



Address Caching

Keeping Address Data Current

Overview

This document discusses examples of changing IP address, IP hostname, and hardware on networked printers and what techniques can be used within HP Web Jetadmin to accommodate these changes.

The Challenge

Envision the following scenario: An administrator has responsibility over an HP Web Jetadmin installation that includes the Reports Generation Plug-in. This administrator must produce consistent asset-utilization reports on all devices in the enterprise. The local IT department has announced that static IP parameters will become a thing of the past; all devices in the enterprise, including printers, will be DHCP configured. Until now, all printers have had static IP addresses and both HP Web Jetadmin and its Reports Generation Plug-in have worked great compiling and sending complete and accurate data. The administrator is wondering what will happen to data collections after IP addresses on these devices begin to change! What will be the best approach in dealing with these changes?

There are some good answers to this question. Notice that *answers* is in plural form. Like most other real-world scenarios, the case of dealing with dynamically addressed printers has more than one answer. HP Web Jetadmin device management functionality as well as data collection in the Reports Generation Plug-in requires the HP Web Jetadmin cache (information store) contain valid device address information. This ensures continued interaction and data collection attempts will not fail. When address information is accurate, device interaction (mostly through SNMP) occurs normally. When the address on a device has changed and the

address information stored within HP Web Jetadmin is not up to date, problems can result.

Let's examine what happens when a device address has changed and an HP Web Jetadmin user tries to invoke that device's status page. This condition can be easily simulated by changing the device's address through an external means such as telnet or the printer's control panel.

NOTE: Don't try simulating the condition by configuring the address through HP Web Jetadmin; the HP Web Jetadmin cache will become updated instantly and automatically when this is done.

Once the device address has been changed and the device status page is invoked within HP Web Jetadmin, the problem becomes obvious. Figure 1 (below) shows a device status page for a device that is active on the network but has had its address and IP hostname changed. A Device Communication Error is displayed because HP Web Jetadmin simply can't find the device at the old IP address. The cached address in HP Web Jetadmin is not the same as what it is on the device.

From this point forward, we will examine details about maintaining current address information within HP Web Jetadmin. Keeping device address data within HP Web Jetadmin current will help both Report Generation Plug-in data collection and general device interaction through HP Web Jetadmin lists and status pages.

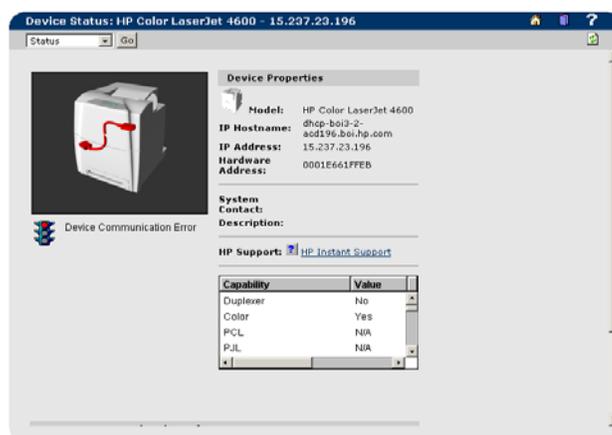


Figure 1: Device Communication Error

HP Web Jetadmin Quick Device Find

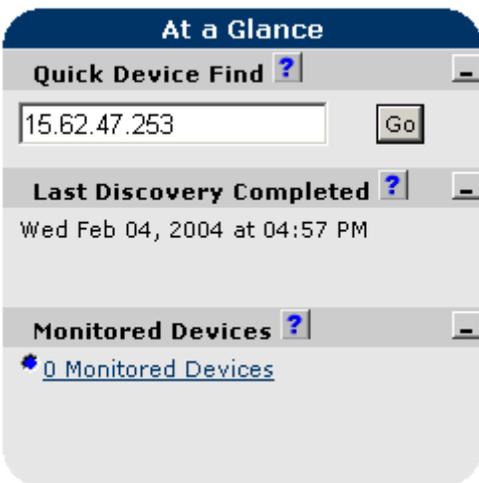


Figure 2: At a Glance Area

In Figure 2 below, a device address is being entered into Quick Device Find to locate that device. The address being used may match the one in HP Web Jetadmin cache, or it may be a new address that HP Web Jetadmin is not aware of. Quick Device Find is a useful tool for updating the cache if the IP address has changed on the device. Let's say a device is found that has had the IP address changed and we have determined what that new address is; perhaps through a device configuration page. By entering the new IP address into Quick Device Find, HP Web Jetadmin begins communicating with the device and the new IP address is updated in cache. From this point forward, HP Web Jetadmin will use this new address and the Reports Generation Plug-in data collections will work correctly.

This does not mean that we have to constantly collect configuration pages in the enterprise every time a device IP addresses changes.

HP Web Jetadmin Discovery

Running regular HP Web Jetadmin discoveries is a great way to keep IP addresses current. This is only true when the discovery settings are done in such a way where HP

Web Jetadmin actually finds the new addresses. A detailed white paper has been created for Discovery and can be found online by going to the following URL:

http://h10010.www1.hp.com/wwpc-JAVA/offweb/vac/us/product_pdfs/webdisc.pdf
 Or:
<http://www.hp.com/go/webjetadmin> - **Technical White Paper section**

There are a few different discovery mechanisms that can accommodate finding changed IP addresses but we will discuss only one of them here.

IP Ranged discovery is one of the most popular discovery mechanisms. It facilitates discovery by scanning ranges of IP addresses based on the *begin* and *end* addresses for each range. An unlimited number of ranges can be entered into the UI shown in Figure 3 below.

Once the IP Ranged discovery is run, any devices that have *moved* to a different address are found with a resulting updated address cache.

While IP Range discovery is powerful, it can also be slow and ineffective if not configured properly. Always use

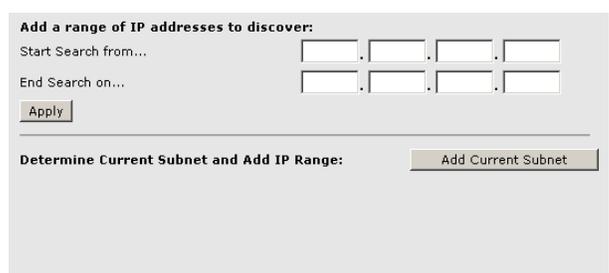


Figure 3: IP Range Settings

IP ranges that represent the actual IP address scheme on your network. Never scan large unused ranges. A good example of an IP Range discovery is seen below:

169.0.10.1 through 169.0.10.254
 169.0.50.1 through 169.0.50.254

Our example network has devices in the "10" network and the "50" network but not the "20" "30" or "40" networks. Because of a two second timeout value, a discovery in these unused areas would have made the process longer unnecessarily. This example shows a scan that would have caused a small discovery delay, consider the range:

10.0.0.1 through 1.0.0.255

This range could literally take a month or more to complete. Again, always consider the real IP addressing scheme of your network when configuring these types of discovery. And, look at the technology note that discusses HP Web Jetadmin discoveries.

After the cache is updated by discovery, device addresses will be accurate and HP Web Jetadmin communications as well as Reports Generation Plug-in collections will function correctly. Jetadmin discoveries.

IP Hostnames and HP Web Jetadmin Software

In some environments, HP Jetdirect connected printers may have static IP hostnames where networked devices have network resolvable names that can be used to initiate communication with the device. A device can have the network name RALPH that can be used to configure a workstation for printing to that device. Also, the name Ralph can be used in Quick Device Find to discover the printer and update HP Web Jetadmin cache.

When HP Web Jetadmin lists are activated by the user and the IP Hostnames column is enabled, HP Web Jetadmin to retrieves IP address information from name resolution services.

NOTE: HP Web Jetadmin uses gethostbyaddr and gethostbyname API calls on the Windows host on which it is installed. In Figure 4 above, we see a list with the IP Hostname column activated.

Activate the IP Hostname column through the Views feature. Select the Views configuration icon next to the

Views drop-down menu. Shown below in Figure 5 is the Views configuration interface.

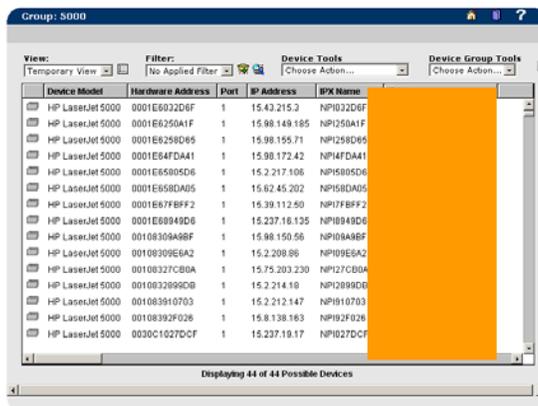


Figure 4: IP Hostname Column Enabled

To activate the IP Hostnames column, simply add the item to the *Columns to Show* list on the right.

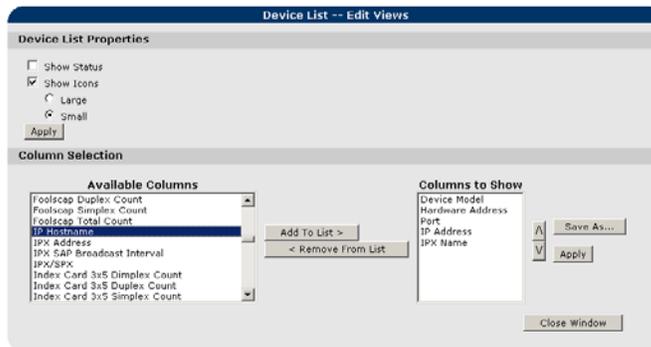


Figure 5: Views Configuration Settings

Choose either *Apply* or *Save As* in order to activate the feature. *Save As* will prompt you for a new View name while *Apply* simply puts the item in a temporary View that only lasts through the current HP Web Jetadmin work session.

Once the IP Hostname column is enabled, HP Web Jetadmin will cache IP hostnames. With IP Hostnames cached, the application will use name resolution if the IP address is changed. This is valuable in environments where IP Hostnames are held static while IP Addresses change through a DHCP lease cycle. A question at this point in our discussion may be, how can IP Hostnames on printers be made static?

In our discussion we should first describe what is meant by the word static. Static means that the IP hostname is not prone to frequent change. IP hostnames can be change by administrators regularly but should be considered static when the administrator has chosen to leave them alone. In some environments, IP hostnames will remain static even though IP addresses change via a DHCP lease process.

One method of making IP Hostnames static is DHCP reservations. This is where individual devices are designated within DHCP with specific items like IP hostnames that stay static. There are a few other ways that IP Hostnames can be made static. We will discuss two of them here.

WINS is a name service on the network that can be used directly by the name resolution service on the HP Web Jetadmin

host and can also be configured into DNS servers. In an environment where HP Jetdirect connected printers are configured by DHCP and WINS servers exist and where DNS uses WINS resolution, an HP Jetdirect device can have it's System Name (otherwise known as local hostname) made resolvable through WINS. The HP Jetdirect System Name can be configured to a custom value like RALPH that can be reflected through name resolution. This can be accomplished in a variety of ways including using HP Web Jetadmin's configuration interface to set the System Name parameter. Once this is done, the HP Jetdirect interface must be made aware of the WINS address. The WINS address parameter can be configured through several means including the DHCP configuration. HP Web Jetadmin allows configuring the WINS address onto the HP Jetdirect device through either single or batch configuration methods. After these items are configured, the WINS

registration for the device will complete automatically.. For more information see both OS specific documentation as well as HP Jetdirect support documentation regarding the technologies being discussed here.

DHCP/DNS IP hostname registration is an action that takes place when the DHCP host has been configured to perform DNS registration on behalf of the HP Jetdirect connected device. The action takes place when the HP Jetdirect device is being updated with DHCP address information. The DHCP server, if configured to do so, will recognize when the HP Jetdirect device contains a System Name and will then register the value of that name into DNS. Once this registration is complete, the name that was registered into DNS is resolvable on the network. Again, a custom System Name can be configured on the HP Jetdirect print server in a variety of ways including using HP Web Jetadmin's configuration interface to set the System Name parameter. No further configuration of the HP Jetdirect print server is needed beyond System Name, DHCP registration will take care of the rest. For more information see both OS specific documentation as well as HP Jetdirect support documentation regarding the technologies being discussed here.

Again, when a device's IP hostname is present in the HP Web Jetadmin cache and when the device's IP address changes to something that can be found through DNS based on the same IP hostname, HP Web Jetadmin will find the device. Remember, the IP Hostname column has to be enabled for this functionality to work.

LAN Hardware Address

Another item at the device that may change is the LAN hardware address. The LAN hardware address is also called the MAC address and can be identified by printing a device configuration page and examining the HP Jetdirect network configuration information. The LAN hardware address is always a 12-character hexadecimal value. This address is the anchor item for each device that is stored in the HP Web Jetadmin cache.

Summary

Keeping IP and other address information current in HP Web Jetadmin software is a challenge when printers are in a DHCP environment. Knowing the environment and a few points about the devices in that environment help greatly when managing address information in HP Web Jetadmin software.

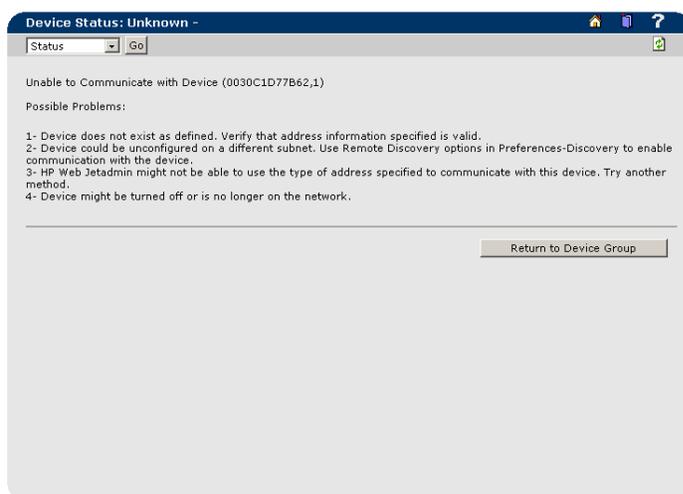


Figure 6: Device Status: Unknown Error Dialogue

Figure 6 shows the screen that may result if a device is found with a changed LAN hardware address. LAN hardware addresses are unique to the HP Jetdirect print server and will change if the HP Jetdirect device is replaced. HP Jetdirect print servers can be replaced due to upgrades or troubleshooting connectivity failures.

If the error screen is encountered, the HP Web Jetadmin refresh button may be used to resolve the cache or, in some situations, the device may have to be removed from cache and re-acquired through Quick Device Find. Removing devices from HP Web Jetadmin cache can be done by going to the All Devices list and choosing the Delete Device item from the Device Tools dropdown menu. Devices may have to be re-added to device groups once this procedure is complete.