

Device Information Polling and Related Features in HP Web Jetadmin

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What is HP Web Jetadmin polling?

HP Web Jetadmin uses a registration mechanism to add both device identities and device data to a background process called polling. HP Web Jetadmin can then query the details from devices on the network by using an efficient centralized polling mechanism. Devices and their associated data move in and out of polling registers for a variety of reasons. Here is an example:

HP Web Jetadmin is set up with Automatic Groups. These groups populate (and depopulate) with devices based on device attributes such as model and capability. As devices are added to the network or as devices change, groups are automatically kept up to date throughout the day and night by background polling. Devices are polled for the details contained in Automatic Group filtering. The returned data either matches or does not match, and the group membership is dynamically updated appropriately. The filter criteria and all the devices that HP Web Jetadmin manages are maintained in background polling.

Database information vs. device information

HP Web Jetadmin stores device and other data in a Microsoft[®] SQL database. All data has a date and time attribute so that a given feature can choose to use stored device data or request fresh data directly from the device, depending on data aging. Some details are considered quite volatile and are requested frequently, such as Page Count. Some details are considered very stable and requests are generated infrequently, such as Color Capability. At this time, the HP Web Jetadmin documentation does not include details about these factors. HP Web Jetadmin does not poll the device directly if the detail is not considered "aged."

Some information is considered static and will never change unless there is a registration action that causes the information to change. Device Model Name and Device IP Address are both considered static. However, Device IP Address is part of the device connection attribute and will change if the device is discovered on a new IP address. A discovery or Refresh Selection (Full) action must take place before HP Web Jetadmin data reflects a Device IP Address change.

IP Hostname is considered static as well, but has a special 12 hour "time to live" attribute. While it is not expected that IP Hostnames will change often, HP Web Jetadmin checks occasionally and adjusts the IP Hostname attribute if necessary.

NOTE: Hostname caching takes place in the Microsoft Windows® operating system. The DNS Client is a service that caches IP hostnames and proxies them for applications like HP Web Jetadmin. Microsoft has a knowledgebase document that covers adjusting the default cache settings and can be found at support.microsoft.com/kb/318803. More information about IP hostnames, HP Web Jetadmin, and Jetdirect print servers can be found in the *Best Practices for Managing Your Assets with HP Web Jetadmin* white paper. This white paper is available on the HP Web Jetadmin support page.

Protocol-How the query takes place

When HP Web Jetadmin queries devices or infrastructure, it uses a variety of protocols depending on the information being gathered. The most important are:

- SNMP-The primary communication method for gathering device information
- HTTPS-Used to gather security, digital sending, and other device information
- 3

• DNS and WINS-HP Web Jetadmin asks the local host to perform a name resolution

Sometimes HP Web Jetadmin requires credentials in order to complete a query. HP Embedded Web Server passwords, SNMP Get names, and other device credentials might be needed. **<Unknown>** appearing in device data can indicate that credentials are needed. Use the **Credentials required** column to determine if HP Web Jetadmin lacks a needed credential. For more information about device credentials and mechanisms such as the HP Web Jetadmin Credentials Store, see the *Application and Device Security for HP Web Jetadmin* white paper. This white paper is available on the HP Web Jetadmin support page.

HP Web Jetadmin feature/action vs. device detail

Data acquisition in HP Web Jetadmin falls into two distinct classes:

- HP Web Jetadmin feature/action-HP Web Jetadmin captures information through polling to process a feature or action, such as alerts triggering, reports data collections, and device list detail.
- **Device detail**—HP Web Jetadmin develops device detail in a "snapshot" during feature-driven output, such as exporting, reporting, or alerts messaging.

Polling types

- Background-Ongoing refresh of all device data plus these features: lists, groups, and filters.
- **Device list**-Supports client devices under view.
- Device tab (single and multi)—Supports Status and Troubleshoot tab actions based on device list selections.
- Alerts-Queries devices under alerts subscription.
- Supplies-Supports Supplies tab actions based on device list selection.
- Other polling features-Data collections and refresh can also be considered types of polling.

Poll rate settings

Each of the three polling mechanisms have three settings that can be adjusted through the HP Web Jetadmin menu tree: **Tools > Options > Device Management > Device Polling** (Figure 1). These are:

- **Polling interval**, measured in seconds, determines the period of time in which HP Web Jetadmin can send device requests to the network.
- **Time between polling intervals**, measured in seconds, is an inactive period when the application does not send device queries.
- Number of devices per poll is the number of devices that can be queried concurrently. HP Web Jetadmin places X number of device queries to the network in a poll burst and wait for responses. It continues to place X device queries each time a burst of queries are satisfied with response packets, and continues to do this until the polling interval expires.

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Figure 1: Device Polling setting

Background polling

Background polling is the more sophisticated type of poll mechanism. Here's why:

- Background polling can run continuously without any client login.
- Device registration is based on the All Devices list.
- Background polling sends polls to a very specific set of default objects.
- Data objects are added as other features come into play:
 - Automatic grouping
 - Client filtering
 - Filtered lists
 - Client lists, device columns enabled

In a default installation of HP Web Jetadmin that includes devices in the **All Devices** list, background polling has the device/data registration as shown in Figure 2.

	DeviceStatusSeverity	DeviceHashCodeIsUnique	FirstDiscoveryTime	FirstDiscoveryGuid	Acknowledged	DeviceGroupMembersh	IsPcConnect	ColorSupported
Device A								
Device B								
Device C								

Figure 2: Default device/data poller registration

This is the minimal and most basic information that is registered in background polling. After clients begin to log in and view devices or features like automatic groups are activated, more detail is added to this registration. Notice the data element in Figure 2 called "ColorSupported". This element directly supports the Color Devices filtered list that appears on the navigation tree by default Figure 3).

🚀 HP Web Jetadmin - loc	alhost			
File View Tools He	dp			
Device Manageme	nt	🖶 A	II Devices (0 of 59
B R Overview		#		Layouts
Error De	Discover devic	es	e Model	
- 👼 Warning	Customize Filb	ers	sesJet 4100	MFP
- 🐻 New (La	Edit over and	ele e	serJet CM1-	415fnw
Ungroup	Edit group pol	oes	Ior LaserJet	5550
Color Devices	[29]	3 H	P Scanjet Enterp	nise 7000n

Figure 3: Filtered lists

Important points to remember about background polling:

- Polling continually works through the All Devices list.
- Polling always runs (unless it is disabled).
- Large numbers of devices take longer (see polling settings).
- Device data elements are added to polling as users interact with lists and as features are enabled.

Device list polling

Other kinds of polling are very similar to background polling in that they perform the same data acquisition sequence on the network. Device list polling is invoked whenever a client login includes a list. The data being viewed (both devices and device data elements or columns) is acquired via device list polling. Polling then circulates through this data based on poll rates that can be adjusted through **Tools > Options** (Figure 1). Because device list polling is separate from other polling, the smaller amount of data is polled separately and more proactively. Figure 4 shows a client viewing a portion of a device list. Only the elements (both devices and device data) are registered in device list polling.

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S Pi All and an Dill	88	Leyouts -	Vramt -	104		
Englander DR		Device Model	SF Adde	Photoara	Part (Anal.	Sei Hardvan Addeus
WaringDevices (7)	17	HPLassier #100 MTP	15.3910.	NPESSOS	1	accoss/s25c3
New Lat Ducchest (5%)	100	HPLaindet De1415tree	15.79.10.	NP#54402	1	O 002583F54402
- Ingespel De-Kei (5%	13	HP Color Level of \$550	15,3910.	spit-952 m.	18	IR10405502
Color Devices (29)	3	HP Scaret Entrepose 7000s	15.29.10.	spielthiam.	1	O 001879679784
B Groups	1.6	Universe Discontected	15.29.10.	NPIC78F4	1	101104C78F4
Colorison	3	HP Scarat Entroption 7000n	15.25.57.	de-dev10.box .	.t	0 INC2N7056
H 99 Alanta	- a	HP Crist Laced at DP9529 Series	15.29.10.	opieState.an.	1	C 002154E30C18
8 🛃 Finan	13	HP Edix Lander DPS256n	15:39.10.	NPUT/CST	1	0 10154/E/CIP
2 gg Reports	18	Caron #3235 36.91	15.3910.	sacords/30a	(Chinese)	O 00007007500
# B Post	13	HPLaulet \$50 MP	15.20.96.	houthd22 box -	1	# 001104/4830C
# 18 Solutions	14	HP Lauster 3040 MPP	15.70.96	8-s471020 bot	1	O 001438901/E0
	1	HP Color Laundat 4700	15.29.96.	builting ba	1	0 0014080707AF
	15	NP-Color Level et 5550	15.29.96.	building be.	1	O OTTACEYS
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		Apply Tamaiana	1 Stream	an Otale		

Figure 4: Device list partially displayed

Device tabs polling

Device tabs polling is invoked when a user has either the **Troubleshoot** or **Status** tab features enabled with devices selected (Figure 5). Again, the polling works independently from other polling and has its own settings under **Tools > Options** (Figure 1).

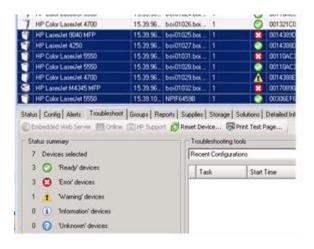


Figure 5: Troubleshoot tab

Alerts polling

Alerts polling is closely related to alerts processing and activated alerts subscriptions. Two main alerts polling mechanisms augment SNMP traps, which are the main triggers for general and critical alerting. Alerts polling can be changed through **Tools** > **Options** > **Device Management** > **Device Polling** (Figure 6). HP Web Jetadmin polls each device for each alert event as configured in alerts subscriptions. If the poll detects a device in an alert state—such as Cover Open or Toner Low—an alert is sent. Many of these alert events also rely on SNMP traps as the main trigger. Polling ensures the reliability of alerts and also ensures that HP Web Jetadmin retains an entry in the devices' traps destination tables.

B Device Tabs	Discovery Configuration Alerta Alerta Areptats Application Management Application Log Use Seculty Device Paling Background Device Paling Background Device Itats Supples Device Filers Device Filers Device Filers	Maximum communication interval: 24 hours Citical alert interval: 5 minutes Reset to Default Values
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Figure 6: Alerts polling rates

Supplies alerts polling

Supplies alerts use a different polling that works in the background and has fixed settings. Much like other alerts polling, its purpose is to trigger alerts for specific events. In the case of supplies alerts polling, the events are defined by threshold levels specified in the supplies alerts subscriptions. Supplies alerts polling gathers supply levels for devices. When a level below its threshold is detected, an alert is sent. The alert is not sent again before the supply is replenished (defined as an increase of 30%). Supplies alerts polling also has a scalable polling rate that can change based on two factors measured by HP Web Jetadmin:

- Supply usage rate
- Supply level proximity to the alert subscription threshold

HP Web Jetadmin matches devices to a poll rate that is appropriate for the supply level state. In this way, the alerting system only polls frequently when needed and does not poll frequently on devices that have full supplies or that are not depleting rapidly. The different rates at which HP Web Jetadmin polls supply levels are:

- 1hour
- 2 hours
- 6 hours
- 12 hours
- 24 hours
- 72 hours
- 168 hours

A few more important points about supplies polling:

- Supplies levels for devices configured in supplies alerts subscriptions are checked anytime an SNMP trap is sent from the device (generally this is frequent when the device is established in one of the general alerts).
- Supplies levels are also tested whenever a 24-hour poll is generated by general alerts.
- Supplies alerts polling rates cannot be adjusted.

Supplies polling

Separate polling exists for the **Supplies** tab (Figure 7), which is another tab feature activated with device list selection. HP Web Jetadmin formerly had a feature named Supplies Groups that used the same polling. Supplies Groups is no longer a feature in HP Web Jetadmin software.

HP LaceUet 904	DMPP 1	53896.	boi010	125.bol -			00143	890 0F42		
HP Lates let 4250	1	5.39.96.	boi010	127.boi	1	0	00143	8808A2C		
HP Color Lates le	1 5550	5.39.96.	boi010	131.boi	1		00110	AC3090F		
HP Color Laseile	1 5550	5 39 96	boi010	128 box	1	A	00110	AC368C7		
HP Color Lates le	r 4700 1	5 39 96	boi010	129 box	1	A	00143	8884506		
HP LaceJet M43	45 MFP 1	53896.	boi010	132 box	1	- C	00170	8904568		
HP Color LaterJe	1 5550	5 39 10.	NPIFE	4598	1	0	00006	EF64598		
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Device Model	IP Hostruame	IP Add	ress	Туре	Supplies	Label		Level		and the second se
1.1.1	IP Hostname boi01025 boihp	IP Add 15.39.9	ress		Supplies			Level	4	a starting for both
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Device Model HP LaceJet 304 HP LaceJet 304 HP LaceJet 4250	IP Hostname boi01025 boi/tp. boi01025 boi/tp. boi01027 boi/tp. boi01027 boi/tp.	IP Add 15 39 9 15 39 9 15 39 9 15 39 9	ress 6.56 6.56 6.58 6.58	Type Tray Tray Mariten	ance Kit	Label Tray 3 Tray 4 Maintena	nce Kit	W/////	;	Not Empty Not Empty Not Empty
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Figure 7: Supplies tab

Device list refresh

Another way HP Web Jetadmin gathers details from devices on the network is with its two refresh features.

Refresh Selection

From the device list, right-click and select **Refresh Selection** or press the F5 key to get real-time status information for one or more devices. With **Refresh Selection**, the HP Web Jetadmin client queries devices directly for all of the data it is tracking, even if the data in the database is not expired. After performing the refresh, normal polling and threshold monitoring continues.

NOTE: Although **Refresh Selection** offers a snapshot of the device status at the time you perform the feature, some device data—such as page counts—can change quickly, and might not be fully accurate even moments after the refresh. Depending on the number of devices selected, there might be a short delay in the data update in your device list.

Refresh Selection (Full)

From the device list, right-click and select **Refresh Selection (Full)** to obtain complete device and status information. With **Refresh Selection (Full)**, HP Web Jetadmin clears device data for the selected device and then re-retrieves the data elements important to device identification. This is

useful when, for example, you believe a device has become disassociated from the IP address recorded for it in the HP Web Jetadmin database. If the recorded IP address for a device is correct, HP Web Jetadmin simply updates the device status information, retaining all acquired data. If, however, the IP address in the database is associated with a different device, HP Web Jetadmin performs the equivalent of a device discovery and registers the new device in the database. Information about the previous device remains as well, but **Communication Error** displays in the device list until HP Web Jetadmin discovers it under a new IP address or it is deleted.

NOTE: For performance reasons, **Refresh Selection (Full)** is currently restricted to a single device. To refresh your device database, run a full discovery on your network or on a specific list of IP addresses using **Specified Address Discovery**.

Refresh features are activated by using the right-click menu shown in Figure 8. Refresh Selection can be used on multiple devices and in any device list.

9	HP LasesJet 9040 MFP	15.39.96.	boi01025.boi	- 1			0014389	-
	HP LasesJet 4250	15.39.96.	boi01027.boi	- 1		0	0014388	
	HP Color LasesJet 5550	15.39.96_	boi01031.boi		ŧ (00110AC	309
	HP Color LasesJet 5550	15.39.96_	boi01028.b	1	Discover			680
	HP Color LasesJet 4700	15.39.96_	boi01029.6	<u>.</u>			- 223	150
۲	HP Lasedet M4345 MFP	15.39.96	boi01032.b		Refresh Selec		F5	-58
	HP Color LasesJet 5550	15.39.10	NP1F64598		Refresh Selec	tion (Full)	15
7	HP LaseJet 4100 MFP	15.39.96_	wja4100mh		Delete		Del	36
7	HP Color LaserJet 4730 MFP	15.39.96_	boi08012.b		Update Crede	initials	han .	6
7	HP Color LaserJet 4700	15.39.10_	NPIC96428		Acknowledge			54
7	HP Designet 4000	15.39.10	npi0013212		Upgrade firm	ware.	2	E
7	HP Color LaserJet 5550	15.39.10_	npif1d1c5.4		Groups		2	þ1
	HP LaseJet 4000	15.39.96	boi08010.b		10000		1	BE
	HP LasesJet 4000	15.39.96_	boi08009.b		Alerts			48
ŧ7	HP LaseJet M3035 MFP	15.39.10_	npia5a2bf.		Configuration	62	•	42
4	HP LaseJet 4250	15.39.96_	samatts425		Reports		•	84
9	HP Color LasesJet CP4520 Series	15.39.10_	wince.ame		Layouts			80
ŧ.	HP Color LasesJet CM3530 MFP	15.39.10_	NP1252A04		Filters		1	2A
:	HP LaseiJet M4345 MFP	15.39.10.	npia2c819.		ricers		,	28
2	HP Scanjet Enterprise 7000n	15.39.10_	NPIEF420A		Сору			42
Ŷ,	Unknown (Disconnected)	15.39.10_	NPIC46321		Advanced Se	arch		53
4	HP LasesJet 4200	15.39.10		1	Print	and the		7E
2	HP Scanjet Enterprise 7000n	15.39.10_	sene-sim-9	-	1000			\$D
E.	HP Color LasesJet CM3530 MFP	15.39.10	000e717580-		Export	0		.SE
24	HP Color LasesJet 9500 MFP	15.39.10_	0014385d93a	. 1		Ó	00110AF	1CF

Figure 8: Refresh Selection

Features and device detail

Polling exists to provide data for features such as device lists or to trigger events like alerts and automatic groups' policies. In this way, polling is an essential component of several key features in HP Web Jetadmin. Two of these are alerts and reports.

Alerts

An alert, which is generated by an alert subscription, can contain many device details. When users set up alerts subscriptions, they can also build custom email or SNMP trap messages containing many device attributes. For example, System Contact, IP Hostname, or Page Count can all be included in the alerts message. Figure 9 shows a Standard Email from an HP Web Jetadmin alert. In this message, HP Web Jetadmin gathered a few device attributes before sending the email. HP Web Jetadmin gathers this information at the time the email message is formatted and not through polling. Some of the details might have existed in the database and might have been fresh enough that HP Web Jetadmin did not need to query them directly from the device. The details are gathered as part of the feature action and not through alerts or supplies alerts polling.

Event	
"Offline"	
Front Panel	
"READY"	
Device Information	
IP Hostname:	"npid77b62.americas.hpgcorp.net"
IP Address:	"15.5.189.121"
Hardware Address:	"0030C1D77B62"
IPX Name:	"NPID77B62"
IPX Address:	"IpxAddress"
Device Model:	"HP LaserJet 410.00"
Serial Number:	"USBDC00600"
Asset Number:	
Location:	
Help Resources	
	ormation "http://cs-
vsrv:8000/device/HP.Imagin/	g.Wjp.Moabdevice.Client.DeviceID, 355a5206-4
88b340474e86;0cca69d3-163b	-45c8-b10.08-2252c95a5ba5"
Contact Information: "my de	vice"

Figure 9: Alert in standard email format

Reports

Reports work much the same way as alerts. Reports are typically based on historical device data that is gathered through a different kind of polling called "data collections," which is not discussed in this document. For more information about data collections, see the *Creating Reports and Exporting Data in HP Web Jetadmin* white paper. This white paper is available on the HP Web Jetadmin support page. Some reports data is actually device data that is gathered at the time of report generation. System Contact, Device Serial Number, and Engine Cycle Count are just a few of the device data elements that can be added to reports. Figure 10 shows a report that has device elements embedded in the actual report output.

(()									
HP Web Jetadmin									
Report Type			e Utilization - Time Ditters	ral (Job Type)					
Date Created			2010 1/26 PM						
Group By		None							
Sort By Date Range			stname (Ascending), Port 2009 - 2/36/2050 (calcul						
Interval		Hond		and)					
Show Totals		Yes							
Device Group		None							
Devices		3							
Interval	Device Nodel	1P Revisance	IF Address	System Contact	System Location	Port (Any)	Setal Name	Total Color	Total
#/S#/2009 - E0/E6/2009	HP Color Lacadet \$550	bed2007.bei.hp.com	15.42.00.99	http://officeprint.hp.com	Bidg 2L analytics room		-		
19/19/5008 - 37/39/5008	HP Celor LaneOut 5550	ball2007.bai.hp.com	35.62.00.99	http://officeprint.hp.com	hidp 2L executive room	8	0*	0.*	e*
11/18/2009 - 12/18/2009	HP Color Lana/Art \$550	ber02007.bei.hp.com	15.42.00.99	Mg-//officeprint.hp.com	Bidg 2L analytics mem-	1	04.5*	0.630*	4,490*
77174/5008 - 7124/5070	HP Celor LaneOut 5550	ball2007.bai.hp.com	35.62.40.99	http://officeprint.hp.com	hidp 21. executive room	8	50*	998*	340*
F\/R#5000 - 5785000	HP Color Lanachet \$550	ber02007.bei.hp.com	15.42.00.99	http://afficeprint.hp.com	Bidg 2L, analytics mem-	1	1,176*	6.245*	7,723*
9/29/2009 - 10/14/2009	HP Lanachet 9040 MPP	3x05044.5x1.hp.com	35.94.351.43	http://officeprint.hp.com		8	-		
10/19/2009 - 11/18/2009	HP Lanachet 9040 MPP	bothtost bothp.com	15.98.151.43	Mig-//afficeprint.hp.com		1	0.4		0.4
27/29/5008 - 35/28/5008	HP Lanacht 9040 MPP	beil\$044.bei.hp.com	35.94.351.43	http://officeprint.hp.com		8	3.992*	**	5.342*
12/19/2009 - 1/18/2010	HP Lanechel 9040 MPP	be05044.bei.hp.com	15.98.151.43	http://afficeprint.hp.com		1	147*		247*
1/2W2050 - 2/3W2050	HP Lanachet 9040 MMP	3xi05044.3xi.hp.com	15.94.151.43	http://officeprint.hp.com		8	4,077**	**	4,077*

Figure 10: Report with device details embedded

Device detail-Information flow

Other features, including exporting device lists, use device data either from storage or from the device itself, depending on the data. These features query device data outside of the poll features that are covered by this document. Figure 11 illustrates this point.

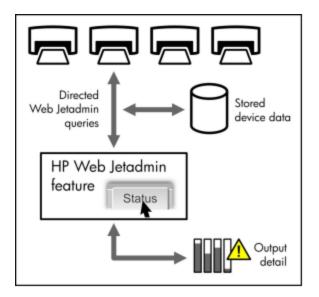


Figure 11: Directed device data query

Helpful details

HP Web Jetadmin uses placeholders to convey status if the data is:

- **<Unknown>**–Data is not present in the database. HP Web Jetadmin is attempting to get the data from the device.
- **<Missing>**—The HP Web Jetadmin client is populating the data on the interface. It should appear soon.
- **<Not Supported>**–Data is not supported for the device model or data is being blocked for some reason.

HP Web Jetadmin has a number of helpful internal informational elements. These are:

- Discovery Date/Time
- Last Communicated
- Credentials Required
- Last Discovered
- Acknowledged
- Multi-homed
- Device Groups
- PC Connected
- Last Collected

- Status
- Severity
- Unique

Network traffic

The following table is an analysis of network traffic related to HP Web Jetadmin. The measurements were taken on an HP network with a variety of printing devices located throughout the enterprise. These measurements might or might not reflect actual network traffic patterns in all environments or for all configurations of HP Web Jetadmin software.

Feature action	Traffic type	Data volume	Packet volume	Average packet size
Background polling, no client lists in view, 260 devices	SNMP	2849.4 bytes/sec	14.2/sec	201.4 bytes
Background and list polling, 1 client list activated with configuration settings, 260 devices	SNMP and SSL	4458.1 bytes/sec	18.4/sec	242.2 bytes
Background and list polling, 1 client list activated with supplies details, 260 devices	SNMP	6984.0 bytes/sec	51.2/sec	136.3 bytes
Supplies alerts, Initial setup, 260 devices	SNMP	10151.4 bytes/sec	95.0/sec	106.8 bytes
Supplies tab, 35 devices selected	SNMP	732.6 bytes/sec	7.698/sec	95.2 bytes
Supplies alerts, ongoing poll for 260 devices	SNMP	6877.8 bytes/sec	71.2/sec	96.6 bytes
Data collection, Device utilization, 260 devices	SNMP	16515.9 bytes/sec	167.8/sec	98.4 bytes

While these measurements were taken on isolated features, it cannot be deduced that running multiple features simultaneously results in a linear sum of their traffic impact. HP Web Jetadmin uses a centralized data structure and device data can be shared between the features without HP Web Jetadmin having to poll every time data is required. HP Web Jetadmin should be independently tested in any given environment in order to determine network traffic impact.

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