Microsoft

Testing Drivers with the Hardware Lab Kit

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Introduction and Agenda

Session Introduction

The Hardware Lab Kit (**HLK**) provides test coverage to assess compatibility with Windows, and offers automation and scale capabilities.

This session introduces key concepts of the HLK and the updates since Windows 10 RTM.

Session Agenda:

Overview HLK in Windows 10

Fast-track Windows 10 Compatibility Program

Playlists

Errata

Mobile Testing

MTBF test

Windows Hardware Lab Kit ?

HCK vs HLK

Hardware Certification Kit	Hardware Lab Kit
Windows 7, 8, 8.1	Windows 10
Windows Client and Server	All Windows Platforms
Required Certification Program	Optional Compatibility Program
Required for Driver Signing	Optional for Driver Signing
Value at end of development cycle	Value throughout development cycle

What's new in the Hardware Lab Kit

- Scenario Testing
- Playlist
- Windows Hardware Compatibility Program
- Merge .hckx Packages
- Partial packaging
- …etc..

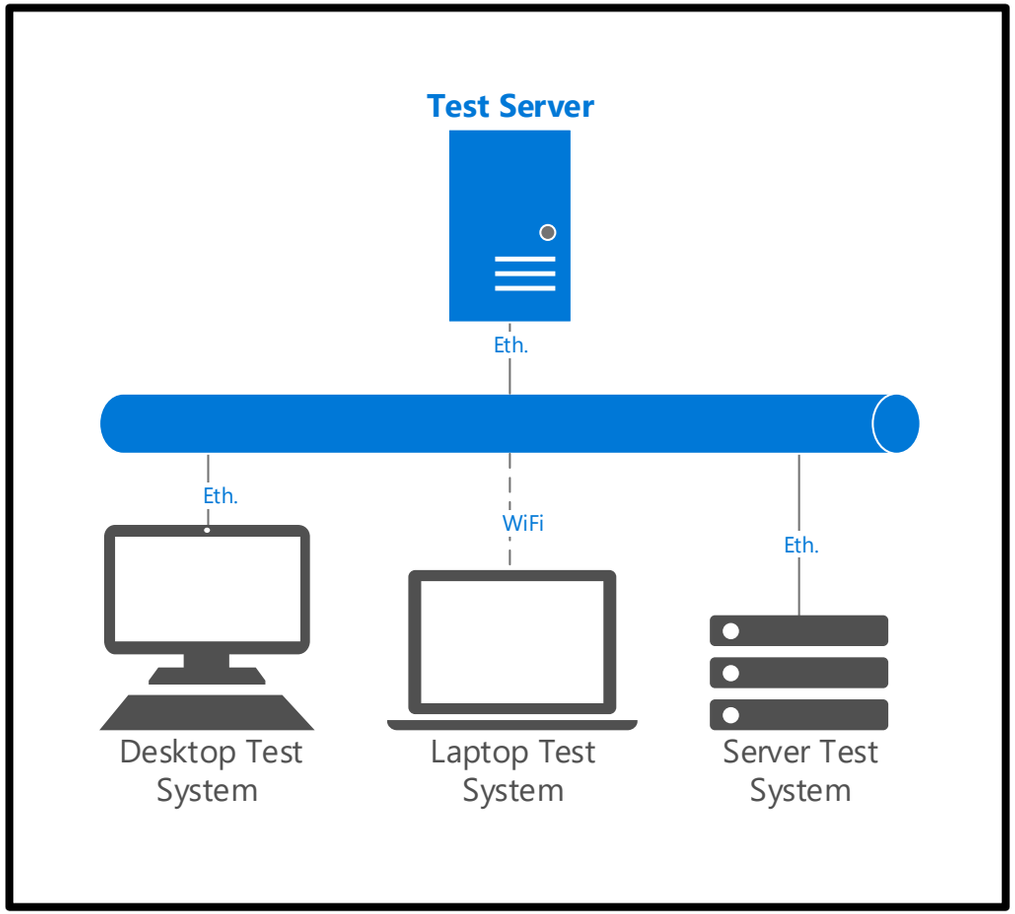
System Requirements - Test server

Component	Minimum	Optimum
Processor	Single Intel or AMD-based x64 platform with a speed of 2.0 GHz	Multicore or multiple x64-based processors running in x64 mode with a speed of 2.0 GHz or faster
System memory	2 GB main memory	4 GB main memory
Hard disk capacity	300 GB minimum to accommodate the volume of logs that can be generated.	RAID configuration
Network connection	100 megabits per second (Mbps)	1 gigabit per second (Gbps)
Operating system	English language and English local version of Windows Server 2008 R2 64-bit with service pack (SP1) or Windows Server® 2012. For information, see the Windows Server website. **Note** Controller isn't supported on Windows Server 2003, Windows Server 2008, Windows Vista, Windows XP, or Windows 2000. Controller isn't supported on an installation that has already been set up as a domain controller. Controller isn't supported in a virtual PC or any third-party Hypervisor environment.	

HLK Testing Environment – Desktop/Server

1-150 Devices

- Ethernet Connected (Preferred)
- Wireless Connected



HLK Testing Environment – Mobile

New in Win10

1-2 Devices

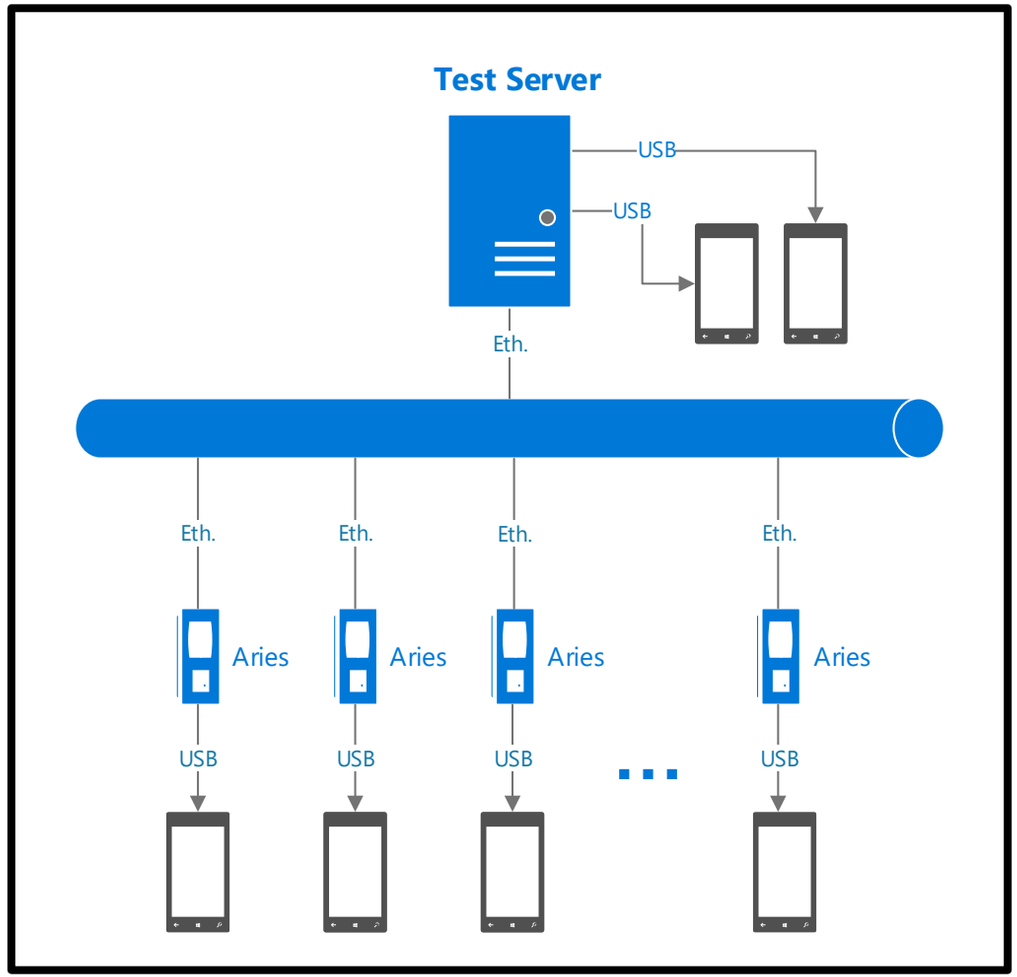
- Aries USB to Ethernet Connection
- Direct USB connection

1-24 Devices

- Aries USB to Ethernet Connection

24+ Devices

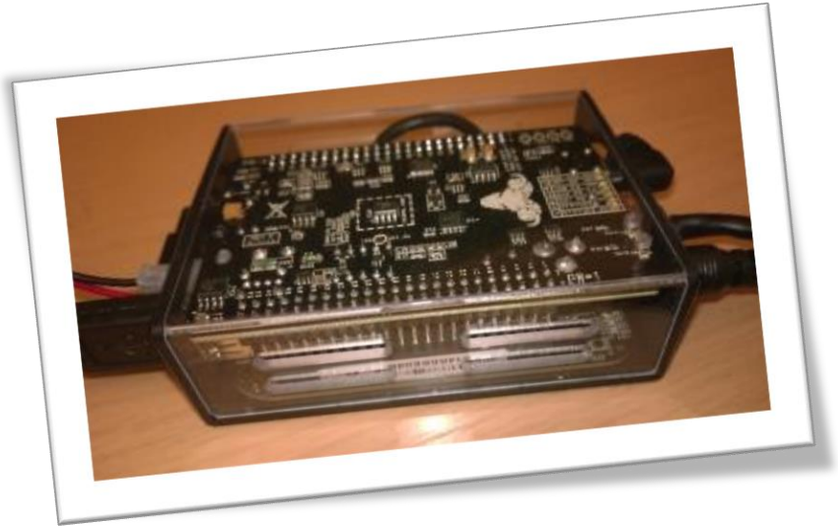
- Aries USB to Ethernet Connection
- 24 devices per sub-network
- Special configuration recommended



Aries

What is it?

- 1:1 USB-to-Ethernet Dongle
- Power Measurement capabilities
- Enables automated device reset and re-flashing
- V1 (**Available Now**)
  - Power sampling at 12 bits at 5k a second, ±5%.
  - 2.5-5V DC at 3.5A
- V2 (**Coming Soon**)
  - Power sampling at 16 bits at 1k a second, ±1%.



Available from Monsoon Solutions Inc.

- aries.msoon.com
- $200-$230 per unit (depending on quantity ordered)
- 1-2 weeks to fulfill order

Windows Hardware Compatibility Program

Playlist

Sign in

Microsoft Hardware Dev Center

Search Dev Center with Bing

Home | Explore | Docs | Downloads | Samples | Community | Programs | Dashboard

Hardware Dev Center > Compatibility Playlists Home

Compatibility Playlists

Windows Hardware Compatibility playlists

This list allows you to discover and download the latest Windows Hardware Compatibility playlists, which are used by the Hardware Lab Kit. Playlists are new for Windows 10, and allow much greater flexibility in the partnership between Microsoft and you – our Hardware Partner. Learn more

Playlist Name	Version	Id	Download
CompatPlaylist	1.7	0d9ea010-3ca3-4f3d-ba3a-a3ff9e0b8a6a	Download

Filters

- Windows hardware
- Test
- Windows Hardware Lab Kit
- HLK User's Guide
- HLK Tools
  - HLK Controller
    - HLK Controller and Client Organization
    - HLK Lab Security
    - HLK Filters
    - Manage HLK User Accounts
    - Install Microsoft SQL Server
    - Install a remote HLK Studio
    - Install standalone HLK Studio
    - Command-line options to install HLK

Windows Hardware Lab Kit Filters

When Microsoft discovers a problem in either a Windows HLK test or in the operating system itself that causes certification tests to fail incorrectly, we create an errata that allows partners to pass the problematic test. Many errata use filters to automatically filter the failure from the submission results. Filters are applied within Windows HLK Studio.

- **Errata** – These filters override tests that have errors that cause them to fail incorrectly. These filters apply to the test for all end users.
- **Contingency** – These filters allow companies to pass certain tests based on a legal agreement with Microsoft to fix device or system bugs within an agreed time period. These are specific to a particular case.
- **Autotriage** – These filters don't change the status of a test from fail to pass. They display information on common errors that can cause test failures.

To install filters

Download the latest HLK Filters

Note
If your HLK environment doesn't have access to the Internet, you can copy the file to your test server.

Windows Hardware Certification Kit Filters - Windows Internet Explorer

http://msdn.microsoft.com/en-us/windows/hardware/hh852367

Favorites | Suggested Sites | Web Slice Gallery

Connecting...

Page | Safety | Tools

Windows | Dev Center - Hardware

DASHBOARD GET STARTED DESIGN DEVELOP CERTIFY

Sign in

Systems Devices Drivers Debugging Downloads Samples

Windows Hardware Ce

When Microsoft discovers a problem in either a Windows Hardw t causes certification tests to fail incorrectly, we create an errata that allows partners to pass the p ailure from the submission results. Filters are applied within Windows HCK Studio.

There are three types of filters:

- **Errata**: These filters override tests that have errors that cause ers.
- **Contingency**: These filters allow companies to pass certain tests based on a legal agreement with Microsoft to fix device or system bugs within an agreed time period. These are specific to a particular case.
- **Autotriage**: These filters don't change the status of a test from fail to pass. They display information on common errors that can cause test failures.

Download Filters now

File Download

Do you want to open or save this file?

Name: HCKFilterUpdates.cab
Type: Cabinet File, 164KB
From: **sysdev.microsoft.com**

Open | Save | Cancel

☑ Always ask before opening this type of file

While files from the Internet can be useful, some files can potentially harm your computer. If you do not trust the source, do not open or save this file. What's the risk?

Done | Trusted sites | Protected Mode: Off | 100%

Fast-track Windows 10 Compatibility Program

Windows 10

Devices meet the following criteria:

- The device was previously certified for Windows 8.1
- The device's binaries have not changed since the submission for Windows 8.1, and only the INF is updated to reflect the new Windows version.

If the device meets these criteria, you can create a submission by following these steps:

- DF – Device Driver INF Verification Test in HLK
- "Merge" win8.1 (full test run) HCKX package in HLK studio
- Submit the .hlkx package to the Windows Dev Center hardware dashboard.

Fast-track Windows 10 Compatibility Program

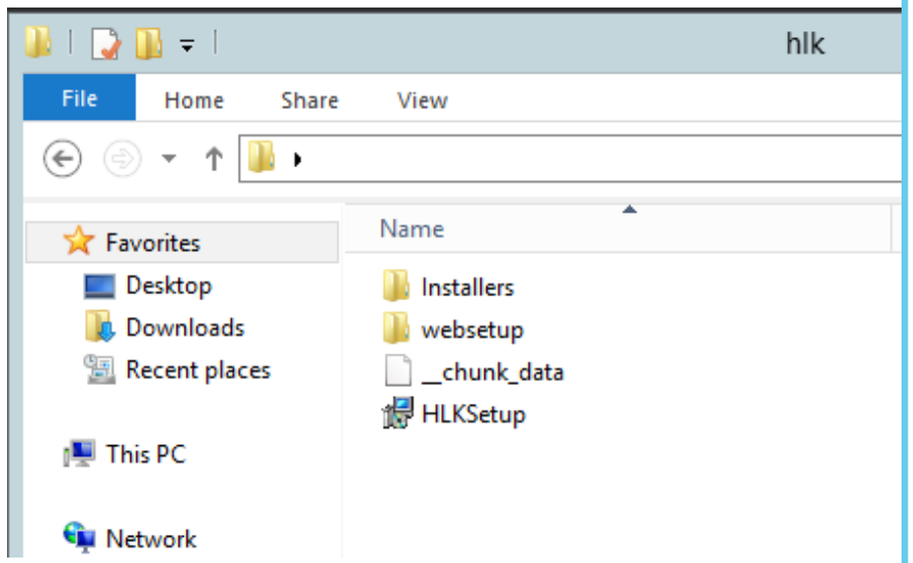
Windows 8.1

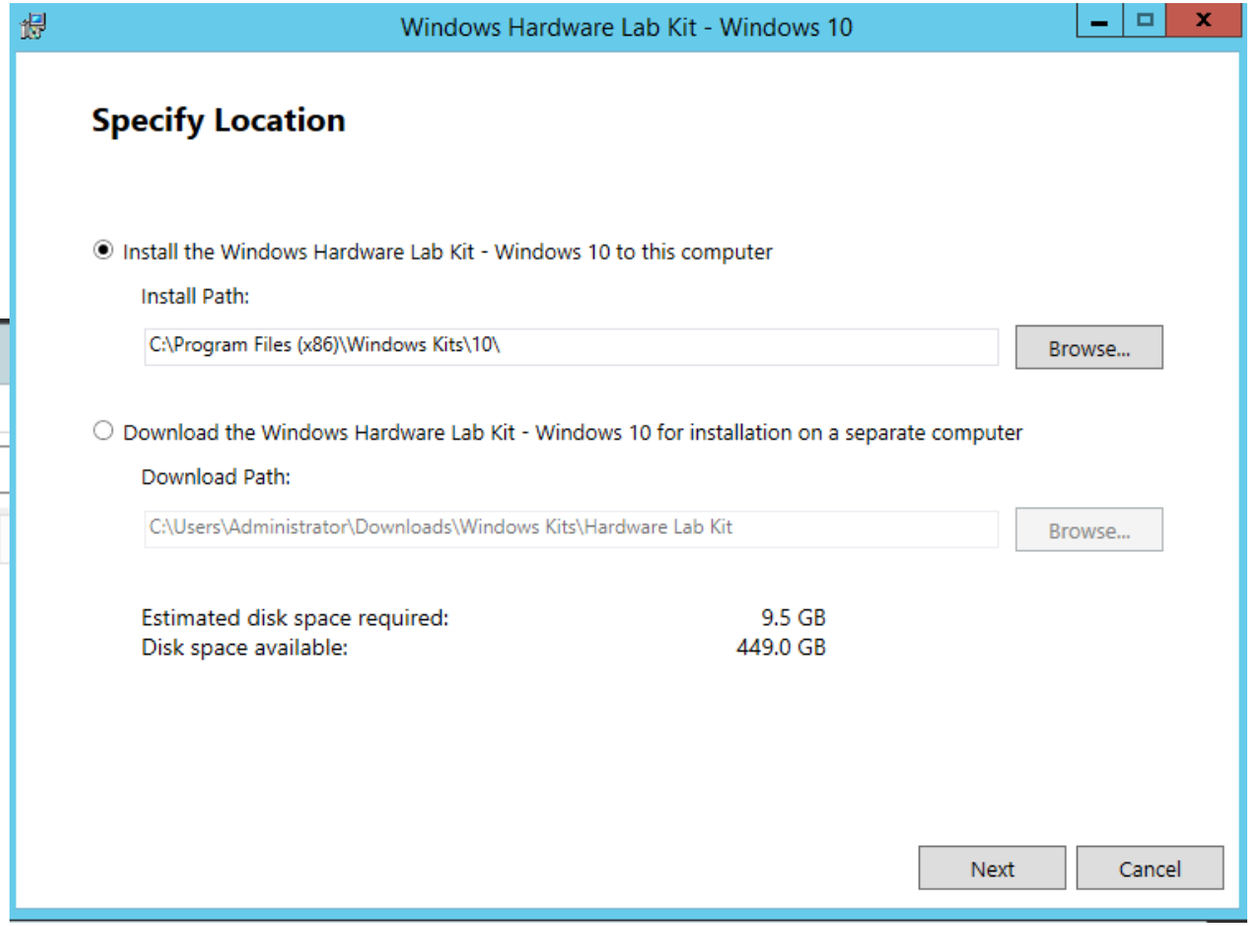
You'll need to prove that the INF is well-formed for Windows 8.1 by following these steps:

- Using the new HLK for Windows 10, create a Windows 10 project and run the full suite of tests.
- Using the Hardware Certification Kit (HCK) 2.1, create a Windows 8.1 project and run only the Device.Devfund INF test.
- Package the results of the projects for the submission by using the Windows Dev Center hardware dashboard packaging tools.

HLK on mobile

Step 1:
Install Controller and Studio on the test server





Step 2: Setup an HLK Proxy System

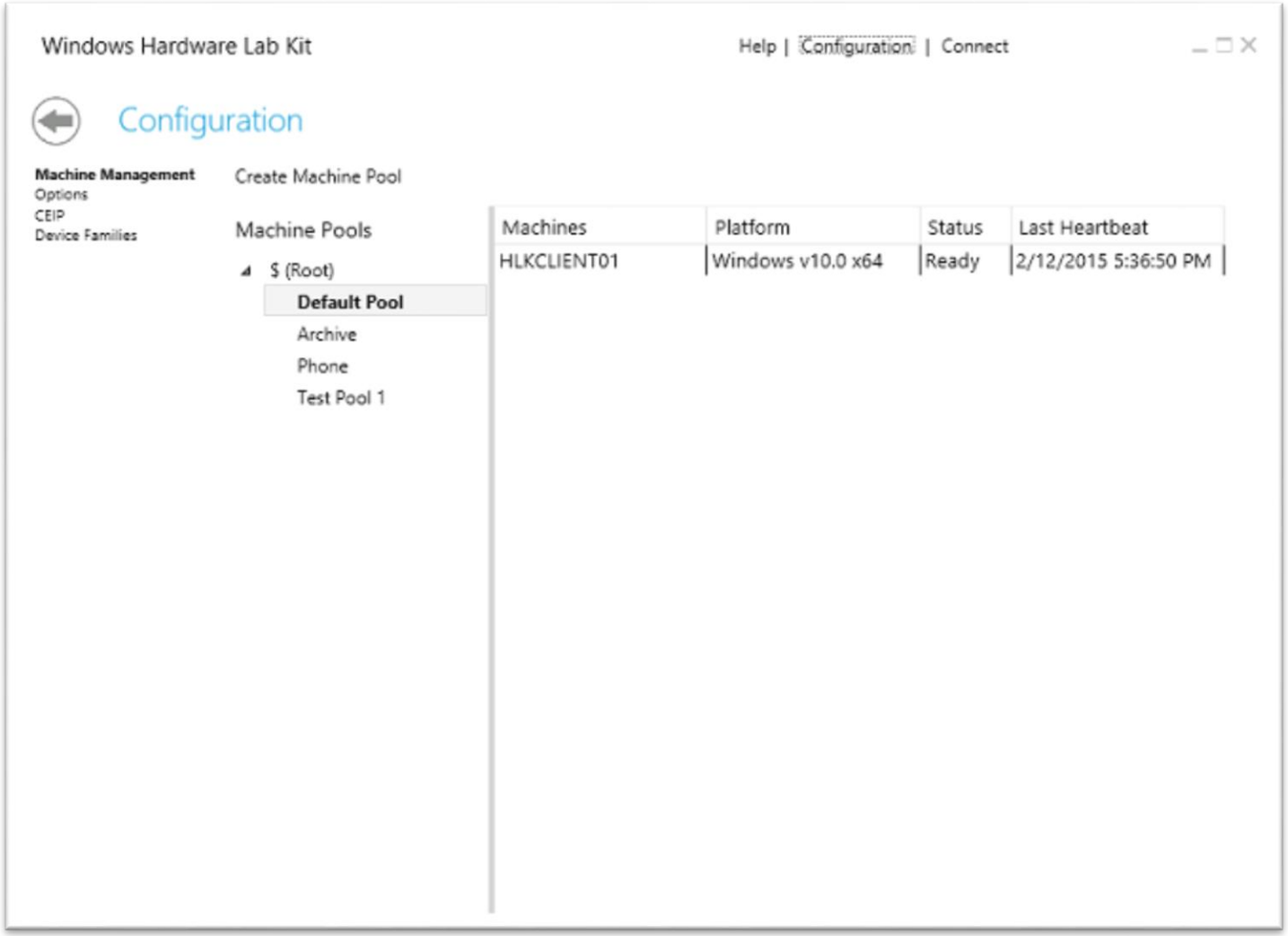
1. On the Proxy syste, browse to the following location:

   \\<ControllerName>\HLKInstall\ProxyClient\

   Note: Replace <ControllerName> with the name of the test server.
2. The WTT Proxy Setup wizard appears. To start the wizard, choose Next.
3. Select Next on the Destination Folder page and Next on the Test Enterprise Information page.
4. On the Service Installation Type page, Select Install as Console Application, and then click Next.
5. Select Install to proceed.
6. Open an elevated command prompt and navigate to %ProgramFiles(X86)%\WTTMobile\Client\
7. Start the Proxy Service by running the following command from the elevated command prompt:

   WTTProxy.exe –console
8. Leave the elevated command prompt window open.

Step 3: Create a machine pool



Step 4: Onboard Mobile Test systems

Onboarding Aries connected devices

1. On the Proxy system, launch an elevated command prompt.
2. Navigate to %ProgramFiles(x86)%\WTTMobile\Tools\ and onboard the phone with the following command:

   KitsDeviceDetector.exe /devicefilters:<aries name> /ImagePath:<full path to the flash_lab.ffu image> /machinepool:<machine pool>

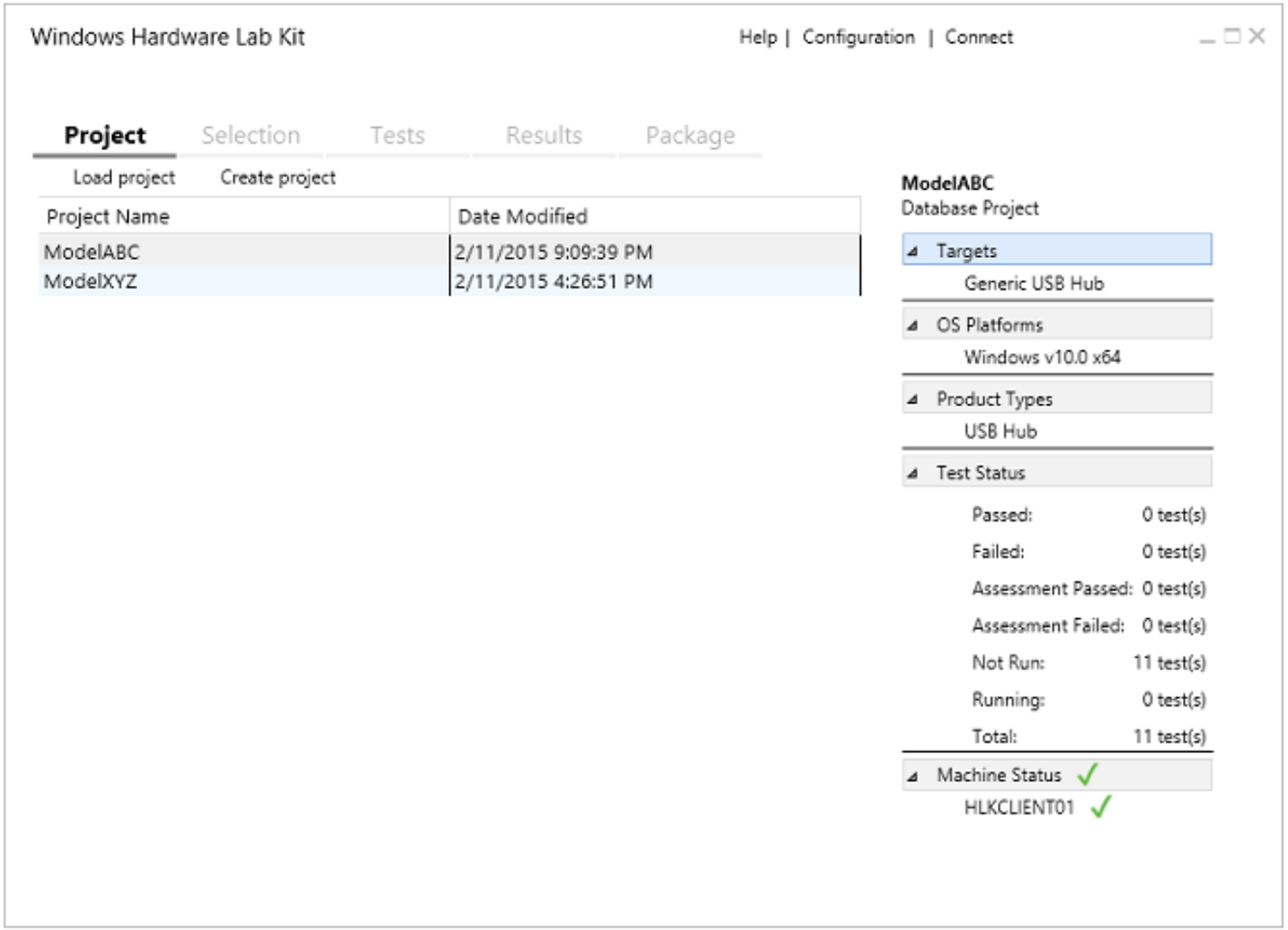
   Example:

   KitsDeviceDetector.exe /devicefilters:myaries /ImagePath:C:\flash_lab.ffu /machinepool:$\mypool
3. Restart the Proxy Service in Elevated console
   1. In the Proxy Service command prompt window press CTRL + C to stop the service
   2. Run the following command: WTTProxy.exe –console

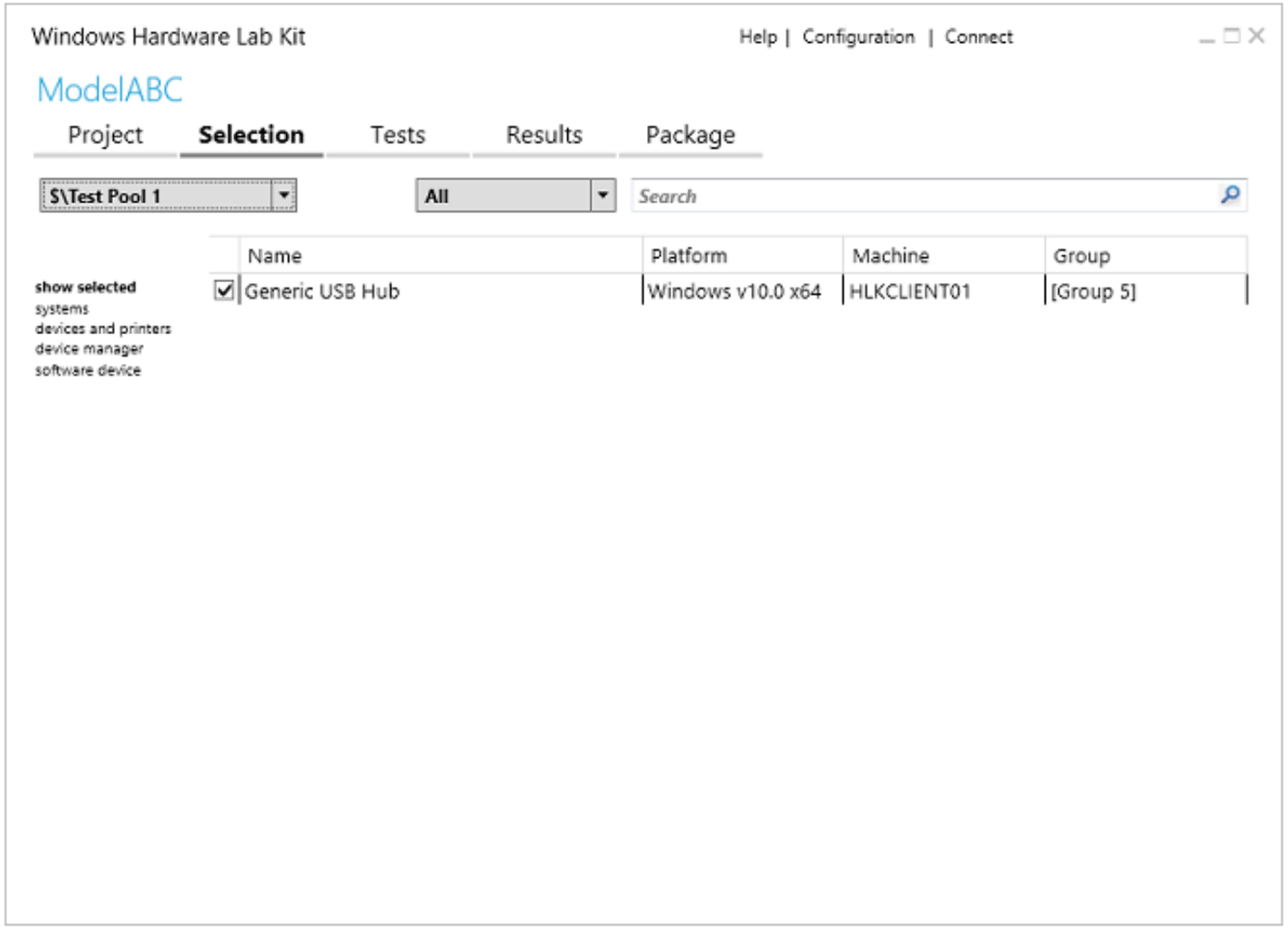
Note:

1. Lab image must be used with the HLK
2. If testing with a Health image, include the following parameter: /imageprofile:health
3. MTBF test needs SD card is present on the device and include /SDMemory:true
4. The KitsDeviceDetector log can be viewed here: %ProgramFiles(x86)%\WTTMobile\Tools\KitsDeviceDetector.log

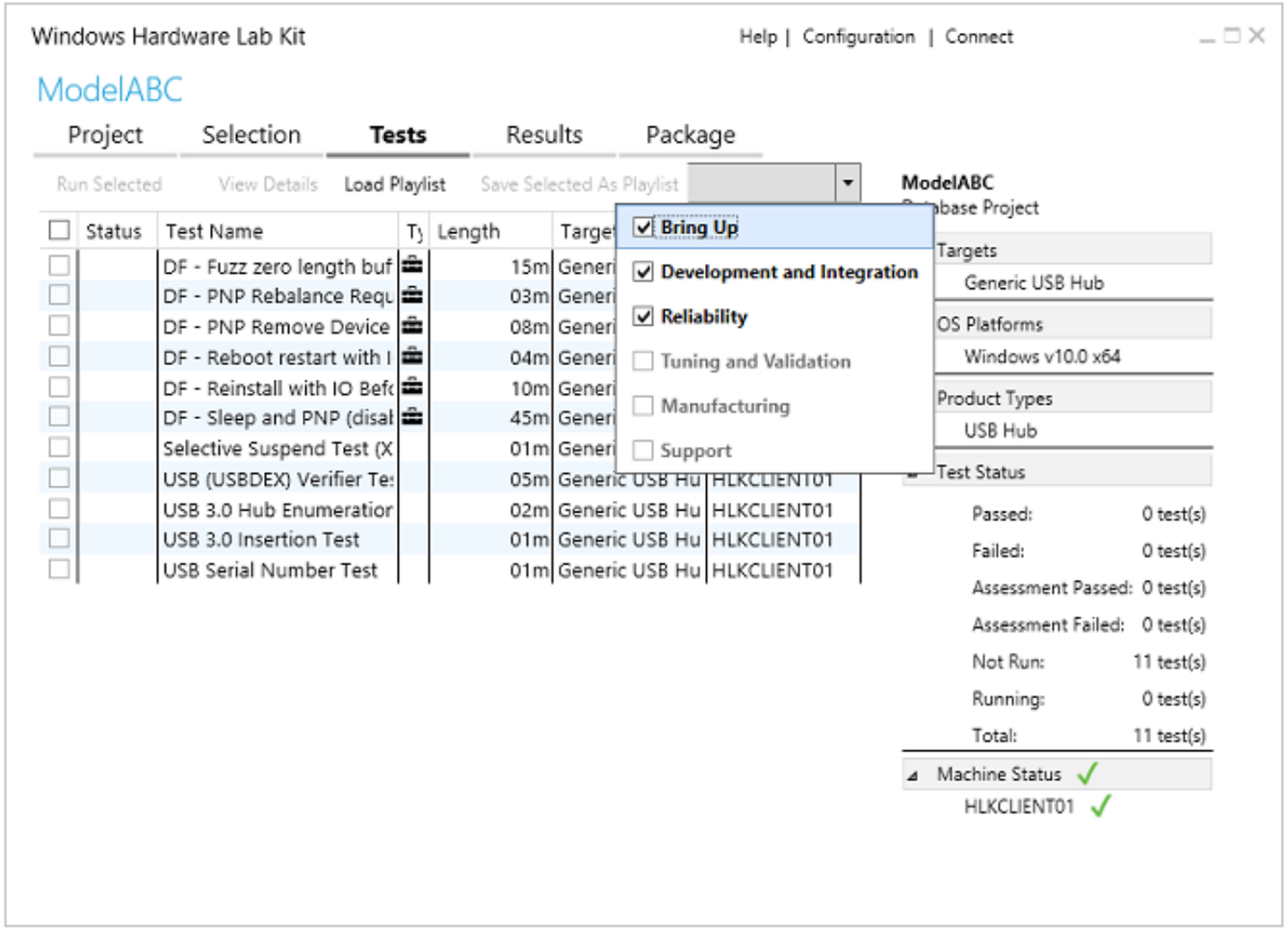
Step 5: Create a project



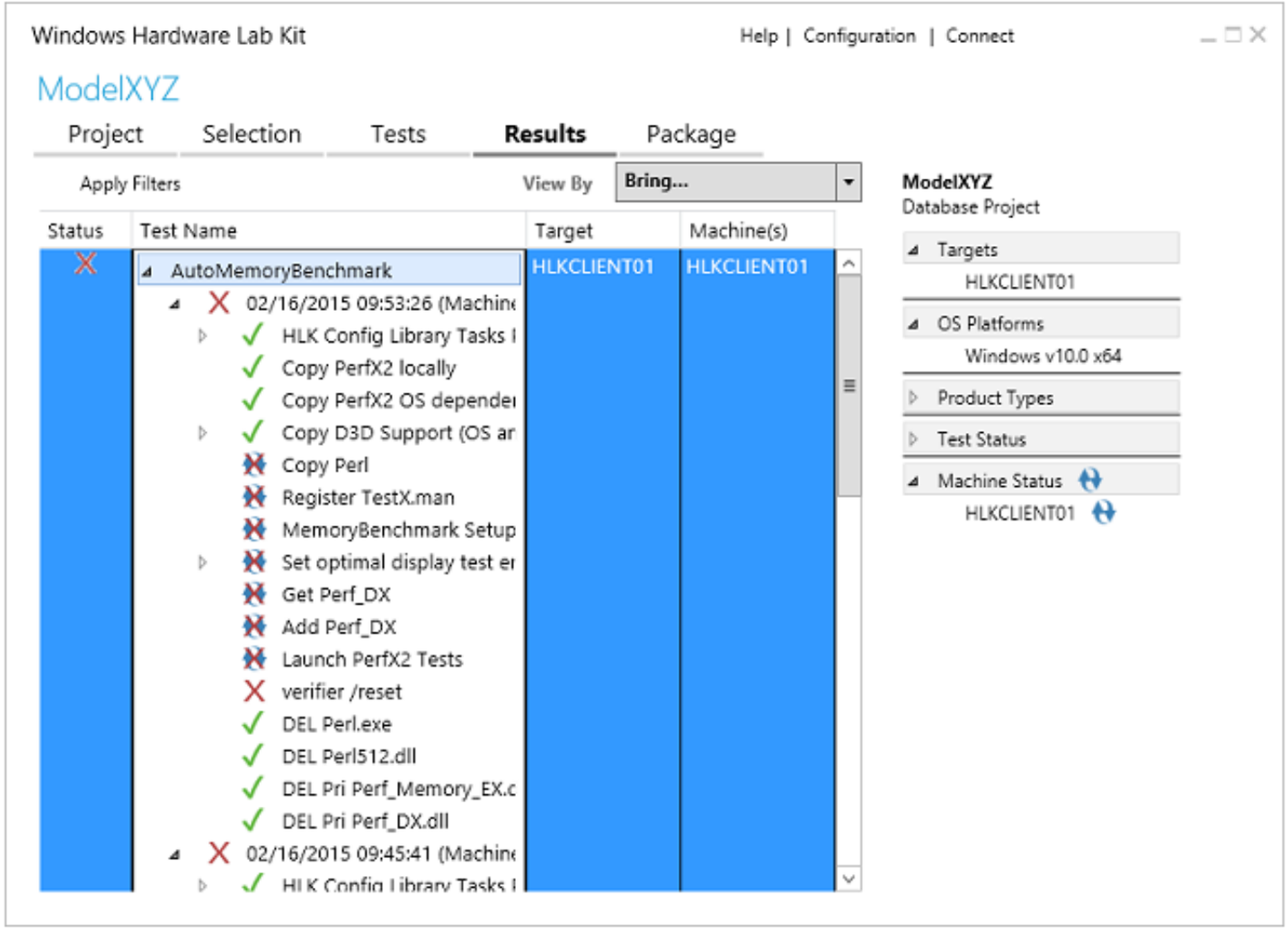
Step 6: Select target to test



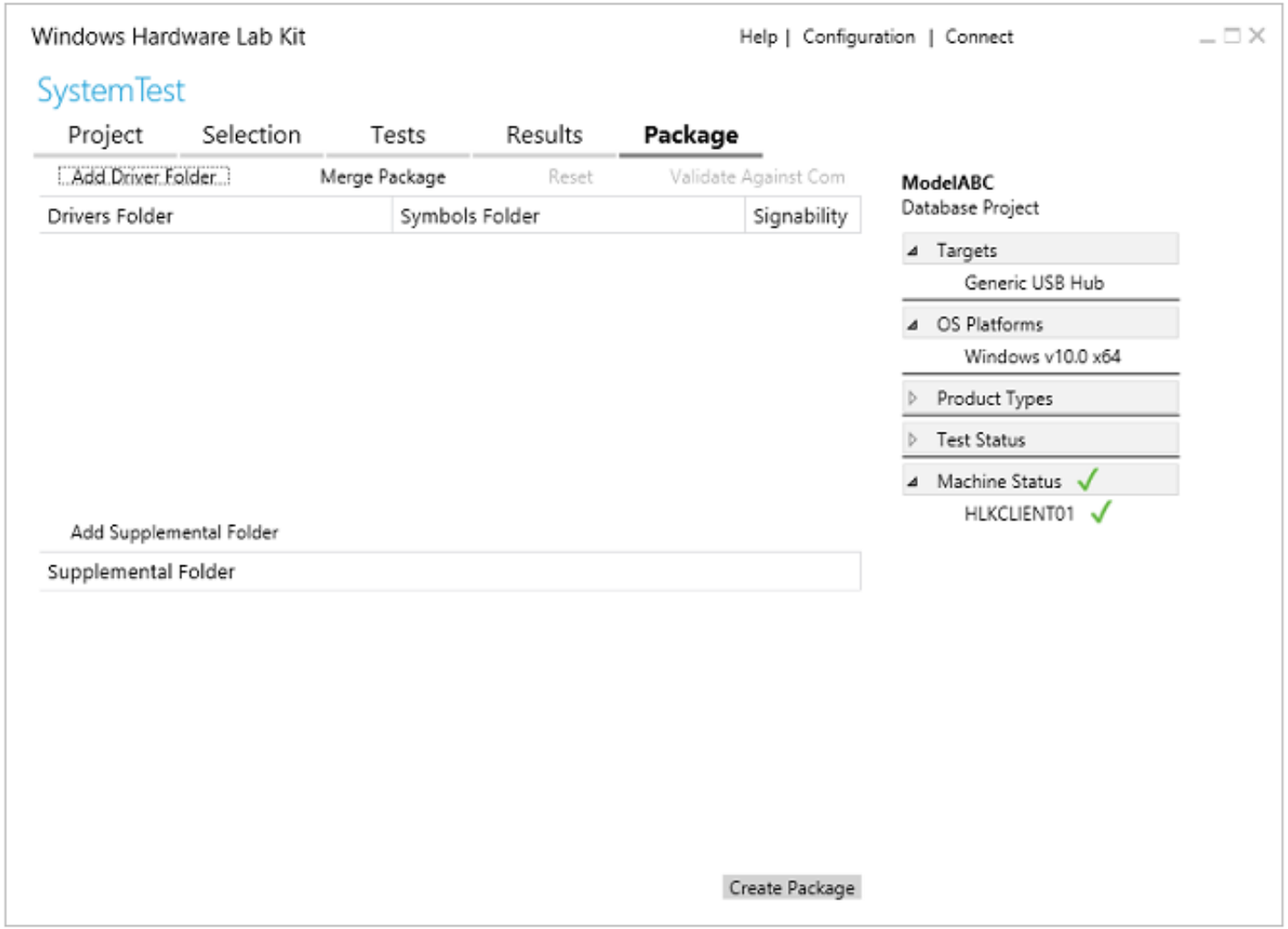
Step 7: Select and run tests



Step 8: View test results and log files



HLK Studio - Package Tab



MTBF Test

Mobile MTBF HLK content

https://msdn.microsoft.com/en-us/windows/hardware/dn913721#test

Downloa...

Windows HLK for Windows 10

The Windows Hardware Lab Kit (HLK) for Windows 10 is an all-purpose test and measurement kit to help you determine how well your hardware interacts with Windows.

Learn what's new with the Windows HLK for Windows 10

Note: Windows HLK for Windows 10 does not support testing with previous versions of Windows. For testing previous version of Windows, download the HCK for Windows 8.1.

Download Windows HLK for Windows 10 (Sept. 2015 Refresh)

Windows HLK supplemental media test content

Additional media downloads are required for all media tests. Download these files to complete Windows HLK media testing.

Required downloads for media tests

HLK_DXVA.iso (July 2015)

HLK_HMFT_Vol1.iso (July 2015)

HLK_HMFT_Vol2.iso (July 2015)

HLK_HMFT_Vol3.iso (July 2015)

HLK_PERF.iso (July 2015)

HLK_MOBILE.iso (July 2015)

HLK_GRFX_FOD.zip (Sept. 2015)

Windows hardware compatibility playlists

Get the official Windows Hardware Compatibility Program playlist so you can run the Windows HLK tests that ensure your hardware meets the requirements for compatibility with Windows 10. Use the Windows HLK to load the playlist. The tool will determine which tests are applicable to your target device.

Download the Hardware Compatibility playlist

Copy the content to the following HLK location:

FROM	TO
<ISO>\MTBF\Tests\MobileMTBFContent\TestData	%HLK Root%\TestPackages\TestData

Phone Setup

- SIM present
- SD for large logs
- Live ID/Password
- Manually walked through OOBE
- ExcludeFilter: global

Generating MTBF Reports

- MtbfReportGenerator.exe

Ex. /input:mtbfsummarylog1.txt,mtbfsummarylog2.txt /type:html /output:MtbfReport.html

MTBF Overview

# of Devices	Combined Duration	Passed/ Expected	Pass Rate
1	01:13:28	36/48	75.00%

MTBF Section Summary Report

	5.1.1	5.1.2	5.1.3	5.1.4	5.1.5	5.1.6	5.1.7	5.1.8	5.1.9	5.1.10	5.1.11
Pass Rate	100.00%	50.00%	66.67%	100.00%	0%	100.00%	100.00%	0%	100.00%	0%	0%
Combined duration	00:00:53	00:19:06	00:08:18	00:03:19	00:00:00	00:02:29	00:07:38	00:00:00	00:31:42	00:00:00	00:00:00

MTBF Device Summary Report

(Main tests only)

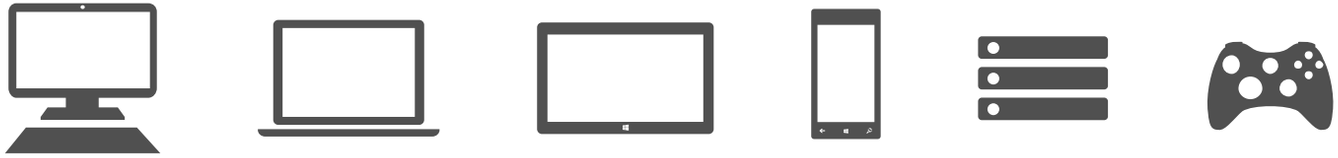
Device	Expected	Passed	Rate	Duration
1	48	36	75.00%	01:13:28
Total	48	36	75.00%	01:13:28

MTBF Detailed Test Report

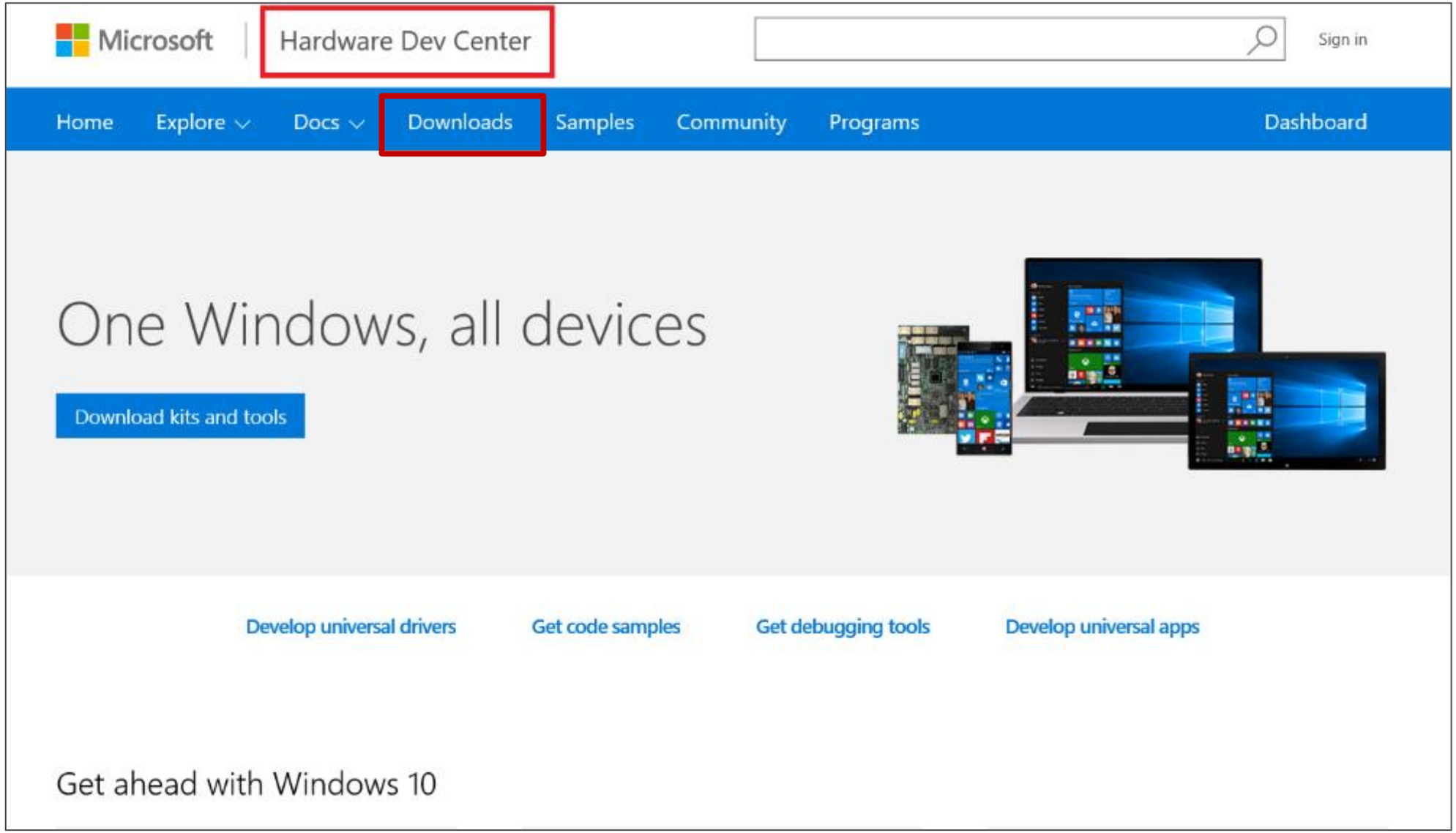
Demo

Key Takeaways

- ✓ Increase your test coverage
- ✓ Ensure compatibility with Windows
- ✓ Assess driver ship-readiness
- ✓ Qualify for the Windows Hardware Compatibility Program



Call to action – Download the HLK



Call to action – Download the HLK

laptops, to all-in-one and desktop devices. Choose from the options below to learn about creating great devices.

Device experience

Minimum hardware requirements

Component guidelines

creating efficient, high-quality drivers for devices running Windows 10.

Install Visual Studio

Install Windows SDK for Windows 10

Install Windows Driver Kit (WDK) 10

drivers and Windows Store apps, including debugging tools, samples and tutorials.

Download driver samples

Debug your drivers and apps

Building a driver with the WDK

Windows HLK

If you're familiar with Windows 8.1 Hardware Certification, you'll find that the tools and functionality are still available with the new Compatibility Program and the new Hardware Lab Kit (HLK) for Windows 10.

Learn about the Hardware Compatibility Program

What's new for HLK for Windows 10

HLK downloads and tools

Windows ADK

The Windows Assessment and Deployment Kit (ADK) for Windows 10 has tools for OEMs and ODMs to customize Windows 10 images, assess the quality and performance of systems or components, and to deploy Windows operating systems to new computers.

What's new for ADK

Get the ADK

Build Universal Windows apps

Create apps for all Windows devices from a single project, in the language you prefer, and learn how to get your app into the Store today. You can also preinstall your apps on the hardware you are creating.

Design, develop and publish apps

Preinstall OEM apps

Call to action – Download the HLK

Test and measure your hardware

More HLK Downloads

Windows HLK for Windows 10

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Call to action – Engage with Us

Enable Telemetry

When installing the HLK, choose **Yes** on the **Join the Customer Experience Improvement Program (CEIP)** page.

Submit your HLK packages for Test Signing

Learn more about how to submit HLK packages to sysdev.microsoft.com in the next session.

Feedback, Questions, Bugs

Email Us at WHLKHelp@microsoft.com

Resources

- Windows Hardware Lab Kit
  https://msdn.microsoft.com/en-us/library/windows/hardware/dn930814(v=vs.85).aspx

- Windows 10 hardware development
  https://msdn.microsoft.com/en-us/windows/hardware/dn859155

- Phone & Small Tablet Device Testing Lab
  https://channel9.msdn.com/Events/WinHEC/2015/OWDHOL102

- Windows HLK supplemental media test content
  https://msdn.microsoft.com/en-us/windows/hardware/dn913721#test

- Windows Hardware Certification blog
  http://blogs.msdn.com/b/windows_hardware_certification/

- Windows Hardware Lab Kit Filters
  https://msdn.microsoft.com/en-us/library/windows/hardware/dn939962(v=vs.85).aspx

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