Microsoft

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Shenzhen 2015

Microsoft

Testing Systems and Devices with the Hardware Lab Kit

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The Hardware Lab Kit enables **you** to evaluate the compatibility of your systems and devices with Windows and assess ship readiness

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 HLK testing workflow.

Session Agenda:

The benefits of using the HLK

Testing with the HLK

Why use the HLK?

Hardware Lab Kit Objectives

One Windows Solution

One kit to target any system and any device of Windows 10.

Self Enablement

Assess for yourself if you're ready to ship.

Test sooner in the development cycle

Catch bugs earlier in development.

The HLK Complements your testing

Scales to meet your testing needs

Test 1-150 devices with a single instance of the HLK

Shares our knowledge

HLK Tests come directly from the teams who created the feature.

Tests Windows Hardware Compatibility Program Requirements

Microsoft endorsed measure of compatibility

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

HLK Update

HLK Submission is available now!

From 4.30 and 5.15, some devices have submitted to the Sysdev Portal and the driver be signed successfully.

Please use the latest Playlist for Compatibility Program

HLK filter is the same as HCK filter.

Driver signing update of Windows 10

All new Windows 10 kernel mode drivers must be submitted to and digitally signed by the Sysdev Portal.

- The driver passes compatibility validation via the Hardware Lab Kit (HLK). If the hardware partner submits successful HLK logs then the driver will be signed by the portal.
- Hardware partners can submit drivers without HLK logs by attesting asserting to compatibility and quality.

Windows 10 will not load new kernel mode drivers which are not signed by the portal.

- The Cross-certifications signed after Windows 10 release will not be loaded by Windows 10

Starting 90 days after the release of Windows 10, the portal will only accept driver submissions that have a valid Extended Validation (“EV”) Code Signing Certificate.

HLK Concepts & Workflow

HLK Testing Environment

HLK Test Server

- Test Execution Engine
- Automated scheduling and machine management
- Centralized test management and results collection
- Components: HLK Controller, HLK Studio
- Recommended platform: Windows Server 2012R2

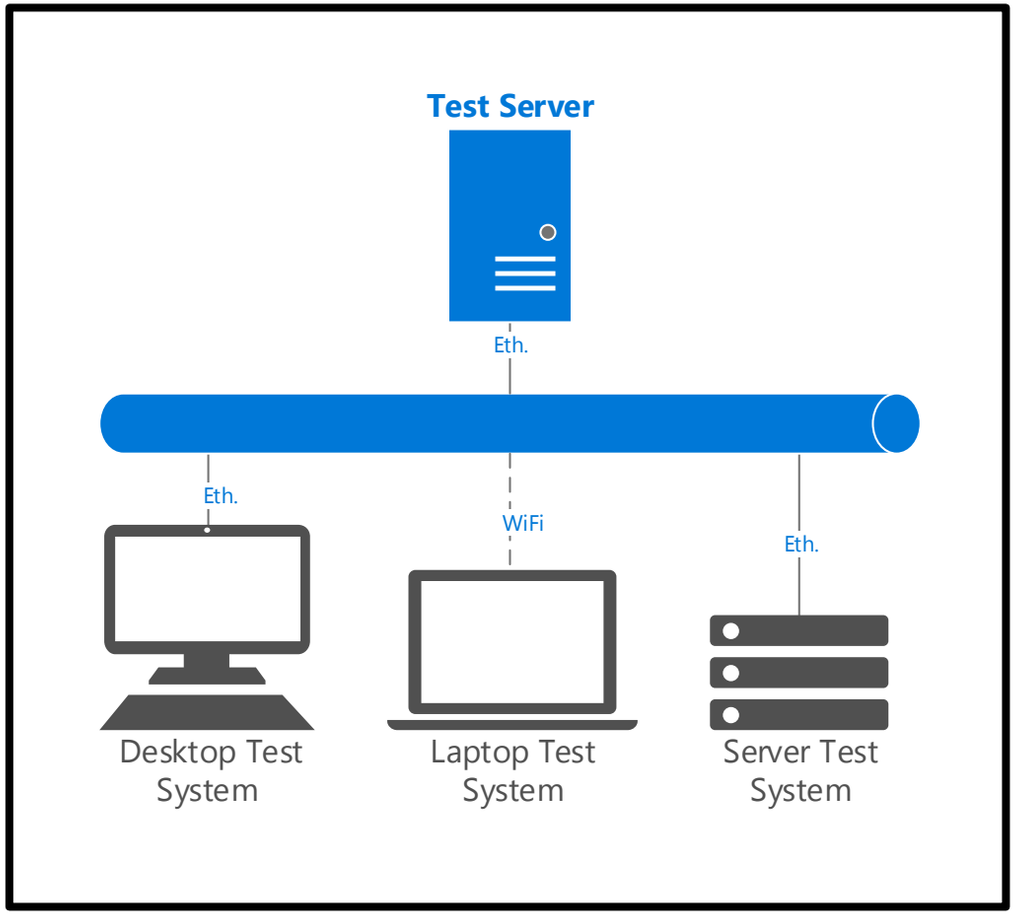
Test Systems

- Configured to your scenarios
- Replicate real-world environments
- Client OS: Windows 10

HLK Testing Environment – Desktop/Server

1-150 Devices

- Ethernet Connected (Preferred)
- Wireless Connected



HLK Testing Environment – Mobile

New in Win10

1-2 Devices

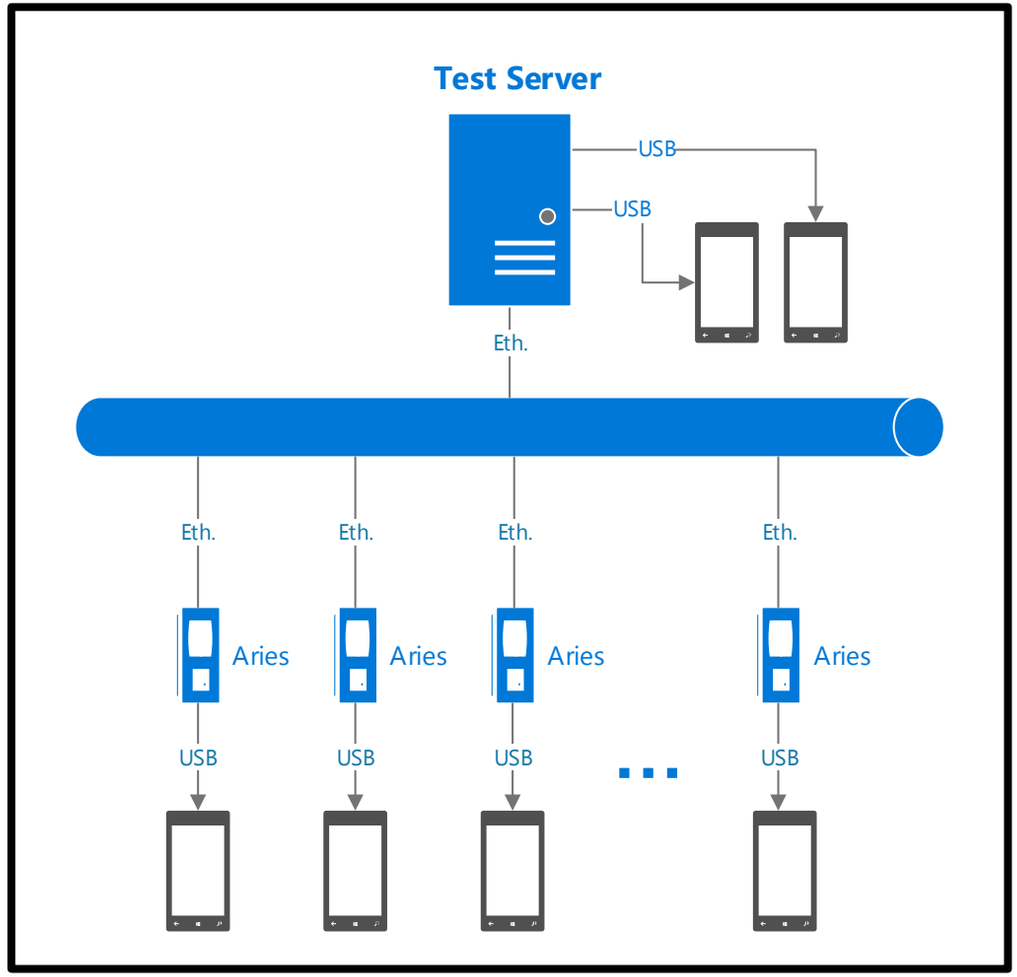
- Aries USB to Ethernet Connection
- Direct USB connection

1-24 Devices

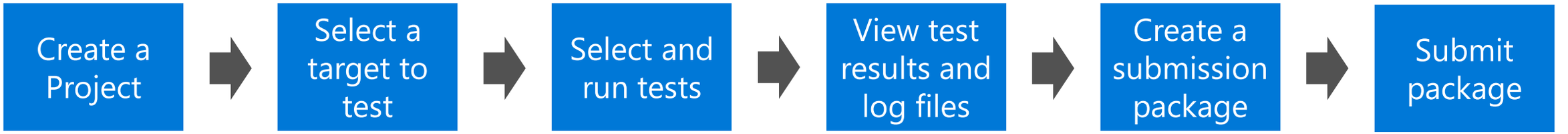
- Aries USB to Ethernet Connection

24+ Devices

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



HLK Testing Workflow

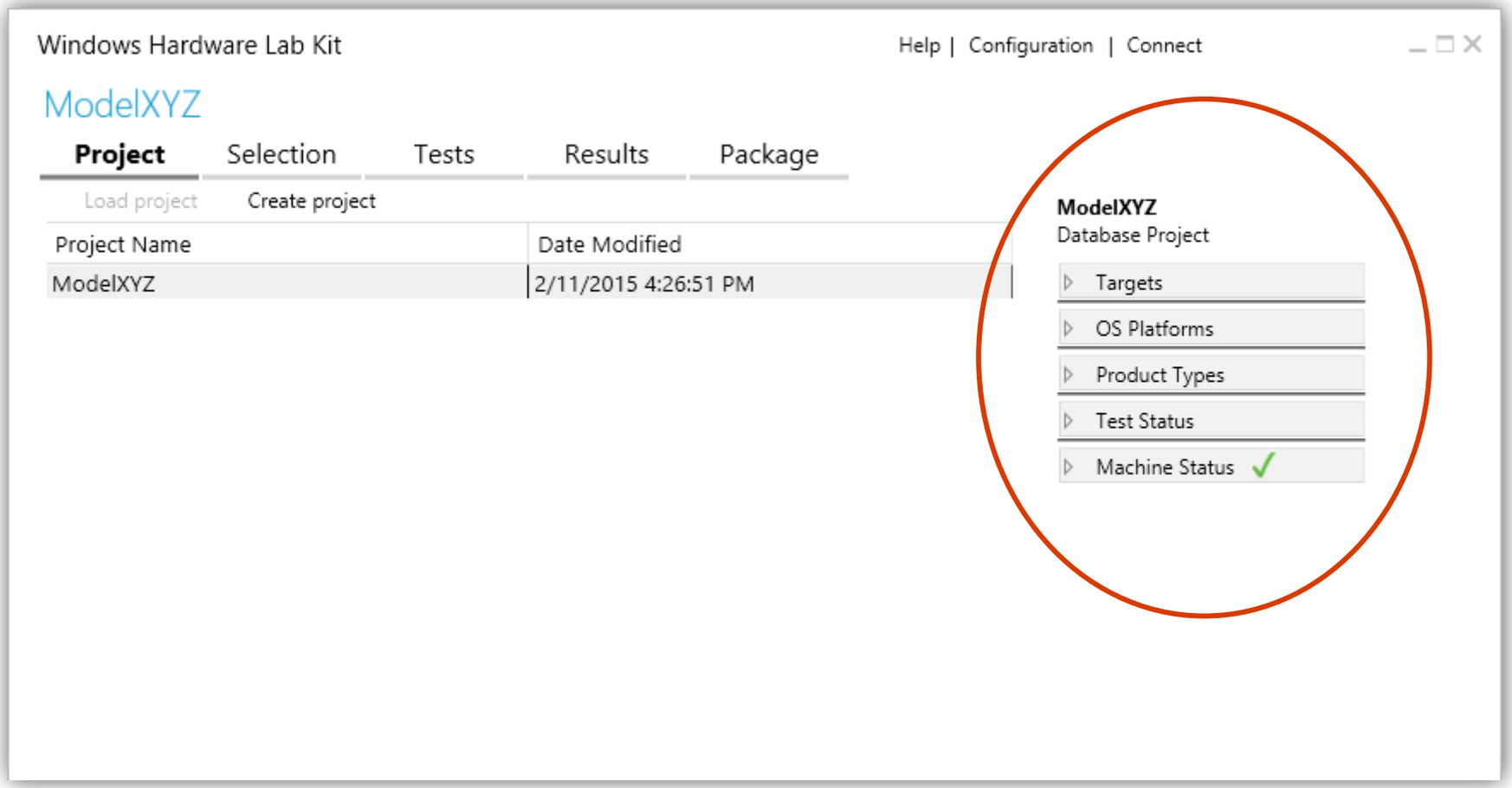


Creating a Project

A project defines your test plan

Project

- Test Systems
- Targets
- Tests
- Results

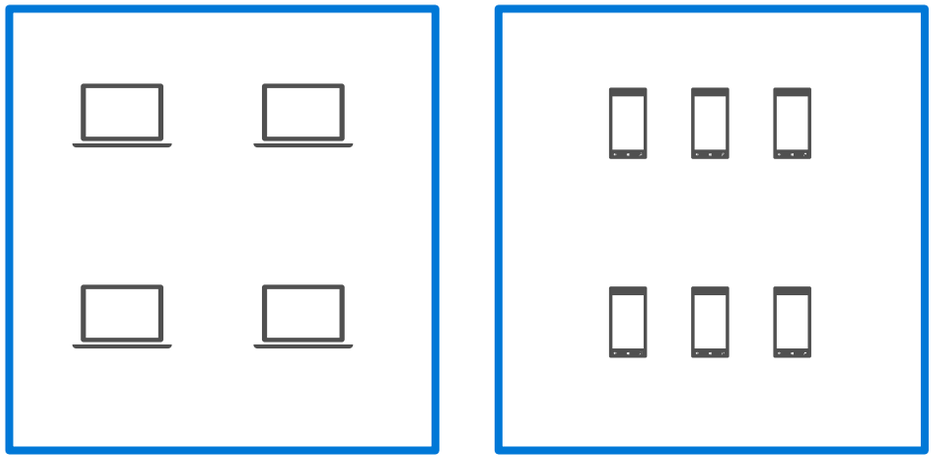


Machine Management

Machine Pools make test scheduling easy.

- Logical separation of test systems
- Enable distributed testing
- Dynamic Pool Growth

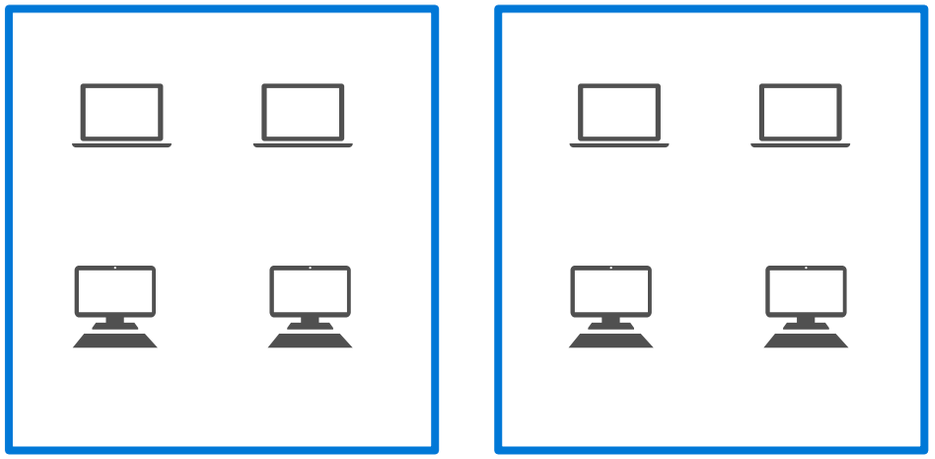
Example: Platform Separation



Laptop Pool

Phone Pool

Example: Usage separation



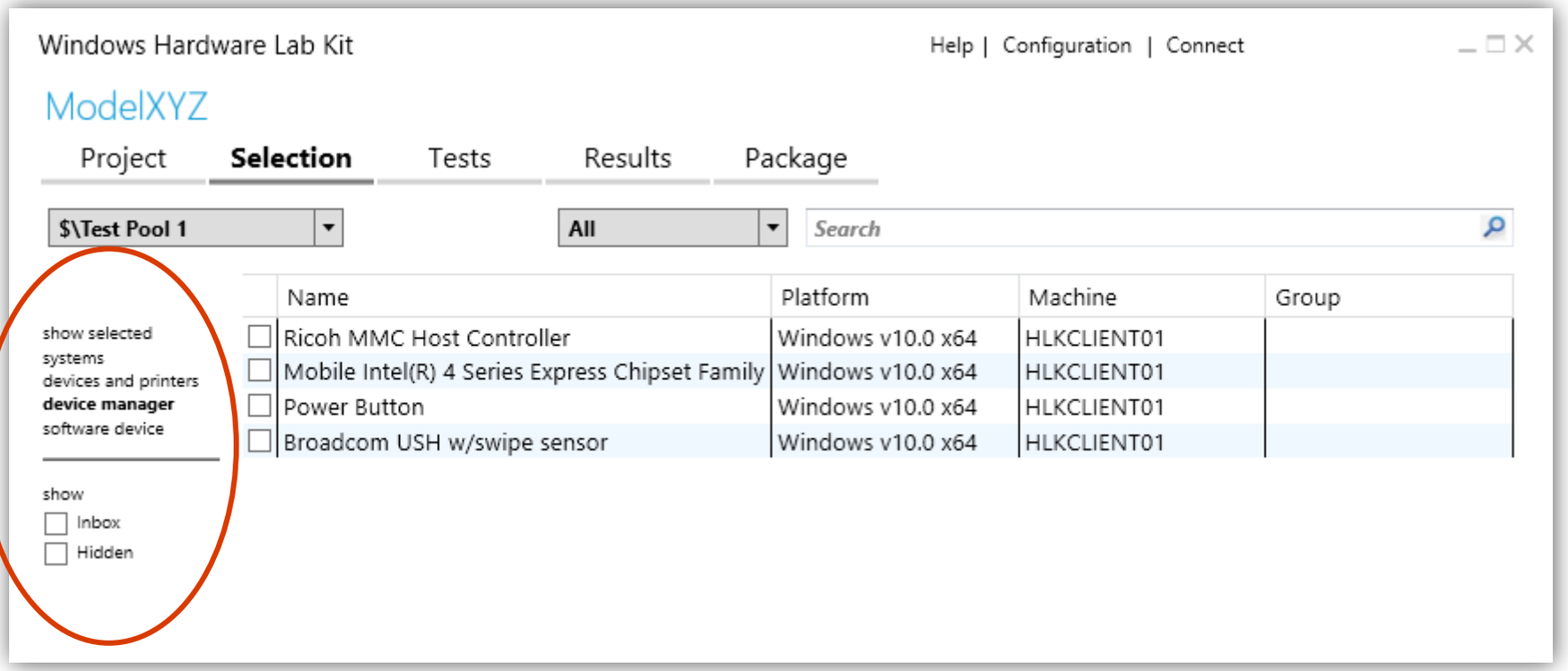
Beta A Pool

Beta B Pool

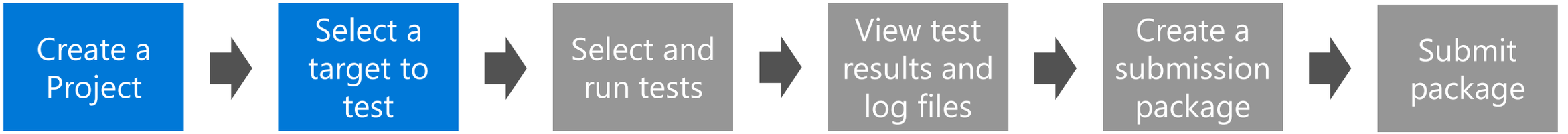
Selecting target(s) to test

A target is a specific testable endpoint

- Systems
- Hardware
- Peripherals
- Filter Drivers



HLK Testing Workflow



Test Organization in the HLK

Device vs System Tests

Device tests provide isolated feature testing

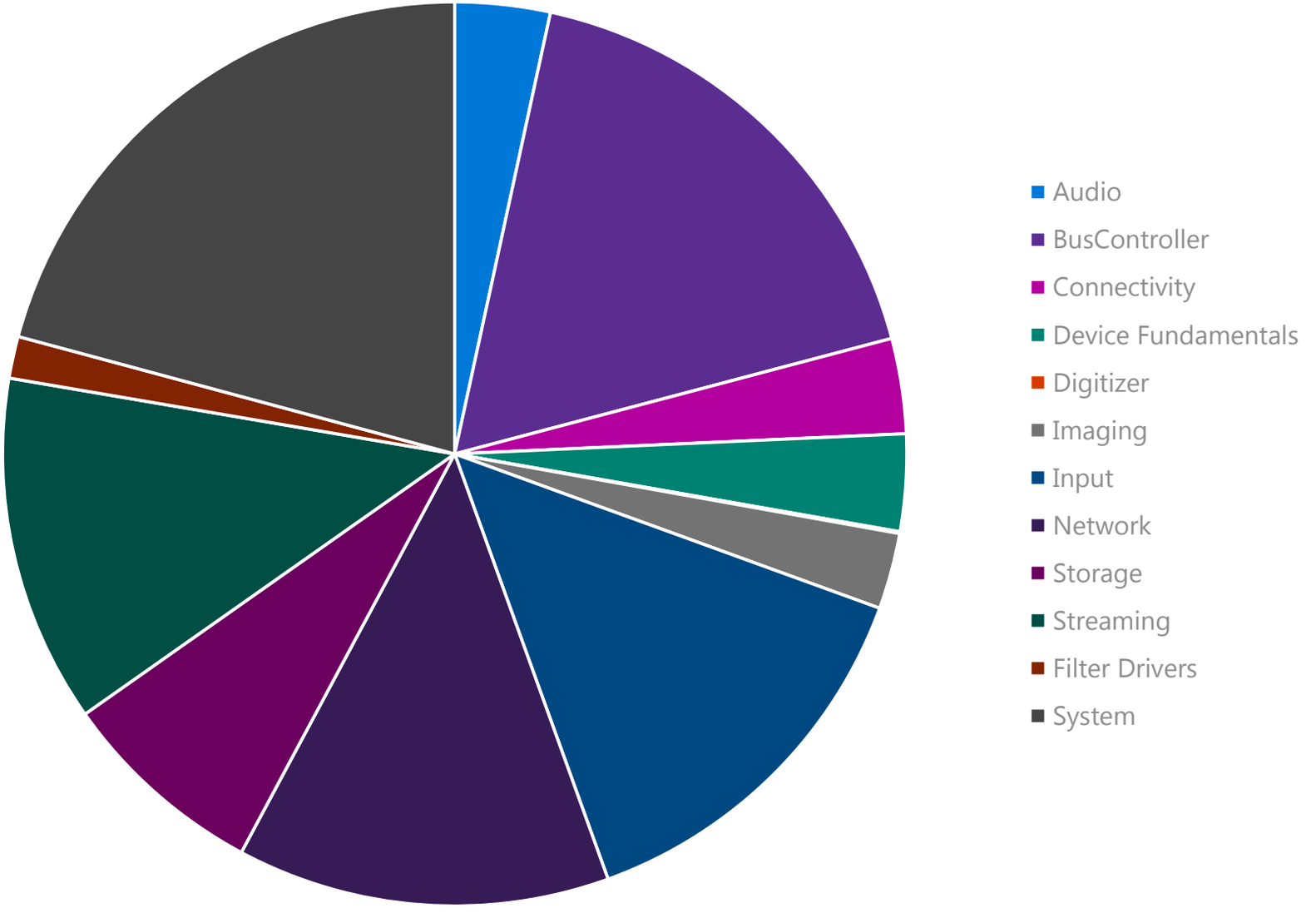
System tests provide integrated testing

Fundamentals vs Feature-Specific

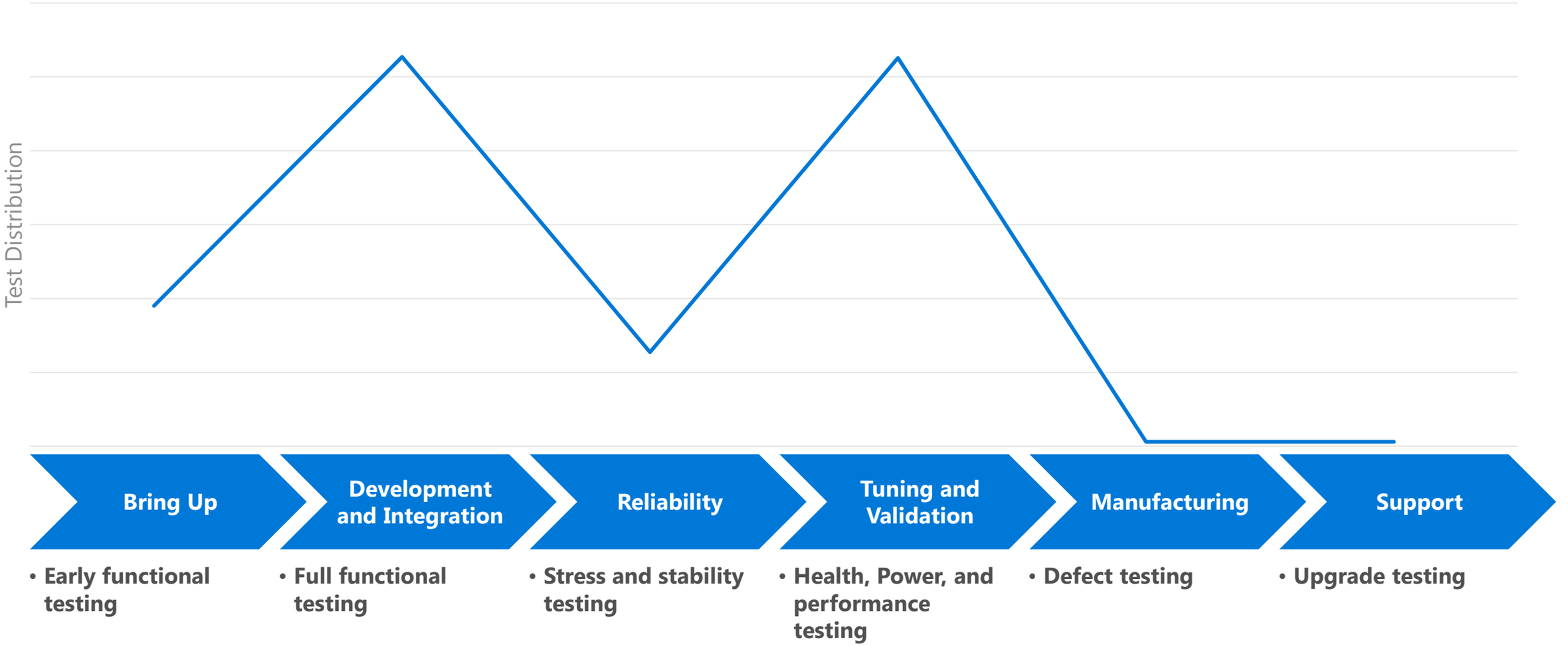
Fundamentals tests are common across all Devices or Systems

Feature specific tests are specific to a hardware or system capability

Test Coverage



Phased Testing Design

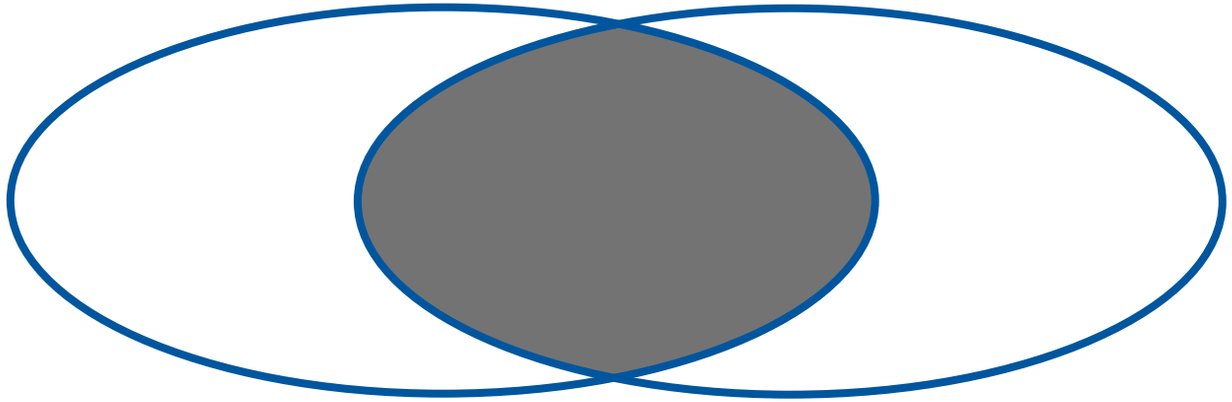


Create and share sets of tests with Playlists

New in Win10

Playlists define a set of tests in a portable format

- Load playlists into a project to modify the project test list



Create custom playlists for your testing scenarios

- Focus on the tests you care about
- Share with others

Windows Hardware Compatibility Program Playlist

Official Playlist

- The Windows Hardware Compatibility Program uses an official playlist to determine which devices meet the requirements for compatibility with Windows 10.
- Uniform Playlist for Windows 10 Desktop

For submission to the SysDev

- All playlists that we have published are acceptable to use for submissions to the Hardware Developer Portal (sysdev).

Download from Here

https://sysdev.microsoft.com/en-US/Hardware/compatibilityplaylists/

Selecting and running tests

Special Configuration

6 selected tests require special configuration. Configuration needs are specified in the help documentation for each of the

Manual

0 selected tests require interaction with the test while the test is running.

Non-Distributable

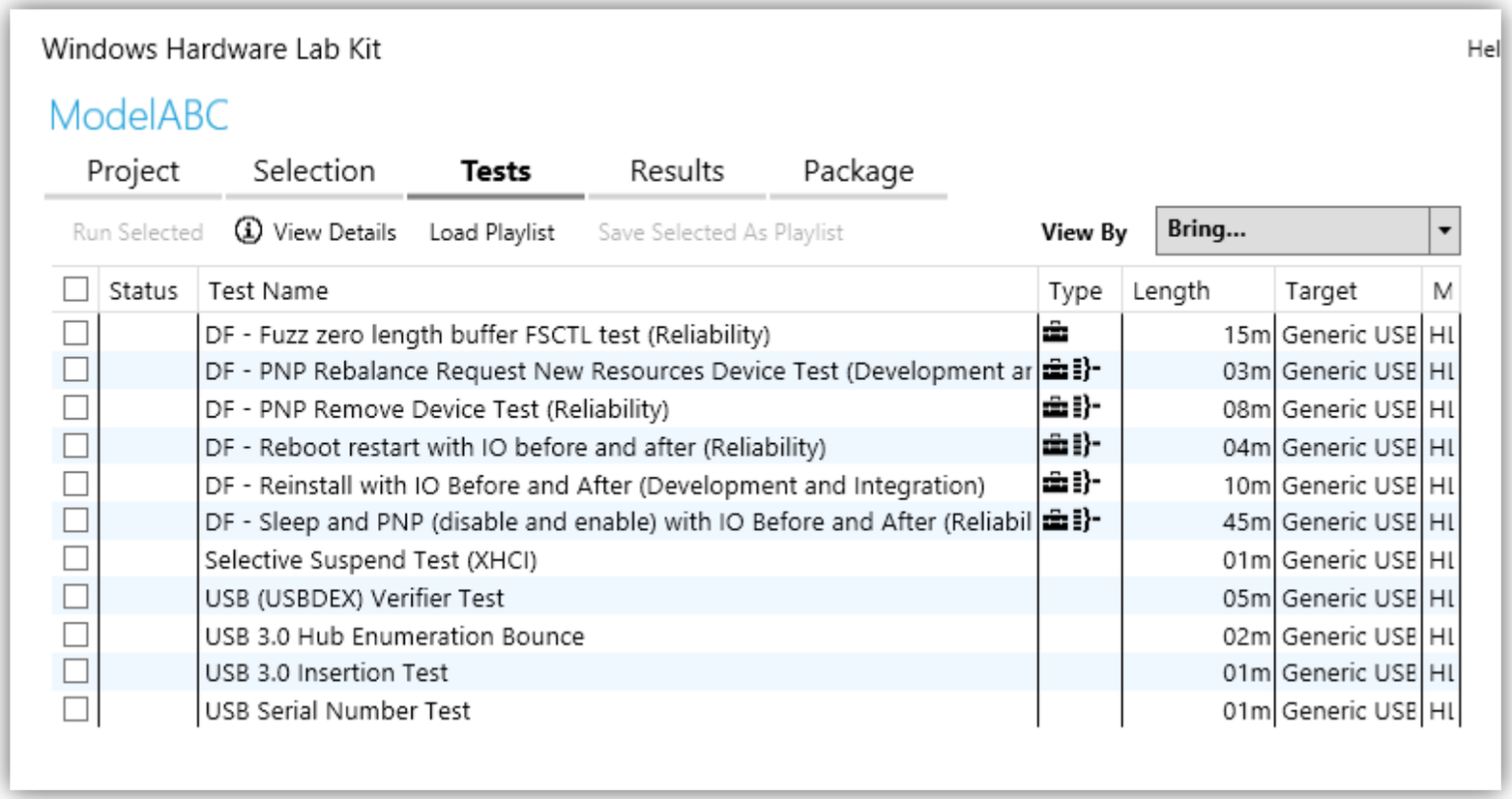
0 selected tests are non-distributable.

Multi-Device

5 selected tests are capable of being scheduled to run once. The test can run on multiple devices at the same time.

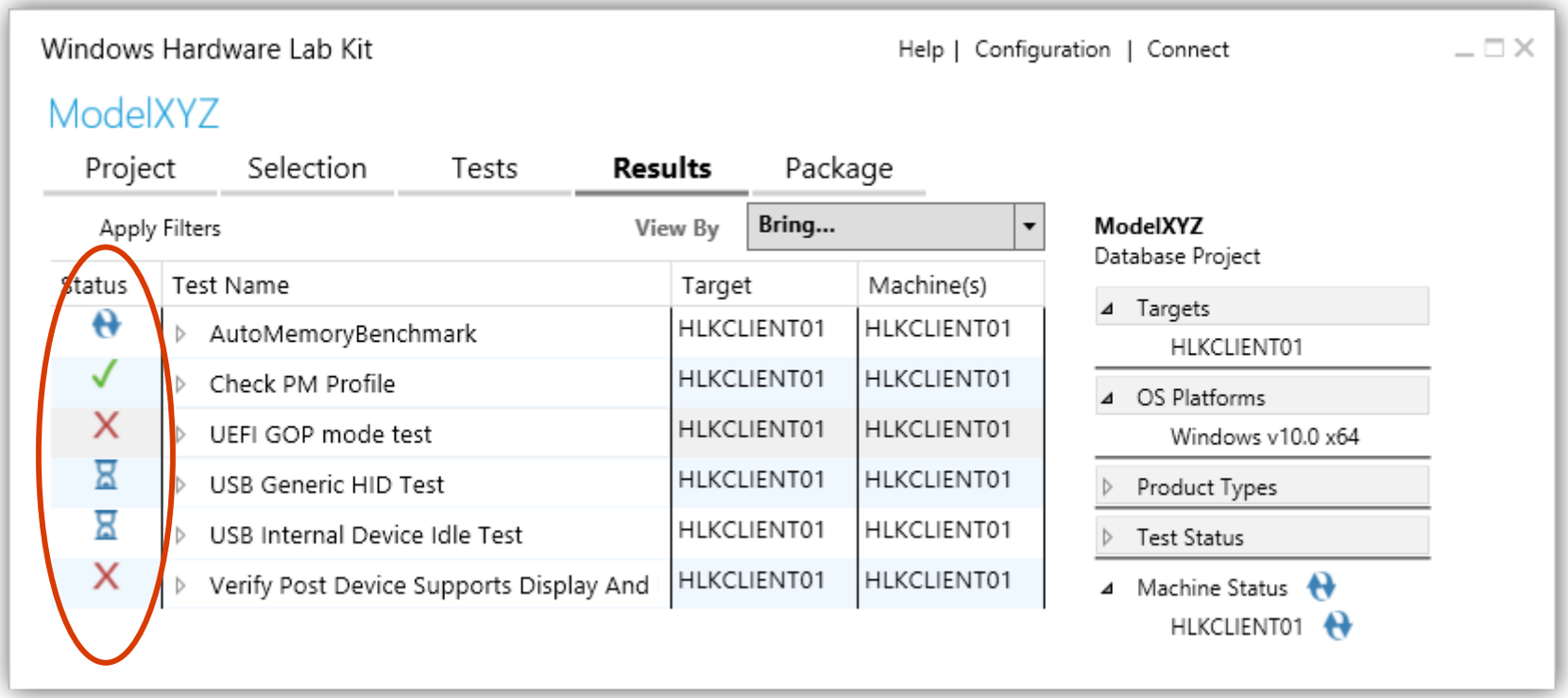
Multiple Machines

0 selected tests require multiple machines in order to execute the test.



View test results and log files

- ✓ Test status in real-time
- ✓ Logs available immediately



Troubleshooting Test Failures

1) Is there a test log?

- **If Yes –** continue to step 2
- **If No** – there was a setup issue or a system crash.
  - Setup issues – read test documentation
  - System Crashes – enable Kernel Crash Dumps

2) Install latest updates and filters

- Check for a newer version of the HLK
- Download the latest filters from the HLK Download page on MSDN
- Filters are updated as often as twice a day
- HCK and HLK use the same filter.

3) Make sure the test was run correctly

- Verify special configuration if required
- Verify user interaction

Troubleshooting Test Failures

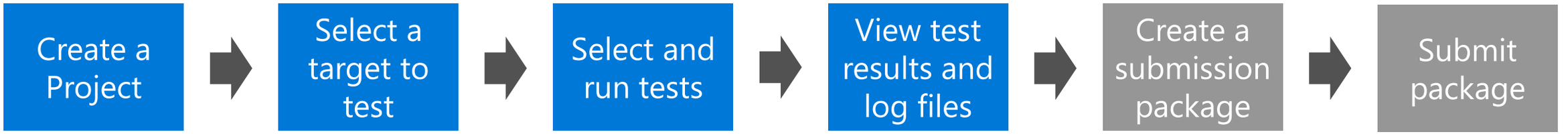
4) Identify failure category

Failure Category	Useful Logs
Test failed because of test results	Test Log
System Crashed	HLK Event Log, Kernel crash dump file
Test Crashed	HLK Event Log, User mode dump file

5) Contact Windows HLK Support

- WHLKHelp@microsoft.com

HLK Testing Workflow



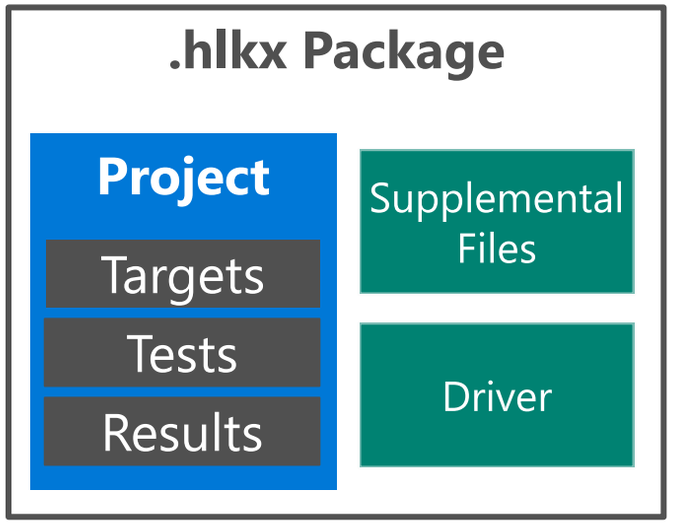
Create a submission package

Submit your test results with an HLK package

The only way to qualify for the Windows Hardware Compatibility Program

Includes:

- Project details
- Supplemental files
- Driver being qualified



Submitting a package

Learn more at WinHEC 2015 Session:

Introduction to Windows Driver Signing, Publishing, Distribution and Servicing

http://channel9.msdn.com/Events/WinHEC/2015/DDF202

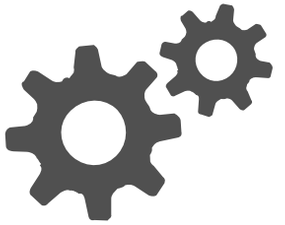
Additional ways to use the HLK

HLK .NET APIs

- Automate any parts of the testing process
- All functionality of HLK Studio accessible
- Support for any Microsoft .NET Framework 4.0 (and later) programming language

HLK Powershell Cmdlets

- Scripting supported steps to automate HLK Testing



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

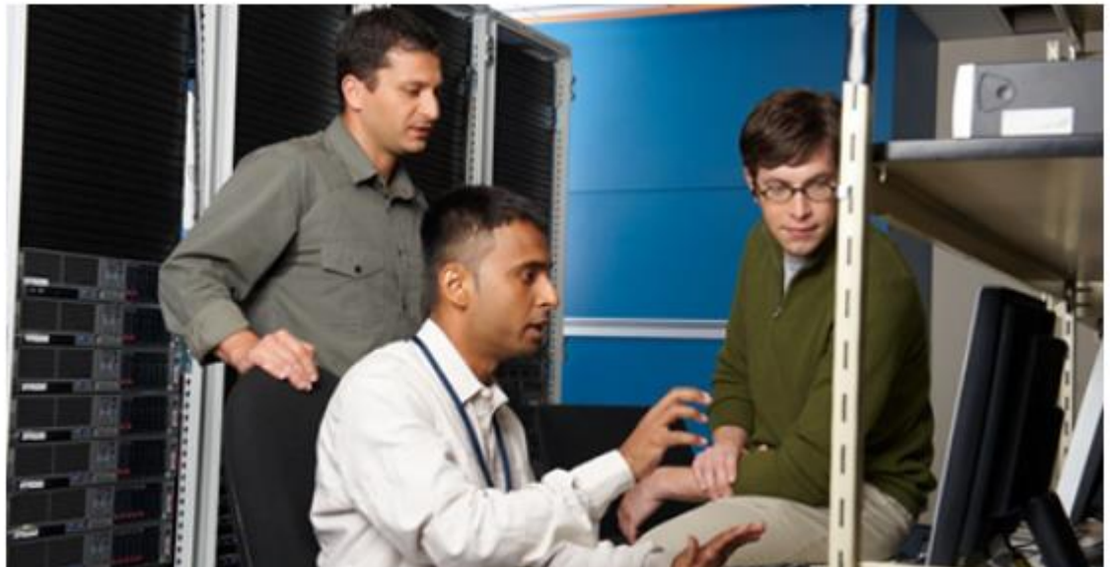
Windows | Hardware Dev Center

Dashboard Get Started Design Develop Certify Deploy Windows 10 Sign in

Get started Design Develop Customize Test Manufacture Service Downloads WinHEC

Dev Center - Hardware > Windows 10 > Downloads

Download kits and tools for Windows 10



Get started with Windows 10

Join the Windows Insider Program

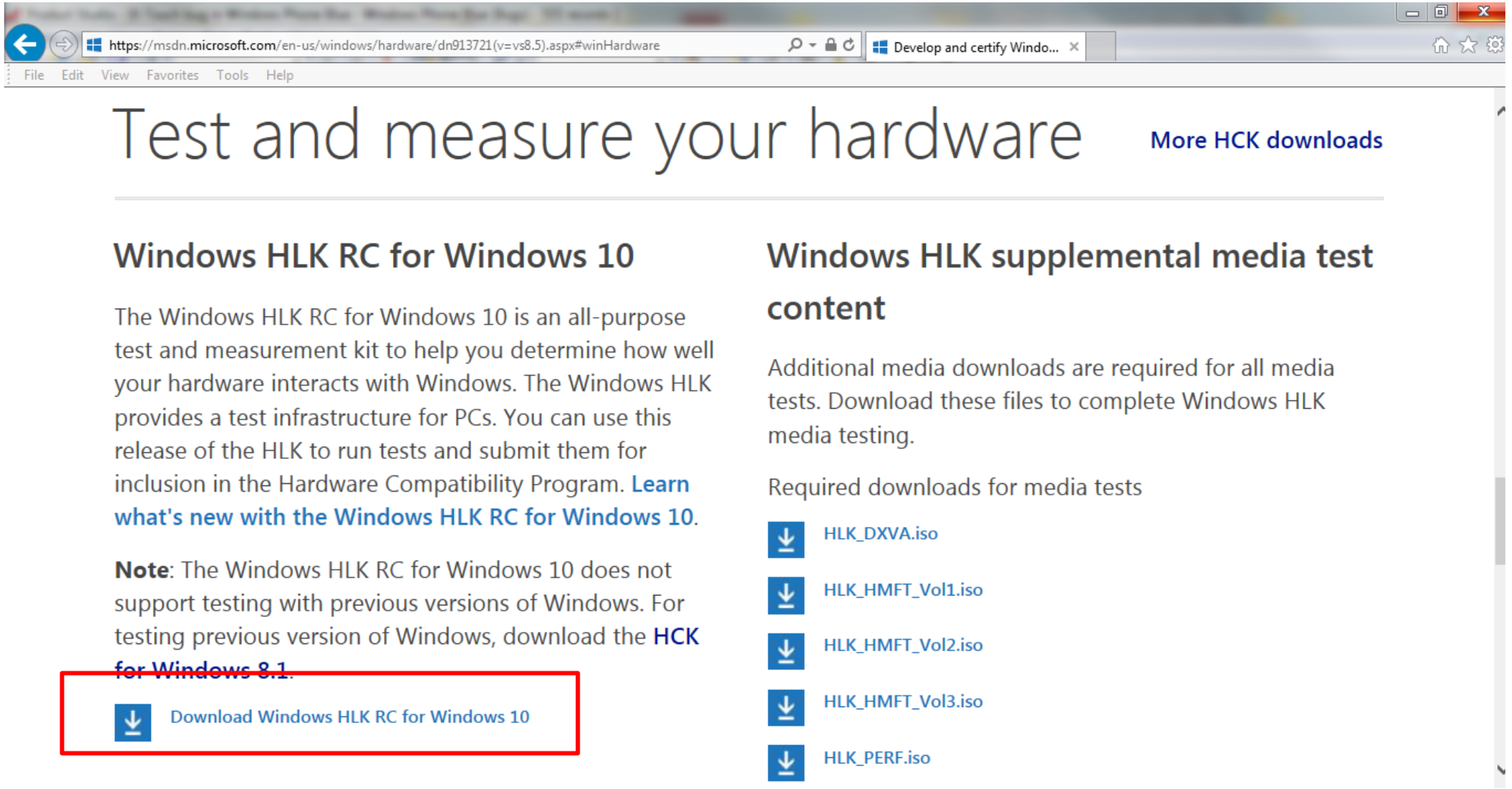
Then, download tools that will help you:

Build, test, debug, and deploy drivers

Test and measure your hardware running Windows

Customize, assess, and deploy Windows on your hardware

Call to action – Download the HLK



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