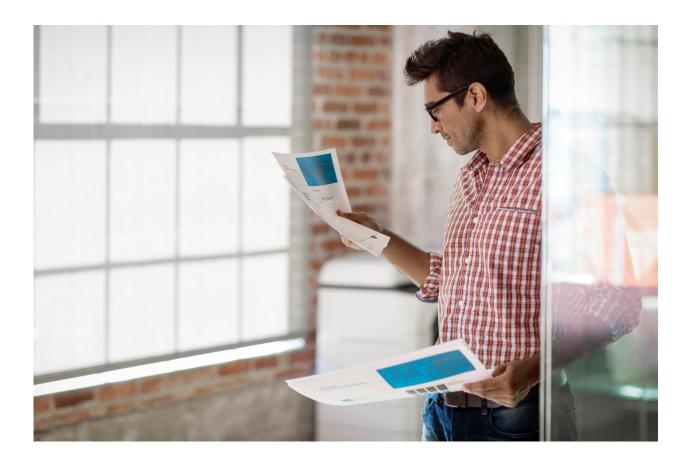
Technical Training Guide

# HP Access Control Technical Training Guide

Version 18.4



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## **Training Objectives**

The purpose of this training is to provide you with all the information and best practices to install HP Access Control (HP AC) Enterprise as a demo on a computer / virtual machine or install the solution as a POC in a customer's environment.

#### How to use this training

This course leverages the HP AC whitepapers and manuals maintained in HP's online system. When HP makes an update to the documents contained in these links, the PDF referenced in this document is automatically updated. This means most of this training is updated through updating the whitepapers.

These documents are created by knowledgeable HP engineers who work on HP AC escalations. The support tickets they resolve provide a basis for the content of the whitepapers. If you will take time to learn the contents of the whitepapers you will be prepared to answer most of the questions you receive regarding HP AC.

Each section has a short introduction identifying the objectives/purpose of that section. You will be directed to the whitepaper for certain content and then back to this training guide for additional information and video links that help clarify the items that are being discussed.

Please follow the guide as it has been outlined when you are first going through the training. Skipping a section or not reading a whitepaper may impede the learning process and cost you more time. After you have completed the training, feel free to use this guide to quickly locate resources which may help you in your HP AC efforts.

## Task 1: Installing HP AC

### **Preparation / Objectives**

The instructions included in this training prepare you to install HP AC on any of the supported operating systems.

For the purposes of this training, we will install HP AC on a Windows 2016 Standard Server operating system on a virtual machine. For another windows version or to use a dedicated SQL server instance, please use the referenced documentation to complete the setup

**NOTE:** This training is using Windows Server 2016 Standard. If you are installing on a different operating system, please refer to the specific information for your system in the documentation. Windows Firewall and User Account Control have both been turned off on our system prior to installation.

In this task we'll be using the HP AC Enterprise Administrator Guide, the HP AC and SQL Installer package document and the zip file containing MS SQL Express Edition, all of which are included in the HP AC download files. These documents provide the information necessary to install HP AC on your chosen server operating system.

The HP Access Control Enterprise Administrator Guide v16.2: <u>http://h10032.www1.hp.com/ctg/Manual/c05641610</u>

The HP AC and SQL Installer package.pdf file is included with the zip file that contains MS SQL Express.

Videos that accompany this section:

Prerequisite checker: https://vimeo.com/292206552/4797a03594

Installing the .Net 3.5 framework on Server 2016: <u>https://vimeo.com/275151464/be1d7980d1</u>

SQL Express Installation and configuration: <u>https://vimeo.com/292206135/6d5f67b45a</u>

Installing HP AC: https://vimeo.com/292206022/81e914dbef

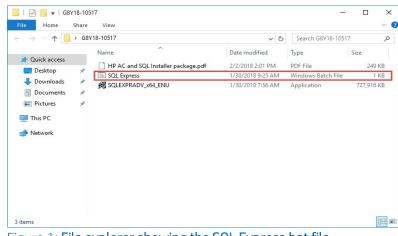
#### **Install SQL Server Express**

If you have an existing instance of MS SQL that you will be connecting to, you need to have the username and password to complete the next steps for setup and can skip to the next section.

Note: If you plan to use SQL Reporting Services for Job Accounting in HPAC, go to Task 9, Section 1 to install the required version of SQL Server Express.

Steps to install SQL Server Express:

1. Read the HP AC and SQL Installer package .pdf file to review the information necessary to complete the MS SQL Express Edition Installation. In this version, we launch the .bat file to complete install.



2. Double click the SQL Express.bat file.

Figure 1: File explorer showing the SQL Express.bat file

**3.** Type your selected system account (sa) password in the command prompt window and press **Enter** to continue with the installation.

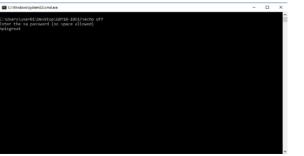


Figure 2: Prompt shown by launching the SQL Express.bat file

**4.** Record your sa password for use with the HP AC installation as it will be required to complete the setup.

The batch file will complete the setup for MS SQL on the selected server. Some SQL screens will display on the desktop, but no further user interaction is required. As a best practice, it is always good to reboot your operating system between installations to keep services running smoothly and reduce the possibility of conflicts.

#### **Install HP AC Enterprise**

Note: HP AC requires .Net 2.0 and 3.5 and IIS to be installed and handles the installation automatically. The automatic installation of the .Net 2.0 and 3.5 features and IIS are only available through Windows Update. An active internet connection is therefore required.

Steps to install the HP AC Enterprise:

- **1.** Open the HP Access Control Enterprise Administrator Guide referenced in the preparation section.
- 2. Read Chapter 1 and 2 and make sure your system meets the requirements specified. Continue to the next step once you are satisfied that your environment meets those requirements.
- **3.** Follow the steps to install HP AC Enterprise in section 3.2.

## Task 2: Configuring HP AC Enterprise Settings

#### Preparation

To complete this task, you need to have a successfully installed instance of HP AC. There should be a shortcut to the HP AC Configuration utility on your desktop. At the end of this task, you will have configured the necessary settings to be able to configure a printer with the HP AC client in the next task.

In this task we'll be using the HP AC Enterprise Administrator's guide.

http://h10032.www1.hp.com/ctg/Manual/c05641610

Videos that accompany this section:

Configuring certificates: https://vimeo.com/275341091/3f2d39e694

HP AC Setting Tile: https://vimeo.com/275705112/6d9c27a252

#### **HP AC tiles familiarization**

The purpose of this task is to familiarize you with the HP AC tiles. The tiles provide all the administrator functions for HP AC Enterprise, so take some time to become familiar with all their functionality.

- 1. Open the HP AC Enterprise Administrator's guide and read section 4.1.
- 2. Read this without opening the HP AC Configuration utility. This will familiarize you with the interface.

#### **HP AC initial settings**

When HP AC is installed for the first time the, there will be several grey and orange tiles (see Figure 3). The tiles in orange show that additional configuration is required to have a successful implementation.

	đ	)	? _ = ×
PersonalQ		Q Device Analysis	Job accounting
PersonalQ management	Intelligent Print Management	Scan and analysis of network devices	Job accounting, database manager
Settings	Devices	Print server	Server Information
View/manage applications settings including IIS server and SQL server	Device installation/configuration	Print queue configuration	Show memory usage and installed applications
License	Pull Print Savings		
View/manage licenses	Real time count of printed page savings		

Figure 3: HP AC Configuration Utility

Steps for HP AC initial settings:

- 1. Open the HP AC Enterprise Administrator's guide and follow the steps in section 4.2 to finalize your configuration settings.
- 2. Remember to press the **Update** button when making any changes to the Pull Print Enterprise tab, and before moving to another tab or tile, or your settings will not be saved. Read till you reach section 4.2.1.

## Task 3 – Configuring Authentication and Storage

#### Preparation

To complete this task, you need to have successfully installed HP AC Enterprise. This is the largest request we receive when configuring HP AC. Therefore, we will change the storage to use a MS SQL Database and configure Card Authentication.

In this task, we'll be using the HP AC Enterprise Administrator's guide.

http://h10032.www1.hp.com/ctg/Manual/c05641610

#### **Configure Authentication and storage**

Steps to configure Authentication and storage:

- 1. Download and review the HP AC Enterprise Administrator guide and review Chapter 5 on Authentication through section 5.3.2.
- 2. You need to get your MS SQL server name and password before you can enable SQL Data Storage. To do this, navigate to the **Settings** tile and choose the **Database** tab. Then, copy the Server name in the Database configuration section.

9		ିଶ			?
File Database tools					
Pull Print Enterprise Spooler Datab	ase IIS User Agent	Print server IP	M Login Licens		
Batabase configuration					
Server (IncaUHPACEXPRESS	1				
O Windows authentication					
SQL authentication					
User 🔄	]				
Password	]				
Atways0n					
				( Test	Apply
Agent configuration					
X LocalSystem account					
	w = armet)				Apply
Restart services after update (w3)					

Figure 4: Database tab with the server name selected

- **3.** Follow the steps in section 5.3.1 to choose Card Only as the Device Authentication method and choose SQL Server for Data Storage.
- **4.** Type a unique Database name (e.g. HPACIRM) and paste your copied value into the Data Storage Server name field.
- 5. Choose the SQL authentication radio button
  - a. User: sa
  - **b.** Password: sa password you set in the SQL Installation.

**6.** Press the Test connection button to make sure it is available, and then click the **Update** button to save your settings.

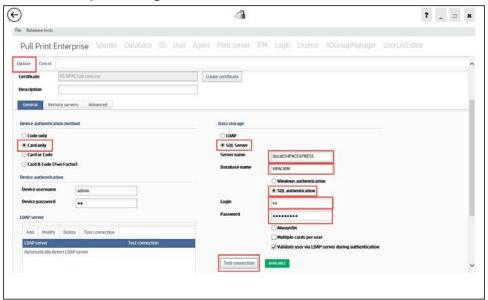


Figure 5: Settings configured properly for SQL Server authentication.

**7.** Section 5.3.2 discusses the LDAP settings. Review those settings and adjust, as necessary, to your environment.

## Task 4 – Creating a pull printer queue (on client)

#### Preparation

To complete this task, you need to have successfully installed HP AC Enterprise. You will need a supported client operating system (OS) as specified in the HP AC Administrator guide, that is joined to the same domain as your HP AC server. This is assuming that you have administrator rights on the computer you are using. At the end of this task, you will have a client with a pull print queue enabled and you will be able to submit jobs to the HP AC queue. We will follow the process to create both an IPP and an LPR queue

In this task we'll be using the HP AC Enterprise Administrator's guide, the HP FutureSmart 4 Administrative Password Security Features whitepaper, and the Secure by Default whitepaper.

HP AC Enterprise Administrator's guide:

http://h10032.www1.hp.com/ctg/Manual/c05641610

The latest HP Universal Print Driver (UPD) PCL 6 version:

http://www.hp.com/go/upd

Videos that accompany this section:

Configure pull print drivers: https://vimeo.com/275680171/58169ba158

#### Create a Pull Print Queue (IPP)

Steps to create a Pull Print Queue:

- 1. Download or open the HP AC Enterprise Administrator's guide and read section 8.1 for an overview of creating pull print queues.
- **2.** Follow the steps in section 8.1.2, titled Adding a printer to use Internet Printing Protocol (IPP), through step 4, then return to this guide.
- **3.** If the latest HP Universal Print Driver (UPD) is installed on your computer, select that UPD and follow the instructions to complete the installation then continue to step 4. If not, follow the steps below:
- **4.** Instead of selecting a printer driver from the list of installed drivers, use an INF from the latest HP UPD. Download the latest HP UPD from the link above and double-click the installer to run the file.
- **5.** In the WinZip Self-Extractor dialog box, click to clear or uncheck the **When done unzipping open:**.\install.exe.

To unzip all files in this self-extractor file to the specified folder press the Unzip button.	Unzip
Unzip to folder:	Run WinZip
Print Driver\pcl6-x64-6.6.0.23029 Browse	Close
Overwrite files without prompting	About
When done unzipping open: Vinstall exe	Help

Figure 6: Self-Extractor for HP UPD

This action creates a folder in the following location: C:\HP Universal Print Driver.

6. Click the Have Disk... button on the Add Printer Wizard.

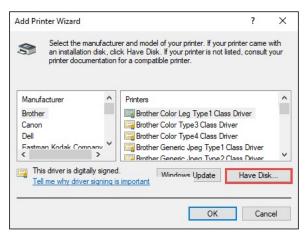


Figure 7: Add Printer Wizard driver selection dialog box

**7.** Browse to the folder containing the .inf files for the HP Universal Print Driver you extracted, select one of the .inf files, and click the Open button.

Look in:	pcl6-x64-6.6	.0.23029		
1	Name	^	Date modified	Туре
$\mathbf{x}$	Drivers		4/17/2018 11:35 AM	File fol
uick access	hpbuio200		3/23/2018 1:54 AM	Setup I
	hpbuio200	le	3/23/2018 1:54 AM	Setup I
	hpcu215u		3/23/2018 1:54 AM	Setup I
Desktop	hpmews02		3/23/2018 1:54 AM	Setup I
-	hpmldm02		3/23/2018 1:54 AM	Setup I
-	hppewnd		3/23/2018 1:54 AM	Setup I
Libraries	hppfaxnd		3/23/2018 1:54 AM	Setup I
	hppscnd		3/23/2018 1:54 AM	Setup I
	hpzid4vp		3/23/2018 1:54 AM	Setup I
This PC	hpzipa23		3/23/2018 1:54 AM	Setup I
-	hpzipr23		3/23/2018 1:54 AM	Setup I
	hpzius23		3/23/2018 1:54 AM	Setup I
Network	<			>
TACCAROTE	File name:	hpbuio2001.inf	~ [	Open

Figure 8: File location of the HP UPD .inf files.

8. Click the OK button to close the Install from Disk dialog box.



Figure 9: Install From Disk dialog box with file selected.

**9.** Select the HP Universal Printing PCL 6 option from the list of printers and click **OK** to continue.

Add Pri	nter Wizard		?
3	Select the manufacturer and mode an installation disk, click Have Dis printer documentation for a compa	sk. If your printer is not I	
	s 9 Universal Printing PCL 6 9 Universal Printing PCL 6 (v6.6.0)		
-	is driver is digitally signed. Il me why driver signing is important	Windows Update	Have Disk
		ОК	Cancel

Figure 10: HP Universal Print Driver PCL 6 selection in the Add Printer Wizard.

- **10.** Complete the remaining steps to install the printer and print a test page before you close the installer.
- **11.** Open the HP AC Configuration utility to the PersonalQ tile and open the personal queue you created. You should see your print job in this queue.

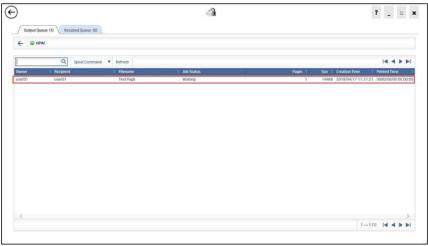


Figure 11: HP AC PersonalQ with files waiting for release.

### Create a Pull Print Queue (LPR)

Steps to create LPR Pull Print Queue:

- **1.** Download or open the HP AC Enterprise Administrator's guide and read section 8.1 for an overview of creating pull print queues.
- **2.** Follow the steps in section 8.1.3, titled *Adding a printer to use Line Printer Remote (LPR)* protocol, through step 13, then return to this guide.
- **3.** Select the Print test page checkbox.
- 4. Click Finish.

🖶 Network Printer Insta	llation Wizard X
	Completing the Network Printer Installation Wizard
	Status:
	Printer installation succeeded.
	Your printer has been installed successfully.
	To test the printer, select Print test page, and then click Finish.
	To install another printer, select Add another printer, and then click finish.
	✓ Print test page
	Add another printer
	< Back Finish Cancel

Figure 12: Network Printer Installation Wizard finish dialog box.

5. Open the HP AC Configuration utility to the PersonalQ tile and open the personal queue you created. You should see your new print job in this queue.

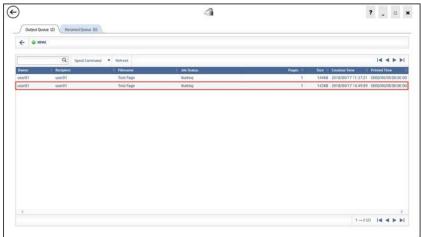


Figure 13: PersonalQ with multiple test pages ready to be released.

## Task 5 – Configuring a printer

#### Preparation

To complete this task, you need to have a successfully installed instance of HP AC. There should be a shortcut to the HP AC Configuration utility on your desktop. You should have configured your storage method and authentication settings before deploying the workflow to the printer so the correct configuration is applied when you install the client on the printer. This guide also assumes you are using an HP Enterprise MFP for installing HP AC. For other printers, follow the specified instructions for those printers in the associated documents.

At the end of this task you should have successfully installed the HP AC print client on a printer. We will be using the Google Chrome browser to launch the HP Embedded Web Server (EWS) and complete the pre and post configuration requirements. You should reset the printer to factory defaults using the EWS or you should perform a partial clean on the printer before completing these steps.

NOTE: This process shows how to configure one printer to work with HP AC. If you have a large fleet of printers you should follow best practices as outlined in the HP AC Enterprise Administrator's guide.

In this task we'll be using the HP AC Enterprise Administrator's guide, the HP FutureSmart 4 Administrative Password Security Features whitepaper, and the Secure by Default whitepaper.

HP AC Enterprise Administrator's guide:

http://h10032.www1.hp.com/ctg/Manual/c05641610

HP FutureSmart 4 Administrative Password Security Features whitepaper:

http://h10032.www1.hp.com/ctg/Manual/c05429015

HP Secure by Default whitepaper:

http://h10032.www1.hp.com/ctg/Manual/c05818654

Videos that accompany this section:

Configure devices: <u>https://vimeo.com/275679899/d904dacc82</u>

Check print queue on printer: https://vimeo.com/275690212/7c99bb9d5a

### **Configure the EWS Password**

You must configure your printer EWS password before you can install the HP AC print client. This includes setting the EWS password, making sure your printer has an IP address on the same network as your HP AC server, and that you have configured the EWS password in your HP AC server.

Steps to configure an EWS password:

- Download or open the HP AC Enterprise Administrator's guide and read section 4.2.1 on adding devices to the HP AC Configuration utility and section to section 5.7 on *Configuring Devices*. These sections detail the importance of the EWS password in the configuration process and the steps required to install the device. This is a read only task. Configuration will take place in the next Task Step.
- **2.** Download and read the HP FutureSmart 4 Administrative Password Security Features whitepaper from the link above.
- **3.** Log into the printer EWS by typing the IP address of your printer into a web browser and bypassing the SSL certificate error.

<b>A</b>
Your connection is not private
Attackers might be trying to steal your information from <b>192.168.0.101</b> (for example, pastwords, meisages, or credit cards). <u>Learn more</u> https://cites.ucre.org/www.uc/
Automatically send some system.information and users.content to Google to help detect dangerous apps and sites. <u>Ethabox.contex</u>
HIDE ADVANCED Back to salety
This server could not prove that it is <b>192,168.0.101</b> ; its security certificate is not trusted by your computer's operating system. This may be caused by a misconfiguration or an attacker intercepting your connection.
Proceed to 192.105.0.101 (unsafe)

Figure 14: Bypassing the SSL error in a browser.

HP LaserJ HP LaserJet Flo		192.168.0.101					Search by Keyword	۹. ۸	Welco Sign
Information General	Copy/Print	Scan/Digital Send	Fax	Supplies	Troubleshooting	Security	HP Web Services	Networking	
Device Status Contiguration Page	Device Statu	IS							
Supplies Status Page Event Log Page	🔺 Tray 5 emp	oty: Plain, Letter							
Usage Page Device Information	Supplies								
Control Panel Snapshot Printable Reports and Pages Open Source Licenses	Black Cartridge Order 81A (GF281. Stapler 1 C8091A: * Estimated levels	A) 80%* 0r	intenance Kit der 110V-B3M	77A, 220V-B3	Supplies Details	0t 10	0%*		
	Media								
	Input/Output	St	atus		apacity	Size		Тура	
	Tray 1	L	_1 Empty		100 sheets	Any Size		Any Type	
	Tray 2	la la	mJ OK	1	i00 sheets	Letter (8.5x	:11)	Plain	
	Tray 3		III OK		500 sheets Legal (8.5x14)		14)	Pialn	
	Tray 4	L.	щ) ОК		00 sheets	Letter (8.5x	310	Plain	
	True E		11 manutes		E00 choote	Lattar (D Ex		Disie	

Figure 15: EWS when no default EWS password is set.

**NOTE:** If a password is not set on the EWS, you will be able to see the entire menu structure on the EWS and for the Authenticated user will display "Welcome" and the Authentication button will have **Sign In** as its text.

- **4.** If the password is not set, follow the instructions in the HP FutureSmart 4 Administrative Password Security Features whitepaper to set the password to the same one you set in the HP AC Configuration utility in the previous task.
- **5.** Once the password is set, the authenticated user will be set to Administrator and the Authentication button text will change to Sign Out.

Control Security     General Security     General Security     Set the Local Administrator Password     An administrator password can be set to prevent unauthorized users from remotely configuring the device or gaining access to functionality reserved for the n     admin     Set Trest     Set Trest     Set Trest     Set Trest     Set Trest	Hintertwork administrator									
An administrator password can be set to prevent unauthorized users from remotely configuring the device or gaining access to functionality reserved for the n anage Remote Apps at the control panet. This password is also the Device Administrator Access Code at the device. User Name administrator access Code at the device. User Name BestrictSecurity Old Password New Password Verity Password	etwork administrator									
An advantage to person of an experimentation person of a set to prevent used under yoters from reindoery contrading use serve or gaming access to initiationality reserves to the initiation of the set of the server and the server and the server and the server access access and the server access access access and the server access ac	etwork administrator									
Set the Service Access Code The Service Access Code controls access to the Service menu at the control panel. It must be 8 slights long.										
Service Access Code Verity Access Code										
( ) ( )										
Leave the access code fields blank to reset the Service Access Eode to the factory default value.	Leave the access code fields blank to reset the Service Access Code to the factory default value.									
Set the Remote Configuration Password	Set the Remote Configuration Password									
By default, DSS uses the EWS administrator password to connect to this product. If the Remote Configuration Password has been set, it can be used by the DSS configuration tools to connect. This allows the administrator to use separate EWS and DSS administrator passwords. User Name	and other remote									

Figure 16: EWS with a password set and the Administrator account authenticated.

#### Add the device to the HP AC Configuration utility and deploy the client

You should have the HP EWS password set to the value you set in the HP AC Configuration utility before you complete this step. This will help the configuration process to move forward more quickly.

Steps to add the device to HP AC Configuration utility and deploy the client:

- **1.** Review the steps in section 4.2.1 of the HP AC Enterprise Administrator guide. and then follow section 4.2.1.1 to add an individual device to the HP AC Configuration utility.
- 2. With the printer in your list, jump to section 5.7 to review the Configuring Devices section. When you reach section 5.7.1, follow the steps for Deploying Workflows to install the agent and configure the HP AC client on the printer with Pull Printing and Authentication.

Deploy workflows					
Printers (1)	Workflows				
NP118688E     HPAC     192.168.0.101     HP LASERJET FLOW MFP M630     HP AGENT (X64) 16.2.0.0	Pull Printing  HPACLAB.COM VERSION: 16.2.0.0				
	Tracking				
	HPACLAB.COM ····				
	☑ Authentication				
	HPACLAB.COM VERSION: 16.2.0.0				
	Quota				
	Agent is manually deployed     The server will do the required set up for pull printing but will not actually deploy the     agent to the printer				
	Deploy Ca				

Figure 17: HP AC Deployment options selected for the POC deployment

**3.** During the deployment process, there are several possible failures that can occur. One of the common failures is a mismatch between the printer EWS administrator password and the EWS password specified in the HP AC Configuration utility. If you receive an error, review the message and take the appropriate steps to resolve the condition to complete the installation.

					Deployment details	
PRINT	ER					
F	NPI186 HPAC 192.168.0					
WORK	FLOWS				LAST DEPLOYMENT	
None						
					AGENT	
					HP Agent (x64) 16.2.0.0	
					DEPLOYMENT	
					ERROR	
DEPLO	OYMENT	LOG				
					STARTING DEPLOYMENT	
					PRINTER MODEL (HP LASERJET FLOW MFP M630) AGENT (HP 16.2.0.0)	~
					PRINTER (192.168.0.101)	
					HP LICENSE ACQUIRED	
					A CONNECTION ATTEMPT FAILED BECAUSE THE CONNECTED PARTY DID NOT PROPERLY	F
					LED TO RESPOND	~
16	APR 2	2018	15:54:43	MFPS0000E	DEPLOYMENT FAILED	
<					>	
SH	OW DEBI	IG MES	SAGES			
_						
Prin	nter EW	5	Download d	eployment log		
						CL

Figure 18: Error which occurs when you have Secure by Default on the printer.

**4.** Finish following the steps in section 5.7.1 to set the Access Control method for the HP AC Secure Pull Print button to use the HP AC server for authentication.

## Task 6 – Enrolling, authenticating, and retrieving

#### Preparation

To complete this task, you need to have successfully installed HP AC Enterprise and you should have configured HP AC for Card authentication or Card + Code authentication methods. You should have deployed the agent to the printer. You must also have a print job waiting in the print queue. You should be using a standard HID proximity card or HID iClass fob for authentication. If you need to configure a different type of card, please review section 5.3.3 of the HP AC Administrator guide for supported card types and how to configure them.

In this task we'll be using the HP AC Enterprise Administrator's guide.

http://h10032.www1.hp.com/ctg/Manual/c05641610

Videos that accompany this section:

Enrolling your card: <u>https://vimeo.com/267308521/529779d37d</u>

Secure Pull Printing: https://vimeo.com/267699858/639b66367f

#### Enroll the card at the device

The easiest way to get cards enrolled with HP AC is to let users perform this function for themselves. This straightforward process typically takes users less than 5 minutes at the control panel of an HP Enterprise MFP.

Steps to enroll the card at the device:

- **1.** Read section 5.8, Enrolling a card at the device, in the HP AC Enterprise Administrator's guide.
- 2. Follow the steps in section 5.8.1 for enrolling your card on the MFP.

#### Authenticate without your card

You can still authenticate at the control panel of the printer if you leave your proximity card at your desk. Follow these steps to authenticate the printer without your card:

1. Touch the HP AC Secure Pull Print icon on the control panel of your printer.

🍻 Reset Sign In		<u> (</u> )	? 3:17 PM
HP AC Secure Pull	Сору	Scan	
Print	Сору	Scall	
		~	
Pi	rint l	Fax	
		1	🔷 Сору

Figure 19: HP Enterprise MFP with HP AC Secure Print button

2. Press OK to enter your network credentials instead of presenting your card.

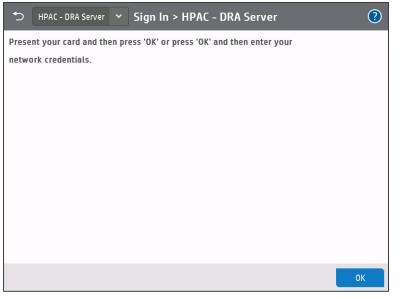


Figure 20: HP AC Sign In screen

**3.** Enter your network credentials then touch the OK button to complete your authentication.

•	HPAC - I	DRA Ser	ver 🗸	Sig	ın In	> HPAC	- DRA S	erver		?
Userna										
user01										
Passwo ••	ora									
q	w		e	r		t	у	u	i	р
	a	S		ŧ	f	g	h	j	k	l
Ĺ	4	z	,	<	с	v	b	n	m	$\overline{\langle}$
123?		)	@	•			\$	<b>-</b> \$	لې	ОК

Figure 21: HP AC authentication screen

#### **Retrieve your printouts**

One of the main reasons to install HP AC in your environment is to start using pull printing. When you can authenticate on the MFP, you can now start pull printing.

Steps to retrieve your printouts:

- 1. Go to your Windows client (Windows 10) and send a print job to your HP AC server using one of the pull print drivers you have set up.
- **2.** Read section 6.7.3, Pull Printing from HP multi-function printers, in the HP AC Enterprise Administrator's guide.
- **3.** Follow the steps outlined in section 6.7.3 and print out one of your print jobs.
- **4.** Check your print jobs to make sure you have retrieved the jobs you sent. Congratulations you have just completed your first pull print with HP AC.

## Task 7 – Intelligent Print Management

#### Preparation

To complete this task, you need to have successfully installed HP AC Enterprise. You should also have a Pull Print queue established on your Windows<sup>®</sup> client.

Intelligent Print Management (IPM) helps you change users printing behaviors. This is done by notifying users of the result of their printing behaviors such as printing on a single side of each page or printing in color versus monochrome. If configured appropriately, users can continue with the print process as they have specified, or they can apply your IPM rules to reduce the cost of printing. Alternately, you can strictly enforce each policy and notify the user of the change you have made or just make the changes without notifying users that you have applied a printing policy to their document.

Installing and configuring IPM by strictly following the HP AC Enterprise Administrator's guide can be somewhat confusing since the tasks may refer to

In this task we'll be using the HP AC Enterprise Administrator's guide.

http://h10032.www1.hp.com/ctg/Manual/c05641610

Videos that accompany this section:

IPM Server Configuration: https://vimeo.com/275697851/51f3255657

IPM Client Configuration: https://vimeo.com/275700094/90cdc74eac

#### **Create rules in the HP AC Configuration Utility**

You need to have printing rules. These rules can either be enforced completely without user's having the opportunity to change the outcome, or you can prompt them to accept or reject the action along with providing cost associated with the print job. For this task we will create a rule that encourages users to duplex jobs with more than one page and use Economode when printing.

Steps to create rules in the HP AC Configuration Utility:

- **1.** Read the Introduction to IPM, section 10.1, in the HP AC Enterprise Administrator's guide to discover the purpose of IPM.
- 2. Follow the steps in 10.3 to create an IPM rule that meets the following criteria:

If a print job has more than one page, force the job to duplex and print in Economode. Prompt the user and allow them to select which rules they want to enforce.

- **3.** Test functionality using the IPM tile to see if your rule will be enabled.
- **4.** Compare your work with Appendix A and the rules we have configured and tested.

#### Configure pricing in the HP AC Configuration Utility

You need to configure some pricing information in the IPM tab of the settings tile to show the price of a print job to your users.

Steps to configure pricing in the HP AC Configuration Utility:

- 1. Read section 10.2.4 of the HP AC Enterprise Administrator's guide. Pay attention to the note before the steps begin. This is how we would set it up in a classroom or demo environment.
- **2.** Copy the Marketing values from step 3 to your HP AC instance, give the profile a name, and click the Apply button.

$   \in $	47		? _ □ X
File Database tools			
Pull Print Enterprise Spooler Data	abase IIS User Agent	Print server IPM Login	License DBUserEditor
<			>
IPM web service	Cost per page General Simplex	Duplex User grouping	ost center
Print activity	Economode .02	.01 O Active Directory	
Enable print activity log	Mono .10	.05	×
Delete log after 30 day(s)	Color .30	.15 Search DN DC=Lab	,DC=com
Desktop notification client	Simplex	Duplex User name	
Named pipe	Economode		E Test
<ul> <li>Direct TCP port</li> </ul>	Mono		
Notification 50101	Color		
Opt-in/Opt-out 50102	Simplex	Duplex	
Machine name	Economode		
Test	Mono		
		Clear cache	Apply
6/8/2018 2:03:59 PM - IPM data saved			
6/8/2018 2:12:06 PM - IPM data saved			

Figure 22: HP AC Settings IPM Configuration

#### **Install the HP AC Print Client**

The HP AC print client facilitates communication between the HP AC server and users' computers to help with functions such as encryption, print delegation and IPM for rules-based printing. The

steps below should be installed on a computer or virtual image running a client OS such as Window 10 which is what we will use.

Steps to install the HP AC Print Client:

- 1. Review section 8.1.6 in the HP AC Enterprise Administrator's guide for information on the HP AC Enterprise Print Client.
- **2.** Follow the steps in section 8.1.6 to install the print client for the correct OS architecture for your client. Make sure you select IPM in the Configuration Screen at a minimum to ensure we can receive our IPM notifications.
- **3.** On my client, I choose to reboot the computer and waited until the Windows Firewall Message appeared to allow access to the PullPrint Client and allowed an exception through the Domain networks firewall setting.

Windows Sect	urity Alert		×
Windo app	ows Defend	ler Firewall has blocked some features of this	
Windows Defender domain networks.	Firewall has blo	ocked some features of PullPrint Client on all public, private and	
A	Name:	PullPrint Client	
S.	Publisher:	Levi, Ray & Shoup, Inc.	
	Path:	C:\program files\hp\hp access control print client\bin \pullprintclient.exe	
Allow PullPrint Clien	t to communica	te on these networks:	
Domain netv	vorks, such as a	a workplace network	
Private netw	vorks, such as n	ny home or work network	
		ose in airports and coffee shops (not recommended ten have little or no security)	
What are the risks	of allowing an a	app through a firewall?	
		Allow access Cancel	

#### Figure 23: Windows Security Alert pop up

**4.** Send a print to your HP AC Pull Printer using the LPR printer port to verify your IPM notifications. Compare your results with those in Appendix B.

## Task 8 – Job Accounting

#### Preparation

To complete this task, you need to have successfully installed HP AC Enterprise.

In this task we'll be using the HP AC Enterprise Administrator's guide.

http://h10032.www1.hp.com/ctg/Manual/c05641610

Videos that accompany this section:

Job Accounting Configuration:

https://vimeo.com/293034052/6ae7b01fc4

#### **Getting Started**

When logging in to HP ACJA for the first time, use the credentials below. The password is case sensitive:

User name: Admin Password: Admin

Read section 12.4 of the HP AC Administrators Guide then follow the steps in Sections 12.4.1 and 12.4.2 to log in and view the information page.

#### **Customizing Reports and Group Organization**

Steps to customize reports and group organization:

- Read section 12.5.8 of the HP AC Administrators Guide for information on Group Organization then follow these steps to configure JA to group users by the Active Directory Property "Department".
- **2.** Log in to HP ACJA then go to Administration > Active Directory > Group Organization.

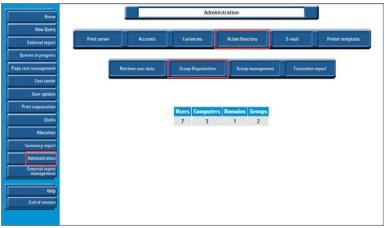


Figure 24: Job Accounting window

**3.** Select the radio button for Active Directory Property and input department in the adjacent field, then click the **D** button.

Group Organization	
Select AD property to use for groups	
○ Primary Group	
O Organizational Unit	
Active Directory Properties department	

Figure 25: Job Accounting group selection

#### Email

Steps to configure email :

- **1.** Read section 12.5.13 of the HP AC Administrators Guide for information on email in HP ACJA, and then follow the steps in section 12.5.14 to create an email address.
- **2.** Read section 12.5.17, and then follow the steps in section 12.5.17.1to create a distribution list.
- **3.** Read section 12.5.18, and then follow the steps in section 12.5.18.1to configure the email server.

## **Performing a Query**

Note that in a POC environment, it is likely that there will be no data in JA, so the resulting reports may not be very useful.

Steps to perform a query

- 1. Read sections 12.11 through 12.11.2.1.7 of the HP AC Administrators Guide for information on the various types of queries available in HP ACJA, and then follow these steps to perform queries based on user and group.
- **2.** Go to the New Query tab of HP ACJA and fill the radio button for Total number of pages printed for top n, select users then click the **u** button to start the query.

External report	Users Printers	Cost Centers	Costs	Printer options	Allocation	Quota
Queries in progress			Query: Users			
age cost management	0	List of users ~				
Cost center	۲	Total number of printed p	ages for the top n	users ~		
User options	0	Total number of printed d	locuments for the top	on domains ~		
100 C 100	0	Total number of printed d	locuments in econom	ode for the top n doma	nins ~	
Print organization	0	Total number of duplex p	ages for the top n d	lomains ~		
Quota	0	Total number of color pag	jes for the top n do	mains 💛		
Allocation	0	Job distribution per don	nain ~			
Summary report	0	Distribution of printed pa	ges per 🛛 domain 🖂			
Administration	0	Number of printed docum	ients per year ~			
External report	0	Number of printed pages	per year ~			
management	0	Number of duplex-printer	d pages per year	<i>u</i>		
Help	0	Number of color-printed p	pages per year	2		
End of session	0	Number of printed docum	nents in economode p	oer year ~		
	0	Detailed list of printed do	cuments			
	0	Simplified list of printed of	locuments			
	0	Job type summary per us	er			
	0	Media type summary per	user			
	0	Media size summary per u	user			

Figure 26: Job Accounting report selection

**3.** On the following screen, click the 🔳 button to view the results of the query.

New Query External report Queries in progress Page cost management Cost center User options			Result Doma Group Printi To : 1.	number of pri t date : 09/28 iln : all > : all	/2018 09:34:5 : 01/01/2000 ::59:59		rs			
Print organization Quota Allocation	User	Group name	Domain	Number of printed pages	Number of bw printed pages	Number of color printed pages	Number of blank printed pages	Number of simplex printed pages	Number of duplex printed pages	Total sheets
Summary report	administrator(Administrator)	Domain Users	LAB	5793	5793	0	0	5793	0	579
Administration	System User()	Unspecified	Unspecified	10	0	10	0	0	10	
External report management	User2(User2)	Domain Users	LAB	10469	10469	0	0	1	10468	523
Help	User3(User3)	Domain Users	LAB	13940	13940	0	0	6956	6984	1044
End of session	User4(User4)	Domain Users	LAB	9009	8110	899	0	1	9008	450
	User5(User5)	Domain Users	LAB	13076	11463	1613	0	0	13076	653
				52297	49775	2522	0	12751	39546	3252

Figure 27: Job Accounting report result

**4.** Repeat steps 2-3 using groups instead of users.

# Task 9 – HPAC Job Accounting with SQL Server Reporting Services (SSRS) (Optional)

### Preparation

Task 9 contains two sections. Section 1 covers the installation of SQL Server 2016 SP2 with Advanced Services prior to installing HPAC. Use this if you have not yet installed HPAC and know you want to use SSRS for HPAC Job Accounting. Section 2 covers the installation of SQL Server 2016 SP2 with Advanced Services (*Note: SSRS 2017 can also be used but requires a license to function beyond a 180-day trial period*) when HPAC and its included version of SQL Server are already installed. For this demonstration, we have already acquired the installation media from microsoft.com. You must have an internet connection during the installation.

In this task we'll be using the HP AC Enterprise Administrator's guide.

http://h10032.www1.hp.com/ctg/Manual/c05641610

Videos that accompany this section:

Job Accounting Configuration: https://vimeo.com/293034052/6ae7b01fc4

Job Accounting Reports with SQL Server Reporting Services: <u>https://vimeo.com/292207962/e03d477047</u>

# Section 1 – Installing SQL Server 2016 SP2 with Advanced Services Before HPAC

Use this section to install and configure SQL Server 2016 SP2 with Advanced Services to use SSRS prior to installing HPAC.

**1.** Run SQLEXPRADV\_x64\_ENU.exe and extract installation files to the directory of your choosing.

	Choose Directory For Extracted Files	×
SQLEXPRA	Choose Directory For Extracted Files           sers\Administrator\Desktop\SQLEXPRADV_x64_ENI           Ok         Cancel         Browse	

Figure 28: SQL Server file extraction

2. Click New SQL Server stand-alone installation or add features to an existing installation.

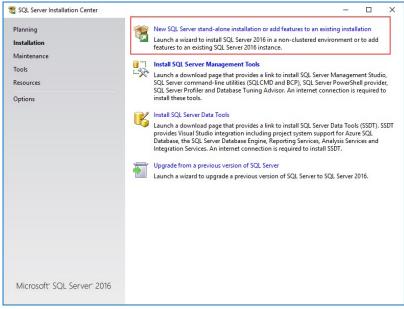


Figure 29: SQL Server Installation center

3. Accept the license terms and click **Next**.

SQL Server 2016 Setup License Terms To install SQL Server 2016,	- C X
License Terms Global Rules Product Updates Install Setup Files Install Rules Feature Selection Feature Rules Feature Configuration Rules Installation Progress Complete	MICROSOFT SOFTWARE LICENSE TERMS MICROSOFT SQL SERVER 2016 EXPRESS These license terms are an agreement between Microsoft Corporation (or based on where you live, one of its affiliates) and you. Please read them. They apply to the software named above, which includes the media on which you received it, if any. The terms also apply to any Microsoft • updates, • supplements, • Internet-based services, and
	Copy Print  I accept the license terms and <u>Privacy Statement</u> SQL Server transmits information about your installation experience, as well as other usage and performance data, to Microsoft to help improve the product. To learn more about data processing and privacy controls, and to turn off the collection of this information after installation, see the documentation.  Cancel

Figure 30: SQL Server License Terms

4. Leave the default services and features selected and click Next.

🐮 SQL Server 2016 Setup			- 0 X
Feature Selection Select the Express features to in	stall.		
License Terms Global Rules Product Updates Install Setup Files Install Rules Feature Selection Feature Rules Instance Configuration Server Configuration Database Engine Configuration Reporting Services Configuration Consent to install Microsoft R Feature Configuration Rules Installation Progress	Features: Database Engine Services SQL Server Replicatio Reporting Services (In-Databa Full-Text and Semant PolyBase Query Servi Reporting Services - Natir Shared Features Client Tools Connectivity Client Tools Backwards C Client Tools SDK Documentation Compon SQL Client Connectivity <<	n se) ic Extractions for Sea ce for External Data ve r icompatibility ents	Feature description: The configuration and operation of each instance feature of a SQL Server instances is isolated from other SQL Server instances, SQL Server instances can operate side-by-side on Prerequisites for selected features: Already installed: Windows PowerShell 3.0 or higher Windows PowerShell 3.0 or higher Microsoft .NFT Framework 4.6 Solar Server Statements Drive C: 3923 MB required, 47455 MB available
Complete	Select All Unselect All Instance root directory: Shared feature directory (x86):	C:\Program Files\Mic C:\Program Files\Mic C:\Program Files (x86	

Figure 31: SQL Server Feature Selection

**5.** Provide an Instance Name and Instance ID, this demonstration will use HPACExpress, then click **Next**.

🃸 SQL Server 2016 Setup					0	8 B		×
Instance Configuration Specify the name and instance		SQL Server. Instance	ID becomes part of t	ne installation	path.			
License Terms Global Rules Product Updates	<ul> <li>Default instance</li> <li>Named instance:</li> </ul>	НРАСЕхр	ress					
Install Setup Files Install Rules Feature Selection Feature Rules	Instance ID:	HPACEXP	RESS					
Peature Rules Instance Configuration Server Configuration Database Engine Configuration Reporting Services Configuration	SQL Server directory: Reporting Services d Installed instances:	-	m Files∖Microsoft SQI m Files∖Microsoft SQI					
Consent to install Microsoft R	Instance Name	Instance ID	Features	Edition		Versio	n	
Feature Configuration Rules Installation Progress Complete								
				< Back	Next >		Cancel	

Figure 32: SQL Server Instance Configuration

**6.** Leave the default settings and click **Next**.

**Note:** Abide by and security policies your organization may have regarding service accounts. If unsure, consult your organizations security officer.

Instance Configuration SQL Full-text Filter Daemon Launc NT Service\MSSQLFDLa Manual SQL Server Browser NT AUTHORITY\LOCAL Disabled Database Engine Configuration Consent to install Microsoft R Feature Configuration Rules Installation Progress SQL Environment SQL Server Browser NT AUTHORITY\LOCAL NT AUTHORITY\LOCAL Installation Progress SQL Full-text Filter Daemon Launc NT Service\MSSQLFDLa Manual SQL Server Browser NT AUTHORITY\LOCAL Installation Progress SQL Full-text Filter Daemon Launc NT Service\MSSQLFDLa Installation Progress SQL Full-text Filter Daemon Launc NT Service\MSSQLFDLa Installation Progress SQL Full-text Filter Daemon Launc Installation Progress SQL Formation SQL						
Microsoft recommends that you use a separate account for each SQL Server service.         Install Setup Files       Service       Account Name       Password       Startup Typ.         Install Nules       SQL Server Database Engine       NT Service/MSSQLSHA       Automatic         Seture Selection       SQL Server Launchpad       NT Service/MSSQLSHA       Automatic         Seture Rules       SQL Server Launchpad       NT Service/MSSQLLau       Automatic         Instance Configuration       SQL Server Browser       NT AUTHORITY/LOCAL       Manual         SQL Server Browser       NT AUTHORITY/LOCAL       Disabled         Database Engine Configuration       Grant Perform Volume Maintenance Task privilege to SQL Server Database Engine Service       This privilege enables instant file initialization by avoiding zeroing of data pages. This may lead to information disclosure by allowing deleted content to be accessed.       Sclick here for details	License Terms	Service Accounts Collation				
Service       Account Name       Password       Startup Typ         Install Setup Files       NT Service/MSSQLSHPA       Automatic         Seture Selection       SQL Server Database Engine       NT Service/MSSQLSHPA       Automatic         SQL Server Launchpad       NT Service/MSSQLFDLa       Automatic         Seture Configuration       SQL Server Browser       NT Service/MSSQLFDLa       Manual         Seture Configuration       SQL Server Browser       NT AutOHTORTV/LOCAL       Disabled         Database Engine Configuration       Grant Perform Volume Maintenance Task privilege to SQL Server Database Engine Service       This privilege enables instant file initialization by avoiding zeroing of data pages. This may lead to information disclosure by allowing deleted content to be accessed.         Listck here for details       Click here for details       Seture Content to into the accessed.	Global Rules	Missoroft recommands that you use	a constate account for each		ina	
Install Rules       NT Service\MSSQLSHPA       Automatic         SQL Server Database Engine       NT Service\MSSQLSHPA       Automatic         SQL Server Launchpad       NT Service\MSSQLFDLa       Automatic         Seture Configuration       SQL Server Browser       NT Service\MSSQLFDLa       Manual         Seture Configuration       SQL Server Browser       NT AUTHORITY\LOCAL       Disabled         Database Engine Configuration       Grant Perform Volume Maintenance Task privilege to SQL Server Database Engine Service       This privilege enables instant file initialization by avoiding zeroing of data pages. This may lead to information disclosure by allowing deleted content to be accessed.       Click here for details						
Feature Selection       SQL Server Reporting Services       NT Service\ReportServer       Automatic         SqL Server Launchpad       NT Service\MSSQLLau       Automatic         Instance Configuration       SQL Full-text Filter Daemon Launc       NT Service\MSSQLFDLa       Manual         Server Configuration       SQL Server Browser       NT AUTHORITYLOCAL       Disabled         Database Engine Configuration       Grant Perform Volume Maintenance Task privilege to SQL Server Database Engine Service       This privilege enables instant file initialization by avoiding zeroing of data pages. This may lead to information disclosure by allowing deleted content to be accessed.       Click here for details				Password		e
Feature Rules       SQL Server Launchpad       NT Service\MSSQLLaun       Automatic         Instance Configuration       SQL Server Launchpad       NT Service\MSSQLFDLa       Manual         Server Configuration       SQL Server Browser       NT AUTHORITY\LOCAL       Disabled         Database Engine Configuration       Grant Perform Volume Maintenance Task privilege to SQL Server Database Engine Service       Consent to install Microsoft R       This privilege enables instant file initialization by avoiding zeroing of data pages. This may lead to information disclosure by allowing deleted content to be accessed.         Installation Progress       Click here for details						~
Instance Configuration Server Configuration Server Configuration Database Engine Configuration Consert to install Microsoft R Feature Configuration Rules Installation Progress Scilick here for details Scilick here for	Feature Selection		•			~
Server Configuration     SQL Server Browser     NT AUTHORITY\LOCAL     Disabled       Database Engine Configuration     Grant Perform Volume Maintenance Task privilege to SQL Server Database Engine Service     This privilege enables instant file initialization by avoiding zeroing of data pages. This may lead to information disclosure by allowing deleted content to be accessed.     SQL Server Database Engine Service	Feature Rules					
Database Engine Configuration       Grant Perform Volume Maintenance Task privilege to SQL Server Database Engine Service         Consent to install Microsoft R       This privilege enables instant file initialization by avoiding zeroing of data pages. This may lead to information disclosure by allowing deleted content to be accessed.         Installation Progress       Click here for details	Instance Configuration				Manual	-
Reporting Services Configuration       Grant Perform Volume Maintenance Task privilege to SQL Server Database Engine Service         Consent to install Microsoft R       This privilege enables instant file initialization by avoiding zeroing of data pages. This may lead to information disclosure by allowing deleted content to be accessed.         Installation Progress       Click here for details	Server Configuration	SQL Server Browser	NT AUTHORITY\LOCAL		Disabled	~
	Database Engine Configuration Reporting Services Configuration Consent to install Microsoft R Feature Configuration Rules Installation Progress Complete	This privilege enables instant file i to information disclosure by allow	nitialization by avoiding zero	oing of data pag	-	ł

Figure 33: SQL Server Service Accounts

7. Select Mixed Mode (SQL Server authentication and Windows authentication) as the Authentication Mode, choose a password and confirm it, add any additional accounts as needed, then click Next.

**Note:** Abide by and security policies your organization may have regarding service accounts. If unsure, consult your organizations security officer.

🃸 SQL Server 2016 Setup		- 0	×
Database Engine Confi Specify Database Engine auther	guration trication security mode, administrators, data directories and TempDB settings.		
License Terms Global Rules Product Updates Install Setup Files Install Rules Feature Selection Feature Rules Instance Configuration Oatabase Engine Configuration Reporting Services Configuration Consent to install Microsoft R Feature Configuration Rules Installation Progress Complete		er administrators	
		estricted access tabase Engine. Cancel	

Figure 34: SQL Server Authentication Configuration

**8.** Select Install and configure then click Next.

🃸 SQL Server 2016 Setup	– 🗆 X
Reporting Services Con Specify the Reporting Services	-
License Terms Global Rules Product Updates Install Setup Files	Reporting Services Native Mode  Install and configure. Installs and configures the report server in native mode. The report server is operational after setup completes.
Instil Rules Instil Rules Feature Selection Feature Rules Instance Configuration Server Configuration Database Engine Configuration <b>Reporting Services Configura</b> Consent to install Microsoft R Feature Configuration Rules Installation Progress Complete	Install only.     Installs the report server files. After installation, use Reporting Services Configuration Manager     to configure the report server for native mode.  Reporting Services SharePoint Integrated Mode     Install only.     Installs the report server files. After installation use SharePoint Central Administration to     complete the configuration. Verify the SQL Server Reporting Services service is started and     create at least one SQL Server Reporting Services service application. For more information,     click Help.
	< Back Next > Cancel

Figure 35: SQL Server Reporting Services Configuration 9.

9. Click Accept then Next.

髕 SQL Server 2016 Setup		-		×
Consent to install Mice				
License Terms Global Rules Product Updates Install Setup Files Install Rules Feature Selection Feature Rules Instance Configuration Server Configuration Database Engine Configuration Reporting Services Configuration <b>Consent to install Microsoft R</b> Feature Configuration Rules Installation Progress Complete	Microsoft R Open is an enhanced distribution of R made available by Microsoft under the Public License v2. R is © the R Foundation for Statistical Computing. For more information on R-related pre- visit http://r-project.org. By clicking "Accept" you are choosing to download Microsoft R Open and install it on yo agreeing to accept patches and updates to this software according to your SQL Server up	oducts our ma	and serv chine, an	ıd
	Accept			
	< Back Next >		Cancel	

Figure 36: Microsoft R Open Consent

**10.** Click **OK** to dismiss the Computer restart required dialog then click **Close**.

📸 SQL Server 2016 Setup			- 🗆	×
Complete Your SQL Server 2016 installati	ion completed successfully with product updates.			
License Terms Global Rules	Information about the Setup operation or possible	next steps:		
	Feature	Status		^
Product Updates	Client Tools Connectivity	Succeeded		
Install Setup Files	Client Tools SDK	Succeeded		
Install Rules	Client Tools Backwards Compatibility	Succeeded		
Feature Selection	Reporting Services - Native	Succeeded		
Feature Rules	Oatabase Engine Services	Succeeded		
Instance Configuration	Computer restart required	Succeeded		×
Server Configuration	computer restart required			^
Database Engine Configuration Reporting Services Configuration	One or more affected files have operations p process is completed.	ending. You must restart your computer	after the setu	p
Consent to install Microsoft R Feature Configuration Rules	<b>Pa</b>		ОК	
Installation Progress Complete	Product Update has successfully applied KB 4 4052908>. These updates have set the patch level of t		:om/?id=	
	Summary log file has been saved to the following lo <u>C:\Program Files\Microsoft SQL Server\130\Setup Files\Microsoft SQL </u>			
			Clos	•

Figure 37: Installation Complete Screen

- **11.** Restart the computer to complete the installation.
- **12.** Refer to Task 1 for instruction on HPAC installation.
- **13.** Open HPAC Configuration Manager then click Settings > Database and click Apply.
- **14.** Go to section 12.19.9 "JA reports in SQL Server Reporting Services" of the HPAC Admin Guide and follow the steps to configure the reporting server for HPAC.

## Section 2 – Installing SQL Server 2016 SP2 with Advanced Services After HPAC

Use this section to install and configure SQL Server 2016 SP2 with Advanced Services to use SSRS with a preexisting installation of HPAC

1. Run SQLEXPRADV\_x64\_ENU.exe and extract installation files to the directory of your choosing.

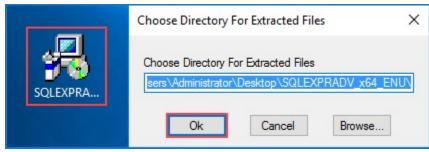


Figure 38: SQL Express Extraction Screen

2. Click New SQL Server stand-alone installation or add features to an existing installation.



Figure 39: SQL Server Installation Center

3. Accept the license terms and click Next.

🃸 SQL Server 2016 Setup	- 0	×
License Terms To install SQL Server 2016, yo	ou must accept the Microsoft Software License Terms.	
License Terms Global Rules Product Updates Install Setup Files Install Rules Feature Selection Feature Rules Feature Configuration Rules Installation Progress Complete	MICROSOFT SOFTWARE LICENSE TERMS MICROSOFT SQL SERVER 2016 EXPRESS These license terms are an agreement between Microsoft Corporation (or based on where yr live, one of its affiliates) and you. Please read them. They apply to the software named above which includes the media on which you received it, if any. The terms also apply to any Microsoft updates, supplements, Internet-based services, and	
	Copy  I accept the license terms and Privacy Statement  SQL Server transmits information about your installation experience, as well as other usage and performance data, to Microsoft to help improve the product. To learn more about data processing an privacy controls, and to turn off the collection of this information after installation, see the documentation.  CBack Next > Cance	

Figure 40: SQL Server License Terms

**4.** Leave the default services and features selected and click Next.

SQL Server 2016 Setup Feature Selection Select the Express features to in	stall.			-		×
License Terms Global Rules Product Updates Install Setup Files Install Rules Feature Selection Feature Rules Instance Configuration Server Configuration Database Engine Configuration Reporting Services Configuration Consent to install Microsoft R Feature Configuration Rules Installation Progress	Features:         Instance Features:         SQL Server Replication         R Services (In-Databa         Full-Text and Semant         Dolybase Query Servic         Reporting Services - National Features         Client Tools Connectivity         Client Tools SDK         Documentation Comport         SQL Client Connectivity S         Select All	n se) ic Extractions for Sea ce for External Data ve ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ;	instance feature isolated from of Server instances Prerequisites for Already installed Windows Pc Microsoft .N C	on and operation o of a SQL Server inst icr SQL Server inst can operate side-I selected features: d: werShell 3.0 or hig JFT Framework 4.6	stance is sances. SQL by-side on	~ ~ ~
Complete	Instance root directory: Shared feature directory: Shared feature directory (x86):	C:\Program Files\Mic C:\Program Files\Mic C:\Program Files (x86	rosoft SQL Server			•
	Shareu reature directory (xoo):	Colorogram Files (200	< Back	Next >	Cance	

Figure 41: SQL Server Feature Selection

**5.** Provide an Instance Name and Instance ID, this demonstration will use HPACJA, then click Next.

**Note:** In the Installed instances: section you should see the existing SQL Server 2017 Express installation that came with HPAC. make note of the Instance Name, as we will use that information later.

📸 SQL Server 2016 Setup					-		×
Instance Configuration Specify the name and instance		SQL Server. Instance ID	becomes part of the i	nstallation path.			
License Terms Global Rules Product Updates	<ul> <li>Default instance</li> <li>Named instance:</li> </ul>	HPACJA					
Install Setup Files Install Rules Feature Selection	Instance ID:	HPACJA					
Feature Rules Instance Configuration Server Configuration Database Engine Configuration Reporting Services Configuration	SQL Server directory Reporting Services d Installed instances:		iles\Microsoft SQL Se iles\Microsoft SQL Se				
Consent to install Microsoft R	Instance Name	Instance ID	Features	Edition	Ve	rsion	
Feature Configuration Rules	HPACEXPRESS	MSSQL14.HPACEX	SQLEngine_VNext	Express	14.	0.1000.169	,
Installation Progress Complete							
	<u> </u>		< E	lack Nex	it >	Cancel	I

Figure 42: SQL Server Instance Configuration

**6.** Leave the default settings and click Next.

**Note:** Abide by and security policies your organization may have regarding service accounts. If unsure, consult your organizations security officer.

🖀 SQL Server 2016 Setup				- D	
Server Configuration Specify the service accounts and	collation configuration.				
License Terms Global Rules Product Updates	Service Accounts Collation Microsoft recommends that you use	a separate account for each	SQL Server servi	ice.	
Install Setup Files	Service	Account Name	Password	Startup Typ	e
Install Rules	SQL Server Database Engine	NT Service\MSSQL\$HPA		Automatic	~
Feature Selection	SQL Server Reporting Services	NT Service\ReportServer		Automatic	~
Feature Rules	SQL Server Launchpad	NT Service\MSSQLLaun		Automatic	
Instance Configuration	SQL Full-text Filter Daemon Launc	NT Service\MSSQLFDLa		Manual	
Server Configuration	SQL Server Browser	NT AUTHORITY\LOCAL		Disabled	~
Database Engine Configuration Reporting Services Configuration Consent to install Microsoft R Feature Configuration Rules Installation Progress Complete	Grant Perform Volume Maintenan This privilege enables instant file i to information disclosure by allow <u>Click here for details</u>	initialization by avoiding zen	oing of data pag	-	ł
		< Bac	k Next	t> Can	cel

Figure 43: SQL Server Service Accounts

 Select Mixed Mode (SQL Server authentication and Windows authentication) as the Authentication Mode, choose a password and confirm it, add any additional accounts as needed, then click Next.

**Note:** Abide by and security policies your organization may have regarding service accounts. If unsure, consult your organizations security officer.

SQL Server 2016 Setup	unation	-		×
-	tication security mode, administrators, data directories and TempDB settings.			
License Terms Global Rules Product Updates Install Setup Files Install Setup Files Install Rules Feature Selection Feature Rules Instance Configuration Server Configuration Database Engine Configuration Reporting Services Configuration Consent to install Microsoft R Feature Configuration Rules	Server Configuration         Data Directories         TempDB         User Instances         FILESTR           Specify the authentication mode and administrators for the Database Engin         Authentication Mode         Image: Configuration Mode         Ima	ne.	ministrat	
Installation Progress Complete	Add Current User Add Remove	Next >	ted acces	S

Figure 44: SQL Server Authentication Configuration

**8.** Select Install and configure then click Next.

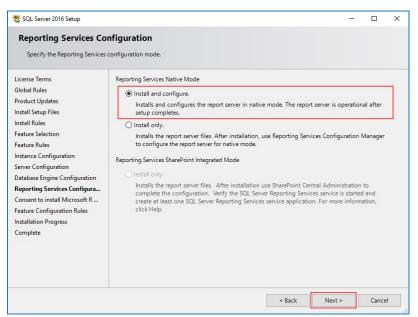


Figure 45: SQL Server Reporting Services Configuration

9. Click Accept then Next.

🃸 SQL Server 2016 Setup		<del>.</del>		×
Consent to install Mici	osoft R Open			
Download and install necessary	pre-requisite.			
License Terms Global Rules Product Updates Install Setup Files	Microsoft R Open is an enhanced distribution of R made available by Microsof Public License v2.	ft under the GN	U General	
Install Rules Feature Selection Feature Rules	R is © the R Foundation for Statistical Computing. For more information on R- visit http://r-project.org.	-related produc	ts and ser	vices,
Instance Configuration Server Configuration Database Engine Configuration Reporting Services Configuration <b>Consent to install Microsoft R</b> Feature Configuration Rules Installation Progress Complete	By clicking "Accept" you are choosing to download Microsoft R Open and inst agreeing to accept patches and updates to this software according to your SQ			
	Accept			
	< Back	Next >	Cance	:



**10.** Click OK to dismiss the Computer restart required dialog then click Close.

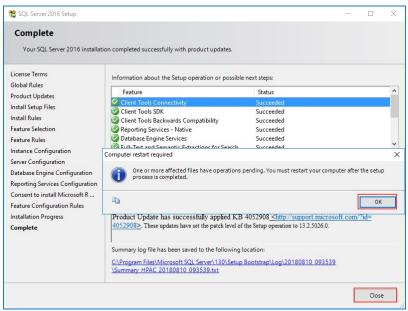


Figure 47: Installation Complete Screen

- **11.** Restart the computer to complete the installation.
- **12.** Go to section 12.19.9 "JA reports in SQL Server Reporting Services" of the HPAC Admin Guide and follow the steps to configure the reporting server for HPAC.

Note that in Step 4, when creating the Data Source, SQLInstanceName refers to the original SQL instance that was installed alongside HPAC, NOT the instance we just installed.

# Task 10 – HPAC MFPsecure (Optional)

## Preparation

Once your customer purchases a license for MFPsecure, you will receive access to the MFPsecure Administrator Guide, requirements guides specific to the manufacturer of your MFPs, and the printer agents required to configure the devices. This guide serves as a reference to complete this task once you have received these items. This guide demonstrates MFPsecure using a supported Xerox MFP.

In this task we'll be using the following documents:

HP AC Enterprise Administrator's guide: <u>http://h10032.www1.hp.com/ctg/Manual/c05641610</u>

MFPsecure Administrator Guide – Available from LRS after purchase of MFPsecure license

Videos that accompany this section:

MFPSecure Feature: https://vimeo.com/292207437/bceffc2c97

## Section 1 – Installing an Agent

Use this section to install an MFPsecure Agent.

**1.** Run the .msi bundled with your license and follow the wizard to install the agent on your server.

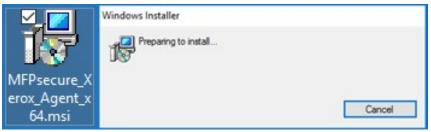


Figure 48: MFPsecure Xerox Agent .msi

**2.** Open the HP AC Configuration Utility and click the Multi-vendor management tile.

	Ğ		? _ = ×
PersonalQ	IPM	Q Device Analysis	Job accounting
PersonalQ management	Intelligent Print Management	Scan and analysis of network devices	Job accounting, database manager
	Devices	Print server	Server Information
View/manage applications settings including IIS server and SQL server	Device installation/configuration	Print queue configuration	Show memory usage and installed applications
License	Pull Print Savings	Multi-vendor management	
View/manage licenses	Real time count of printed page savings	Non HP Devices	

Figure 49: HP AC Configuration Utility

3. Click Admin > Add.

rinterr VPSLID Status ≧ Device Deployment MPRecure Add overt Last Deployment Secure Delivery Scincithal St No Rema were found to display in list Lipidate: Copy Deliste	yment Secure Delivery Scandifell Scande
Сору	
Delate	
5	
ia a	
5	

Figure 50: HP AC MFPsecure Tile

**4.** Enter a Printer Name, IP Address, VPSX ID and COMMType. Fill out the form and those on the remaining tabs to the specification of your device. Click Add when you have finished.

The SNMP tab allows you to choose the SNMP version used by your MFP and the MFPsecure Options section of the Advanced tab allows you to input the device username and password.

)	43		? _ n x	${igodot}$		? =
tdd Cancel				Add Cancel		
Printer Name Xerox		AC		Printer Name Xerox	VPSX ID HPAC	
Printer Long Name	Printer Group			Printer Long Name	Printer Group	
Basics SNMP Presentation End	rypt Fliters Actions Advanced Mall Tra	cc		Basics SNMP Presentation Encrypt	Filters Actions Advanced Hall Trace	
Basic Parameters				SNMP		
HOST/IP Address				SNMP 🗹		
192.168.0.12				SNMP version SNMP v1 V		
CommType Remote Port PERSONALQ V 515				SNMP v1		
Optional Parameters				SNMP Community Name public		
Windows Driver	R	tain Time		SNMP v3		
				User name Server Defa		
Linux/Mac Driver		vice Properties		Authentication protocol Server Deta		
Location		Color		Authentication type Server Defa	uit 🗹	
Location		≕ Staple		Authentication passphrase Server Deta	ut	
Contact		PullPrint		Privacy protocol Server Defa	uit 🗹	
		-		Privacy type Server Defa	ult 💌	
Department				Privacy passphrase Server Defa	ut .	
				Context Name		
				<		
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) Printer Name Xerax		40		<ul> <li>Image: A start of the start of</li></ul>	4	7 _ 0
Printer Name Xarox	VPSX ID H	AC	7 <u> </u>	2	a	7 _ 0
Printer Long Name	VPSX ID HI Printer Group			<ul> <li>Image: A start of the start of</li></ul>	VISKID HAA	2
Printer Long Name Rasics SNMP Presentation Enc	VPSX ID H			Add Cannol		
Printer Long Name Rasics SNMP Presentation Enc	VPSX ID HI Printer Group			Anti Central Printer Name Printer Lang Name	VPSX ID HPAC Printer Group	7 _ 1
Printer Long Name Basics SNHP Presentation Enc 1 Advanced Parameters + TCP/IP Options	VPSX ID HI Printer Group			KAL Canal      Printer Hama     Xanax      Printer Long Name     Easts SAMP Presentation Storyst	VPSK ID HPAC	
Vinter Long Name Paster StHP Presentation File Advanced Parameters + TCP/IP Options + P3L Options	VPSX ID HI Printer Group			Addi Canad      Printer Neme      Printer Loop Sease      Backs Stell Presentation Serveys      + Advacod Furnameters	VPSX ID HPAC Printer Group	<b>X U</b>
Printer Name Xarss  Printer Long Kanes  Interior GRHP Desentation Fre  Advanced Farameters  TCP/IP Options  PR Options  + Printer Options	VPSX ID HI Printer Group			Add Canad      Prior Canad      Prior Canad      Prior Canad      Read	VPSX ID HPAC Printer Group	
Printer Hanna Xarav Printer Long Name Rasia: GRB Pessentation Free 1 Advanced Parameters + TCP/IP Options + PRINter Options + Windows Printer Options	VPSX ID HI Printer Group			Alli Canal      Printer Hama      Printer Hama      Printer Long Hama      Printer Lon	VPSX ID HPAC Printer Group	<b>N</b> U 1
Printer Name Zaras Printer Long Name Eastes 1949 Pessentation For t Advanced Parameters + TCP/IP Options + Print options + Print options + Windows Printer Options - Windows Client Options	VPSX ID HI Printer Group			Att canad Print Canad Print Canada Print Canada Add Canada Ad	VPSX ID HPAC Printer Group	
Philder Manna Varnur Prider Leng Hanna Fankin (2019) Presentation Pro- t Advanced Parameters 1 P31 optimus 1 P31 optimus 1 P31 optimus 1 P31 optimus 1 P31 optimus 1 P31 optimus 1 P31 optimus 2 P31 optimus	VPSX ID HI Printer Group			Atta     Caula      Marco Caula      Printer Hemme     Some     Printer Long Hemme     Some     Athanacod Parameters	VPSX ID HPAC Printer Group	
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Neter Name Series Serie	VPSX ID HI Printer Group			Catal     Canal      Printer Hama      Printer Long Hama      Printer Long Hama      Printer Long Hama      Printer Updians      Printer Updians      Printer Updians      Printer Updians      Printer Updians      Widewase Client Options      Statestan Chiefred      User Data      Statestan	VPSX ID HPAC Printer Group	
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Notice tang tang Parker Long tang Tank Delanced Parker + Differentiation of the + Differentiation + Dif	VPSKID HE Proteine Comp ggt fillers Actions Antonenet Heat Tra			Act Count     Count     Privac Team     P	VPX1D #44 Pictor Grwp Piters Active Advanced Hall Taxs	
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Protor taxas Varias Protor taxas Varias Protor taxas Varias Protor Varia	yet These Actions Absorbed Had To Actions Absorbed Had To			Actic         Canadi           Priorie Hamin         Natros           Priorie Homin         Natros           Balancia         Report           Mandance Orderine         Report           Mathia         Report           Mathia         Report           Mathia         Report           Prior and priorier shahe as ID address         Report           These rate priorier shahe as ID address         Report	VYRX ID 0942 Printer Group Printer Actions Advanced Hei Trace	7
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Figure 51: MFPsecure Device Configuration

**5.** Select the new MFP and click MFPsecure > Deploy Workflows.

PRINTER V				Q	🗌 Maski	ng 🔻	Printer I	nfo 🔻	Admin	•	MFPsecure	Refres
printer	VPSX ID	Status	۸	Device		Deplo	yment	MFPsec	ure		Deploy Workflo	ws
XEROX	HPAC	Idle	2	Xerox ColorQube	87005	NOT	DEPLOYED				Cancel Deployr	nent
											Remove Workf	lows
											Update Status	
											View Details	
											Clear Details	

Figure 52: MFPsecure Device Llst

6. Make sure that Secure Delivery is checked click Deploy.

	Deploy workflows
Printers (1)	MFPsecure
• XEROX HPAC 192,168.0.12	HPAC.LAB.COM VERSION: 1.3.19.0
XEROX COLORQUBE 8700S XEROX AGENT (X64) 1.3.020.006	Workflows
	Secure Delivery
	Agent is manually deployed MPPecure will do the required set up for Secure Delivery but will not actually deploy the agent to the printer
	Deploy Canc

Figure 53: MFPsecure Deploy Workflows

**7.** Click Close once deployment has completed.

ent details		
LAST DEPLOYMENT		
2018/08/31 12:42:15		
AGENT		
Xerox Agent (x64) 1.3.020.006		
DEPLOYMENT		
: V1R3.20.6		^
ONFIGURED		
Y		
		*
	>	
	2018/08/31 12:42:15 AGENT Xerox Agent (x64) 1.3.020.006 DEPLOYMENT DEPLOYED : VIR3.20.6 VULY COMPLETED	2018/08/31 12:42:15 AGENT Xerox Agent (x64) 1.3.020.006 DEPLOYNENT DEPLOYNENT : VIR3.20.6 ULLY COMPLETED ONFLOURED

Figure 54: Deployment Complete Screen

**8.** The deployment process should configure most of the necessary settings. Follow the vendor specific configuration steps in the Administrator Guide to verify and complete the configuration.

# Appendix A – IPM rule creation

This is not an exclusive solution for the problem in task 7 but represents one way you can approach the issue.

**1.** Click to open the IPM tile.

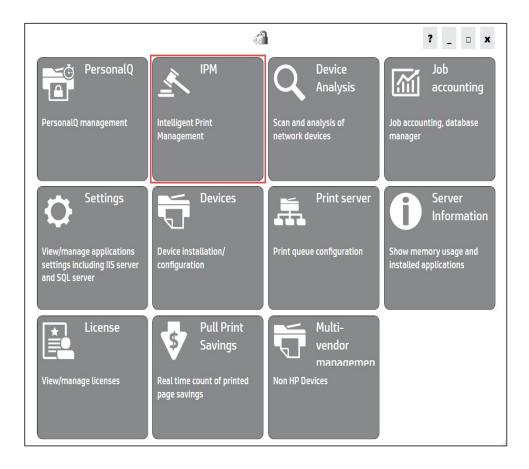


Figure 55: IPM tile on the HP AC Configuration Utility

2. On the Rules tab, type a name for your IPM rule such as Duplex – Econo as in the example here then click the Create button.

$\overline{\mathbf{e}}$	1	? _ 🗆 x
File Database tools		
Rules Process Job validation Print activity log	Process design	
Enter a new rule name:		
Duplex - Econo     Create       Rename rule     Delete rule       Duplicate rule		
		3
Move your mouse on icons to get a context	ual helpj	Auto-arrange Check

### Figure 56: HP AC IPM tile

- **3.** Click the Process tab and drag the following icons to the screen in the order below then click the Auto-arrange button.
  - **a.** The Job properties condition icon
  - **b.** The Duplex action icon
  - **c.** The Economode action icon
  - **d.** The Prompt action icon

$   \in $	d'a	? _ = ×
Actons	Duplex - Ecoro	
Nove your mouse on icons to get a	n contractual help	Auto-arrange Chack

### Figure 57: HP AC IPM tile

**4.** Double-click the Job properties conditions icon to open the Job dialog box.

	1)	? _ = x
File Database tools Rules Process Job validation Print activity log Conditions Actions Actions Wolf Cations Wolf Cations Wolf Cations Wolf Cations Wolf Cations Wolf Cations With Cations W	Duplex - Econo	
Nove your mouse on icons to get a context	al help	E Auto-arrange Check

## Figure 58: HP AC IPM tile

- **5.** Do the following to configure the Job properties condition:
  - **a.** Check the Number of pages checkbox
  - **b.** Check the Greater than checkbox.

- **c.** Type 1 in the condition textbox.
- **d.** Click the Ok button to save the changes and close the Job dialog box.

$\bigcirc$	<i>6</i> 2	? _ 🗆 x
File Database tools Rules Process Job validation Print activity log Conditions Example 1 Conditions Actions	Duplex - Econo	
Image: Second	: Greater than or equal to Less than or equal to Espuel to	× [Auto-arrange]
Ok		Cancel

### Figure 59: HP AC IPM tile

**6.** Double-click the Prompt action icon to bring up the properties.

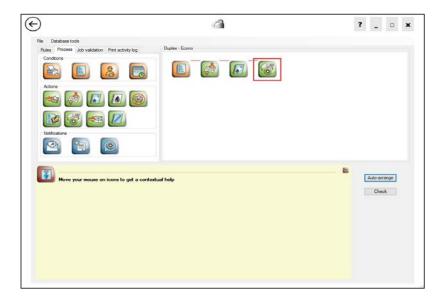


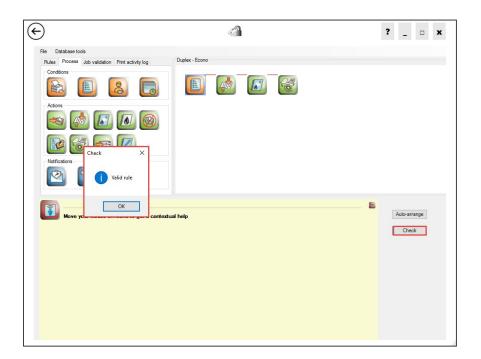
Figure 60: HP AC IPM tile

- **7.** Do the following things to complete the configuration for the Prompt action:
  - **a.** Edit the message if desired (I typically leave it alone)
  - Adjust the timeout so there is enough time for the user to make an informed decision (for demo purposes I change it to 600 seconds, which is 10 minutes, so I can show what happens as I interact with the options)
  - **c.** Check the Display cost checkbox (this allows users to see what savings are possible given the rule actions)
  - **d.** Check the Display advanced mode checkbox.
  - e. Check to select the Economode checkbox
  - **f.** Check to select the Duplex checkbox
  - **g.** Finally, click the Ok button to close the Opt-in/Opt-out dialog box.

$\bigcirc$	1	? _ 🗆 x
Fie Database tools Rules Proces Job validation Pint activat Conditions Actions Actions Wolf Cations Wolf Cat	ykg Duplex - Econo Contini/Opt-out X Message Do you want to apply the print policy (RULENAME]? Time-out ECO second(s) V Display: dotanced mode V Duplex Ok Cancel	Auto-strange         Check

#### Figure 61: HP AC IPM tile

**8.** Click the Check button to validate the rule. If everything is set correctly you will receive a Value rule message in the Check dialog box.



### Figure 62: HP AC IPM tile

**Note:** HP AC will warn you if the rule is not valid and the error causing process step will flash so you can identify which option you need to address to create a valid rule. Correct the issue and then check the rule again to make sure it is valid and stop the incorrect option from flashing.

$\odot$	d'à	? _ □ ×
File       Database tools         Rufes       Process       ub validation       Print activity (or)         Conditions       Image: Conditions       Image: Conditions       Image: Conditions         Natification       Image: Conditions       Image: Conditions       Image: Conditions         Natification       Image: Conditions       Image: Conditions       Image: Conditions         Natification       Image: Conditions       Image: Conditions       Image: Conditions         Image: Conditions       Image: Conditions       Image: Conditions       Image: Conditions         Image: Conditions	Deplex - Econo tel help	E Auto-arrange Check

Figure 63: Check dialog box showing Invalid rule error with Job properties conditions flashing off

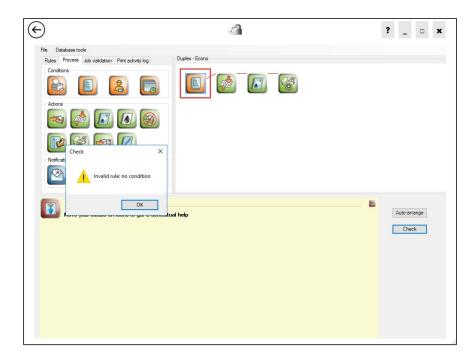


Figure 64: Check dialog box showing Invalid rule error with Job properties conditions flashing on

# Appendix B – IPM - Print Client notification

If you followed the guide and created the same rules and costs that we have you should see similar results when you receive the IPM notification using the print client. If your selections are different from ours your dialog boxes should vary accordingly.

**1.** Send the print job with more than one page to the HP AC LPR printer object you created.

Pri <u>n</u> ter: Pull Printer  V  Properties	Advanced	Help (
Copies: 1 Print in gray	yscale (black and white)	
Save ink/to	ner 🛈	
Pages to Print	Comments & Forms	
<u>A</u> II	Document and Markups	$\sim$
○ C <u>u</u> rrent page	Summarize Comments	
Pages 1-4	Scale: 96%	
<ul> <li>More Options</li> </ul>		
Page Sizing & Handling 🕕	8.5 x 11 Inches	
Size Poster Multiple Booklet	HM HP Access Control	
	Printing Solutions	WP)
⊃ <u>F</u> it ⊃ Actual size		
Actual size     Shrink oversized pages	- 15	100
Custom Scale: 100 %		A COLOR
	Web Type could.	
Choose paper source by PDF page size	<ul> <li>- El Altorio de la evaluarja de executiva por esta por esta por esta por esta por esta por esta esta esta esta esta esta esta esta</li></ul>	iest and from any line (free from the fit
Print on <u>b</u> oth sides of paper	White Patients Constructions	
Orientation:	P and the second	
Auto po <u>r</u> trait/landscape	61%	
○ Portrait	of or generative respected a professional data based to the space procession of the space to the space procession of the space procession of the space of the space procession of the space procession of the space of the space procession of the space procession of the space procession of the space procession of the space procession of the procession of the space procession of the space procession of the procession of the space procession of the space procession of the procession of the space procession of the space procession of the procession of the space procession of the space procession of the procession of the space procession of the space procession of the procession of the space procession of the space procession of the procession of the space procession of the space procession of the procession of the space procession of the space procession of the procession of the space procession of the space procession of the procession of the space procession of the space procession of the procession of the space procession of the space procession of the procession of the space procession of the space procession of the procession of the space procession of the space procession of the procession of the space procession of the space procession of the procession of the space procession of the space procession of the procession of the space procession of the space procession of the procession of the space procession of the space procession of the procession of the space procession of the space procession of the procession of the space procession of the space procession of the procession of the space procession of the space procession of the procession of the space procession of the space procession of the procession of the space procession of the space procession of the procession of the space procession of the space procession of the procession of the space procession of the space procession of the space procession of the space procession of the procession of the space procession of the space procession of the space	nin 1. Franz Calence an Andrea Marine Statement (Statement Marine Reconstruction (Statement Marine Marine (Statement)) Marine (Statement)
🔾 Landscape		
	<	- >
	Page 1 of 4	
Page Setup	Print	Cancel

#### Figure 65: Print dialog box

**2.** Verify the IPM dialog box appears to notify you of your print policy and cost.

M		
o you want to apply the print po	licy to Duplex Econo ?	
	A	
Print job cost = <b>\$0.04</b>	Savings = <b>\$0.36</b>	
Selected actions will be applie	ed	
Economode		
Duplex		
	No	

Figure 66: IPM dialog box popup

**3.** Uncheck some of the options to see the cost of your print job change.

you want to apply the print pol	icy to Duplex Econo ?	
Print job cost = <b>\$0.40</b>	Savings = <b>\$0.00</b>	
Selected actions will be applie	d	
Economode		
Duplex		
	No	Cancel

## Figure 67: IPM dialog box job cost

The IPM notification from the print client allows your users to make informed decisions when sending documents to the printer. This is a great way to start changing print behaviors inside your company.