



Technical and organisational prerequisites v6.1

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Introduction

Purpose of this manual

This document provides the technical and organisational prerequisites needed to install Watchdoc v6.1.

In this document, **print device** refers to a printer or multifunction printer (MFP) installed on a network.

Intended audience

This manual is intended for the decision-maker and the IT specialists in charge of validating the technical environment before installing Watchdoc.

Symbols used



Information: highlights important information required to fine tune the installation or configuration of the solution, any information that may be useful for a better understanding or knowledge of a notion or a function of the tool, or provides a specific case of use of this tool.

Contact Doxense®

Doxense's technical assistance service is reserved for certified, technical partners and can be contacted via Connect, customer portal dedicated to partners.



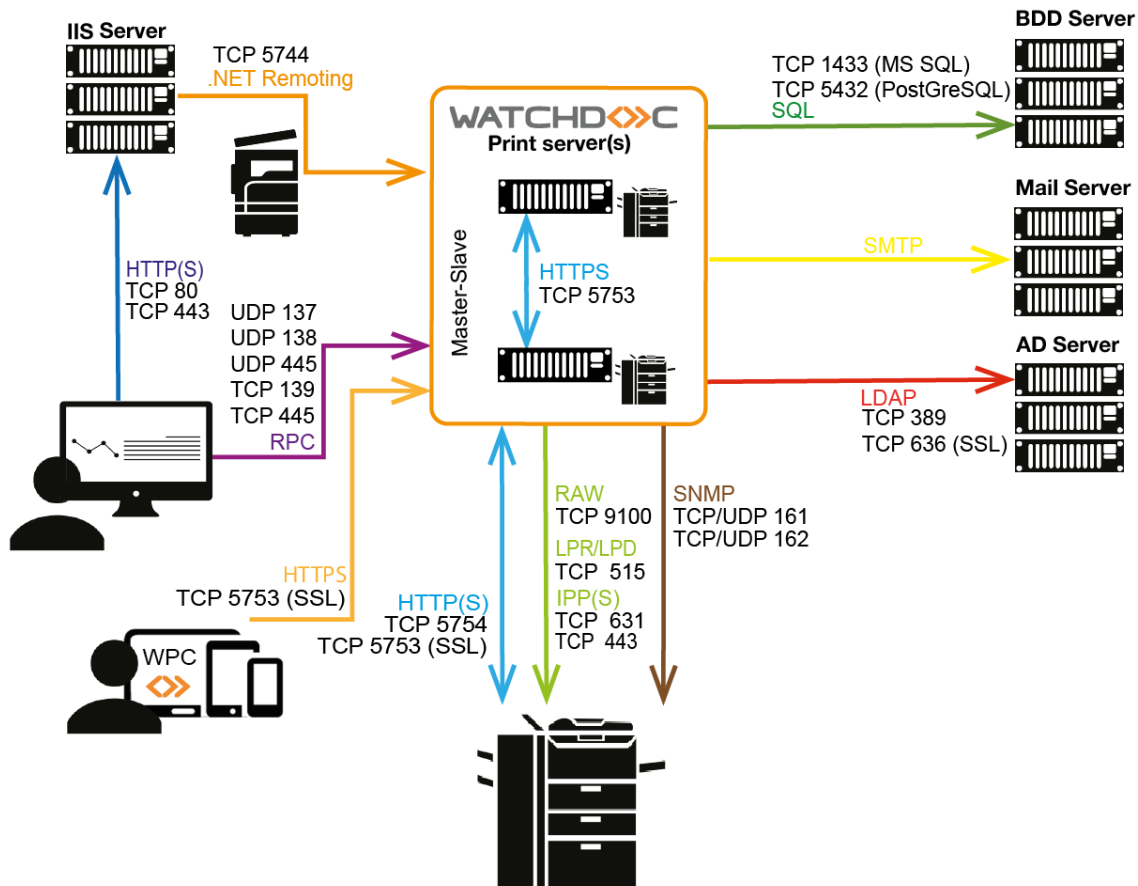
For all other questions, please contact your Doxense® consultant or send us an email at contact@doxense.com

Versions

Date	Description
05/22/2024	update for the 6.1 version.
12/21/2023	update for the 6.0 version.
07/25/2022	update for the MS Windows server and MS SQL server supported versions
01/24/2020	update of the network ports pattern
10/09/2019	update for the 5.3 version.

Network architecture

Network ports and protocols



Network ports matrix

The network ports to open are the following:

Source	Port	Protocol	Target
WES (Watchdoc Embedded Solution) on printing device	TCP 5754 or 5753	HTTP HTTPS	Watchdoc service (core) - print server
Watchdoc web site (IIS)	TCP 5744	Dotnet protocol	Watchdoc service (core) - print server
Web Browsers : web interfaces	TCP 80 TCP 443	HTTP HTTPS	Watchdoc web site (IIS)
Watchdoc Service (core print server)	TCP 1433	SQL	DataBase server Microsoft SQL®
Watchdoc Service (core print server)	TCP 5432	SQL	PostgreSQL
Watchdoc Service (core print server)	UDP 161 UDP 162	SNMP	Printing devices
Watchdoc Service (core print server)	TCP 9100 TCP 515 TCP 631 or TCP 443	RAW LPD IPP IPPS	Printing devices
Watchdoc Service (core print server)	TCP 389 TCP 636	LDAP Protocol SSL	Users Directory Server
Watchdoc Service (core - print server) or user browser	TCP 5756	HTTPS	Watchdoc Supervision Consol (WSC)
Watchdoc Print Client for...	TCP 5753	HTTPS	Watchdoc Print Server & Watchdoc Master (if exists)
Watchdoc Notification Server	TCP 445	SMB	Users workstations
Watchdoc	TCP 5751		Watchdoc Notification
Watchdoc	TCP 443	HTTPS	WES - Watchdoc Embedded Solution - Lexmark (in some specific configurations).



If there is a firewall in the infrastructure, this firewall must allow accesses to the server on which Watchdoc is installed. WSD (Web Services for Devices) technology is not supported by Watchdoc.

WES ports matrix

The network ports to open for the WES are the following:

Labels	Source	Port	Protocol	Target
Canon	Watchdoc	TCP 8000 TCP 8443	HTTP HPPS	Printing device
Epson	Watchdoc for authentication, secure port required	TCP 80 TCP 443	HTTP HPPS	Printing device
Hewlett-Packard	Watchdoc	TCP 57627 TCP 7627	HTTP HPPS	Printing device
Konica Minolta	Watchdoc	TCP 50001 TCP 50003	HTTP HPPS	Printing device
Kyocera	Watchdoc	TCP 50001 TCP 50003	HTTP HPPS	Printing device
Lexmark	Watchdoc	TCP 80 TCP 443	HTTP HPPS	Printing device
Toshiba OEM Lexmark	Watchdoc	TCP 49629 TCP 49630	HTTP HPPS	Printing device
Ricoh	Watchdoc	TCP 80 TCP 443	HTTP HPPS	Printing device
SharpOEM LExmark	Watchdoc	TCP 80 TCP 443	HTTP HPPS	Printing device
Xerox SNMP required for installation	Watchdoc accounting (jba) for authentication, secure port required	TCP 80 TCP 80 TCP 443	HTTP HTTP HTTPS	Printing device

The network ports to open for the WES Konica Minolta are the following:

Marque	Source	Port	Protocole	Target
Konica Minolta	Watchdoc	80	webdav	KM device
	Watchdoc	50003	SSL	KM device
	Watchdoc	50001	Non-SSL	KM device
	Watchdoc	59158	OpenAPI	KM device
	Watchdoc	59159	OpenAPI	KM device
	Watchdoc	59160	OpenAPI	KM device
	KM device	5753	SSL	Watchdoc
	KM device	5754	Non SSL	Watchdoc

Interserver port matrix

The network ports to activate the interserver printing are the following:

Source	Port	Protocole	Target
Server of the domain	TCP 5753	HTTPS SSL	Server of the domain
Watchdoc service	9100	RAW IPP/IPPS	Printing devices

Server Architecture

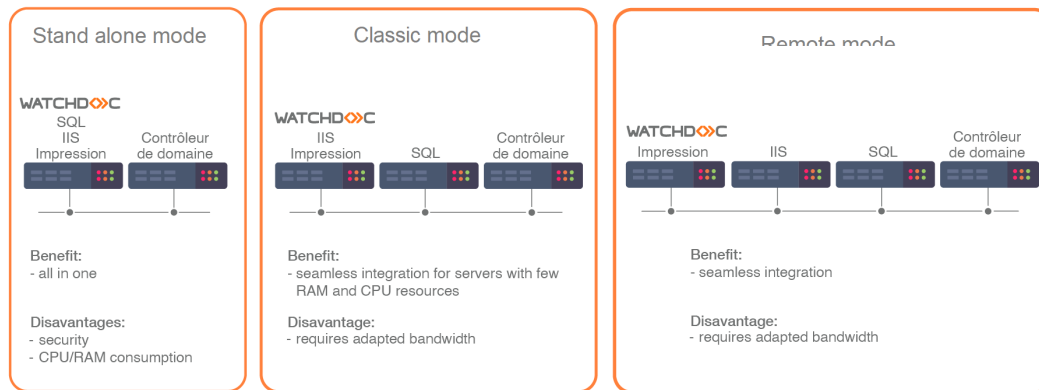
Architecture overview

To operate, Watchdoc needs four Windows services:

- Watchdoc core running on a print server
- a directory on a domain controller or other user authentication source (AD, Open LDAP, SQL, CSV file, etc.)
- a website
- databases on a SQL server.

These four services can be installed on one or more physical machines:

- stand-alone mode
- classic mode
- remote mode.



In **stand-alone mode** and in **classic mode**, the Watchdoc core and the web site are installed onto the same server. (cf. [Install Watchdoc kernel and Web Site](#)).

In **remote mode**, the Watchdoc core and the web site are installed into two separate servers (cf. [Install the Watchdoc kernel](#) and [Install the Watchdoc web site](#)).

Watchdoc administration and end-user interfaces are fully web based and they are compatible with the following Evergreen browsers:

- Edge
- Google Chrome (versions up to 2 years old compared to the Watchdoc version)
- Mozilla Firefox (versions up to 2 years old compared to the Watchdoc version)
- Safari.

Each component needs to interact with the others, either locally or over the network. When networked, it is important to know what are the necessary ports for proper operation.

Specific Deployments

Watchdoc can be deployed in a Domain configuration, i.e. with a master server and other servers (slaves).

Certain parameters defined for the domain's master server can be automatically applied to all the other servers that depend on it (if the **Global** box is ticked in the master's configuration interface).

In addition, the update applied to the master server can be propagated to all the servers that depend on it (via WSC - Supervision Console).

Watchdoc allows inter-server on-demand printing when the servers belong to the same domain. Inter-server printing is based on a pool in which configuration data for printing peripherals and user data are shared.

Prerequisites for WEScan

Watchdoc includes WEScan, a new feature that scans from the printer device and sends the scanned document to a specific email address or folder on the network.

Saving the scanned document in a shared folder on the network requires an account with read and write permission on the destination folder. This account must :

- have the property "Log as a service" (so that you can act from outside on the server without having to authenticate himself) ;
- have a password that never expires.

When installing Watchdoc, the access account must be specified in the "Privileged Services options" dialog box to enable WEScan.

Servers prerequisites

Compatible Windows Server® Editions

- MS Windows Server® 2016
- MS Windows Server® 2019
- MS Windows Server® 2022

Watchdoc is also compatible with virtualization software (VMware, Hyper-V, etc.).

The Core version of MS Windows Server® is not supported.

Microsoft Visual® C++ 2013 is mandatory.

Microsoft® .NET Framework 4.8 is mandatory.

Analysed languages

Watchdoc uses Type 3 print drivers.

Type 4 print drivers are not supported.

Watchdoc analyses the following languages:

- PDL
- PCL 5, 5c, 5e
- PCL 6 (PCL-XL)
- HPGL2
- Postscript DSC (Document Structuring Conventions)
- ESC/P 2
- EMF
- XPS (however, given the limitations of this format on certain functions (spool transformation and inter-server print-on-demand in particular), we **do not** recommend its use).



The preview features are only available with the EMF and PCL6 data-streams.

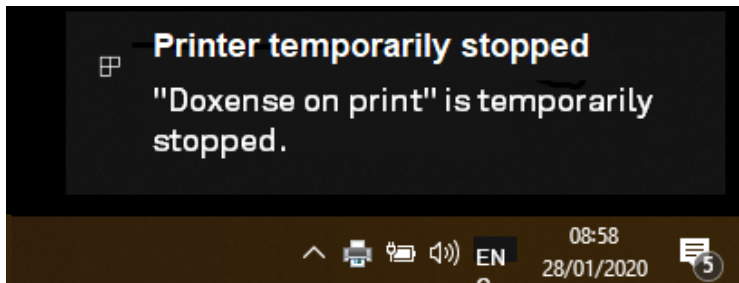
Removal of pages within a print document is only possible with prints made with PCL6 drivers.

Redirection of print jobs can only be used with printers:

- using the same language;
- having compatible print files.

Printing notifications

When the MS Windows® print queue is controlled by Watchdoc, it is paused by default. As soon as a user starts printing, an MS Windows® notification informs him that the printing device is paused, which may lead to confusion. We therefore recommend that you deactivate this notification:



Example of Ms Windows® 10 notification

Automatic process

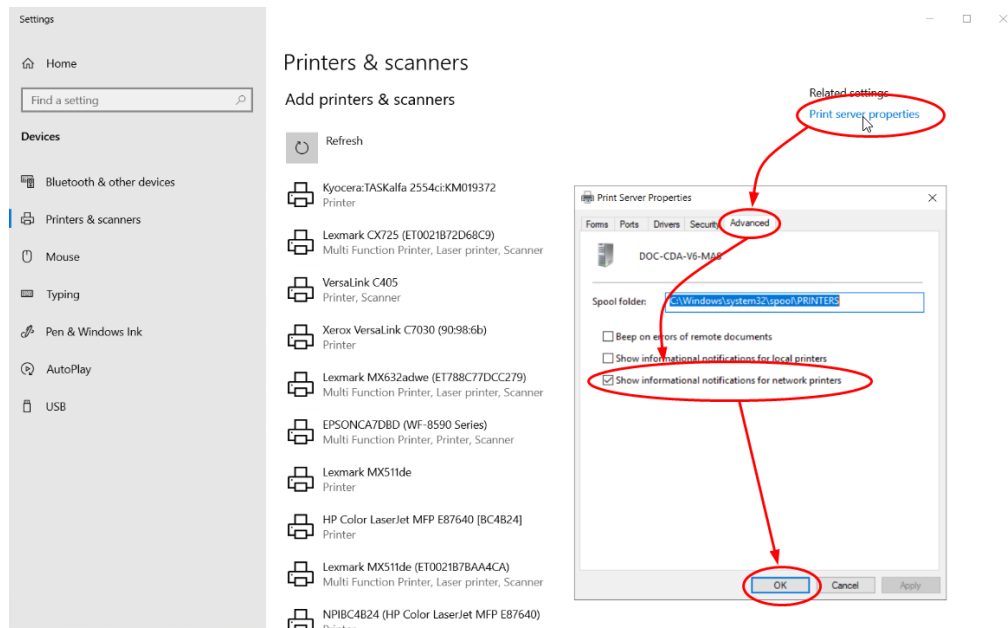
If the workstations are running MS Seven® or MS Eight®, we recommend that you change the value of the following registry key from 1 to 0:

```
HKEY_CURRENT_  
USERS\Printers\Settings\EnableBalloonNotificationsRemote
```

This action will disable tooltips for the printouts sent to the print server.

Manual process

1. access the Watchdoc printing server as an administrator;
2. access the **Server's Control Panel**, then **Hardware** and **Devices and Printers**;
3. In the **Devices and Printers** window, click on **Printing Server Properties**;
4. In the **Print Server Properties**, click on the tab **Advanced**;
5. untick the box "**Display the printing notifications for the network printers**":



6. from a work station, check that the notification no longer displayed when launching a print job.

Antimalware, antivirus

The server antivirus or antimalware tools (like Windows Defender[®], Bit Defender[®], Kaspersky[®], Mac Afee[®], for example), must exclude the spools directory and the Watchdoc installation directory. If not, slowness occurs, generated by the security tool analysis.

Application server

Watchdoc runs under a Internet Information Server (IIS) server. Required IIS components are:

- Web-Server
- Web-ASP
- Web-Metabase,
- Web-Windows-Auth



Microsoft[®] .NET Framework 4.8 mandatory

Directory Server

One or more of these directories are compatible:

- Active Directory®
- Open LDAP®: validated set up required (the directory must have the same structure as an AD)
- MS SQL® database (structured like a directory)
- XML file (structured like a directory)
- Proxy Directory : correspondence between user login and number or between the name or user login known on the device (data via SNMP, copicodeIP).



For any other type of directory, please contact us.



Watchdoc is able to manage multiple directories, provided that there are no homonyms between them.

Database Server

Watchdoc registers statistics and the users's Virtual Purses in two databases. Compatible Database servers are the following:

- MS SQL Server® (Express/Standard/Enterprise) 2012, 2014 or 2016, 2017 and 2019 with following prerequisites:
 - Mixed mode;
 - SQL browser (if remote SQL with a named instance).
 - the language used must be Case Insensitive (e.g. French_CI_AS).

i If the SQL server is remote (in classic or remote modes), make sure that TCP/IP is enabled in **SQL Server Configuration Manager**. Also make sure the **SQL Browser** service is started so that Watchdoc can display the list of servers and available instances.

- PostgreSQL® (Doxense® does not offer any assistance with settings).
- In the case of using Report Services for Watchdoc (WRS) (to generate comprehensive printing activity reports), Reporting Services (included in MS SQL Server min. of SQL: 2008 R2) must be installed.

i Watchdoc is **not** compatible with Oracle® Database.

Notifications

The notification feature of Watchdoc uses the SMTP protocol.

The following parameters must be checked :

- MSG.exe must be activated to display messages;
- on the workstations, the value of the following key must be 1:
`HKLM\SYSTEM\CurrentControlSet\Control\TerminalServer`

Capacity planning

CPU and Memory

For more information, see Microsoft® [Print Server Scalability and Capacity Planning](#).

As stated in this Microsoft® document, it may be difficult to size a print server, as there are many parameters to consider: number of printers, type and number of client workstations, type and size of spool files, network interface.

For resources to be allocated to Watchdoc, here are our recommendations:

- Less than 200 print queues: 4 CPU cores as a minimum with 1 GO of available RAM.
- Between 200 and 1'000 print queues: 8 CPU cores as a minimum with 2 GB of available RAM.

SNMP Network Monitoring Traffic

Examples measured on Doxense network:

- Xerox WorkCentre 24 (Internal Auditron enabled with 80 accounts): 30 MB/day
- Kyocera Mita KM-4035 : 18,5 MB/day
- Dell 5100cn : 10,8 MB/day
- Lexmark T420 : 10,4 MB/day

Local Agent Network Traffic

For each document printed on a local printer, the agent sends a message to the Watchdoc server. Its actual size depends on the protocol being used:

- .NET Remoting (TCP sur le port 5744): 2,5 kB (kiloBytes) per transaction ;
- HTTP : 3,5 kB (kiloBytes) per transaction.

Database storage requirements

In the database, each printed document needs between 1,5 and 2,5 kB.

For monitored network printers and MFP:

- Incidents : 1 kB per incident on connected devices (if SNMP is active);
- Supplies and counters: 600 bytes/device/hour or 5,2 MB/device/year;
- Server counters (RAM, CPU...): 200 bytes/server/hour or 1,8 MB/server/year.



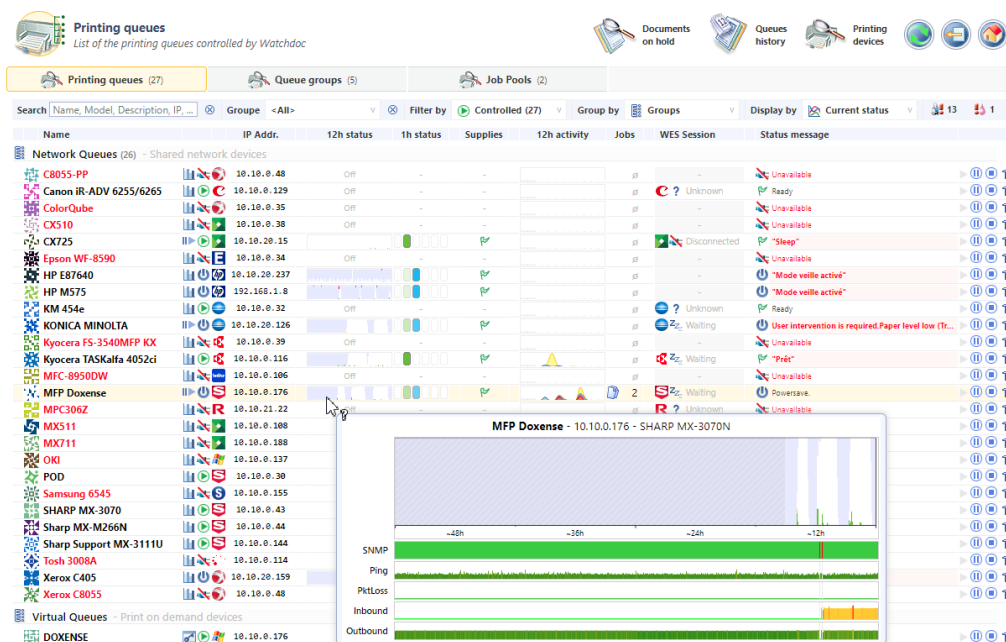
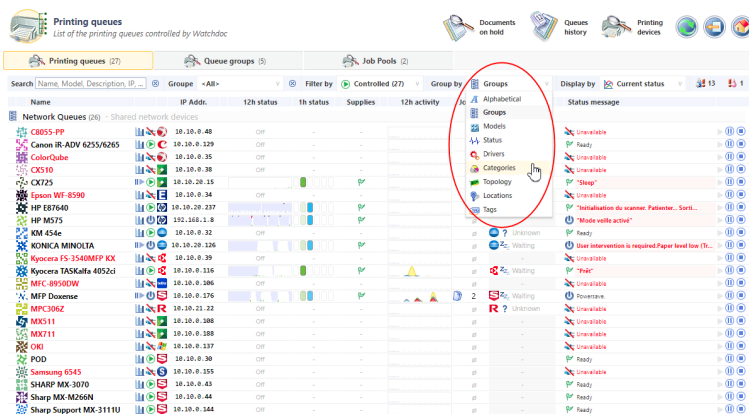
Note that Microsoft® does not support workstations with desktop OS as a production server.

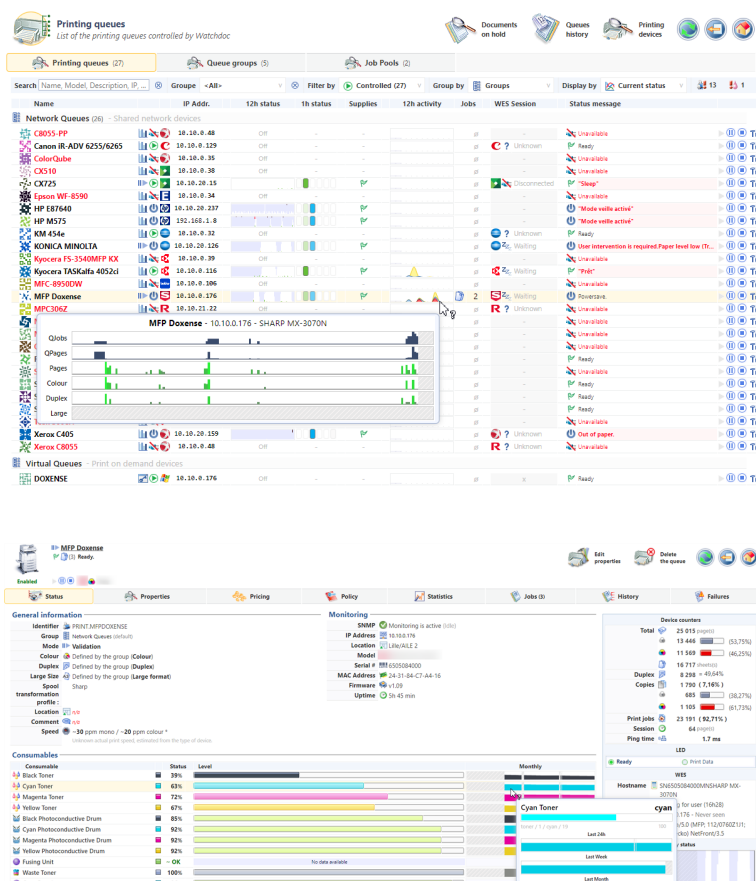
SNMP

General overview

Watchdoc can retrieve information about the printer or multifunction via SNMP:

- information on consumables: paper, ink, toner, staples etc.;
- information on device status in the administration site: LCD display messages, LED Status, errors and warnings;
- collection of counters: prints, copies, 'scan to disk' or 'scan to mail' operations...





i Watchdoc supports SNMP v3 since version 6.1.0.4898

Print Device Compatibility

The list of Watchdoc Certified manufacturers is available in the [WES section](#) of the documentation web site.

For these manufacturers, a partnership has been established to maximise the compatibility of Watchdoc with their devices.

For the other manufacturers, Watchdoc uses standard SNMP protocol to collect data (common MIB) and analyse the print files (PCL 5/6 and PS).

Within the Watchdoc package, we provide tools for you to validate the Watchdoc application in the customer's environment and check drivers and data stream compatibility.

Security

Duxense recommends customising all SNMP community strings.

Client Workstation

General overview

By default, there is no installation required on the client workstation. The user must print to the shared printer queues on the print server. The printer is installed as a network printer either manually or using tools like the Microsoft® Group Policy (GPO) or other utilities.

Client Operating Systems

- Watchdoc works on the following systems:
- Windows® 2000 / XP / Vista / 7 / 8 / 8.1 / 10 / 11
- Mac OS® X / Linux : printing via Samba or via Line Printer Daemon Protocol(LPR).
Possible loss of identity of the user.

 For Unix® printing via the LPR protocol (Mainframe® for example), prior validation is required. However, no information on the identity of the job owner is available under this configuration.

Drivers

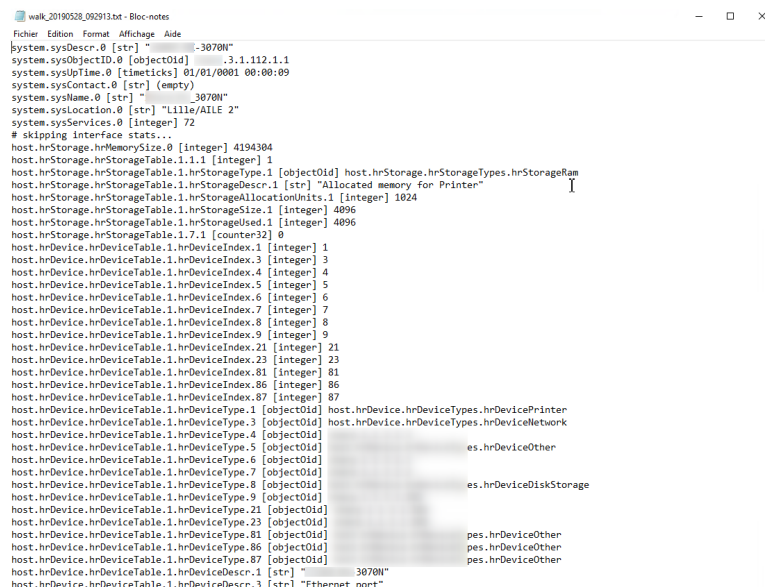
Watchdoc uses only type 3 print drivers.
Type 4 print drivers are not supported.

Applications

The Watchdoc analysis capabilities are regularly tested with the most common applications (Microsoft® Office Suite, Adobe Reader, Photoshop, web pages...). For custom applications (e.g. generated in a UNIX® environment), if the client generates themselves their print file (Postscript® for example), it is recommended to get some print files for compatibility testing.
If the format is not standard, it may be necessary to develop a specific component dedicated to the analysis of print jobs from the application.

SNMPWalker

SNMP Walk is a command that allows to collect, thanks to the SNMP protocol, data about a device installed on a specific network:



```

walk_20190528_092913.txt - Bloc-notes
Fichier Edition Format Affichage Aide
system.sysDescr.0 [str] "3070N"
system.sysObjectID.0 [objectOID] .3.1.112.1.1
system.sysUpTime.0 [timeticks] 01/01/0001 00:00:09
system.sysContact.0 [str] (empty)
system.sysName.0 [str] "3070N"
system.sysLocation.0 [str] "Lille/AILE 2"
system.sysServices.0 [integer] 72
# skipping interface stats...
host.hrStorage.hrMemorySize.0 [integer] 4194304
host.hrStorage.hrStorageTable.1.1.1 [integer] 1
host.hrStorage.hrStorageTable.1.hrStorageType.1 [objectOID] host.hrStorage.hrStorageTypes.hrStorageRam
host.hrStorage.hrStorageTable.1.hrStorageDescr.1 [str] "Allocated memory for Printer"
host.hrStorage.hrStorageTable.1.hrStorageAllocationUnits.1 [integer] 1024
host.hrStorage.hrStorageTable.1.hrStorageSize.1 [integer] 4096
host.hrStorage.hrStorageTable.1.hrStorageUsed.1 [integer] 4096
host.hrStorage.hrStorageTable.1.7.1 [counter32] 0
host.hrDevice.hrDeviceTable.1.hrDeviceIndex.1 [integer] 1
host.hrDevice.hrDeviceTable.1.hrDeviceIndex.3 [integer] 3
host.hrDevice.hrDeviceTable.1.hrDeviceIndex.4 [integer] 4
host.hrDevice.hrDeviceTable.1.hrDeviceIndex.5 [integer] 5
host.hrDevice.hrDeviceTable.1.hrDeviceIndex.6 [integer] 6
host.hrDevice.hrDeviceTable.1.hrDeviceIndex.7 [integer] 7
host.hrDevice.hrDeviceTable.1.hrDeviceIndex.8 [integer] 8
host.hrDevice.hrDeviceTable.1.hrDeviceIndex.9 [integer] 9
host.hrDevice.hrDeviceTable.1.hrDeviceIndex.21 [integer] 21
host.hrDevice.hrDeviceTable.1.hrDeviceIndex.23 [integer] 23
host.hrDevice.hrDeviceTable.1.hrDeviceIndex.81 [integer] 81
host.hrDevice.hrDeviceTable.1.hrDeviceIndex.86 [integer] 86
host.hrDevice.hrDeviceTable.1.hrDeviceIndex.87 [integer] 87
host.hrDevice.hrDeviceTable.1.hrDeviceType.1 [objectOID] host.hrDevice.hrDeviceTypes.hrDevicePrinter
host.hrDevice.hrDeviceTable.1.hrDeviceType.3 [objectOID] host.hrDevice.hrDeviceTypes.hrDeviceNetwork
host.hrDevice.hrDeviceTable.1.hrDeviceType.4 [objectOID]
host.hrDevice.hrDeviceTable.1.hrDeviceType.5 [objectOID] es.hrDeviceOther
host.hrDevice.hrDeviceTable.1.hrDeviceType.6 [objectOID]
host.hrDevice.hrDeviceTable.1.hrDeviceType.7 [objectOID] es.hrDeviceDiskStorage
host.hrDevice.hrDeviceTable.1.hrDeviceType.8 [objectOID]
host.hrDevice.hrDeviceTable.1.hrDeviceType.9 [objectOID]
host.hrDevice.hrDeviceTable.1.hrDeviceType.21 [objectOID]
host.hrDevice.hrDeviceTable.1.hrDeviceType.23 [objectOID]
host.hrDevice.hrDeviceTable.1.hrDeviceType.81 [objectOID] pes.hrDeviceOther
host.hrDevice.hrDeviceTable.1.hrDeviceType.86 [objectOID] pes.hrDeviceOther
host.hrDevice.hrDeviceTable.1.hrDeviceType.87 [objectOID] pes.hrDeviceOther
host.hrDevice.hrDeviceTable.1.hrDeviceDescr.1 [str] "3070N"
host.hrDevice.hrDeviceTable.1.hrDeviceDescr.3 [str] "Ethernet port"
  
```

The analysis of the collected data allows:

- to report the status of a device;
- to study new devices models;
- to report the internal counters of the device;
- to check the condition of the consumables (paper trays, cartridges, etc.);

Walks are valuable for monitoring Watchdoc malfunctions of the device. They are sometimes requested for troubleshooting by the Doxense Support team.

To perform an SNMP walk capture, you have the SNMPWalker tool provided by default in the Watchdoc installation folder.

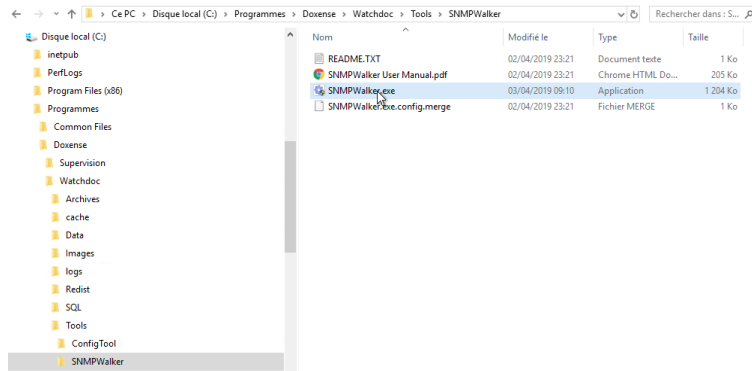
This tool, which creates a point capture of the device's SNMP tree, can be used at regular intervals, before or after a printout, to allow a comparative study of the different data in the device.

Procedure

Access to SNMPWalker

To access the SNMPWalker tool:

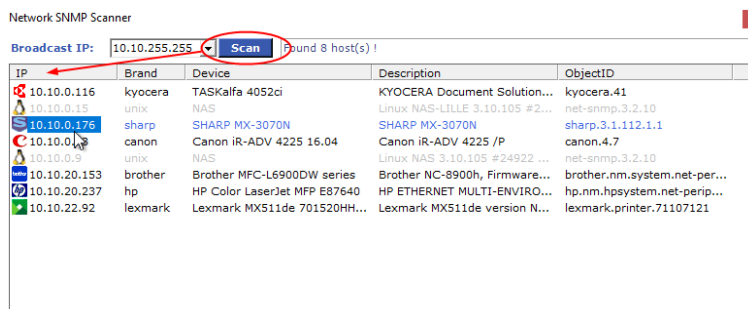
1. access the Watchdoc[®] server as administrator ;
2. using an explorer, access the SNMPWalker folder saved by default in:
C:/Programs/Doxense/Watchdoc/Tools/.
3. The SNMPWalker.exe executable can be found in the SNMPWalker folder:



Use SNMPWalker

To obtain an SNMP walk :

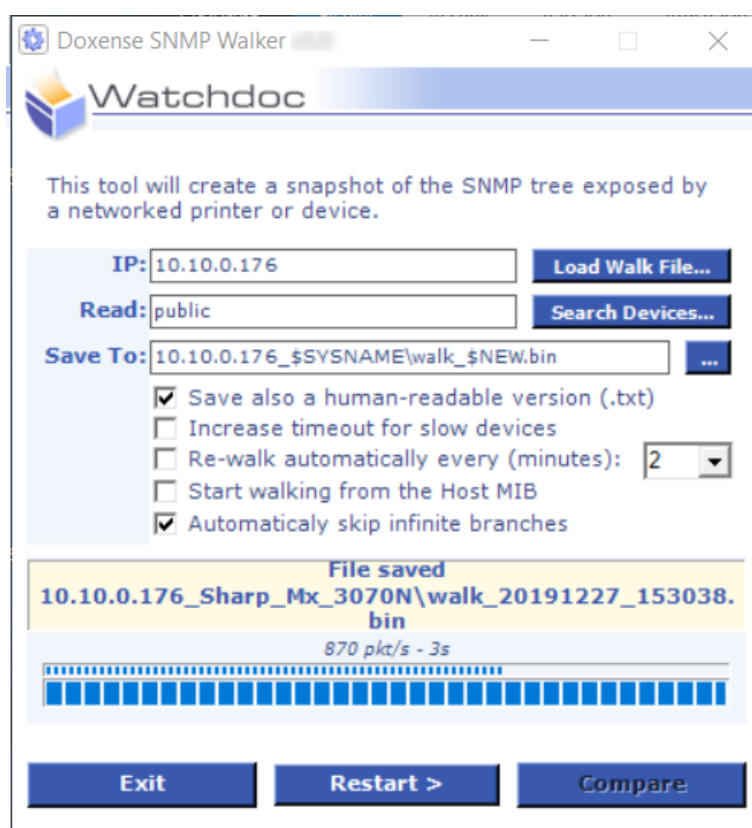
1. click on the executable SNMPWalker.exe ;
2. in the Dossiers SNMP Walker tool, click on the Search Devices button;
3. in the Network SNMP Scanner tool, select the network IP to be scanned, then click Scan :
4. In the list of detected devices, double-click on the I.P. of the device whose data you want to study;



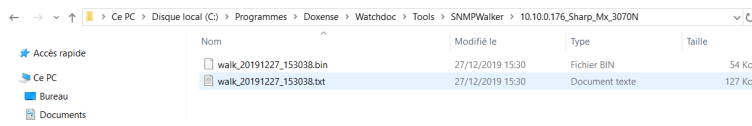
5. from the window in which the device to be scanned is selected, click on the button **Scan** to start the scan:



→ A cursor indicates the progress of the analysis. At the end of the operation, a message indicates the file in which the analysis is saved. By default, this file is saved in **\\Doxense\\Watchdoc\\Tools\\SNMPWalker** and bears the name of the scanned device:



→ In the SNMPWalker folder, open the **walk[...].txt** and **walk[...].bin** files to read the analysis and or send them to the Doxense Support team:



Nom	Modifié le	Type	Taille
walk_20191227_153038.bin	27/12/2019 15:30	Fichier BIN	54 Ko
walk_20191227_153038.txt	27/12/2019 15:30	Document texte	127 Ko