

# Configuration of Remote HP PC Hardware Diagnostics UEFI



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## Executive summary

Remote HP PC Hardware Diagnostics UEFI is a firmware (BIOS) feature, present on some HP Workstation models, to download and execute HP PC Hardware Diagnostics UEFI, and to upload results.

## Overview of Remote HP PC Hardware Diagnostics UEFI

The Remote HP PC Hardware Diagnostics UEFI feature consists in a BIOS wrapper that initializes the network interface, sets up a RAM disk, downloads the HP PC Hardware Diagnostics UEFI package from a pre-configured server, verifies its digital signature, executes it, optionally uploads the diagnostics logs to a separate pre-configured server, and reboots.

The diagnostics package can be downloaded from hp.com or from a customer server. Results can be uploaded to a customer-defined repository. No local storage (such as a disk drive or USB stick) is required to run the diagnostics from the network.

Diagnostics can be run on demand in interactive mode, from the BIOS Startup menu (Esc) or from Computer Setup (F10), and can also be run unattended, following a schedule. The actual set of diagnostics to run is also configurable.

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### Notes:

- The ability to execute existing BIOS resident and off-line HP PC Hardware Diagnostics UEFI (from a disk drive or removable media) is not altered.
  - Only English is supported in the initial release (October 2016).
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## Supported models

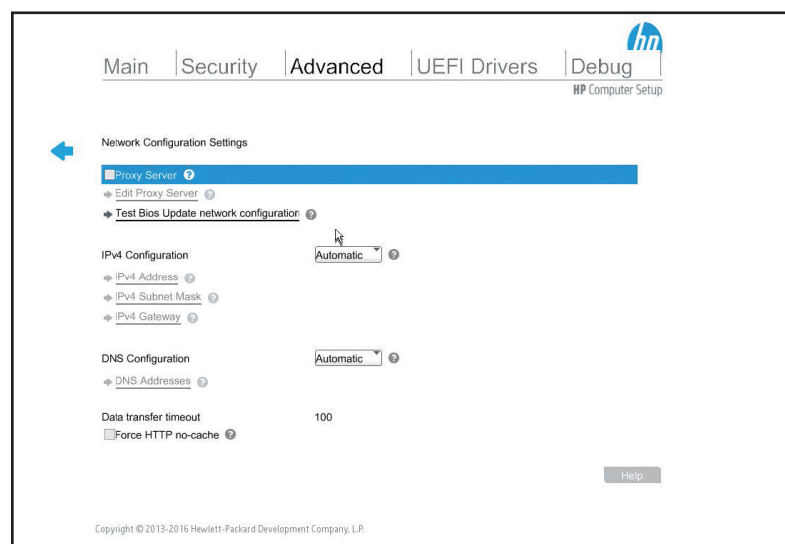
Remote HP PC Hardware Diagnostics UEFI are available on the following models:

- HP Z440 Workstation
- HP Z640 Workstation
- HP Z840 Workstation

The earliest BIOS version to include Remote HP PC Hardware Diagnostics UEFI is M60 2.24.

## Network configuration settings

To connect to the network, download the diagnostics, and upload log files, the network settings must first be configured. To modify network settings, go to **Advanced > Network Configuration Settings** in HP Computer Setup (F10 Setup).



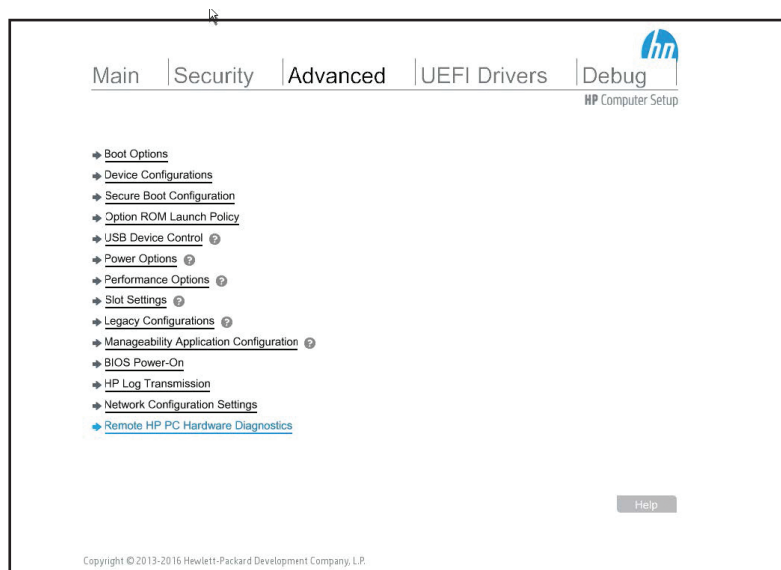
By default, the workstation is set to obtain its configuration automatically via DHCP. Depending on your network configuration, it may be necessary to set a proxy server to download the diagnostics package from [hp.com](http://hp.com)

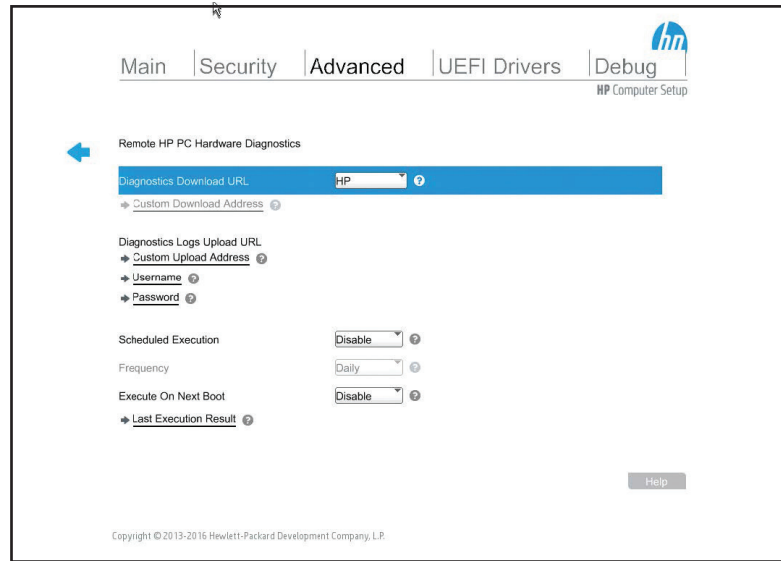
The complete list of network configuration settings is:

Item	Description
Proxy Server	Check box to enable a proxy server
Edit Proxy Server	URL for the proxy server
Test BIOS Update network configuration	Immediate test, trying to reach the BIOS update server (no update occurs)
IPv4 Configuration	Automatic or Manual
IPv4 Address	Static IPv4 address, e.g. 192.168.1.42
IPv4 Subnet Mask	Static IPv4 netmask
IPv4 Gateway	Static IPv4 gateway address
DNS Configuration	Automatic or Manual
DNS Addresses	List of DNS servers
Data transfer timeout	Timeout value in seconds
Force HTTP no-cache	Checkbox to disable HTTP caching

## Remote HP PC Hardware Diagnostics UEFI settings

To modify settings for Remote HP PC Hardware Diagnostics UEFI settings, go to **Advanced > Remote HP PC Hardware Diagnostics > Settings** in HP Computer Setup (F10 Setup).





The configurable options are:

**Diagnostics Download URL** indicates where to download the diagnostics package from: HP or a customer repository. If **Custom URL** is selected, the **Custom Download Address** field lets you enter the actual URL. See Setting up a repository below for details on how to host your own diagnostics package.

Diagnostics logs can only be uploaded to a customer-defined repository. The **Custom Upload Address** field lets you specify where to upload the logs. This can be an FTP server, or an HTTP server that allows uploads. (HTTPS is not supported at this time.) You can also configure an upload username and password, either in the corresponding fields **Username** and **Password**, or directly in the URL defined in **Custom Upload Address** (e.g. `http://user:password@server.com/path/to/upload`). Note that these are stored in plain text. Logs are uploaded as individual files. The filename format is: `<serial number>_<log name>_<SKU number>_<timestamp>.log`. Note that you can also save the diagnostics logs to local media when running in interactive mode, see Saving the diagnostics logs below for details.

By default, diagnostics are only run on demand. You can set up periodic execution by setting **Scheduled Execution** to **Enable**, and then by setting **Frequency** to the desired value (**Daily**, **Weekly**, or **Monthly**). When the unit reboots, it checks if the elapsed time since the last completed diagnostics run has been long enough, and triggers a new run if that is the case. Note that the BIOS does not trigger a reboot after the specified delay has elapsed, but waits until the next reboot to check if it should run remote diagnostics.

You can also force a one-time diagnostics run on the next reboot by setting **Execute on Next Boot** to **Enable**. The setting automatically resets to **Disable** after diagnostics have run.

**Last Execution Result** lets you view the date, time, and return value of the last attempted diagnostics run. The BIOS itself does not report how many tests passed or failed, that information is only available from the diagnostics logs.

In **Advanced > Remote HP PC Hardware Diagnostics**, **Execute Remote Diagnostics** starts an immediate diagnostics run in interactive mode. Note that any unsaved BIOS settings are lost (if you modify settings, you must save and restart to apply them).

The complete settings are:

Item	Description
Diagnostics Download URL	HP or Custom URL
Custom Download Address	URL for the diagnostics package
Custom Upload Address	URL for uploading diagnostics logs
Username	Upload username, if necessary. Stored as plain-text
Password	Upload password, if necessary. Stored as plain-text
Scheduled Execution	Enable or Disable
Frequency	Daily, Weekly, or Monthly
Execute on Next Boot	Enable or Disable
Last Execution Result	Displays timestamp and status of last attempt to run diagnostics

The associated WMI settings are:

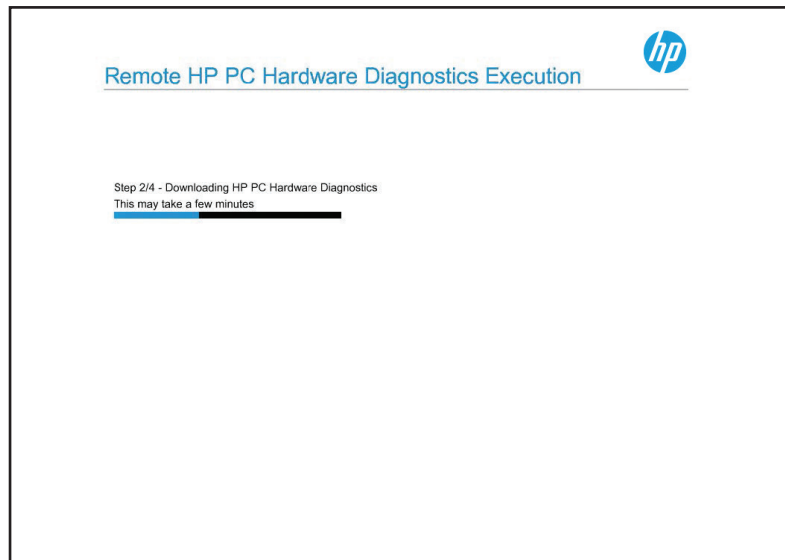
```

Remote HP PC Hardware Diagnostics Custom Client Upload Url
Remote HP PC Hardware Use Custom Download Url
    *Disable
    Enable
Remote HP PC Hardware Diagnostics Custom Client Download Url
Remote HP PC Hardware Diagnostics Scheduled Execution Enabled
    *Disable
    Enable
Remote HP PC Hardware Diagnostics Scheduled Execution Frequency
    Daily
    *Weekly
    Monthly
Remote HP PC Hardware Diagnostics Upload Server Username
Remote HP PC Hardware Diagnostics Upload Server Password
Remote HP PC Hardware Diagnostics Execute On Next Boot
    *Disable
    Enable
    
```

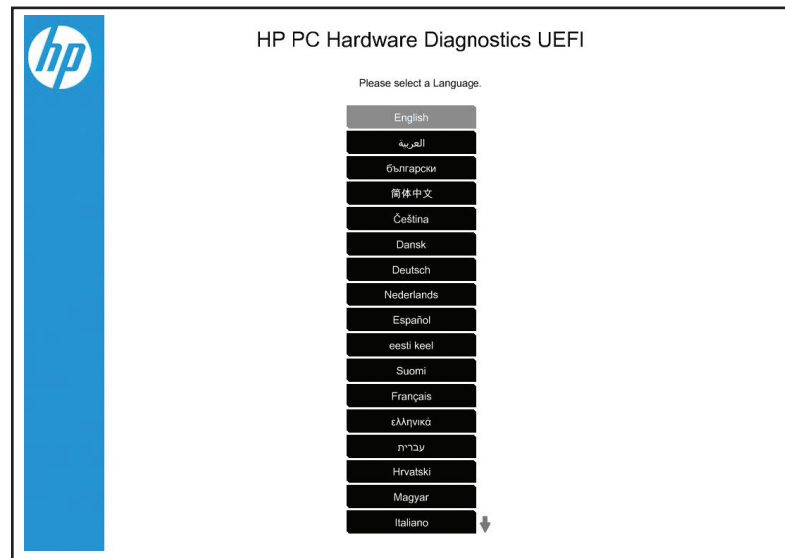
These settings can be modified programmatically using the integrated “Replicated Setup” menu in Computer Setup, using the HP BIOS Configuration Utility (BCU), or using WMI-capable scripting tools such as PowerShell or Windows Script Host.

## Running the diagnostics

When running Remote HP PC Hardware Diagnostics, the BIOS first initializes the network interface and sets up its TCP/IP stack. Next, it downloads the diagnostics package:



Once the package is downloaded, the BIOS starts executing it. From that point on, the user interface is the same as when running HP PC Hardware Diagnostics UEFI from local media.



## Saving the diagnostics logs

You can upload the diagnostics logs using the BIOS settings described in the previous section. When you run diagnostics in interactive mode, you can also save the logs to local media by selecting **Test Logs > Save Logs** from the main menu, and then selecting a file system on which to save the logs.

## Setting up a repository

If you wish to download the diagnostics package from your own server (unmodified or with your own *factory.xml* file), you can download HP's version from a Softpaq, and then copy it to your server. Check the download section for your model on hp.com.

After setting up an FTP or HTTP server, you should create a subdirectory that will be used to store the diagnostics package. This subdirectory can be a virtual or physical directory that is located anywhere in the directory hierarchy that is accessible via HTTP or FTP. The specific name used for the directory and file is at your discretion; for example, if the server's host name is *www.server.com*, then a simple approach would be to create a virtual directory at *www.server.com/hpdiagnostics* and the **Diagnostics Download URL** would then be in the form *http://www.server.com/hpdiagnostics/HpSysDiags.tar*.

The domain portion of the URL is not case-sensitive; thus *http://example.com* and *HTTP://EXAMPLE.COM* are treated as being the same.

The path portion of the URL is generally case-sensitive on UNIX or Linux® platforms, regardless of the web server deployed, and is generally not case-sensitive on Windows platforms, again regardless of the web server deployed. Thus, if running Apache on Linux®, for example, *http://example.com/bios* and *http://example.com/BIOS* are generally not treated as being the same; however, if running IIS on Windows, *http://example.com/bios* and *http://example.com/BIOS* are generally treated as being the same. Any case-sensitivity is determined by the HTTP or FTP server, not by the HP workstation downloading the diagnostics package or uploading the log.

## Modifying the diagnostics package

The diagnostics package (*HpSysDiags.tar*) is generated with the UNIX *.tar* format. It includes the diagnostics executable (*HpSysDiags.efi*, which must be the same base name as for the *.tar* file) and a configuration file (*factory.xml*) for unattended use.

### Diagnostics configuration file

Here is a sample *factory.xml* configuration file, which runs the memory test once for one minute (*-scmems -scmetime=1*), and then runs the SMART disk drive check (*-scsmart*):

```
<TEST Name="System Check Test Scenario" Mode="Sequential" Loop="1">
  <TEST Name="System Diagnostics"
    Loop="1"
    FileName="HpSysDiags.efi"
    Exception="false"
    Arguments="-scmems -scmetime=1 -scsmart"
  />
</TEST>
```

You can modify this example to define your own set of tests, as follows:

The attributes *FileName="HpSysDiags.efi"* and *Exception="false"* must be present in this exact form.

The *Loop* attribute lets you specify how many times a given test will run.

Arguments specifies which tests to run from the following list:

Argument	Description
-scldst	Runs the Long DST Test
-scrawdsk	Runs the Raw Drive Read Test
-scsdst	Runs the Short DST Test
-scsmart	Runs the SMART Hard Drive Check
-sccdsk	Runs the SMART Conveyance Test
-sdrv=x	Allows selection of Hard Drives to use during testing -sdrv=all Runs on all detected Hard Drives -sdrv=hhh Hex bitmask of drives to run (0000000000000001 runs on drive 1)
-scmeml	Runs the Extensive Memory Test
-scmems	Runs the Quick Memory Test
-scmemf	Runs the Fast Memory Test
-scmemtime=	Specifies the Memory test maximum time in minutes
-sccpu	Runs the Processor Check
-scpci	Runs the PCI Device Read Test
-scusbll	Runs the USB Port Check in field mode
-scvidf	Runs the Fast Video Memory Test
-scvids	Runs the Quick Video Memory Test
-scvidl	Runs the Extensive Video Memory Test
-scvmentime=	Runs the Quick or Extensive Video Memory Test with a defined test time in minutes -scvidl -scvmentime=5 Runs the extensive Video Memory Test for 5 minutes

The `-lang` parameter lets you specify the display language in HP PC Hardware Diagnostics UEFI (it does not modify the BIOS language). Options are:

Value	Language
Eng	English
Ara	Arabic
Bul	Bulgarian
Chs	Chinese
Cze	Czech
Dan	Danish
Deu	Deutsch
Dut	Nederlands
Esp	Spanish
Est	Estonian
Fin	Finnish
Fra	French
Gre	Greek
Heb	Hebrew
Hrv	Hrvatski aka. Croatian
Hun	Hugarian
Ita	Italian
Jpn	Japanese
Kor	Korean



<b>Value</b>	<b>Language</b>
Lav	Latvian
Lit	Lithuanian
Nor	Norwegian
Pol	Polish
Pop	Portuguese (Portugal)
Por	Portuguese (Brazil)
Ron	Romanian
Rus	Russian
Slk	Slovak
Slv	Slovenian
Srp	Serbian
Swe	Swedish
Tha	Thai
Tur	Turkish
Ukr	Ukrainian
Zho	Chinese

## Related documents

**Technical white paper** - HP PC F10 Setup overview, 2012, 2013, and 2014 Business Notebooks, Desktop PCs, and Workstations, <http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA5-2078ENW.pdf>

**HP BIOS Configuration Utility (BCU)** – User Guide, [https://whp-hou4.cold.extweb.hp.com/pub/capssoftpaq/cmit/whitepapers/BIOS\\_Configuration\\_Utility\\_User\\_Guide.pdf](https://whp-hou4.cold.extweb.hp.com/pub/capssoftpaq/cmit/whitepapers/BIOS_Configuration_Utility_User_Guide.pdf)

HP PC Hardware Diagnostics home page, <http://hp.com/go/techcenter/pcdiags>

**Brief** – Reduce your downtime with HP PC Hardware Diagnostics, <http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA5-3192ENW.pdf>

## Libarchive copyright notice

The Remote HP PC Hardware Diagnostics UEFI binary is statically linked to the libarchive library (<http://libarchive.org/>), which is subject to the following copyright notice:

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