

Welcome

How are we evolving Windows? There's so much on everyone's mind here today when it comes to PCs, which we now refer to as devices more often than not. When we talk about PCs we are talking about devices—just like everyone, we see these as converging and all we're really talking about is if devices have different size screens, used primarily for different scenarios or not, and what characteristics they have in hardware and software. We know for sure that everyone wants everything—the power and breadth of software for today's laptop, the consumer electronics behavior of a mobile phone, and the information consumption scenarios we see in a new generation of tablets.

How will Windows come to define this next generation of computing? Let's talk about this forward looking view by first looking back a bit.

The Release of Windows 7

Briefly, it is worth recapping how far we have come since January 2009. In January 2009 we released the Beta of Windows 7. By the time we had released the beta, two million developers had installed the Developer Preview of Windows 7. Within a few weeks several million people in a dozen countries had successfully installed and were using Windows 7. So regardless of the views of Windows Vista, Microsoft "rebounded" with a new product and built on the core assets of the franchise and that new product was widely praised.

When we talk about these developments internally we talk about this as "the resiliency of Windows"—the power of great software, investment for the long term, recognition of what needs to improve, and robust engineering continue to be the cornerstone of how we deliver Windows.

Perhaps one of the most defining moments during the development of Windows 7 was the introduction of the "netbook" PC. These low priced PCs were originally introduced as alternatives to Windows-based PCs. Most probably don't recall, but the first of these devices, and the excitement at Computex 2007/2008, was based on the fact that these devices were alternatives to Windows PCs. They ran variants of Linux, had CPUs with less processing power, and used less RAM and disk drive space. The wave of Netbooks that followed all talked about the need to run Linux because Windows was too big and had too many unnecessary features for "occasional web browsing" and "lightweight productivity".

Almost immediately customers began to see the limitations of a device that did not run Windows. Whether it was printing, using digital cameras, running games, using their favorite applications, or even using iTunes, the limitations were as varied as the customer base. Within a short time, many were buying the Linux devices and installing Windows XP. And subsequently Microsoft began offering Windows XP to Netbook manufacturers. It was a short while until Windows XP came to be the preferred Operating System for Netbooks.

While this might have been news to those touting alternatives or claiming that a new solution for all of today's needs exists, we were informed by the understanding of how consumers really use their PCs.

The telemetry of real world usage and the data we compiled (anonymously, privately, and opt-in) told us a very different picture of PC usage than was being talked about as “lightweight productivity and browsing”. The reality is that people use hundreds of thousands of unique Windows programs and while people browse a large amount that only accounts for half the average usage time on PCs—and that time has been additive to PC usage over the years, not a replacement.

In November 2008, we introduced the first developer previews of Windows 7. At the introduction we showed Windows 7 running on a first generation Netbook—complete with reduced RAM and disk drive requirements. In addition, the work with the hardware ecosystem to provide all the required drivers made it easy to cleanly install Windows 7 on the current generation of Netbooks. At Computex 2009 that Spring, Netbooks were shown from all major manufacturers running the pre-release of Windows 7.

While there are many other positive stories contributing to well over 200 million licenses of Windows 7 being sold in the first year (released in October 2009), the seeds for this most successful product launch were sown with an attention to the new form factors and the desire customers had to bring forward the value they see in Windows. In the first year of Windows 7, approximately 30 million Netbooks were sold with Windows 7 preinstalled.

The Introduction of Slates

Of course innovation and evolution, or perhaps revolution, never stops in the world of computing devices. In January of 2010, Apple demonstrated the iPad—a slate form factor built on the iPhone, now iOS, operating system. The device was available in the US in April 2010, about 8 months ago. Since that time about 1.5 million iPads a month have been sold (Bernstein) or about 18 million a year. Many have said this is cannibalizing Netbook sales. It is worth noting that in this timeframe, our industry will sell well over 350 million PCs (exclusive of servers based on Windows) of all form factors from 7" laptops to high end desktop machines—for all scenarios imaginable.

We've also seen, sort of, the announcement of slate form factors devices based on Google's Android mobile OS. One device has been released though many more have been announced and subsequently put on hold. Whether these come to market and sell many units or not does not change the dialog with respect to how Windows and Windows devices are viewed in today's marketplace.

Putting aside that debate, many have asked "where's Windows" in this new form factor. Windows, of course, has had slates, which we called TabletPCs, since the introduction of Windows XP TabletPC edition in 2002. We have had a decidedly different focus—rather than entertainment and media consumption, Windows focused more on productivity and bringing the power of pen and ink the PC. While many valued these scenarios and many businesses built vertical applications around this new OS infrastructure, there was hardly a mass market acceptance. But when it comes to new form factors, one also has to keep in mind that what comes first doesn't always come to define a category or be the only entry in what might ultimately be a full line of products. Netbooks were originally defined by small capacity SSD drives, which quickly gave way to large capacity 1.3" drives as consumers valued large storage more than absolute minimum of storage even if it was a new technology. The screen size and

resolution of a device is often a product of what is available at the time—the iPad at 1024x768 is neither well-tuned to the web nor movies/books. There is clearly room for more of a variety, if not a more optimal screen size.

So to many, Microsoft was missing the boat on this new wave of innovation. Was this a miss in the price of the tablet PC? Was it a miss in the focus on productivity over consumption? Was it a miss in the focus on business over consumers? Was it a miss in the lack of a specific hardware specification versus the diversity of the PC ecosystem? All of these have been suggested as reasons that Microsoft was caught off guard or even missed the boat.

Would it be possible to "recover" from this "misstep"?

Whether one takes all of these issues or specific ones, there's a shift going on in the marketplace. There's an overall consumerization of the computing experience—more devices from phones to PCs to servers are taking on the characteristics of the CE industry with more hardware/software integration, a more controlled environment, and of course simplicity and reliability to name a few characteristics. We see this consumerization of computing, for example, as it snuck up on all of us as laptops moved from black, square, and large to sleek, colorful, and personalized.

The Resiliency of Windows Over time

The challenge of a changing landscape is not new to Windows—to the Windows franchise. The changing demands of customers with respect to technology, the dramatic improvements in the hardware ecosystem, and of course the innovation in software have been constant factors in the evolution of Windows since it was first introduced in 1985 (having just passed the 25th anniversary of the launch of Windows at COMDEX 1995).

Windows has made so many transitions through the changing technology and consumer landscapes that it is far more the rule than the exception. Windows has proven to be remarkably resilient because of the openness of the APIs provided to developers, the focus on quality and support we provide consumers, and the connection to a vast array of ecosystem partners that make so many things possible. It is worth looking at a few of the major milestones in the history of Windows:

- GUI transition – Windows itself was the product of a transition that many doubted could be made. Could an entire OS be built upon the "shaky" underpinnings of MS-DOS? Of course a remarkable amount of work went into the technology across the ecosystem, such support for the 386 microprocessor, that made Windows 3.0 such a watershed product. And yet underlying that you could still bring forward your investments in all those applications and peripherals from DOS.
- 32-bit transition – The transition to 32-bits was one that required a vast amount of change and brought with it the introduction of "plug and play" and the ability to run more sophisticated graphical applications and games of unrivaled qualities. The introduction of Windows 95 was of course a watershed moment for our whole industry. While in hindsight it looks as though it was a sure thing, many at the time proclaimed it would be technically impossible.

- Internet transition – Immediately after the release of Windows 95, the conventional wisdom quickly became that Windows would be replaced by a browser. Yet today few would argue with the fact that the presence of Windows—the support for networking, the introduction of graphical web browsers on Windows, as well as the openness of the platform all contributed to the transformation of the world of information technology. And of course today we're seeing how the powerful graphics of Windows are bringing standards-based HTML5 to life in unprecedented ways.
- Server Scale – As we continued to evolve the client (workstation) OS we were using this same OS foundation to power at the high end and low end. Windows Embedded, not often talked about at the consumer level, is used in millions of devices around the world. And of course at the server we now scale this same “client” OS to hundreds of computing cores and terabytes of storage. And along the way we created this OS for multiple CPU architectures driven by the demands of server computing (Alpha, MIPS, Itanium, and of course 64-bit). At each step most people believed that such flexibility was neither prudent nor possible.
- Security and Reliability – Through all of the above transitions, there was an undercurrent that Windows was “aging” and that it could not transition to modern computing needs of much larger memory architectures, multi-core OS support, and the needs for deeper security and reliability. The introduction of Windows XP was a milestone in bringing our enterprise server and workstation OS to mainstream consumers en masse. Ironically, at the introduction of Windows XP many thought we had reached too far and that the OS was more than people would need. Yet as time would tell, the stickiness of the OS has been remarkable—this is due at least in part to all the qualities that have come to define Windows including the breadth of software, developers, and ecosystem support.

The resiliency of Windows is not something borne out of a business need to maintain Windows, but is in fact an asset that Windows has. The flexibility of software and the ability of software to bring forward investments from one generation to another are amazing assets. With literally millions of applications and a billion people familiar with Windows, building on that resiliency is the cornerstone of how we bring the product forward.

As one looks at the reviews of slates, there are some obvious consistent comments. Nearly universally customers express the desire to add functionality already present in PCs to these slates—whether it is productivity, media management and editing, peripheral support (like printing), multi-tasking, or even just a keyboard.

With each new release of Windows we look at fundamental, ne architectural, changes that move the product forward. At each step, there have always been critics that say “throw it out and start over” and to them we basically say that it is not about throwing out Windows, but about responsibly bringing forward literally trillions of dollars of investment and associated knowledge.

Competitively some ask if Microsoft can “catch up”? We actually ask ourselves if the competition can catch up to Windows. We can revolutionize Windows as we have in the past to bring forward the technology and scenarios customers clearly value as fast or even faster than our competitors can just go

back and add those same things (differently) all over again. The beauty of software is that it can be re-written, re-architected, and morphed to support new scenarios. There's a lot to be said from starting from a strong base and honing it rather than working to add things all over again.

The Innovations on the Way

Today we want to talk about where we are taking Windows. We want to talk about how Microsoft will continue to build on the resiliency of Windows and bring forward the investments people have in Windows. Today's announcements are specifically about the evolution of modern computing with respect to three main trends:

- Touch hardware of all shapes and sizes
- Microprocessors and the introduction of System on a Chip (SOC) by the ecosystem
- Web-based programming using HTML5

The iPhone and now Windows Phone 7 have come to define the introduction of extremely responsive touch hardware to the portable device. The iPad brought this to a larger screen. This type of interaction has come to set the standard for how people would like interact in many scenarios with their "PC".

Today we want to show the next generation of the Surface computer. The Surface was a table-sized Windows PC introduced in the Spring of 2007 (again another example of being early with a technology). The key innovations in Surface were around the delivery of a new generation of touch hardware for large form factor displays.

Surface v2 takes this to a new level by creating a Surface flat panel display. This 40" diagonal, 4" thick panel is a complete Windows 7 PC. In addition, it exposes APIs for developers to build purpose-built applications for the form factor. There's a great deal of forward looking learning that takes place by delivering a commercialized product and transitioning it to consumers (much the way the auto industry learns from professional racing).

The surface shows the types of technologies we can build on with Windows 7 and working closely with hardware to deliver an amazing experience. We want to make this type of interaction more mainstream and make sure that the notion of super high quality touch interaction does not find itself limited to "big phones".

The software environment is changing as well with a vast amount of industry focus on developing in HTML5. HTML5 forming the basis of a developer API for creating applications is a huge advantage for developers who want standards-based tools and techniques. With Internet Explorer 9 we have focused on delivering world-leaded HTML5 support, collaborating with industry standards bodies, and making sure that the Windows platform provides the best underlying support for delivering the fastest and most robust browsing experience. These innovations play a critical role in how we will move forward as they form the developer foundation for delivering a great consumer-oriented experience.

Many have said some of the major innovations with the new slate form factors are that they are built on a different underlying hardware that supports lower power consumption and better connection to the wireless networks that are everywhere. There's a trend in the chipset world that underlies these capabilities and it is the role of Moore's law in how those capabilities have come to be realized in phones.

Of course today's mobile phones and devices have processing power far in excess of Windows XP-based hardware (and recall that netbooks run both Windows XP and Windows 7) with commonly 1GB of memory, multi-core processors, and hardware accelerated graphics far in excess of Windows XP machines. What makes them so efficient is both hardware and software. At the software level there are many things in the OS that work to reduce battery consumption and provide features such as fast resume and always-on. At the hardware level the major change is the incorporation of more and more features into a single chip—this system on a chip (or SOC) reduces battery consumption and size of the overall device. SOCs represent a major shift in the realization of devices.

What we are going to show today is how Windows is preparing for the forthcoming generation of SOC hardware and how Windows will once again demonstrate a resiliency that allows it to not just make a transition, but come to define the transition to a new generation of computing devices.

First, the most important thing to show in a new generation of devices is that we also embrace the new expectations customers have regarding the fundamentals of operation. There are a few four things we want to show today that we are well into the development of for Windows:

- Fast resume
- Reduced power consumption
- Rejuvenating your device
- High-quality video playing through HDMI
- Printing
- SD card or other peripheral
- Browsing the HTML5 web

Of course these are just some of the underpinnings and basic requirements for Windows to be part of a new wave of devices. What is interesting about these demonstrations we just showed is that these are running on the newest SOC from Intel. This system, code named "*somethingfield*" (or *somethingtrail*) has a total power consumption of only X watts of power. This along with the work done in Windows to reduce power means that devices built with Windows on this system will see significantly improved battery life.

This shows how we are evolving the core of Windows to be far more modern and forward looking. Let's take a look at another system. Here you see this looks like Windows and has all the capabilities of Windows. We can even launch Word and Excel and show those both multi-tasking and projecting on an external monitor at full resolution. I can even put in an SD card and browse my photos.

What is remarkable about this demonstration is that it is running on an entirely new chipset architecture—this is an nVidia TEGRA SOC. This SOC uses a totally different instruction set from the Intel SOC—an instruction set developed by ARM Holdings. Yet the capabilities of Windows are all there. We're running this demonstration on this board (hold up board attached to plywood) and this is all native Windows—no emulation, no virtual machines, just Windows.

Of course we know everyone wants to know much more specifically about what is next for Windows—features, dates, and so on. Today we wanted to show you the work we have done in the time since Windows 7 released and rest assured there is much more to show. We're focused on the engineering and opportunities the SOC changes will bring. This call to action for the ecosystem of hardware partners is our first step in bringing a new generation of Windows to the market.

What's Next

We've talked about the changes taking place in our industry right now and how through an historical lens Windows has shown flexibility, adaptability, and resiliency. We are focused on bringing Windows into a new age of consumer electronics with new types of hardware than enable new scenarios.

Windows is preparing for the forthcoming generation of SOC hardware and how Windows will once again demonstrate a resiliency that allows it to not just make a transition, but come to define the transition to a new generation of computing devices. Rather than one specialized device or one set of scenarios, we are going to bring Windows forward to see many devices, many form factors, vast amounts of software.

The advantages Windows brings are the ones that have brought success and customers to so many people in this room:

- Broad opportunities for developers
- Openness of the software platform
- Breadth of devices and peripherals

These will continue to be the hallmarks of Windows.