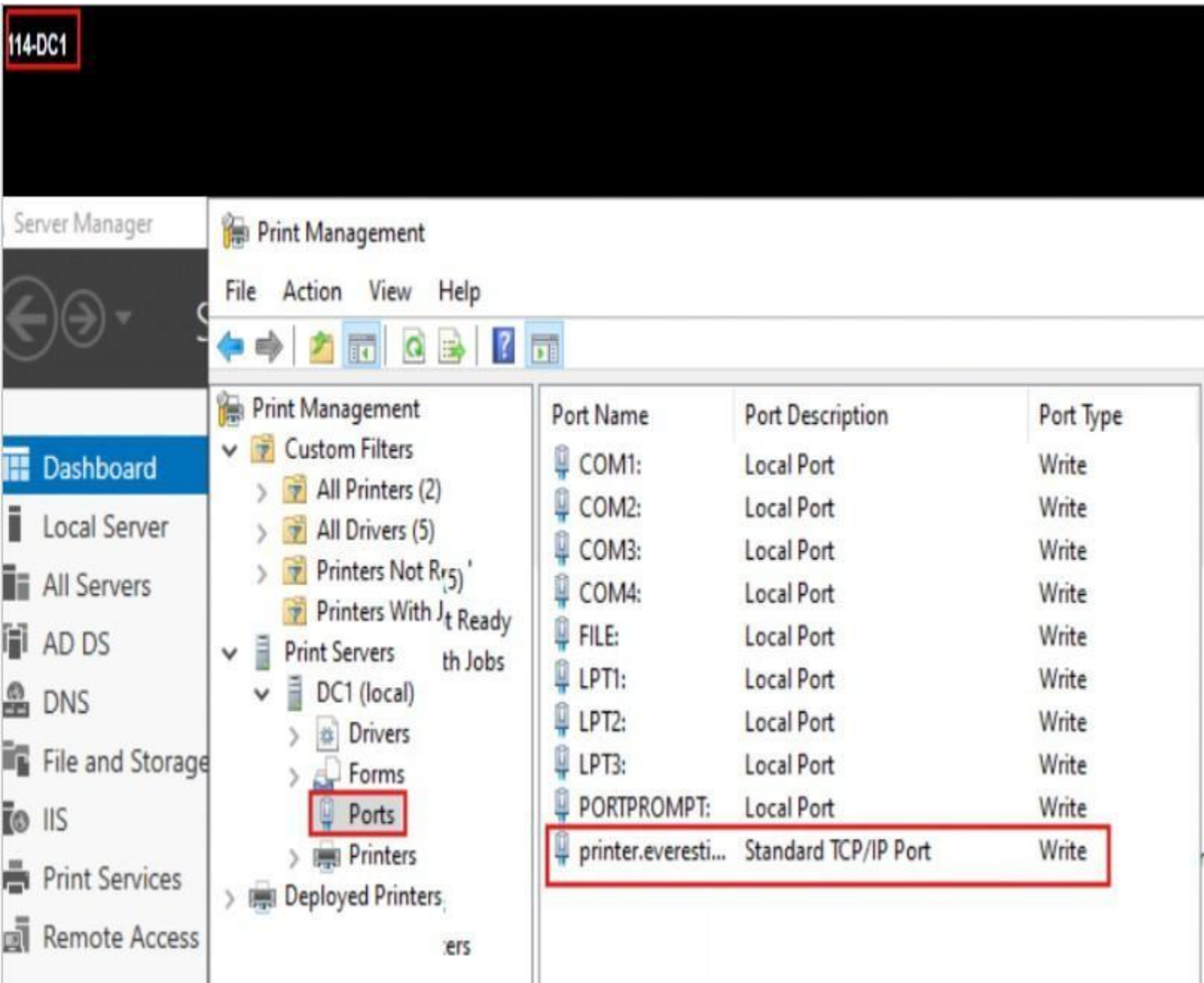
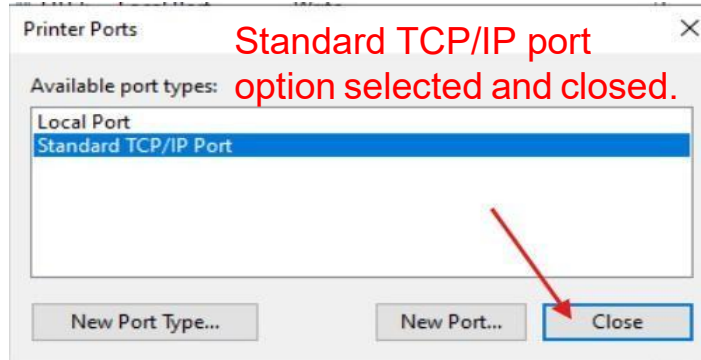
Completing the Add Standard TCP/IP Printer Port Wizard

You have selected a port with the following characteristics.

SNMP:	Yes
Protocol:	RAW, Port 9100
Device:	printer.everestitt.com
Port Name:	printer.everestitt.com
Adapter Type:	HP Color LaserJet MFP M283cdw

To complete this wizard, click Finish.

< Back **Finish** Cancel



- ❖ The new Standard TCP/IP port has been successfully created and is now listed under Ports in Print Management.

Add Printer Driver and Create TCP/IP Port



Download and Prepare Driver

Download the correct printer driver from the vendor's website and extract files to an accessible folder.

Install Driver via Print Management

Use Print Management's 'Have Disk' option to install the extracted printer driver for proper integration.

Create Standard TCP/IP Port

Create a new Standard TCP/IP port using the printer's hostname or IP for network communication.

Confirm Connectivity Setup

Verify the new TCP/IP port appears in Print Management ensuring reliable network printer communication.

➤ Step 11: Add a new printer using the created port and select the installed driver.

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Server Manager

Print Management

File Action View Help

Print Management

- Custom Filters
 - All Printers (2)
 - All Drivers (5)
 - Printers Not Ready
 - Printers With Jobs
- Print Servers
 - DC1 (local)
 - Drivers
 - Forms
 - Ports
 - Printers
 - Deployed Printers

Printer Name Queue Status Jobs In ... Serv

Microsoft XPS Document Writer	Ready	0	DC1
Microsoft Print to PDF	Ready	0	DC1

Add Printer...

Show Extended View

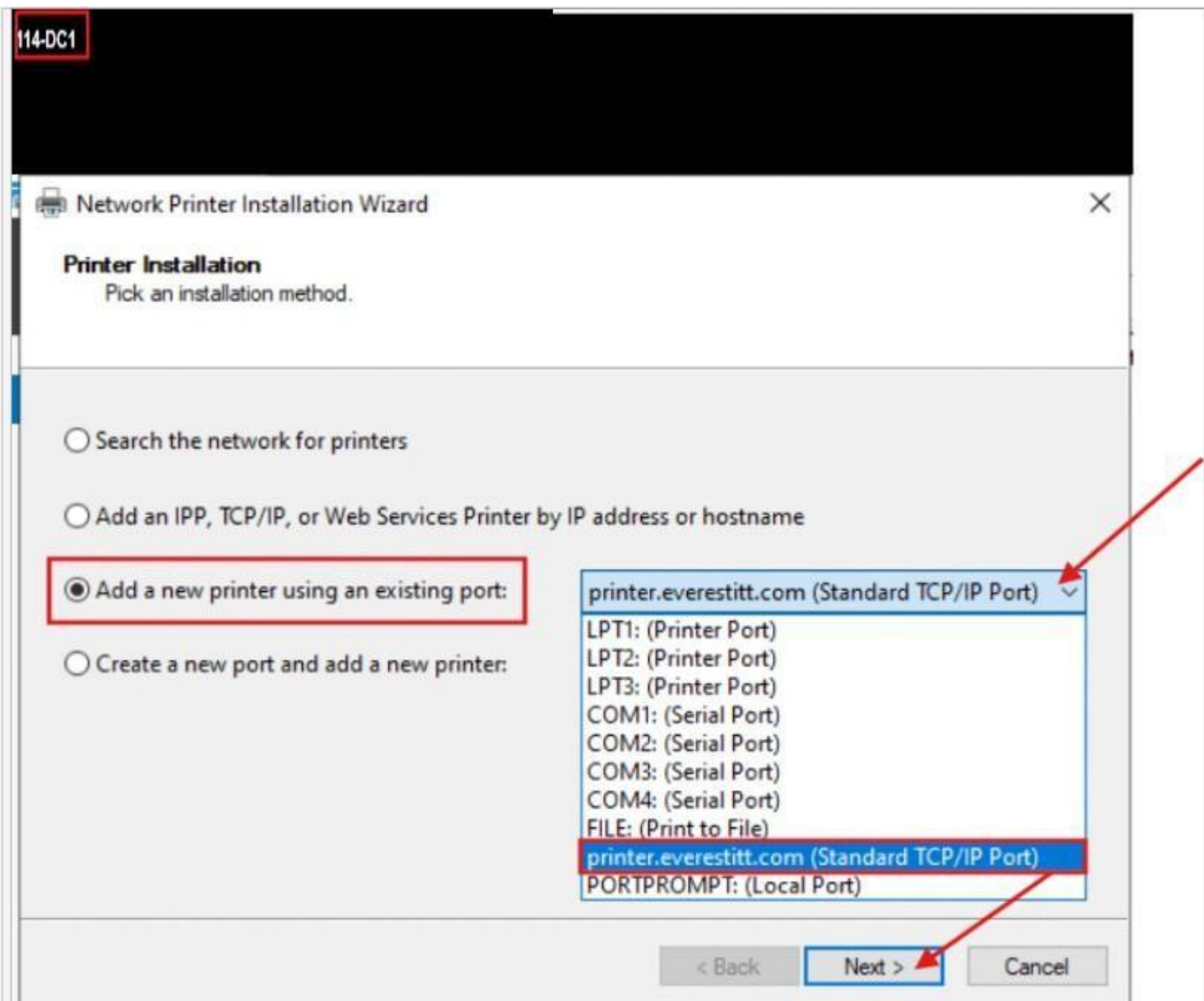
View >

Refresh

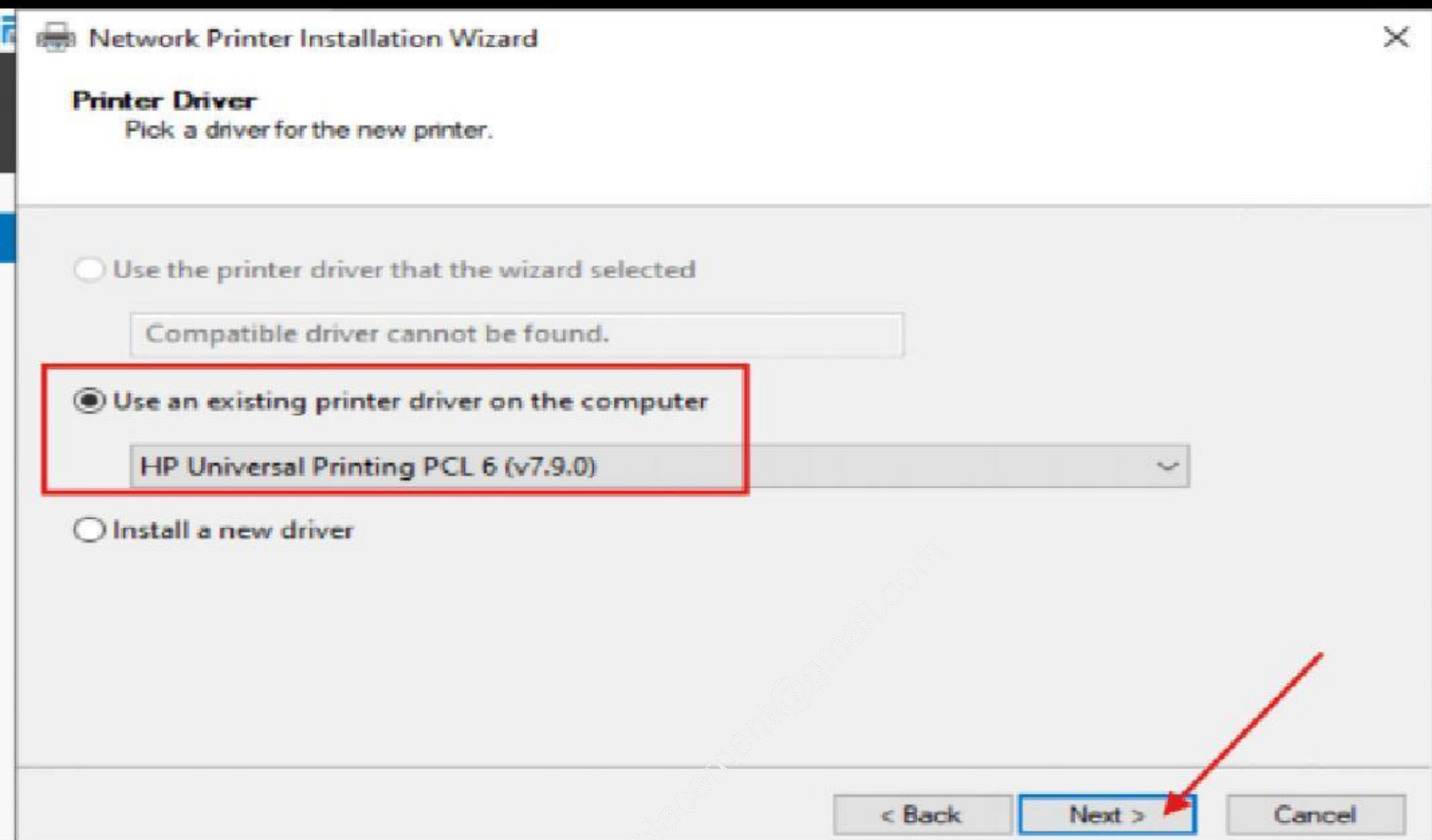
Export List...

Help

I chose the previously created TCP/IP port to install the printer.



❖ Use existing HP Universal Printing PCL 6 driver and proceed to the next step.



Configure Printer and Enable Sharing

Printer Setup and Naming

Add the printer using the configured port and installed driver, assigning a clear name and location for easy user identification.

Enable Printer Sharing

Enable sharing so the printer is accessible on the network and listed in Active Directory for easy discovery by domain users.

Testing and Deployment

Print a test page to verify functionality and support centralized deployment via Group Policy for seamless user access.

Management and Monitoring

Proper printer sharing supports monitoring and management through the print server for full administrative control over print jobs.



➤ Step 12: Name the printer, set location.

114-DC1

Network Printer Installation Wizard

Printer Name and Sharing Settings
You can give the printer a friendly name and specify whether other people can use the printer.

Printer Name:

☒ Share this printer

Share Name:

Location:

Comment:

< Back **Next >** Cancel

➤ Printer details are confirmed and ready to be installed using the selected driver and TCP/IP port

114-DC1

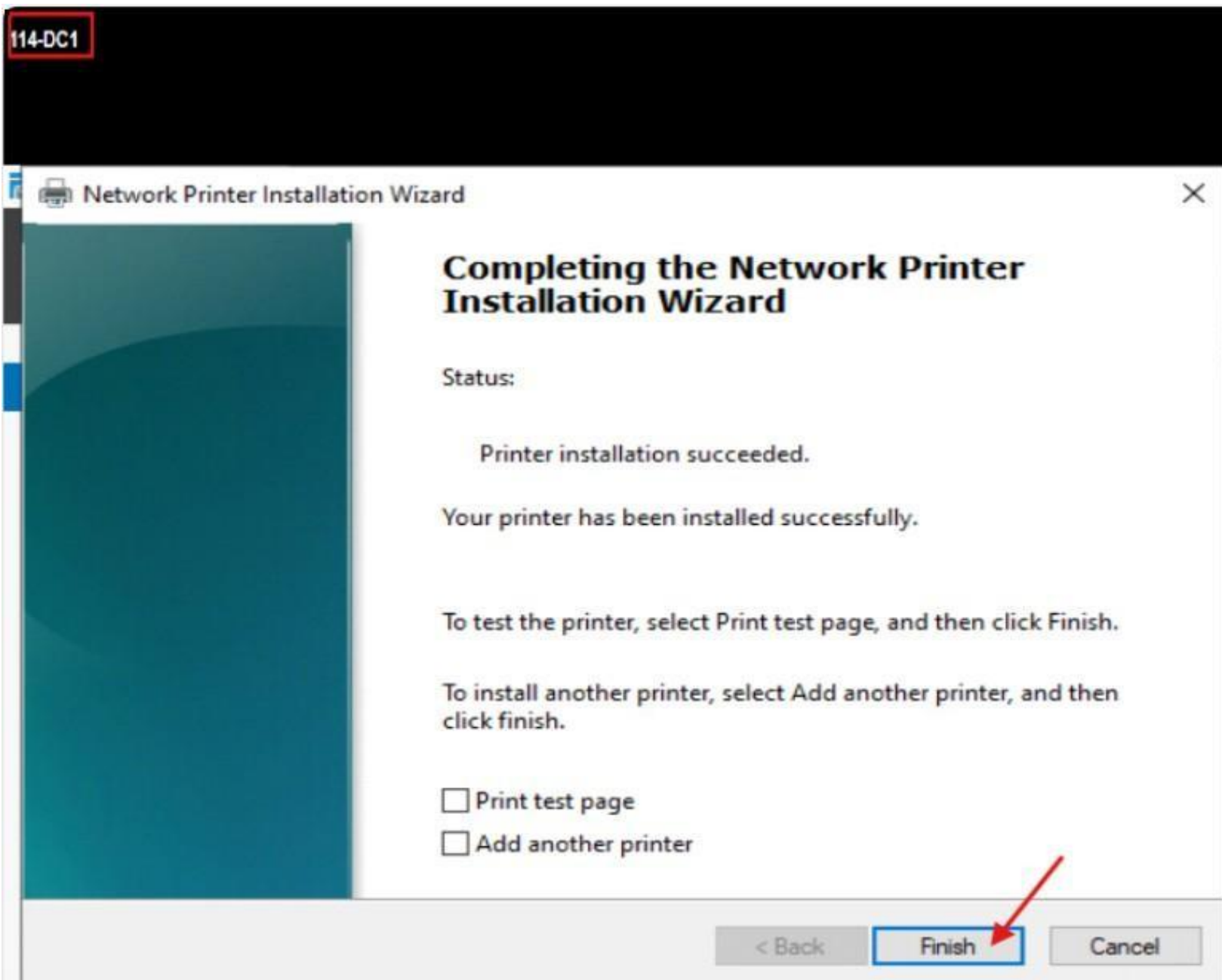
Network Printer Installation Wizard

Printer Found
The printer is ready to be installed. Please review the printer settings below, and then click Next to install the printer.

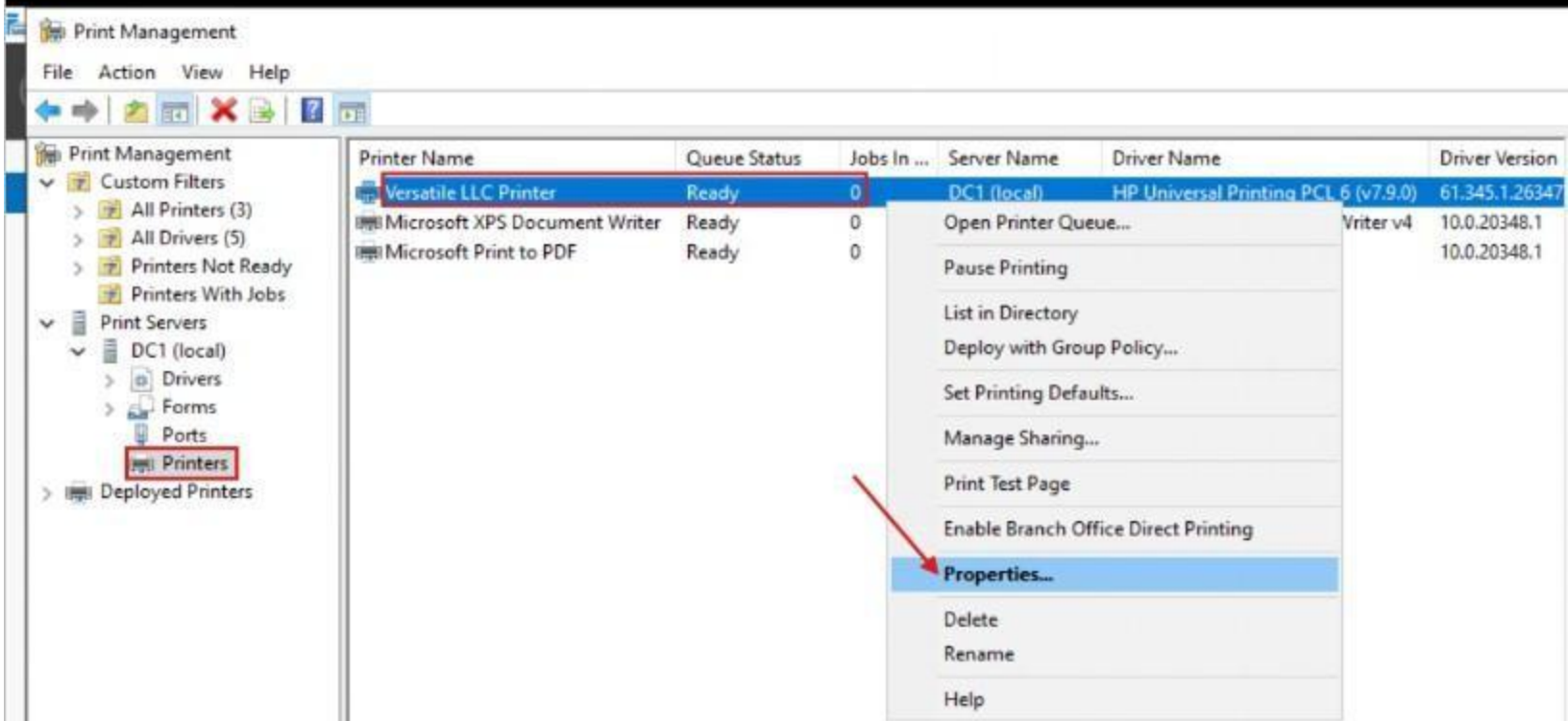
Name:	Versatile LLC Printer
Share Name:	HP Universal Printing PCL 6 (v7.9.0)
Model:	HP Universal Printing PCL 6 (v7.9.0)
Port Type:	Standard TCP/IP Port
Port Name:	printer.everestitt.com
Location:	2114 Library Road
Publish:	No
Comment:	Library Branch Printer

< Back **Next >** Cancel

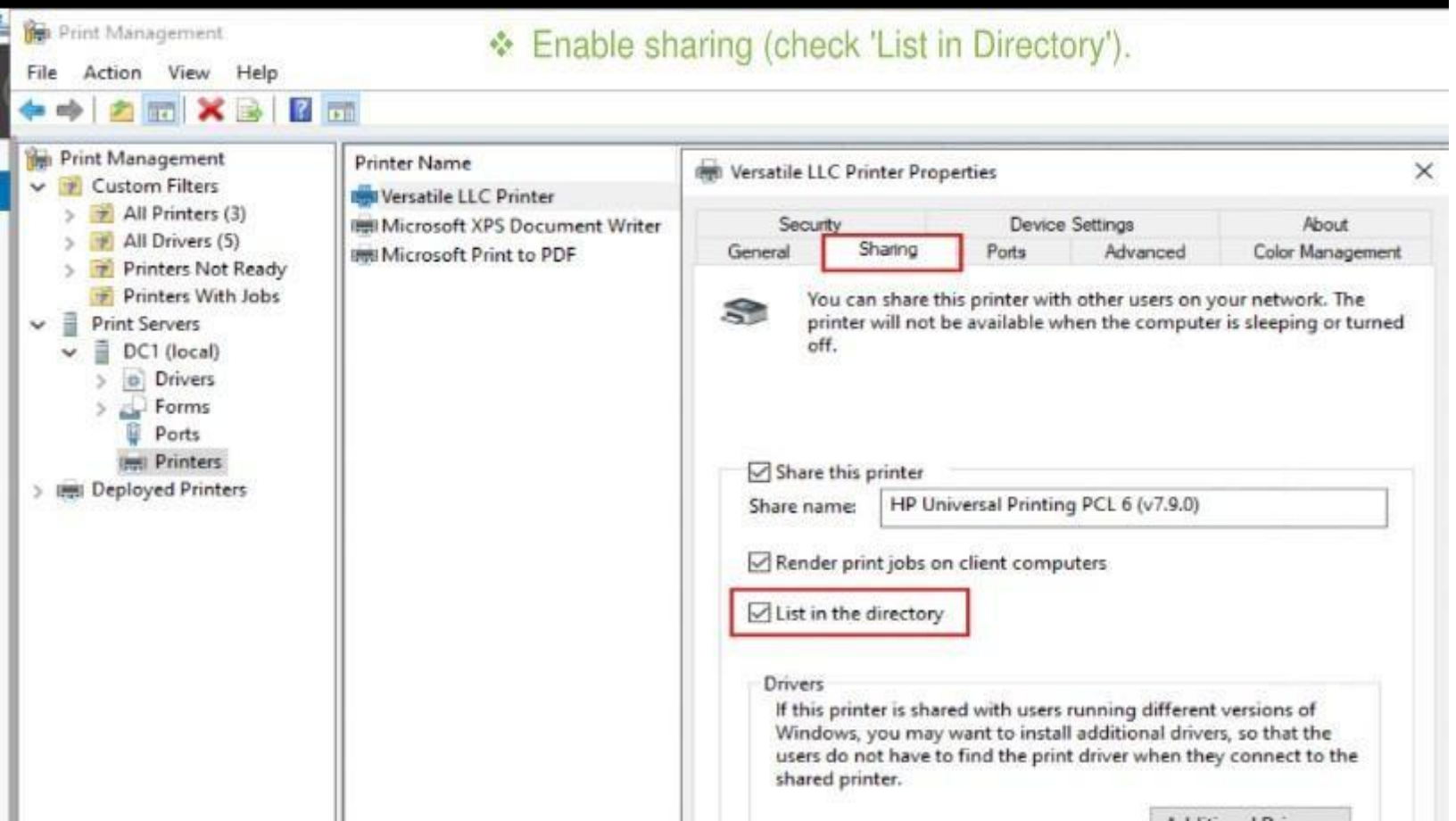
- ❖ Network Printer Installation Wizard has completed successfully, and it gives the option to print a test page to verify if the printer is working before clicking Finish.



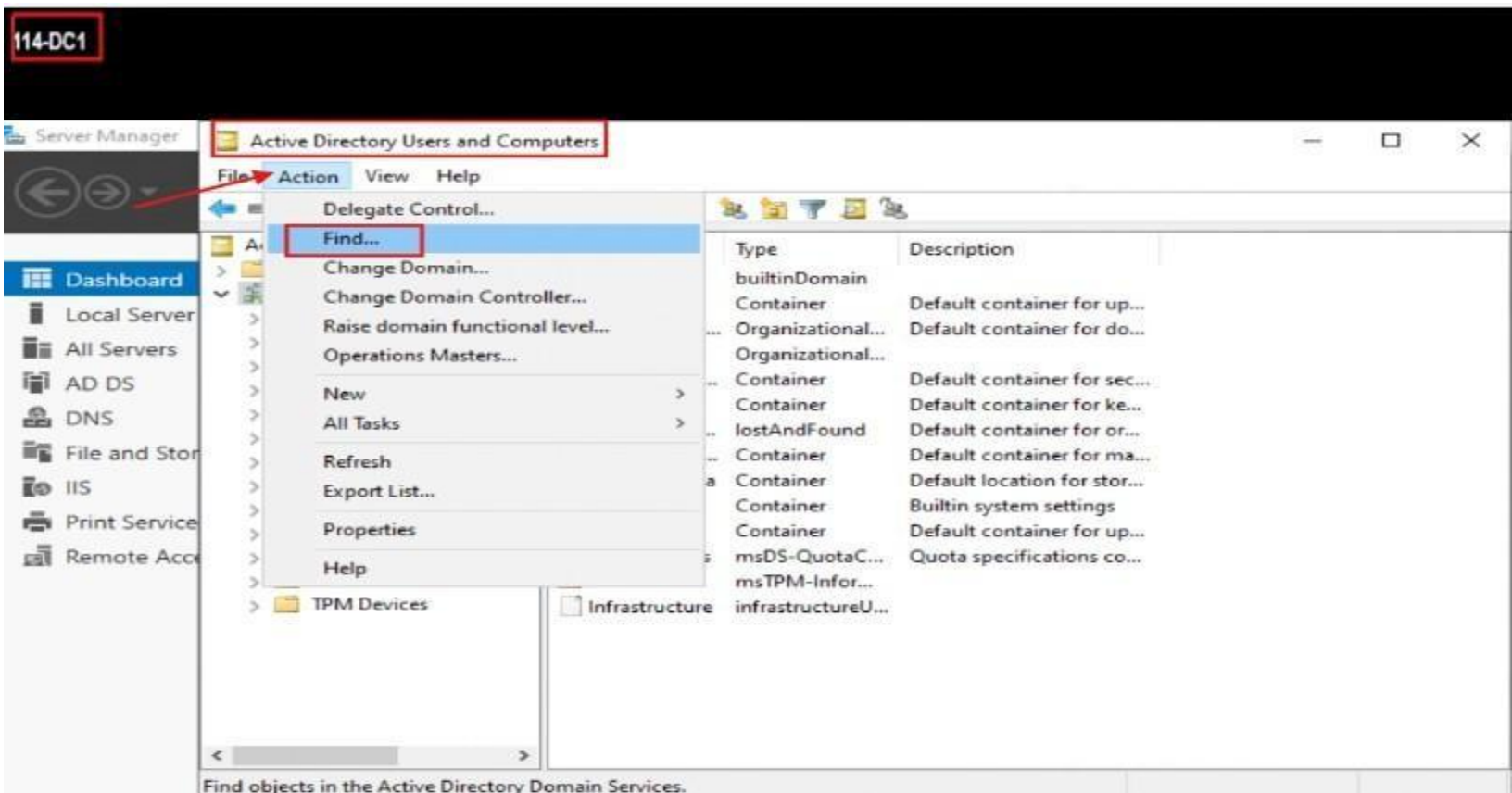
- ❖ I accessed the Properties of the printer I previously installed to view or configure its settings.



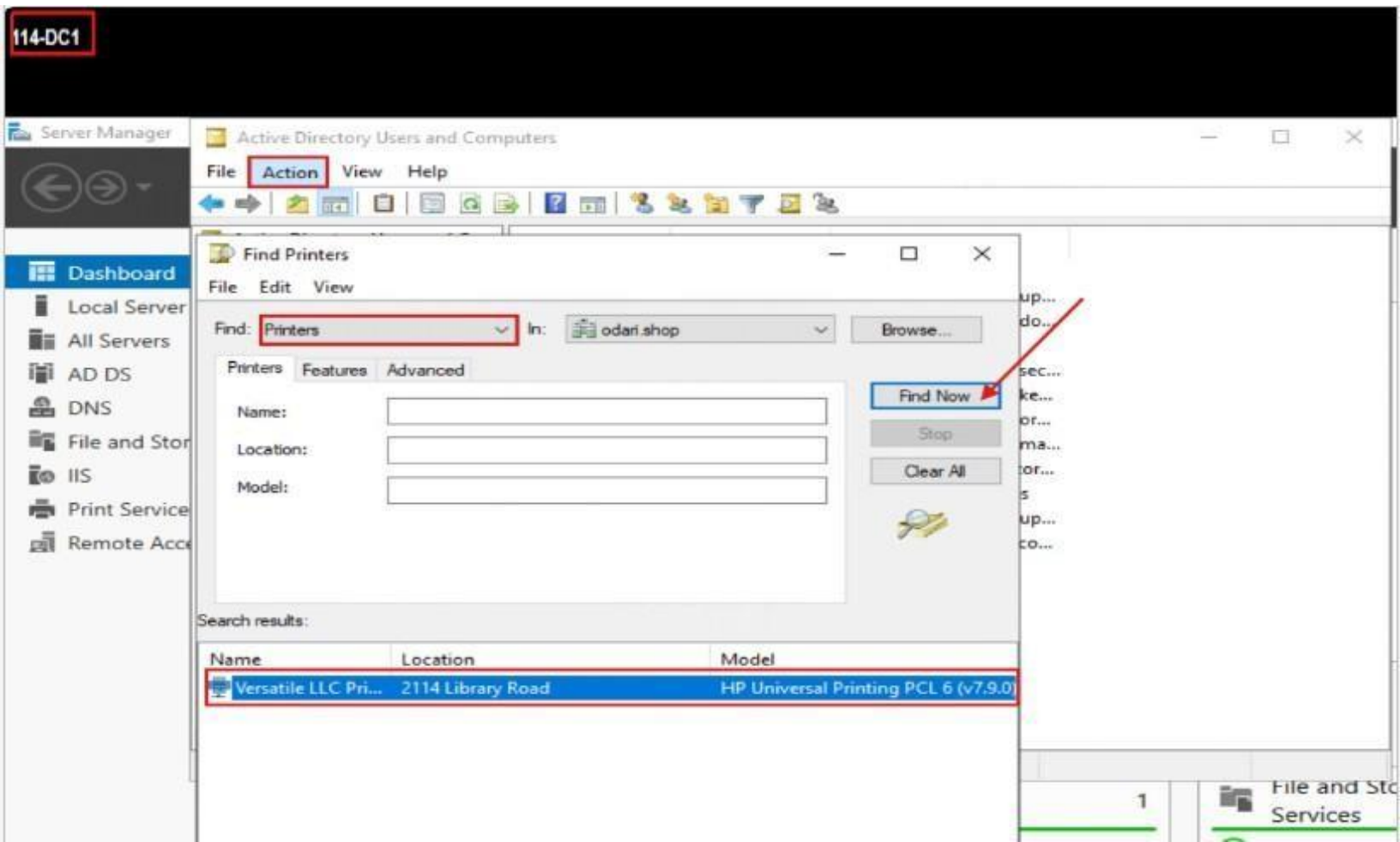
❖ Sharing: Lets you share the printer on the network and list it in Active Directory.



➤ Step 13: Verify printer in Active Directory Users and Computers (ADUC).



➤ This shows Active Directory Users and Computers being used to search for printers published in the domain. By clicking Find Now under the Printers search, it confirms that the shared printer (Versatile LLC Printer) is successfully published in Active Directory and visible to domain users, proving the printer deployment and sharing are working correctly.



❖ What is Group Policy?

- Group Policy is like a remote control for your network computers. Instead of configuring printers or settings on each PC manually, you create rules (policies) that apply automatically to all domain computers.

I use Group Policy Management to create a new GPO and link it to the Employees OU. This ensures every user in that group gets the shared printer without extra steps. It saves time, reduces errors, and keeps everything consistent across the organization.

❖ Why Use Group Policy for Printers?

Without Group Policy:

- Printers must be added on each PC
- More time, more errors

With Group Policy:

- Printers deploy automatically
- Same settings for all users
- Faster and cleaner setup

✓ Benefits of Using Group Policy for Printer Deployment

- **Saves Time** – Printers are deployed automatically without installing them on each PC manually.
- **Centralized Management** – All printer settings are managed from one place using Group Policy.
- **Automatic Deployment** – Everyone receives the same configuration, reducing setup issues.
- **Targeted Deployment** – Only users in the correct OU receive the printer.
- **Easy Troubleshooting** – Issues can be managed centrally instead of checking individual machines.
- **Consistent Experience** – All domain users get the same printer configuration.
- **Scalable Solution** – New users or computers added to the OU receive the printer automatically.

Automating Printer Deployment



Creating and Linking GPO

Create a Group Policy Object and link it to the target Organizational Unit for printer deployment.

Configuring Printer Settings

Add shared printers through User Configuration in Group Policy to enable automatic installation on login.

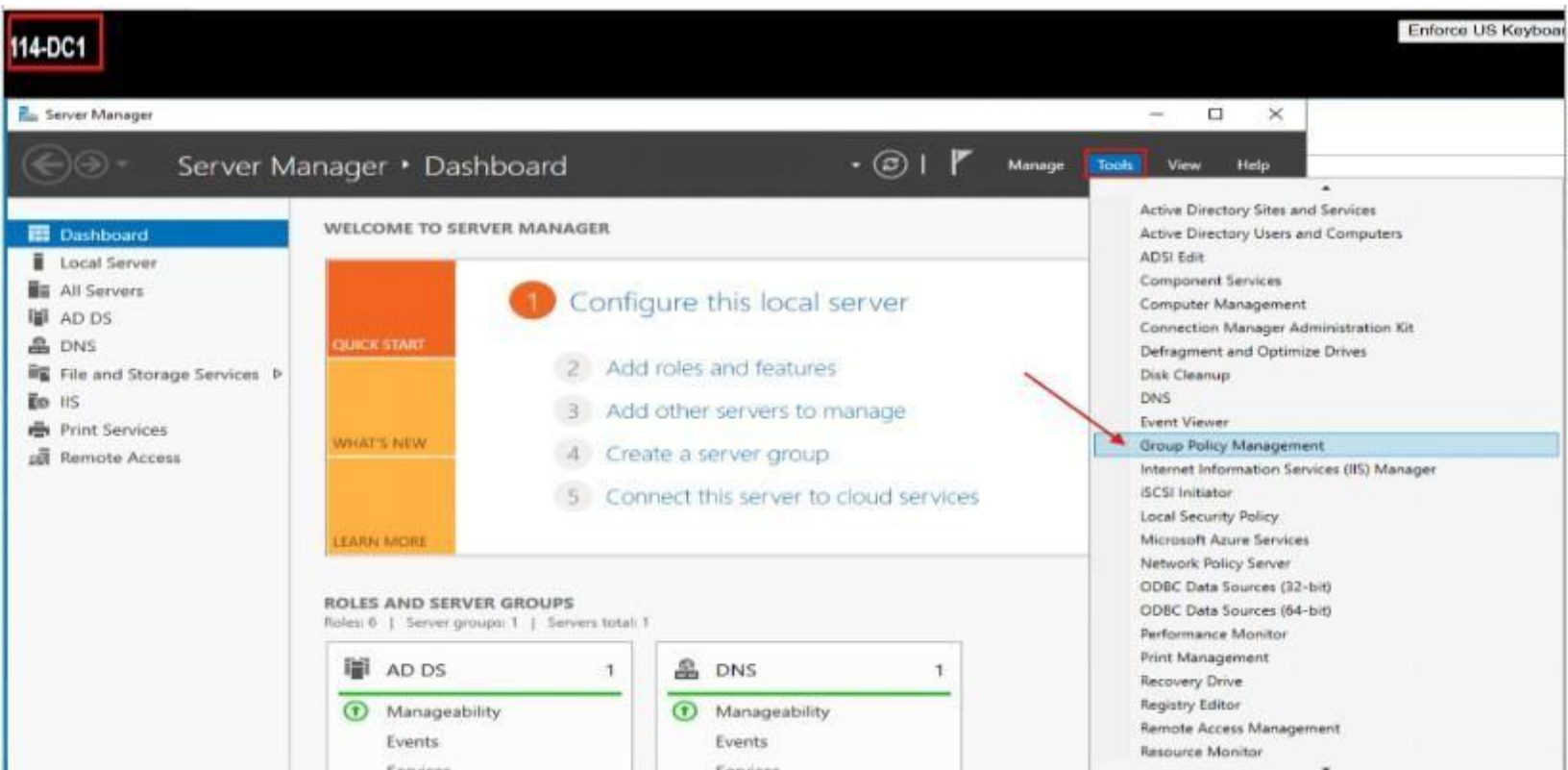
Updating and Verifying Policy

Use 'gpupdate /force' to update policies and verify printer availability in user settings.

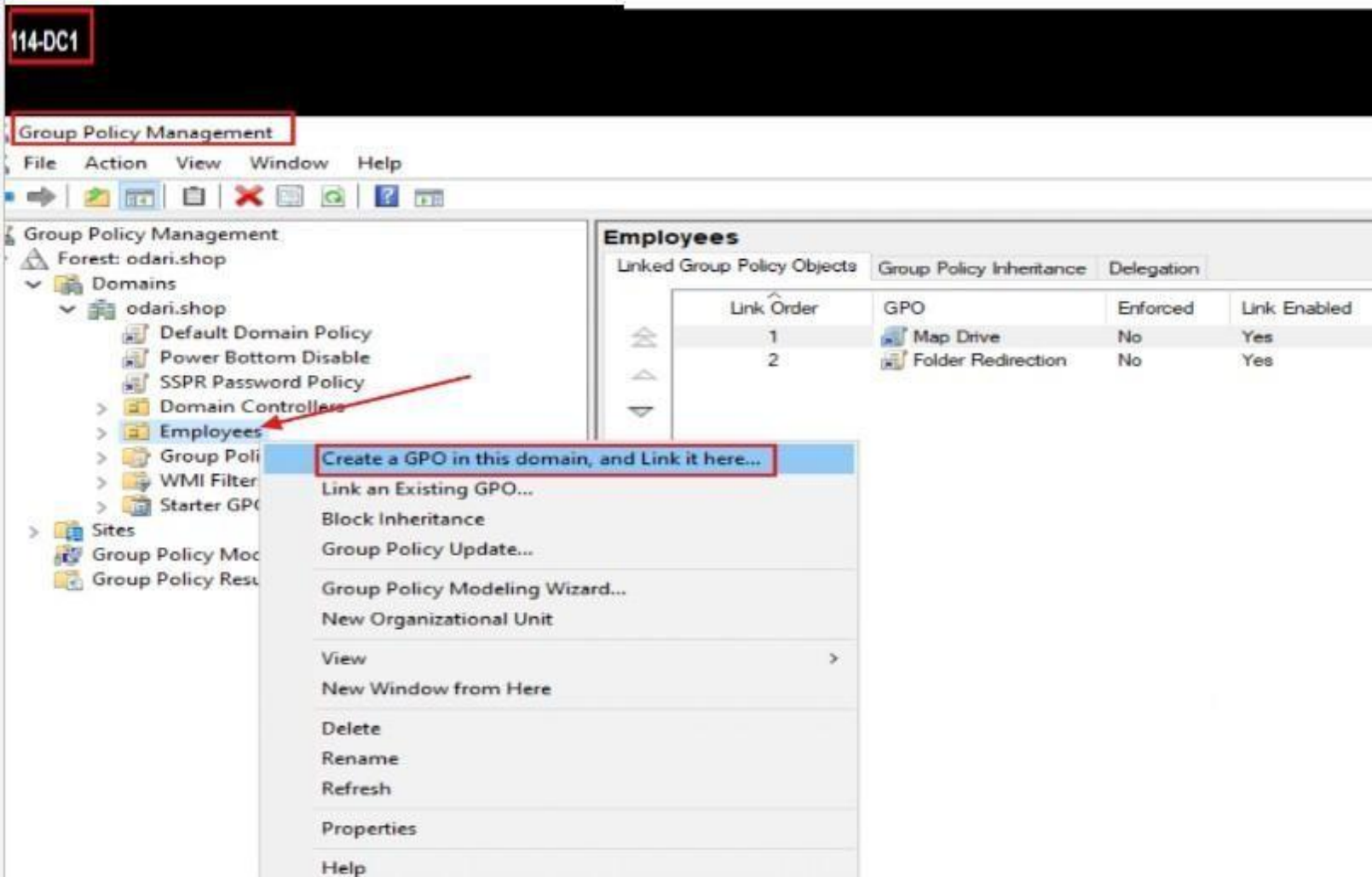
Benefits of Automation

Automated printer deployment saves time, reduces errors, and ensures consistent settings across the network.

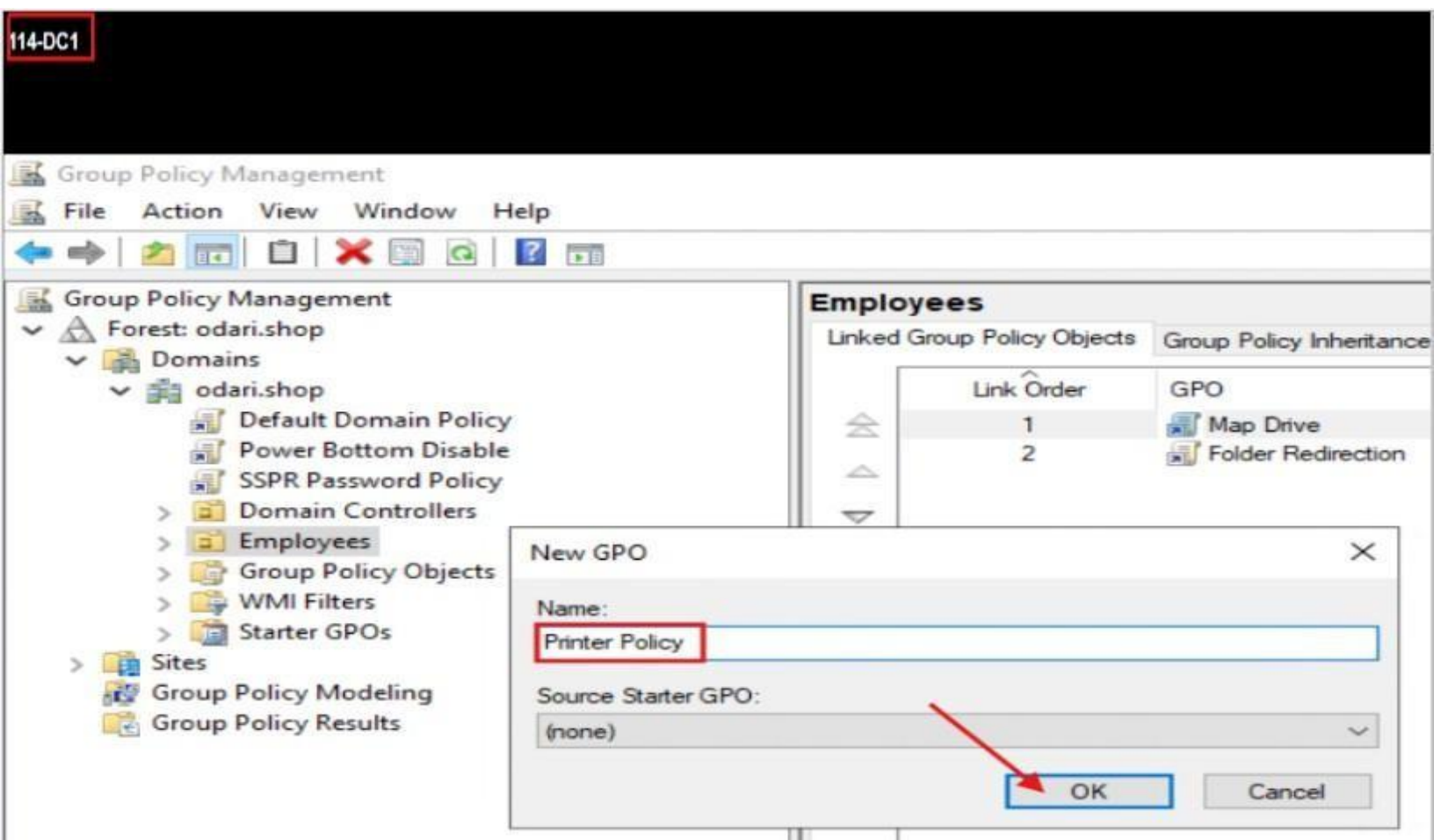
- Step 14: Create a Group Policy in Group Policy Management to deploy the printer to domain PCs.



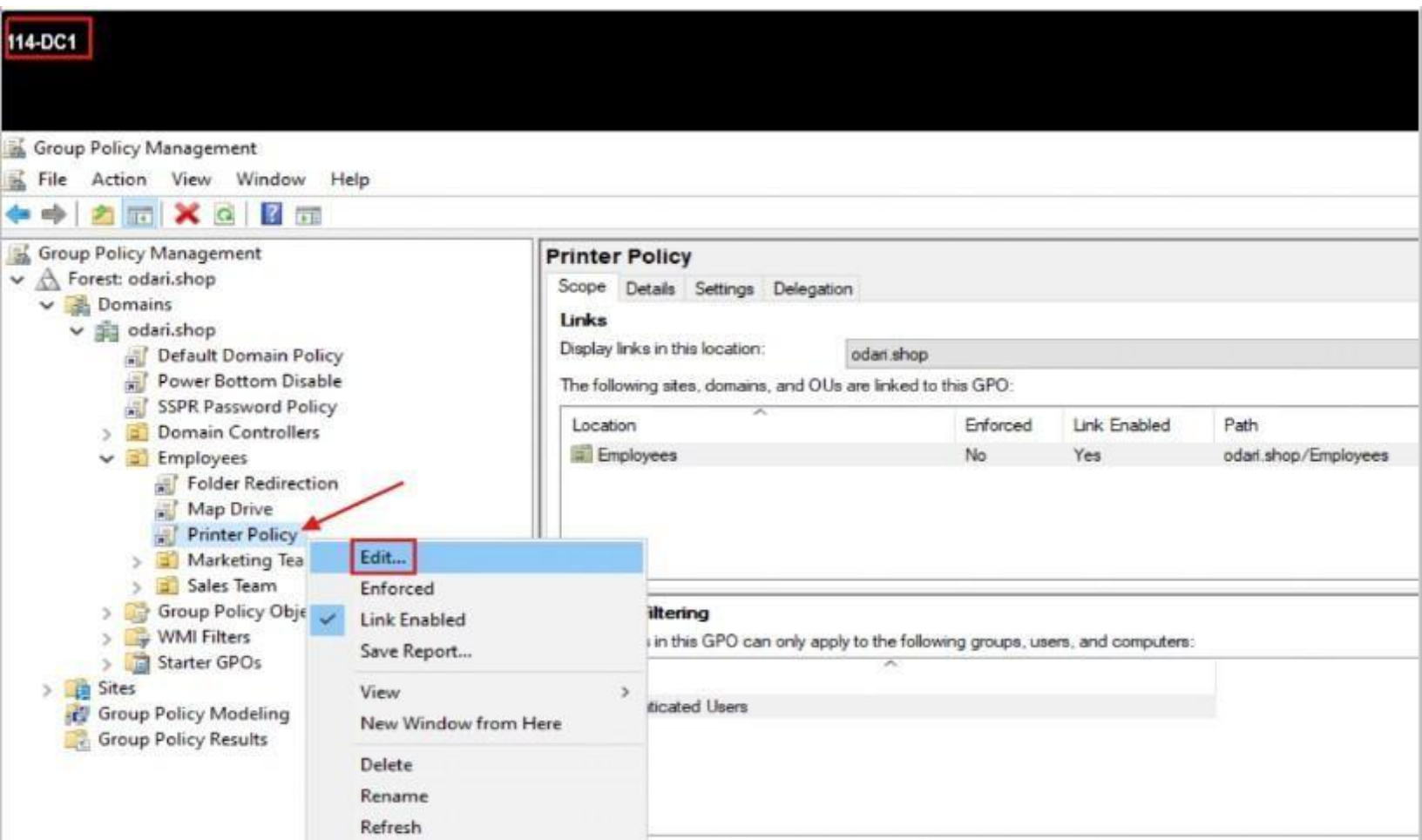
❖ Create New GPO for Printer Deployment:



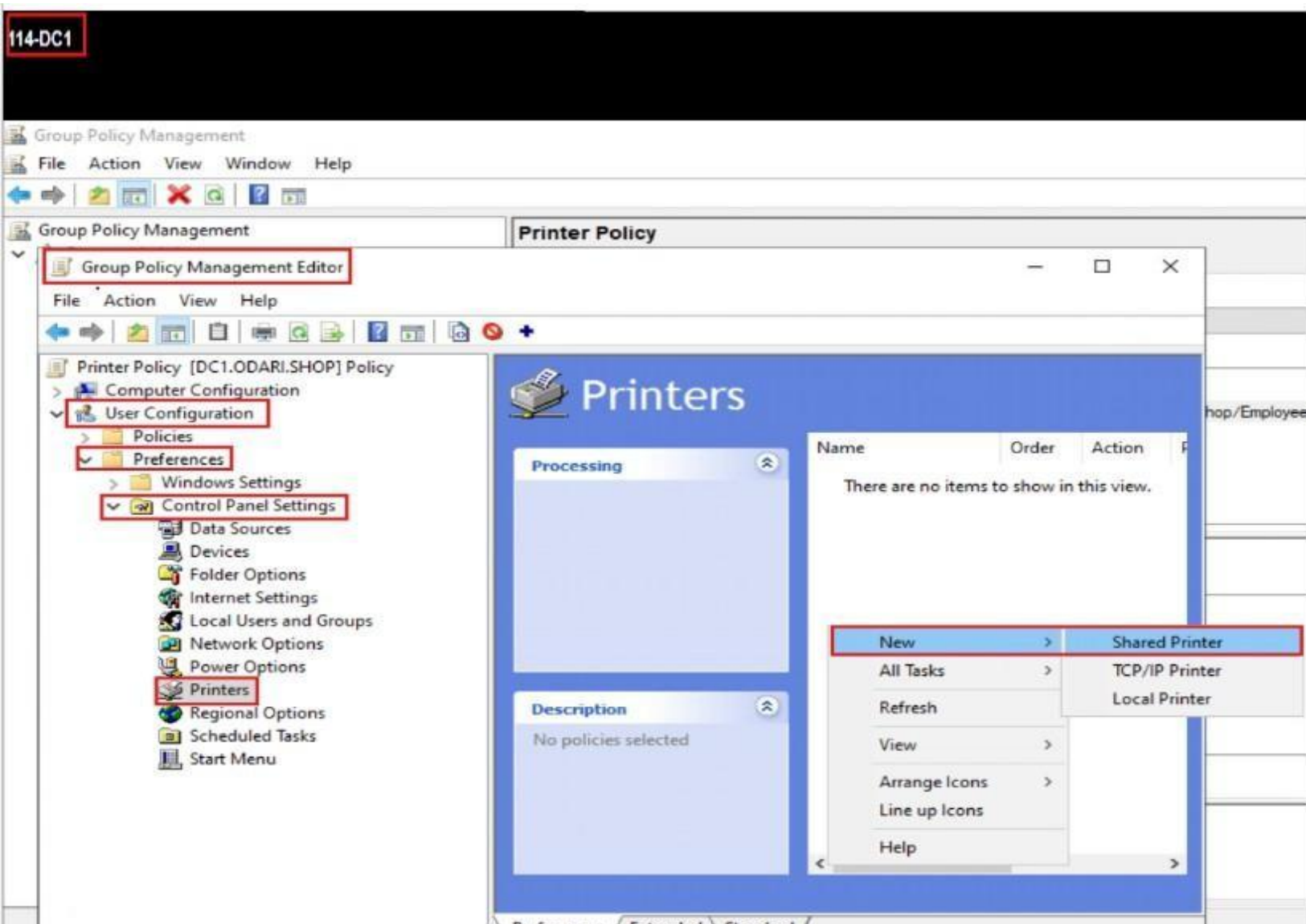
- A new Printer Policy GPO is created and linked to the Employees OU to deploy printers automatically to users.

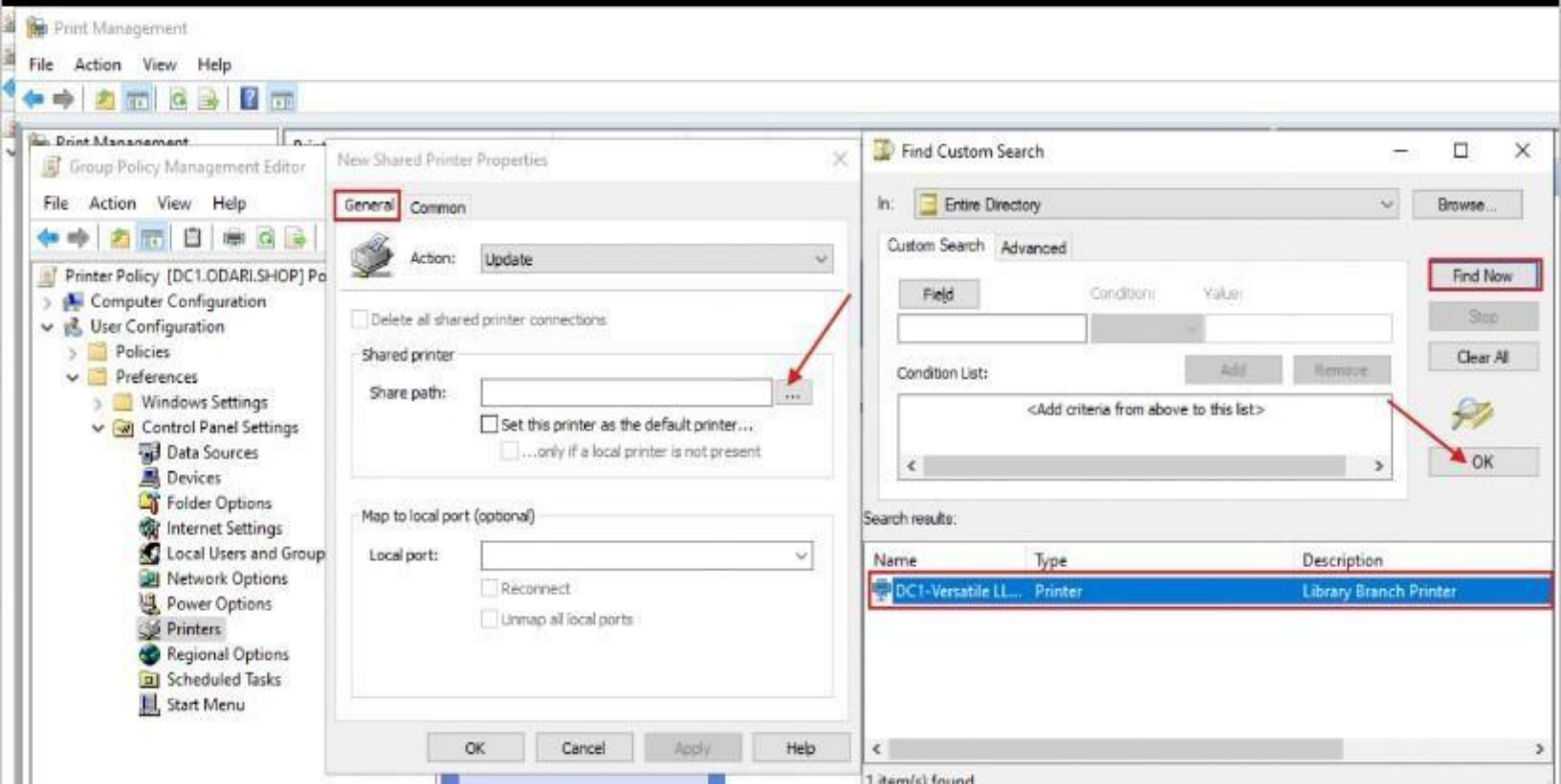


- Printer Policy GPO is opened for editing to configure printer deployment settings

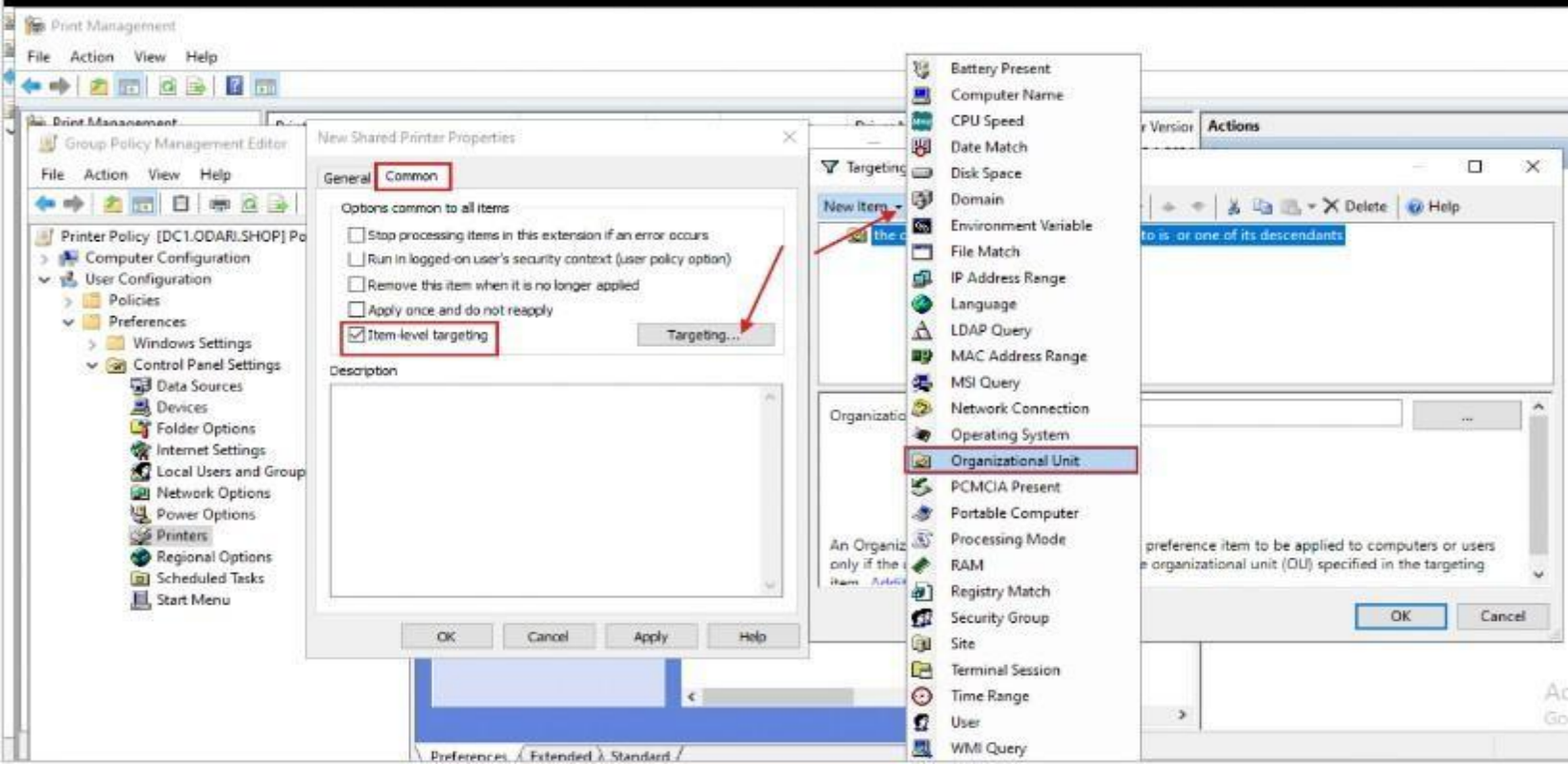


- ❖ We use Group Policy so that all domain computers automatically get the shared printer without setting it up manually. By creating a printer policy under the Employees OU, the printer is deployed to every user in that group when they log in. This saves time, reduces errors, and ensures the same printer settings for everyone.
- ❖ Group Policy Management Editor → User Configuration → Preferences → Control Panel Settings → Printers → New → Shared Printer





- Configuring Item-level Targeting for the shared printer in Group Policy, where Organizational Unit (OU) is selected so the printer applies only to users or computers in the specified OU, ensuring the printer is deployed to the correct group and not everyone in the domain.



- This shows item-level targeting where the Employees Organizational Unit (OU) is selected, ensuring the shared printer is deployed only to users in that specific OU and not the entire domain.

114-DC1

Enforce US Keyboard Layout

Print Management

File Action View Help

Group Policy Management Editor

New Shared Printer Properties

Targeting Editor

the organizational unit the user belongs to is or one of its descendants

Organizational unit: Employees

☐ Direct member only
☒ User in OU
☐ Computer in OU

An Organizational Unit targeting item allows a preference item to be applied to computers or users only if the user or computer is a member of the organizational unit (OU) specified in the targeting item. Additional information

OK Cancel

Find Custom Search

In: Entire Directory

Custom Search Advanced

Field Condition Value

Condition List: <Add criteria from above to this list>

Find Now Stop Clear All OK

Search results:

Name	Type	Description
Sales Team	Organizational Unit	
Marketing Team	Organizational Unit	
Employees	Organizational Unit	
Domain Control...	Organizational Unit	Default container for domain contr...

4 item(s) found

- Step 15: Update Group Policy using Command Prompt → `gpupdate /force`.

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Print Management

File Action View Help

Administrator: Command Prompt

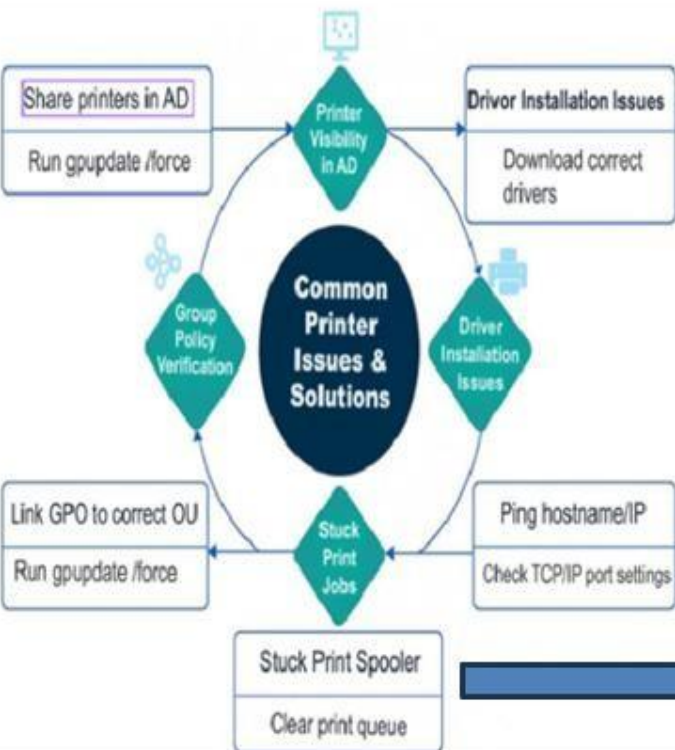
```
Microsoft Windows [Version 10.0.20348.4052]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Administrator>gpupdate /force
Updating policy...

Computer Policy update has completed successfully.
User Policy update has completed successfully.

C:\Users\Administrator>
```

Common Printer Issues and Solutions



Printer Visibility in AD

Ensure printers are shared and listed in Active Directory to appear correctly, then refresh Group Policy with 'gpupdate /force.'

Driver Installation Issues

Download correct drivers from official sources and reinstall using 'Have Disk' option in Print Management for compatibility.

Network Connection Problems

Verify printer connectivity by pinging hostname or IP and check network and TCP/IP port configurations if unreachable.

Stuck Print Jobs

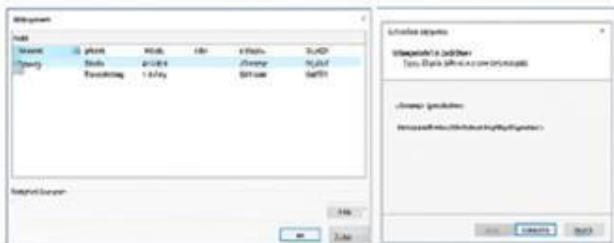
Restart the Print Spooler service and clear the print queue to resolve stuck or stalled print jobs efficiently.

Group Policy Verification

Ensure GPO is linked to the correct OU and confirm policy application using 'gpresult /r' command to apply printing policies.

Common Printer Issues & Solutions

Printer Visibility in AD



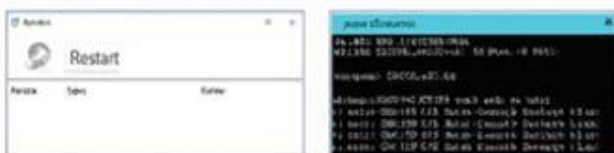
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Driver Installation Issues



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Stuck Print Jobs



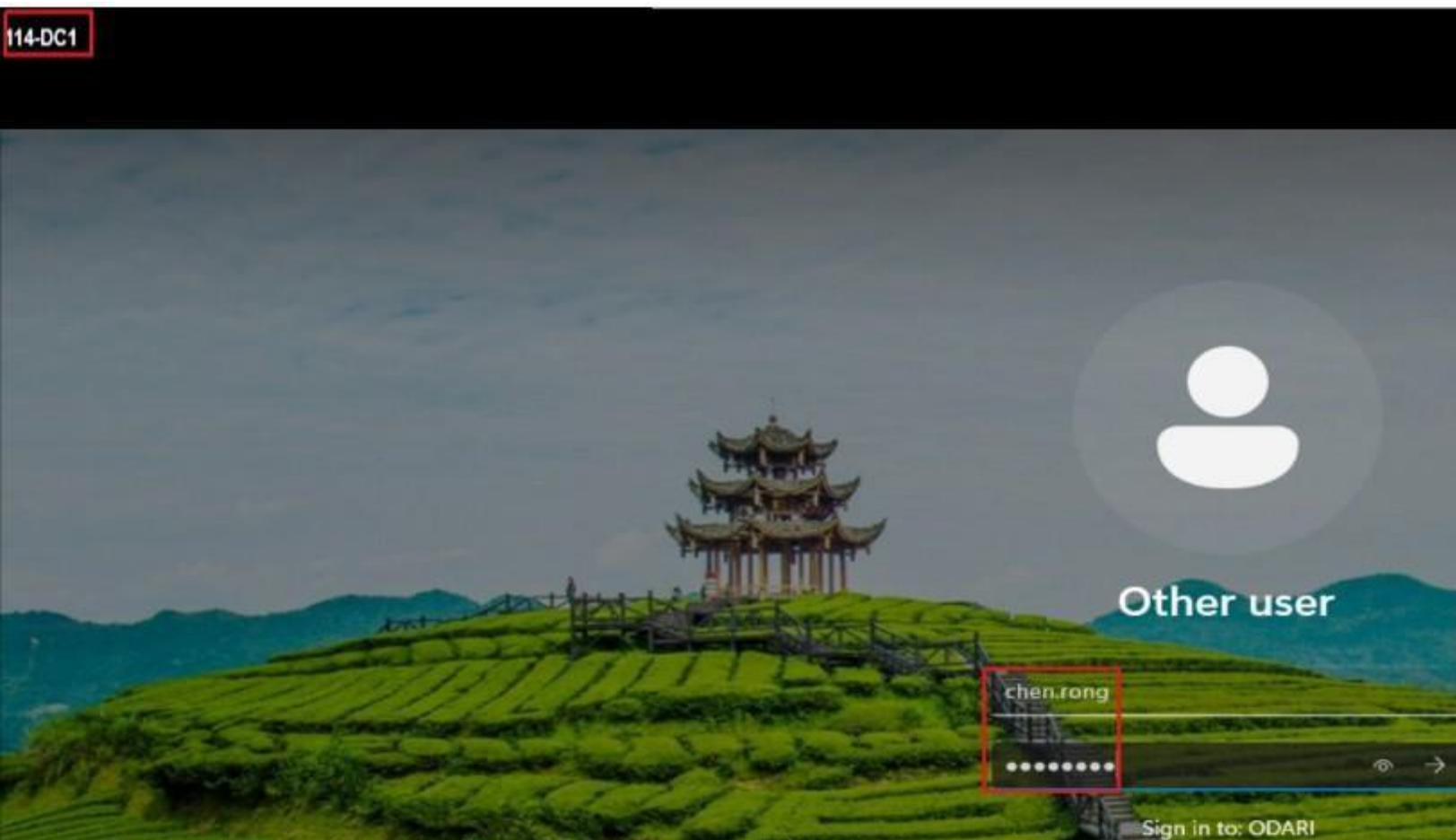
Restart the Print Spooler service and clear print queue to resolve stuck or stalled

Group Print Jobs

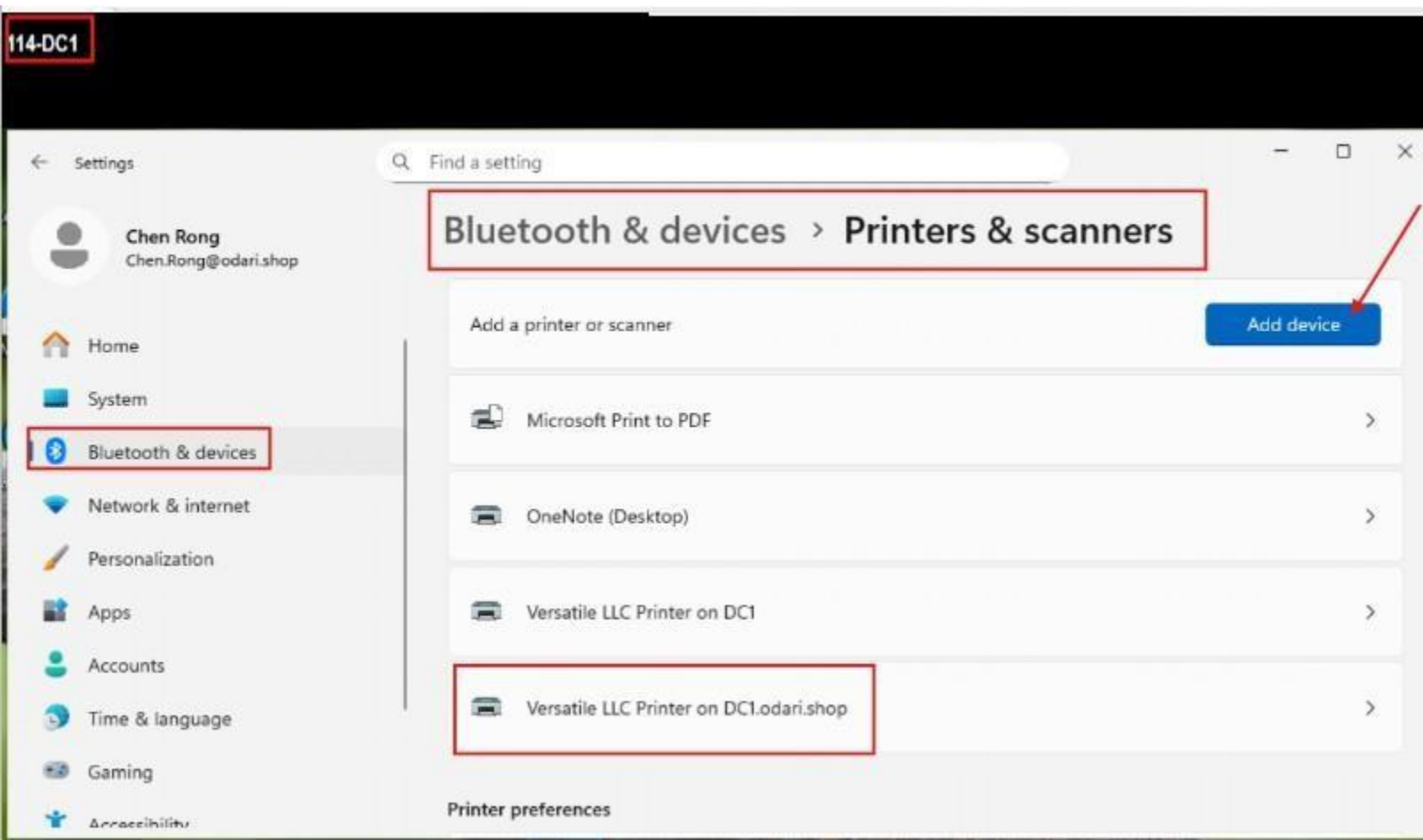


Ensure GPO is linked to the correct OU and confirm policy application using 'gpresult /r

❖ Chen.rong is logging into the domain-joined computer.



➤ Step 16: Log in as a domain user and verify printer under Settings > Printers & Scanners.



Benefits and Engagement

Streamlined Management

Centralized printing simplifies management by using a single print server to handle drivers, sharing, and policies.

Enhanced Security

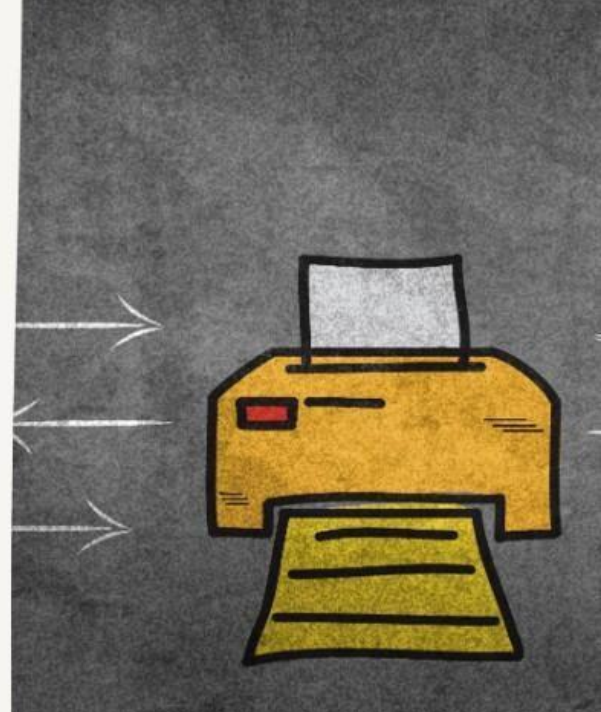
Centralized printing improves security by controlling access and reducing configuration errors across devices.

Improved Efficiency

This approach reduces configuration time, minimizes errors, and simplifies troubleshooting in IT environments.

Supports Scalability

Centralized printing supports organizational growth by enabling scalable and proactive infrastructure management.



❖ Conclusion:

Centralized printing provides a streamlined and efficient approach to managing print resources within an organization. By implementing a single print server to handle drivers, sharing, and policies, administrators can reduce configuration time, minimize errors, and ensure consistent printer access across all domain-connected devices. This solution enhances security, simplifies troubleshooting, and delivers uniform printing experience for users, making it an essential component of a modern IT infrastructure.