



Managing Third-Party Printers in HP Web Jetadmin

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Overview

Administrators want the ability to effectively discover and manage printers offered by all major printer vendors from a single software interface. Only having to install one software and learn a single interface saves valuable time and money. The tool also has to provide adequate levels of support for all vendors. Fortunately, HP Web Jetadmin is a premier printer management solution that can effectively discover and manage non-HP printers. The level of support provided depends on the ability of the device to adhere to a set of industry standards.

Discovering devices

During discovery of devices, HP Web Jetadmin uses SNMP queries to gather information from the device. If HP Web Jetadmin concludes that the device is a peripheral such as a printer, plotter, or multifunction device, it displays the device in the list of discovered devices. In order for HP Web Jetadmin to conclude that a device is a peripheral, the device must be able to answer a set of industry-standard questions.

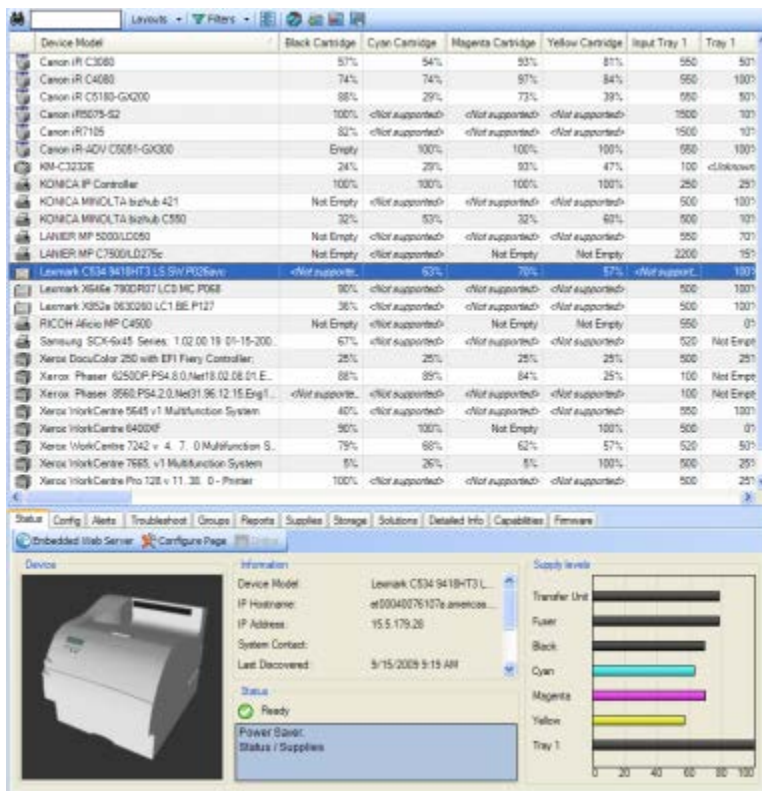


Figure 1: Third-party device support

A Management Information Base (MIB) is a set of objects that defines the types of SNMP queries that can be asked of a device. For example, the Standard Printer MIB (RFC 1759) is a generic set of objects to which most peripherals should be able to provide answers when queried. The Standard Printer MIB consists of objects that describe functionality and capabilities of the printer, such as page counts or media types. Other common MIBs include MIB2 (RFC 1213) and the Host Resources MIB (RFC 1514). Device vendors also have a set of proprietary MIBs that contain information unique to their devices. HP Web Jetadmin must have knowledge of MIB objects in device plug-ins before it can send queries to devices using those MIB objects.

Devices must be able to answer queries defined in the common industry-standard MIBs in order for HP Web Jetadmin to discover the devices. Otherwise, there is not enough information pertaining to the device to warrant displaying it in the list of discovered devices. HP Web Jetadmin focuses on printer management, and it would be increasingly difficult to distinguish devices as printers unless they can answer a standard set of questions such as those defined in the Standard Printer MIB.

After a device is discovered in HP Web Jetadmin, the level of support that can be provided depends on the depth of queries defined in the respective device plug-ins.

Device plug-ins

Device plug-ins in HP Web Jetadmin contain SNMP queries to support functionality for a device. The more definitions that exist in the plug-in that are unique to that device, the higher the level of support that is provided.

HP Web Jetadmin has no specific knowledge of proprietary objects for a third-party device, therefore a single plug-in containing industry-standard objects is used for each vendor. The level of information that can be provided depends on the ability of the device to answer the standard queries.

For HP devices, a device plug-in exists for every HP model containing proprietary objects to provide advanced support.

Level of support

Third-party device support in HP Web Jetadmin can be quite extensive—however, it is strictly the responsibility of the device to answer the standard queries. A significant amount of HP Web Jetadmin functionality can be supported through standard queries such as basic status, configuration, alerts, reporting, and page counting. HP Web Jetadmin attempts to support the following functionality for third-party devices using standard queries for basic support:

- Device Page

- Status tab

- Device

- A single picture of a generic device to represent the vendor

- Device Model, IP Hostname, IP Address, System Contact

- Status

- Basic status (online/offline, toner low, toner out, media low, media out, paper jam, cover open, service requested)

- Front panel display

- Supplies

Input tray remaining levels

Supplies remaining levels

- Detailed Info tab
 - General category
 - Serial Number
 - Engine Cycle Count
 - Contact Person
 - System Contact
 - System Location
 - Interpreter information (language, version, date)
 - Jetdirect category
 - HW address, protocols, packets, system uptime, system name
- Config tab
 - Device
 - Contact Person
 - System Contact
 - System Location
 - Control Panel language
 - Printer Job Language (PJM) Configuration
 - Company Name
 - Network
 - System Name
 - IP Address
- Troubleshoot tab
 - Reset device
 - EWS button

- Capabilities
 - Installed components such as input tray capacities, interpreter languages, duplexer, hard disk, total memory
- Supplies tab
 - Input tray levels
 - Supplies levels
- Alerts tab
 - General alerts only, polling only of SNMP Alert table and status Object Identifier (OIDs)
- Alerts (limited set of events via polling only, no traps)
 - Service (online, offline, error, disconnected)
 - Supplies (paper out, toner low, toner out, other supplies low/out/replace)
 - Media Path (paper jam, cover open, output full)
- Reports
 - Device Inventory
 - Device Utilization (Total Page Counts only)
- Columns
 - Supplies remaining levels
 - Input tray capacities
 - Input tray remaining levels
 - Engine Cycle Count
 - Storage such as hard disk and installed RAM
 - Serial Number
 - Contact Person
 - System Contact
 - System Location
 - System Name
 - System Up Time

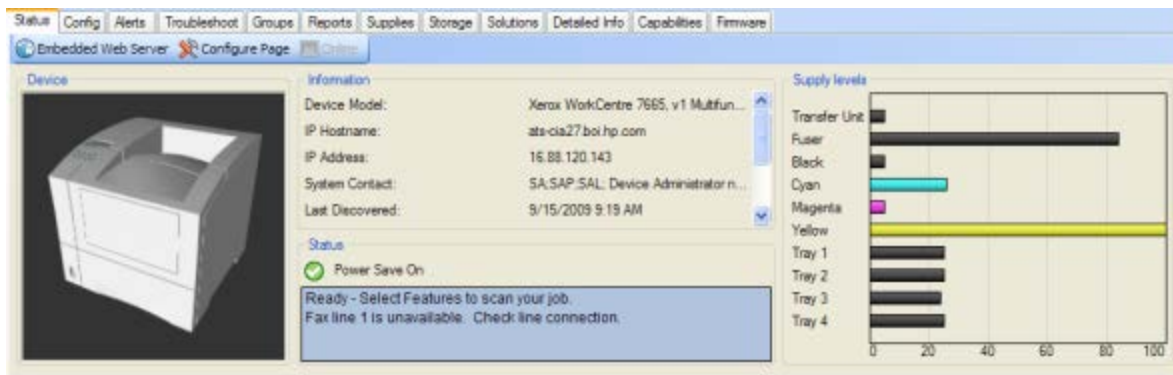


Figure 2: Third-party device support: Status page

Device Model	Black Cartridge	Cyan Cartridge	Magenta Cartridge	Yellow Cartridge	Input Tray 1	Tray 1	Hard Disk	Installed RAM	RAM Disk	Flash Disk
KONICA IP Controller	100%	100%	100%	100%	250	25%	No	512	No	No
Lexmark X852e 0630260 LC1 BE.P127	36%	<Not supported>	<Not supported>	<Not supported>	500	100%	Yes	256	No	No
Samsung SCX-6x45 Series: 1.02.00.19 01-15-200...	67%	<Not supported>	<Not supported>	<Not supported>	520	Not Empty	No	256	No	No
Xerox Phaser 6250DP/PS4 8.0/Net18.02.08.01.E...	88%	89%	84%	25%	100	Not Empty	No	256	No	No
Xerox WorkCentre 7665, v1 Multifunction System	5%	26%	5%	100%	500	25%	Yes	755	No	No

Device Model	Serial Number	Contact Person	System Contact	System Location	System Name	System Up Time	Control Panel Access	Engine Cycle Count
KONICA IP Controller	<Not supported>			CI Lab 6B	Fiery 50C-K	77:19:34:46:740	Unlock	26,192
Lexmark X852e 0630260 LC1 BE.P127	0630260-60-0				ET000400F32F...	37:18:11:46:580	Unlock	16,221
Samsung SCX-6x45 Series: 1.02.00.19 01-15-200...	826181EP200081T	Network Admi...			SEC00158904...	226:05:28:43:0...	Unlock	9,270
Xerox Phaser 6250DP/PS4 8.0/Net18.02.08.01.E...	PHG567477				Phaser 6250DP	1:13:39:38:520	<Not supported>	3,326
Xerox WorkCentre 7665, v1 Multifunction System	VDR540735	<operator (ope...	SA; SAP; SAL...	CI Lab	XRX0000A46F...	35:22:10:23:410	<Not supported>	30,072

Figure 3: Third-party device support: Column samples

Reserved functionality

While a majority of functionality in HP Web Jetadmin is provided by using SNMP queries, some functionality is reserved only for HP devices because the functionality requires techniques beyond querying SNMP objects. The basic and advanced support provided for non-HP devices is restricted to the use of industry-standard or vendor specific SNMP queries to gather information. Functionality that is reserved for HP devices due to non-SNMP techniques to provide it includes:

- Firmware upgrades
- Print queue creation
- Some extended configuration items
- Print Test Page button
- Secure disk erase
- Font and forms management

Functionality definitions

This section provides definitions for many of the supported features for third-party devices and the objects used for obtaining the information. The feature is supported if the device can answer the industry-standard query defined in these definitions.

Bitmap and Icon

HP Web Jetadmin displays any predefined bitmaps and icons that have been created in a device plug-in. HP devices have a unique matching picture, while third-party support provides one generic picture per third-party vendor.

Model

The printer model name appears according to the response to hrDeviceDescr.

Status

Device status that indicate the current state of the printer (for example: Online, Paper jam) is displayed based on responses to standard objects such as hrPrinterDetectedErrorState.

Control Panel Display

The current message on the printer front panel is displayed using prtConsoleDisplayBufferText.

Serial Number

The Serial Number is a unique manufacturing identifier for the printer. The serial number is a critical identifier item for HP Web Jetadmin that is used to determine the uniqueness of a device along with other items such as MAC Address and IP Address. Some functionality, such as Reports, is blocked in HP Web Jetadmin if the serial number cannot be obtained. Therefore, HP Web Jetadmin makes strong efforts to obtain the serial number from third-party devices. The most typical and widely supported object for obtaining serial number is prtGeneralSerialNumber.

Engine Cycle Count

Engine Cycle Count is a value stored on the printer that represents a cumulative total of pages printed for the life of the printer. Engine Cycle Count is displayed if a printer supports prtMarkerLifeCount. Page counts for monochrome, color, simplex, duplex, fax, copy, and scan can only be obtained via proprietary queries and only supplied for HP devices.

IP Hostname

IP Hostname is displayed as long as the operating system can resolve an IP address to a hostname from a name server such as DNS or WINS using a GetHostByAddr call. System Name, which can be the hostname if the NIC registers it with a name server, is displayed if the device answers the sysName MIB2 object.

System Contact

System contact is displayed according to the response to sysContact.

Description

Description is displayed according to the response to sysLocation.

Storage

Presence of storage media— such as hard disk, flash disk, RAM disk, and installed RAM—can be detected using `hrDiskStorage` objects. Additional storage information is provided on the **Storage** tab for certified devices.

Capabilities

Capabilities such as installed languages, trays, and accessories are displayed on the **Capabilities** and **Detailed Info** tabs using the **Status** page as supported by the device and based on objects such as `prtInterpreterDescription` or `prtInputDescription`.

Remaining Toner Levels

The approximate amount of toner or ink remaining in the cartridge cavity is determined by calculating a percentage based on the `prtMarkerSuppliesLevel` and `prtMarkerSuppliesMaxCapacity`.

Remaining Input Tray Levels

The approximate amount of paper remaining in a particular tray is displayed by calculating a percentage based on responses to the Standard MIB objects `prtInputCurrentLevel` and `prtInputMaxCapacity`.

Alerts

Polling at a specified interval is used to provide alerts based on status queries that match certain conditions or `prtAlerts` table objects. Standard status queries can typically determine the following types of alert conditions:

- Toner Out
- Toner Low
- Paper Out
- Paper Low
- Cover Open
- Offline
- Paper Jam
- Printer Error

HP devices can process traps for real time alerts when events occur for most items in the **General** category. Polling of remaining supplies levels to provide Supplies alerts at desired thresholds is also available for HP devices.

Configuration

The following items are provided at minimum for configuration, assuming the device supports the objects:

- System Contact (sysContact)
- System Location (sysLocation)
- Control Panel Language (prtConsoleLocalization)
- Contact Person (prtGeneralServicePerson)
- System Name (sysName)

HP devices can provide extended configuration items using proprietary objects.

Reports

Third-party support includes only reports that indicate Device Inventory or Engine Cycle Counts. HP devices include reports that make use of the various supported page count values, such as Accessories Inventory (capabilities), Supplies Utilization (marker supply info), Device Utilization (page counters), and Peak Usage (hourly page counters).

Troubleshooting

Trying to determine why a particular third-party device supports what it does usually boils down to the ability of the device to answer the queries HP Web Jetadmin sends. HP Web Jetadmin is at the mercy of the device to answer industry-standard queries. Some devices support more gauges than others and it cannot be assumed that all devices from a particular vendor support the same features. For example, one Xerox model might support the control panel display while another Xerox model does not. Common explanations for why particular items may not appear for devices include:

Issue: A gauge might be present for a consumable, but the gauge is hashed out instead of containing a remaining percentage.



Figure 4: Supplies gauges contain hashes instead of levels. Generic HP bitmap

Reason: If a device answers prtMarkerSuppliesDescription correctly, the gauge is present because HP Web Jetadmin knows the consumable exists. However, if the device cannot answer either prtMarkerSuppliesMaxCapacity or prtMarkerSuppliesLevel correctly, the percentage cannot be calculated and HP Web Jetadmin displays hashes instead to indicate an “unknown” level.

Issue: A paper tray gauge does not indicate a remaining percentage.

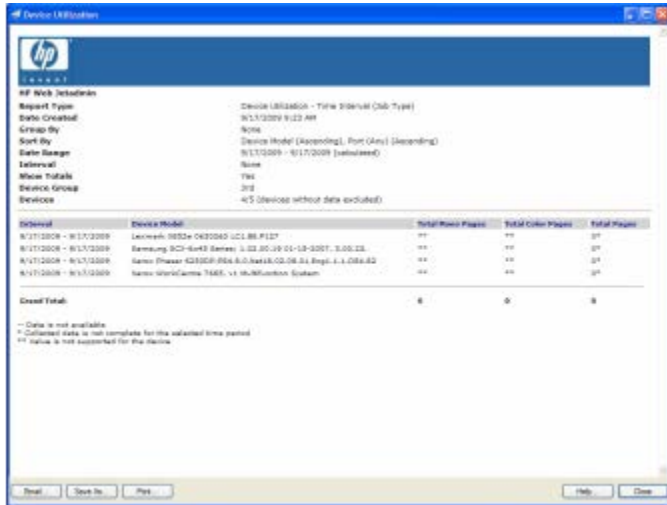


Figure 5: Device utilization report displays only total pages

Reason: If a device answers the prtInputType query to indicate a tray is present, the device might respond to the prtInputMaxCapacity and prtInputCurrentLevel queries with either valid values or indicate that at least one sheet remains. If valid values are returned, a calculation is presented. If valid values are not provided, HP Web Jetadmin displays either “empty” or “not empty” depending on whether the device indicates at least one sheet remains.

Issue: Control Panel displays “Not Supported” or “Unknown”.

Reason: “Not Supported” indicates the device did not respond to the prtConsoleDisplayBufferText object. “Unknown” might indicate that the device recognizes the prtConsoleDisplayBufferText object, but did not respond with any text.

Issue: The model name for the device appears to be much longer than the true name of the device.



Figure 6: Unknown front panel message. Non-truncated device model name.

Reason: HP Web Jetadmin relies on hrDeviceDescr to display the model name. Properly truncated model names are generally provided in proprietary objects. HP Web Jetadmin does not know how to truncate a response to hrDeviceDescr if it contains too many characters. For example, if a Lexmark printer responds with “Lexmark X652de 7932M8R LJ.MN.P092”, HP Web Jetadmin does not know where to truncate the string.

Issue: No consumable gauges are present for items such as toner or fuser.



Figure 7: Missing supplies gauges. Unknown front panel message. Generic HP bitmap

Reason: A device must answer prtMarkerSuppliesDescription correctly, otherwise HP Web Jetadmin has no idea the consumable exists and cannot display a gauge.

Summary

By supporting third-party printers in HP Web Jetadmin, LAN administrators can now discover and manage printers from all major printer vendors with a single software interface. By simplifying printer management with a single, powerful tool, HP Web Jetadmin can save administrators significant time and effort.

Appendix A—Third-party support examples

The following table contains a list of potential functionality that HP Web Jetadmin supports for third party devices. An asterisk (*) next to a consumable gauge indicates the gauge is present, but the device is unable to reflect an exact value. In the case of Paper Trays, since it can reflect a value of “Empty” or “Not Empty”, it is considered a “Y” (yes) for support. In the case of the other consumable gauges, since it reflects no value at all, it is considered an “N” (no) for support.

Device Name	Serial Number	Page Count	Control Panel Display	Consumable gauges						System Location	System Contact
				Toner /Ink	Fuser	Cleaning Kit	Transfer Unit	OPC	Paper tray Level		
Canon iR 5070	N	Y	N	Y	N	N	N	N	Y	Y	Y
Canon iR C2880	N	Y	N	N	N	N	N	N	Y	Y	Y
Canon iR C4080	Y	Y	N	Y	N	N	N*	N	Y	Y	Y
Canon iR2230	N	Y	N	Y	N	N	N	N	Y	Y	Y
Canon iR5000	N	Y	N	Y	N	N	N	N	Y*	Y	Y
Canon MF8170	N	Y	N	N	N	N	N	N	Y*	Y	Y
Gestetner DSC 38	Y	Y	N	Y	N	N	N	N	Y*	Y	Y
KONICA MINOLTA bizhub 420	Y	Y	N	N	N	N	N	N	Y	Y	Y
KONICA MINOLTA bizhub C253	Y	Y	N	Y	N	N	N	N	Y	Y	Y
KYOCERA MITA Printing System	N	Y	Y	N	N	N	N	N	Y	Y	Y
Lanier 2138	Y	Y	N	Y	N	N	N	N	Y*	Y	Y
Lanier MP C7500	Y	Y	N	N*	N	N	N*	N	Y	Y	Y
Lexmark Optra Se 3455	N	Y	Y	N*	N	N	N	N	Y*	Y	Y
Lexmark Optra W810	Y	Y	Y	N*	N*	N	N	N*	Y*	Y	Y
Lexmark T632	Y	Y	Y	N*	N	N	N	N	N	Y	Y
Lexmark X646e	Y	Y	N	Y	N	N	N	N	Y*	Y	Y
Lexmark X652de	Y	Y	Y	Y	N	N	N	N	N	Y	Y
Okidata C5100	Y	Y	N	Y	N	N	N	N	Y*	Y	Y
Ricoh Aficio 2051	N	Y	N	N	N	N	N	N	Y	Y	Y
Ricoh Aficio 3260C	Y	Y	N	N*	N	N	N*	N	Y	Y	Y
Ricoh Aficio AP 3800C	Y	Y	N	Y	N	N	N	N	Y*	Y	Y
Ricoh Aficio MP 2510	N	Y	N	N	N	N	N	N	Y*	Y	Y
Ricoh Aficio MP 4500	Y	Y	Y	N*	N	N	N	N	Y	Y	Y
Ricoh Aficio MP C2500	Y	Y	Y	N*	N	N	N*	N	Y	Y	Y
Ricoh Aficio MP C4500	Y	Y	Y	N*	N	N	N*	N	Y	Y	Y
Samsung SCX-6x55 Series	Y	Y	Y	Y	N	N	N	N	Y*	Y	Y
Savin SLP 38C	Y	Y	N	Y	N	N	N	N	Y*	Y	Y

Device Name	Serial Number	Page Count	Control Panel Display	Consumable gauges						System Location	System Contact
				Toner /Ink	Fuser	Cleaning Kit	Transfer Unit	OPC	Paper tray Level		
Sharp MX-2700N	Y	Y	Y	Y	N	N	N	N	Y*	Y	Y
Toshiba e-STUDIO2500c	Y	Y	Y	N*	N	N	N*	N	Y	Y	Y
Xerox DocuColor 3535	N	Y	N	Y	N	N	N	N	Y*	Y	Y
Xerox Phaser 6250DP	Y	Y	N	Y	N	N	N	N	Y	Y	Y
Xerox Phaser 8560	Y	Y	Y	N	N	N	N	N	Y*	Y	Y
Xerox WorkCentre 4150	Y	Y	Y	N	N	N	N	N	Y*	Y	Y
Xerox WorkCentre 4260	Y	Y	Y	Y	N	N	N	N	Y	Y	Y
Xerox WorkCentre 5645	Y	Y	Y	N	N	N	N	N	Y	Y	Y
Xerox WorkCentre 7242	Y	Y	Y	Y	N	Y	Y	N	Y	Y	Y
Xerox WorkCentre Pro 128	Y	Y	N	Y	N	N	N	N	Y	Y	Y
Xerox WorkCentre Pro 65	Y	Y	N	Y	N	N	N	N	Y	Y	Y

Appendix B—HP vs. third-party support summary

This table includes a summary of feature differences between HP and third-party device support.

Function	Third-party	HP
Picture	One standard bitmap per vendor or generic HP bitmap if vendor plug-in undefined	Unique customized bitmap to match each device for which a device plug-in exists
Model	hrDeviceDescr	Same, but may use HP-specific objects for better representation
Status	hrDeviceStatus	Same, but may use HP-specific objects for better representation
Control Panel Display	prtConsoleDisplayBufferText	Same
Control Panel Language	prtConsoleLocalization	Same
Serial Number	prtGeneralSerialNumber	HP-specific objects for better representation
Page Counts	prtMarkerLifeCount	HP-specific objects to represent total, monochrome, color, simplex, duplex, copy, fax, scan, and so on
Contact Person	prtGeneralServicePerson	Same
System Contact	sysContact	Same
System Location	sysLocation	Same
System Name	sysName	Same
Remaining Supplies Levels	prtMarkerSuppliesLevel prtMarkerSuppliesMaxCapacity	Same
Remaining Input Tray Levels	prtInputCurrentLeve prtInputMaxCapacity	Same
Alerts	<p>Polling only of status objects and prtAlerts table to provide alerts for following events when present during polling interval:</p> <ul style="list-style-type: none"> Toner Out Toner Low Paper Out Paper Low Cover Open Offline Paper Jam Printer Error 	Processing of traps for real time alerts when events occur for most items under General category; polling of remaining supplies levels to provide Supplies alerts at desired thresholds.
Reports	Device Inventory and Device Utilization (total page count only)	Includes reports that make use of the various supported page count values such as Accessories Inventory (capabilities), Supplies Utilization (marker supply info), Device Utilization (page counters), Peak Usage (hourly page counters)

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