



# Ultrabooks™ Broaden Software Usage Models on Touch-Capable Mobile Devices

Ultrabook™ devices combine intuitive, dynamic touch interfaces with large HD displays, enabling software makers to deliver extraordinary user experiences. The 3rd generation Intel® Core™ processor family provides the performance and responsiveness to support a broad range of demanding usage models.

Software makers can innovate freely when they target Ultrabook devices, building compelling offerings based on compute-intensive workloads that range from enterprise apps to video editing and high-end gaming. The visual enhancements built into the platform further enhance the user experience with crisp images, rich colors, and lifelike depth for video and audio.

Microsoft Windows\* 8 complements the hardware features and capabilities built into the Ultrabook platform with robust touch enablement built into both the traditional desktop interface and the new Windows 8 UI. The OS delivers excellent responsiveness to touch input, a rich body of tools support Ultrabook software development, and the new Windows store provides a ready-made online global distribution channel.

Ultrabooks also have built-in capabilities to extend the user experience beyond the device itself. Intel® Wireless Display (Intel® WiDi) allows content to be streamed from the Ultrabook to an HDTV, redefining the user experience for media content. The robust set of mature device drivers available for Windows and Intel® architecture also makes using the full universe of peripherals seamless, right out of the box.

This article illustrates usage models that application architects and other decision makers at software companies in both the business and consumer markets can deliver by means of the large touchscreens on Ultrabook devices. It is part of a series of papers that explore key considerations in taking advantage of the Ultrabook market segment with software:

- [Harnessing the Ultrabook™ Experience to Sell More Applications](#)
- [Optimizing the Cost-Effectiveness of Software Development for Ultrabooks™](#)
- [The Winning Combination of Keyboard and Touch for Ultrabooks™](#)
- [Ultrabooks™ Broaden Software Usage Models on Touch-Capable Mobile Devices](#)
- [Sensors Deliver New Opportunities for Ultrabook™ Software Innovation](#)

## Ultrabook Devices Support Unparalleled User Experience Innovation

Software makers have the opportunity to deliver user experiences on Ultrabook devices that can distinguish their offerings within their market segments. Large touch-enabled displays provide the basis for interactions that support demanding applications based on the performance and related capabilities of the Ultrabook platform. Responsiveness features complement touch functionality to make the computing environment highly enjoyable, and built-in visuals<sup>1</sup> elevate the Ultrabook visual experience.

When users take their Ultrabooks with them throughout their day, Intel® Rapid Start Technology<sup>2</sup> transitions the device from hibernate to a fully active state in just five to six seconds. That capability is complemented by Intel® Smart Connect Technology<sup>3</sup>, which periodically refreshes data from the Internet (such as email or social networks) during low-power states. Together, these features largely remove the limitations to usage models associated with powering the device up and down, so software can be a constant companion as the user makes his or her way through the day.

Ultrabooks deliver the performance needed to handle the full spectrum of computing tasks that software may demand, further expanding the capabilities available to software makers. Large-scale on-die resources include up to four processor cores (with Intel® Hyper-Threading Technology) and 8 MB cache, with the last-level cache shared between the processor and integrated graphics. Intel® Turbo Boost Technology<sup>4</sup> (available on select processors only) automatically raises the processor clock speed temporarily when additional performance is needed for workload peaks.

Ultrabooks directly benefit in terms of performance from the investments that most software makers have made in development for parallel Intel hardware architectures, using existing code bases, tools, and processes. The performance features built into the platform help Ultrabooks provide the computing power for application workloads that extend from general-purpose applications to graphics-intensive ones such as content creation and high-end games.

Ultrabooks also deliver extraordinary battery life, which makes the user experience even better. The processors are based on 22nm process technology, which enables small, densely packed components to operate with lower power requirements, as well as 3D Tri-gate transistors that operate at lower voltage and have less leakage than conventional transistors. Longer running times between charges further improve the user experience that software can provide on Ultrabooks.

Another performance feature of the advanced display capabilities built into Ultrabook devices is Intel® Advanced Vector Extensions (Intel® AVX). This instruction set can accelerate performance in image processing and graphical applications. This factor helps software makers extend their most demanding applications to the Ultrabook platform, with outstanding results from entertainment and media usages, but also to include scientific simulations, financial analytics, and 3D modeling. Learn more on the [Intel® Developer Zone Intel AVX page](#).

For insights about software development techniques to take advantage of the performance capabilities of the 3rd generation Intel Core processor, see the Intel® Developer Zone article, "[Performance Development for Ultrabook™ Devices using 3rd Generation Intel® Core™ Processor \(code-named Ivy Bridge\)](#)."

## **Built-in Visuals<sup>1</sup> Make Large Displays Come Alive**

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The large touch displays provided by Ultrabook devices enable applications to deliver HD visual content with sharp, crisp images and deep, rich color, so everything from games and video to medical images can be delivered with uncompromising quality. The visual technologies built into the 3rd generation Intel Core processor family enable Ultrabook devices to enhance the value of their large displays to application developers as they innovate around visual content.

### **Intel® Wireless Display (Intel® WiDi)<sup>5</sup>**

A connection technology that extends the display from an Ultrabook to an HDTV, Intel® WiDi provides support for up to 1080p high-def resolution and 5.1 multi-channel audio. Functioning similarly to an HDMI cable connected between the Ultrabook and the TV, Intel WiDi allows for innovative usage models that range from simple streaming of content to multi-tasking using a multiple-display configuration. Software makers can take advantage of Intel WiDi in their marketing efforts for media players and other applications to offer greatly enhanced display functionality, relative to conventional mobile screens. Learn more on the [Intel.com Intel WiDi page](#).

### **Intel® HD Graphics<sup>6</sup>**

With user expectations around the quality of visual content rising, many software developers are looking for ways to enhance the display capabilities of their applications. Intel has responded to that requirement by providing Intel® HD Graphics, built directly into the 3rd generation Intel Core processor family, as part of the Ultrabook platform. The integration of the graphics engine into the processor silicon reduces latency, so that gaming and other 3D experiences deliver amazing performance and stunning 3D visuals, without the need for a separate graphics card. Software makers can therefore push the limits of the graphics and video in their applications, knowing that Ultrabook users will get a user experience that meets or exceeds their expectations.

## Intel® Quick Sync Video

Using hardware acceleration for video encoding, Intel® Quick Sync video enables applications to deliver very fast functionality associated with creating and editing video, burning it onto DVDs or Blu-Ray\* discs, synchronizing it with other devices, and sharing it across networks or the Internet. Because applications enabled for Intel Quick Sync video are able to free the processor from handling these video conversion tasks, the processor is freed to perform other work, which allows the software to handle larger amounts of work at once.

That increase in speed directly benefits the user experience associated with software titles running on Ultrabooks, providing a simple approach to faster overall application performance. Developers interested in optimizing their applications for Intel Quick Sync Video can learn more from the [Intel® Media Software Developer Kit \(SDK\) web site](#).

## Intel® InTru™ 3D Technology

Software makers can add a new dimension to the viewing experiences their applications offer, using Intel® InTru™ 3D Technology. Ultrabook users can play games or watch other 3D content with Blu-Ray Stereo 3D\* playback using passive or active shutter 3D glasses. InTru 3D Technology by Intel in association with Dreamworks delivers 1080p full high-definition resolution on an HDTV over HDMI\* 1.4. Developers can use 3D display in their offerings as an attention-grabbing point of emphasis, helping build enthusiasm around their titles for the Ultrabook and differentiating themselves from other products in their market segments.

## Intel® Clear Video HD Technology

Software makers can take advantage of Intel® Clear Video HD Technology to deliver optimized HD video playback in their applications on Ultrabook devices. This capability built into the 3rd generation Intel Core processor family vastly improves video playback, delivering cleaner, sharper images, more natural, accurate, and vivid colors, and a clear and stable video picture. In particular, software makers benefit from the ability of Intel Clear Video HD Technology to reduce or eliminate variations in how colors are displayed, with adaptive contrast, skin-tone enhancements, and intelligent color space mapping.

## The Power of Pairing with Microsoft Windows 8

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Ultrabooks benefit dramatically from the collaboration between Microsoft and Intel during the development of Windows 8, which is part of many decades of co-engineering between the two companies to tune their products to bring out the best in each other. Application developers automatically benefit from the advantages this collaboration offers to the user experience, beginning with the OS being engineered explicitly for touch. In addition to the conventional desktop user interface, the new Windows 8 UI shown in Figure 1 represents a re-imagined approach to human-machine interaction that is at once fluid, intuitive, and powerful.



**Figure 1.** The Windows 8 New UI on an Ultrabook.

Software makers that design applications for use with the new UI benefit from its ability to respond immediately to touch input, which helps the user experience to be engaging and immersive, taking advantage of the Ultrabook's large touchscreen for direct manipulation of on-screen elements. Programmers can create interactions based on user gestures in addition to taps, such as stretching or pinching with two fingers to zoom in and out, as well as swiping from the edges of the screen to navigate through the application.

The Windows Store is an online digital distribution point for Windows 8 applications, including those built for the traditional desktop and the new Windows 8 UI. To support the creation of Windows Store apps, Microsoft now includes Blend, a design and development tool, in Visual Studio\* 2012. Blend provides a visual design surface and related tools for UI development, as shown in Figure 2, to streamline visually rich applications that take advantage of the advanced, large-scale, highly capable displays built into Ultrabooks.



Figure 2. Blend for Visual Studio 2012 (Source: Microsoft, <http://i.msdn.microsoft.com/dynimg/IC592898.png>).

## Development Resources that Help Build a Competitive Advantage

Software makers have a lot to gain from the free-of-charge resources available through the Intel Developer Zone Ultrabook Community. Extend the expertise of your development team to include best practices, tools, and techniques for the Ultrabook category.

Quickly grasping the new opportunities and implementing the skill sets required to take advantage of them helps make applications early to market so they can start building market segment share as soon as possible. A few resources from the community that may prove especially beneficial in driving excitement around your software offerings for Ultrabook devices include the following:

- [The Human Touch: Building Ultrabook™ Applications in a Post-PC Age](#) presents Intel research that investigates which application characteristics create the most compelling user experiences on Ultrabook devices.
- [User Interface Design Guidelines for Great Experience Design](#) introduces considerations for developers as they produce UIs that deliver outstanding user experiences.
- [Adding Touch Support to Desktop Applications for Ultrabook™ Running on Windows\\* 8](#) provides hands-on coding instructions that demonstrate how to touch-enable an application UI.
- [Developing Power Efficient Desktop Applications for Ultrabook™ on Windows\\* 8](#) is a developer how-to article with in-depth examination of techniques for power-related coding in .NET.
- [Re-imagining Apps for Ultrabook™ series](#) offers new ways of thinking and practical design advice that can help fuel innovation at software companies as they explore the new opportunities for Ultrabook devices.



Go set the world on fire:  
[www.intel.com/ultrabook](http://www.intel.com/ultrabook)

## About the Author



Matt Gillespie is an independent technology and business writer with a specialty in illuminating the real-world value of emerging hardware and software technologies, mostly working for the microprocessor industry. His previous work experience includes hands-on network IT at California Federal Bank, research writing at the University of California, Davis Center for Neuroscience, and equities writing at Morningstar Inc., the Chicago financial publisher. Matt studied physics and sculpture but eventually received a degree in English from the University of Illinois. You can reach him at [spanningtree-at-comcast-dot-net](mailto:spanningtree-at-comcast-dot-net).

- <sup>1</sup> Built-in visual features are not enabled on all PCs, and optimized software may be required. Check with your system manufacturer. Learn more at [www.intel.com/go/biv](http://www.intel.com/go/biv).
- <sup>2</sup> Requires a select Intel® processor, Intel® software and BIOS update, and an Intel® Solid-State Drive (Intel® SSD). Depending on system configuration, your results may vary. Contact your system manufacturer for more information.
- <sup>3</sup> Requires a select Intel® processor, Intel® software and BIOS update, Intel® wireless adapter, and Internet connectivity. Solid-state memory or drive equivalent may be required. Depending on system configuration, your results may vary. Contact your system manufacturer for more information.
- <sup>4</sup> Requires a system with Intel® Turbo Boost Technology. Intel Turbo Boost Technology and Intel Turbo Boost Technology 2.0 are only available on select Intel® processors. Consult your PC manufacturer. Performance varies depending on hardware, software, and system configuration. For more information, visit [www.intel.com/go/turbo](http://www.intel.com/go/turbo).
- <sup>5</sup> Requires an Intel® Wireless Display-enabled system, compatible adapter, and TV. 1080p and Blu-ray\* or other protected content playback only available on 2nd or 3rd generation Intel® Core™ processor-based PCs with built-in visuals enabled, a compatible adapter and media player, and supporting Intel® WiDi software and graphics driver installed. Consult your PC manufacturer. For more information, see [www.intel.com/go/widi](http://www.intel.com/go/widi).
- <sup>6</sup> Intel® HD Graphics is available on select models of the 2010 Intel® Core™ processor and 2nd Generation Intel® Core™ processor families.

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