



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

- **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.

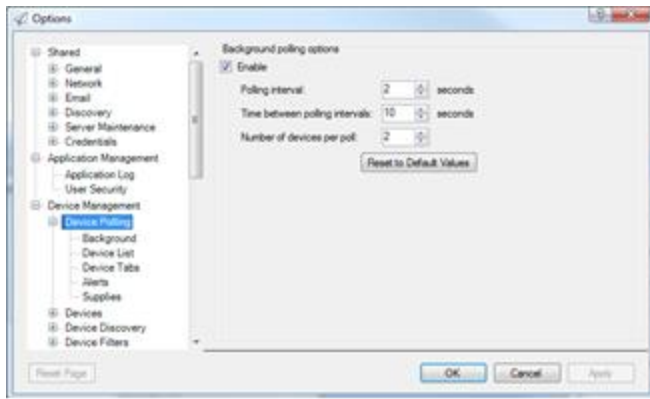


Figure 1: Device Polling setting

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	IsPConnect	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).

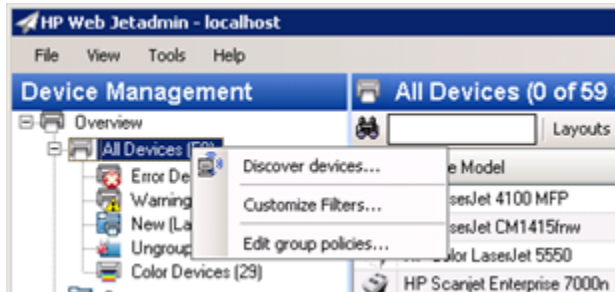


Figure 3: Filtered lists

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.

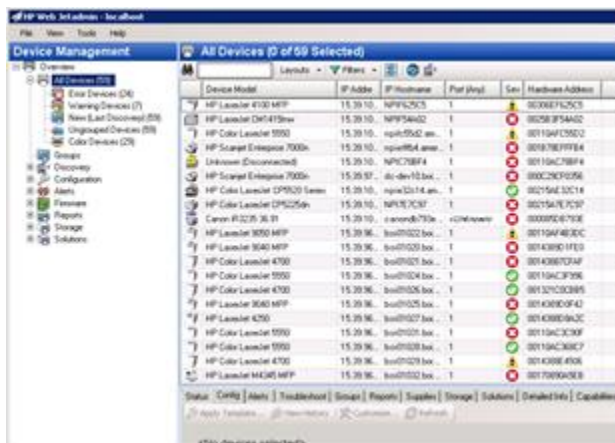


Figure 4: Device list partially displayed

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).

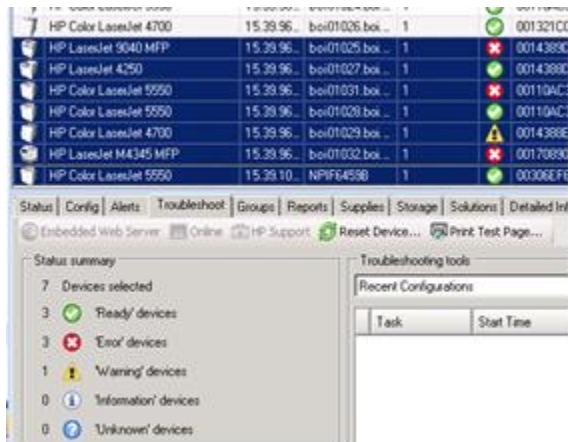


Figure 5: Troubleshoot tab

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.

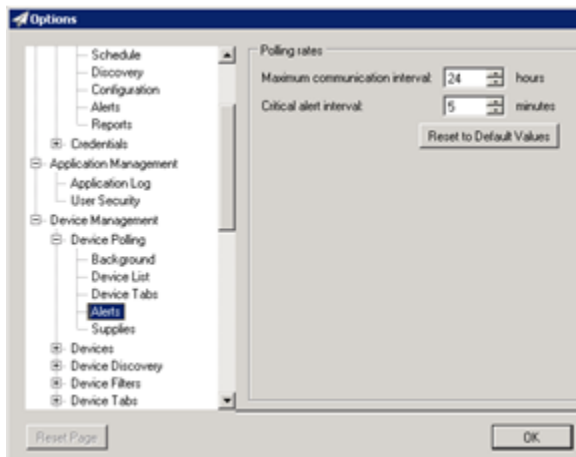


Figure 6: Alerts polling rates

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:

- 1 hour
- 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.

Device Model	IP Hostname	IP Address	Type	Label	Level	Pages Remaining
HP LaserJet 904	boi01025.boi.hp...	15.39.96.56	Tray	Tray 3	4	Not Empty
HP LaserJet 904	boi01025.boi.hp...	15.39.96.56	Tray	Tray 4	4	Not Empty
HP LaserJet 4250	boi01027.boi.hp...	15.39.96.58	Maintenance Kit	Maintenance Kit	7	Not Empty
HP LaserJet 4250	boi01027.boi.hp...	15.39.96.58	Manual Feed Tr.	Tray 1	0	Empty
HP LaserJet 4250	boi01027.boi.hp...	15.39.96.58	Tray	Tray 2	Not Empty	Not Empty
HP LaserJet 4250	boi01027.boi.hp...	15.39.96.58	Tray	Tray 3	Not Empty	Not Empty
HP LaserJet 4250	boi01027.boi.hp...	15.39.96.58	Tray	Tray 4	Not Empty	Not Empty

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.

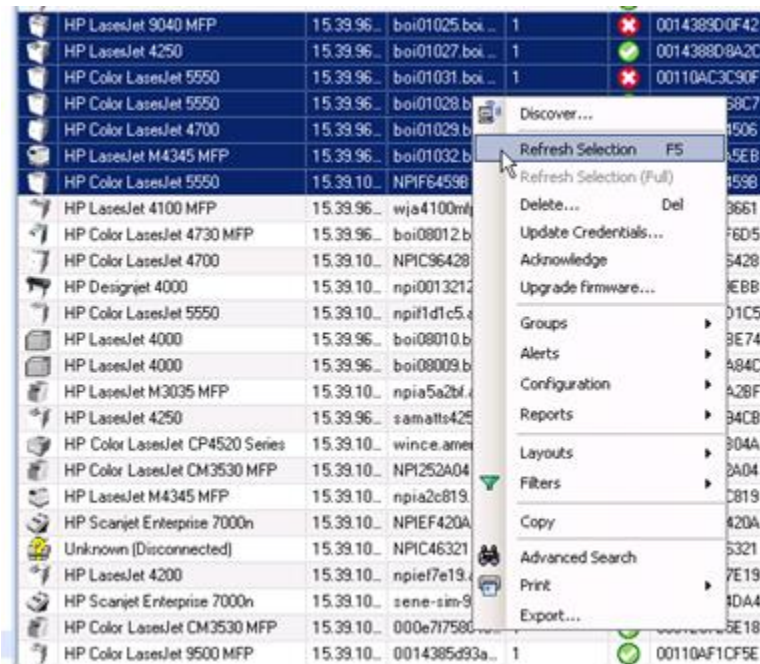


Figure 8: Refresh Selection

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.hpqcorp.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
  Detailed Device Information "http://cs-vsrv:8000/device/HP.Imaging.Wjp.Moabdevice.Client.DeviceID,355a5206-488b340474e86;0cca69d3-163b-45c8-b10.08-2252c95a5ba5"

Contact Information: "my device"
  
```

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.

The screenshot shows the HP Web Jetadmin interface. On the left, there are filter options: Report Type (Device Utilization - Time Interval (Job Type)), Date Created (2/18/2010 1:26 PM), Group By (None), Sort By (IP Hostname (Ascending), Port (Any) (Ascending)), Date Range (1/1/2009 - 2/18/2010 (calculated)), Interval (Monthly), Show Totals (Yes), Device Group (None), and Device (3). The main area displays a table with the following columns: Interval, Device Model, IP Hostname, IP Address, System Contact, System Location, Port (Any), Total Name, Total Color, and Total.

Interval	Device Model	IP Hostname	IP Address	System Contact	System Location	Port (Any)	Total Name	Total Color	Total
1/1/2009 - 10/18/2009	HP Color LaserJet 9550	8a02007.bos.hp.com	15.42.80.99	http://vff@agprint.hp.com	Bldg 2L, executive room	5	--	--	--
10/1/2009 - 10/18/2009	HP Color LaserJet 9550	8a02007.bos.hp.com	15.42.80.99	http://vff@agprint.hp.com	Bldg 2L, executive room	5	0*	0*	0*
11/1/2009 - 12/18/2009	HP Color LaserJet 9550	8a02007.bos.hp.com	15.42.80.99	http://vff@agprint.hp.com	Bldg 2L, executive room	5	803*	2,620*	4,495*
12/1/2009 - 1/18/2010	HP Color LaserJet 9550	8a02007.bos.hp.com	15.42.80.99	http://vff@agprint.hp.com	Bldg 2L, executive room	5	504*	1,019*	1,649*
1/1/2010 - 2/18/2010	HP Color LaserJet 9550	8a02007.bos.hp.com	15.42.80.99	http://vff@agprint.hp.com	Bldg 2L, executive room	5	1,279*	6,249*	7,723*
1/1/2009 - 10/18/2009	HP LaserJet 9040 MFP	8a05044.bos.hp.com	15.96.151.43	http://vff@agprint.hp.com		5	--	--	--
10/1/2009 - 10/18/2009	HP LaserJet 9040 MFP	8a05044.bos.hp.com	15.96.151.43	http://vff@agprint.hp.com		5	0*	**	0*
11/1/2009 - 12/18/2009	HP LaserJet 9040 MFP	8a05044.bos.hp.com	15.96.151.43	http://vff@agprint.hp.com		5	1,381*	**	1,381*
12/1/2009 - 1/18/2010	HP LaserJet 9040 MFP	8a05044.bos.hp.com	15.96.151.43	http://vff@agprint.hp.com		5	147*	**	147*
1/1/2010 - 2/18/2010	HP LaserJet 9040 MFP	8a05044.bos.hp.com	15.96.151.43	http://vff@agprint.hp.com		5	4,819*	**	4,819*

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.

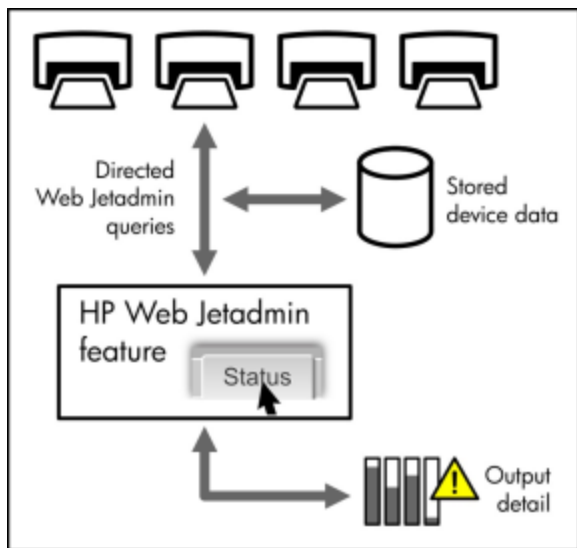


Figure 11: Directed device data query

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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pdf_6881599_en-US-1, September 2020

