Session Agenda

- Input Platform Investment
- Touch and Precision Touchpad (PTP)
  - Features and Requirements
- Compatibility Program
- Call to Action
- Resources - Implementation and Validation Guides
Windows 10 Input Platform Investment
Windows 10 powers a huge range of hardware...
Input Platform – One Platform Across All Devices

• Universal Apps get input handling automatically with framework & built-in controls

• Ultimate simplicity with Input Platform Convergence across all devices
Universal Application – One Input Platform

• One app, one API for all versions of Win10 and all form factors
• Touchpad, Touch, Mouse & Keyboard behave the same on all form factors and in UAP applications
• Simple to add Ink support to UAP application with DirectInk
Input Driver Model

- **RIM.sys**
- **HIDClass.sys**
- **HIDUSB.sys**
- **HIDBTH.sys**
- **HIDI2C.sys**
- **Touchpad HID Mini-Port**
- **Touch HID Mini-Port**
- **Pen HID Mini-Port**
- **SPBCx**
- **USB.sys**

**Drivers and Controllers**
- GPIO Controller Driver
- I²C Controller Driver
- SPI Controller Driver

**Input Devices**
- Mouse
- Keyboard
- Precision Touchpad
- Touch
- Pen

**Inbox Components**
- Planned Inbox Convergence Point
- Existing Inbox Component
- IHV Provided
- SiV Provided

**HID Compliant Input Devices**
Our Goals for Windows 10

• Amazing input experience on all Windows devices

• Easier than ever to build input devices for Windows

• Seamless Upgrade and devices are kept up to date
Windows 8/8.1 Touch is AWESOME!

• Windows 8 set the bar for natural and smooth touch

• Modern apps designed for direct touch interactions

• Rich platform APIs across modern and desktop

• Great hardware solutions!
Windows 10 - Awesome Touch Even Better!

- Desktop touch experience are even better

- Universal applications have automatic support for touch, it ‘just works’ across all devices and SKUs!

- Low level platform support allows hardware to interface with Windows the same way
Touch Friendly Taskbar

Without Touch

With Touch: More space between icons
Touch Friendly Controls

Windows 8

Windows 10
Touch Friendly Context Menu System

Windows 8

Mouse & Touch

Windows 10

Mouse

Touch
New Touch Swipe Gestures
We’ve relaxed requirements on how the digitizer should perform around screen edges to support a broader range of hardware!

Edge gestures on all four sides of the screen provide quick access to important system UI in Windows 10.
Left Edge Swipe: Task View

Windows 8.1

Bring out the last-used app or the list of most recently used apps (Switch List).

Windows 10

Bring up a grid of most recently used apps (Task View).
Right Edge Swipe: Action Center

Windows 8.1

Bring up the Charms Bar, which includes commonly used system settings.

Windows 10

Bring up Action Center, which shows notifications and commonly used system settings.
Top Edge Swipe: Multitasking

Windows 8.1
Bring up the app commands (short swipe) or snap/close an app (long swipe).

Windows 10
Bring up a hidden title bar (short swipe) or snap/close an app in Tablet Mode (long swipe).
Windows 8.1

Bring up app commands.

Windows 10

Bring up the taskbar when an app is full screen.
Continuum
Productive Tablets and Flexible 2-in-1s
Continuum Shines on 2-in-1s and Tablets

**Tablets**
Pure tablets and devices that can dock to external monitor + keyboard + mouse.

**Detachables**
Tablet-like devices with custom-designed detachable keyboards.

**Convertibles**
Laptop-like devices with keyboards that fold or swivel away.
Windows 8.1

Win32 Apps

Desktop Environment

Windows Store Apps

Immersive Environment
Windows 10

Win32 Apps

Windows Store Apps

Desktop Environment

Tablet Mode
Introducing Tablet Mode

A new UI mode designed for tablets and touch-first usage:

1. Beautiful, touch-optimized Start screen
2. Immersive, adaptable Windows Store apps
3. Full support for Win32 apps
4. Lightweight tablet taskbar with global back button
5. Lightweight window management model
6. Auto-invoking touch keyboard
Entering and Exiting Tablet Mode

User-Initiated

Users can manually enter and exit Tablet Mode on any touch device through Action Center.

Hardware-Suggested

The system can automatically prompt users to enter and exit Tablet Mode when an appropriate hardware event occurs.
<table>
<thead>
<tr>
<th>Attribute</th>
<th>Windows 10 Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>HID Compliance</td>
<td>Required</td>
</tr>
<tr>
<td>Ghost Points</td>
<td>No ghost contacts are reported</td>
</tr>
<tr>
<td>Accuracy</td>
<td>(\leq +/- 1\text{mm} \text{ (outside 3.5mm from edges)})  (\leq +/- 2\text{mm} \text{ (within 3.5mm of all edges)})</td>
</tr>
<tr>
<td>Move Latency</td>
<td>For &lt;7”, (\leq 35\text{ms}), For (\geq 7)””, (\leq 25\text{ms})</td>
</tr>
<tr>
<td>Down Latency (Active)</td>
<td>(\leq 35\text{ms})</td>
</tr>
<tr>
<td>Down Latency (Idle)</td>
<td>(\leq 150\text{ms})</td>
</tr>
<tr>
<td>Cold Boot Latency</td>
<td>Immediately responsive once the display is active</td>
</tr>
<tr>
<td>Resolution</td>
<td>(\geq) Native display resolution or greater</td>
</tr>
</tbody>
</table>
## Easier Win10 Touch Requirements for Compatibility

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Windows 10 Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linearity (Moving jitter)</td>
<td>&lt;= +/- 1mm (outside 3.5mm from edges)</td>
</tr>
<tr>
<td></td>
<td>&lt;= +/- 2mm (within 3.5mm of all edges)</td>
</tr>
<tr>
<td>Stationary Jitter</td>
<td>&lt;= 0.5mm</td>
</tr>
<tr>
<td>Finger Separation</td>
<td>&lt;= 8mm [Edge to Edge]</td>
</tr>
<tr>
<td>Minimum Simultaneous Contacts</td>
<td>&gt;= 5</td>
</tr>
<tr>
<td>Buffering</td>
<td>&gt;= 100ms of data</td>
</tr>
<tr>
<td>Report Rate</td>
<td>&gt;= Display Refresh Rate</td>
</tr>
<tr>
<td></td>
<td>&lt;= 250Hz</td>
</tr>
<tr>
<td>Custom Gestures</td>
<td>Custom gestures are not allowed</td>
</tr>
<tr>
<td>Third party drivers</td>
<td>Desktop: Third party drivers prohibited</td>
</tr>
<tr>
<td></td>
<td>Mobile: Third party drivers allowed</td>
</tr>
</tbody>
</table>
Precision Touchpad
Precision Touchpad

PTP is an implementation program that marries the best of breed partner clickpads or forcepads and their compliant firmware with Windows 8.1 or 10 investments in gesture recognition, accidental activation prevention, direct manipulation and a modern control panel to deliver a HID compliant Touchpad experience that will result in delighting our customers.
Why are Precision Touchpads the Best?

• Settings and gestures that are familiar, useful and responsive
• Accidental Activation Prevention keeps users on-target/on-task
• Windows modern control panel to refine their experience
• HID compliant firmware solutions always available & up to date
• Hardware compatibility program that ensures a great experience
A Principled Approach

**Touchpads are consistently great and are the best precision pointing device**

- The best precision input device in Windows
- Fast and responsive
- Consistent and reliable
The Best Precision Input Device

Best in class experience

• Fundamental device requirements ensure hardware with superior accuracy, latency, and report rate

• An optimized experience for mouse movement & panning

• Touch excels at quick input and direct manipulation, and touchpads offer unparalleled precision
Fast and Responsive

• Build on Windows’ unique platform assets
  • Get the same buttery smooth, stick to your finger panning and zooming experience

• Shell integration in Windows 10 to support new multifinger touchpad gestures
  • Three and four finger taps and slides
  • Removal of edge gestures
Consistent and Reliable

Consistent and reliable experience for all Windows devices

- Gesture experience is discoverable
- Accidental activation prevention instills confidence in multi-modal input
- Inclusion in the modern control panel
- Invest in fundamentals – performance, battery life, security
- Firmware without 3rd party driver – always works, always up to date

Try the latest touchpad gestures

We’ve made a few changes and improvements to gestures. You’ll need a precision touchpad to use them all—otherwise, experiment to see which ones work on your PC.

To find out if your PC has a precision touchpad, go to Start > Settings > Devices, and then select Mouse and touchpad.

Once you’re all set, try some of the new gestures we’ve added:

- Swipe three fingers up to open task view and see all your open apps.
- Swipe three fingers down to show the desktop.
- Swipe three fingers either left or right to switch between your open apps. Slide your fingers slowly across the touchpad to flip through them all.
Control Panel Options

Touchpad

Your PC has a precision touchpad.

Touchpad
-On

Leave touchpad on when a mouse is connected
-On

No mouse connected

Reverse scrolling direction
-Off

To help prevent the cursor from accidentally moving while you type, turn off taps or change the delay before taps work.

Medium delay

Change the cursor speed

Allow double-tap and drag
-On

Use a two finger tap for right click
-On

Use a two finger drag to scroll
-On

Use a two finger pinch to zoom
-On

Choose what to do with a three finger tap

Search with Cortana

Choose what to use with three finger drags and slides

Switching apps
Precision Touchpad Gestures
We’ve significantly reduced the cost of Precision Touchpads and replaced edge gestures with new, easier-to-use multi-finger gestures.

1-Finger
- Left Click
- Double-Click
- Move Cursor
- Tap + Slide

2-Finger
- Right Click
- Scroll / Pan
- Pinch / Zoom

3-Finger
- Invoke Cortana
- Multitasking Gestures

4-Finger
- Invoke Action Center

4-finger slide interactions are currently reserved for future use.
By implementing Precision Touchpad you can instantly make your customers more efficient and productive!
Get the Windows 10 PTP Experience

<table>
<thead>
<tr>
<th>Feature</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accuracy</td>
<td>(\leq +/- 2\text{mm})</td>
</tr>
<tr>
<td>Stationary Jitter</td>
<td>(\leq +/- 2\text{mm}) for 2+ contacts</td>
</tr>
<tr>
<td>Report Rate</td>
<td>(\geq 125\text{Hz} ) (single contact)</td>
</tr>
<tr>
<td></td>
<td>(\geq \text{Display Refresh Rate} + 10\text{Hz}) for 2+ fingers</td>
</tr>
<tr>
<td>Finger Separation</td>
<td>(\leq 8\text{mm (edge to edge)})</td>
</tr>
<tr>
<td>Contact Count</td>
<td>3 – 5 (4+ recommended)</td>
</tr>
<tr>
<td>Down Latency</td>
<td>(\leq 35\text{ms})</td>
</tr>
<tr>
<td>Moving Latency</td>
<td>(\leq 70\text{ms})</td>
</tr>
<tr>
<td>Resolution</td>
<td>(\geq 300\text{DPI})</td>
</tr>
</tbody>
</table>
## Touchpad Experience Comparisons on Win10

<table>
<thead>
<tr>
<th></th>
<th>Firmware PTP on 8.1 Requirements</th>
<th>Firmware PTP on Win10 Requirements</th>
<th>Driver PTP on Win10 Requirements</th>
<th>Legacy Touchpad</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Precise pointing</strong></td>
<td>Improved accuracy</td>
<td>Improved accuracy</td>
<td>Accuracy dependent upon 3rd party driver</td>
<td>OK</td>
</tr>
<tr>
<td><strong>Direct Manipulation for performance and experience</strong></td>
<td>Yes (pan/zoom)</td>
<td>Yes (pan/zoom)</td>
<td>Yes (pan/zoom)</td>
<td>NO</td>
</tr>
<tr>
<td><strong>Shell integrated productivity gestures</strong></td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>NO</td>
</tr>
<tr>
<td><strong>Always working, up to date, secure</strong></td>
<td>Yes</td>
<td>Yes</td>
<td>Only if driver published on WU</td>
<td>Yes with inbox driver, no with 3rd party driver</td>
</tr>
<tr>
<td><strong>Accidental Activation</strong></td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Limited or 3rd party drivers</td>
</tr>
<tr>
<td><strong>Touchpad control</strong></td>
<td>Expanded Modern Settings</td>
<td>Expanded Modern Settings</td>
<td>Expanded Modern Settings</td>
<td>Hot key, 3rd party driver</td>
</tr>
<tr>
<td><strong>Certification program ensuring the user experience</strong></td>
<td>Self-test PTPHQA program equivalent to THQA for touch</td>
<td>Compatibility program available to determine approved parts</td>
<td>Compatibility program available to determine approved parts</td>
<td>Minimal</td>
</tr>
<tr>
<td><strong>Custom Gestures</strong></td>
<td>Yes, sample driver available</td>
<td>Yes, sample driver available</td>
<td>Yes, sample driver available</td>
<td>No: All gestures are implemented by developer</td>
</tr>
<tr>
<td><strong>Compatible as PTP for Win8.1 Downgrade</strong></td>
<td>Yes</td>
<td>Hardware dependent – experience testing required</td>
<td>Hardware dependent – experience testing required</td>
<td>N/A</td>
</tr>
</tbody>
</table>
Compatibility Program
Windows 10 Hardware Lab Kit (HLK)

- Windows HLK is specifically designed for Windows 10
  - THQA and PTPHQA are no longer required
  - Touch and PTP devices tested for compatibility in Windows 10 may **NOT** work with Windows 8.1
  - Customization drivers on PTP do **NOT** apply to Windows 8.1 certified systems

- Windows Hardware Certification Kit (WHCK) 2.1 specifically designed for Windows 8.1
  - Touch and PTP devices certified for Windows 8.1 with WHCK 2.1 can be fast track to be Windows 10 Compatible
Windows As A Service

• Upgrade Customer Satisfaction Program (UCS)
  • No more major media releases XP/Vista/7/8 etc...
  • Updates are similar to 8->8.1 upgrade

• What this means for you
  • Ensure that your hardware is able to withstand more frequent servicing events
  • Invest in HID compliant firmware solutions!
Call to Action

• Procure HID compliant firmware solutions that use inbox driver

• Deliver great hardware by meeting HLK requirements to ensure a great Win 10 Touch and PTP experience

• Participate & support the UCS Program
Resources

• Implementation and validation guides available
  http://go.microsoft.com/fwlink/?LinkId=528890

• Windows 10 Compatibility requirements

• Windows 10 Hardware Dev Center
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