IDF 2011: Paul Otellini, President and Chief Executive Officer

Tuesday, September 13, 2011, 9:00 am – 10:00 am

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Female Voice: Ladies and gentlemen, please take your seats. Our program is about to begin. As a courtesy to our presenters as well as those around you, please silence all electronic devices, especially cell phones. Thank you for your cooperation. Ladies and gentlemen, please welcome Johan Jervoe.

Johan Jervoe: Wow. It's September again. Good morning and welcome to IDF 2011. We have a great agenda for you this year. Daily keynotes with the latest technologies for you to innovate around your next design; 220 hours of technical training sessions; over 250 demos from industry leaders; and then, of course, take the time and the advantage of networking with all the brilliant minds to answer questions and uncover new business opportunities.

As you can tell, I'm excited about the keynote lineup this year.

First, Paul Otellini, our president and CEO, will give us his vision on the future of computing. Tomorrow, we'll start the day with Mooly Eden. Mooly will expand on Intel's PC strategy and will show how Intel-architecture-based PC solutions are evolving to deliver outstanding user experiences anytime, anywhere. And then, on Thursday, Justin Rattner will show us technologies and compelling research that's going to accelerate our future. Also today, Intel's CIO, Diane Bryant, will be moderating and hosting a panel. She'll be joined by chief information security officers from several different industries,

including Intel's Malcolm Harkins, Patrick Hind from Salesforce, Sherry Ryan from Blue Shield, and Michael Wilson from McKesson. They'll provide the audience direct visibility into the rapidly-changing security landscape and the evolving approach to enterprise security. And, again, this year, we have assembled the top technical talent from Intel and across the entire industry.

IDF is truly an industry event. Over a third of our speakers are technical leaders from outside Intel, and then, of course, you will have the opportunity to interact with the most brilliant technical minds at Intel, our Intel fellows.

Let me thank our eleven gold and three silver sponsors who have partnered with us to share their vision. Do take the time to visit the sponsors in the exhibitor area in the technical showcase area. Our commitment to use technology for intelligent solutions to reduce impacts doesn't stop at the processor. IDF is working to create permanent changes and mesh our actions that reduces waste, conserve energy, and water. Actually, that's an IDF tradition. The team won an Imax Green Award last year, so join us this year in making IDF a green event again.

Two more things. First, we have prizes each day, and today it's a Netgear Push2TV HDTV adapter for Intel wireless display. All you have to do is complete your online session evaluation after each eligible session. Evaluations must be completed by 5:45 p.m. each day. And the winners will be notified by email.

And then tonight – tonight, join us for the IDF networking nightcap, from 8 o'clock to 11:30. Well, that didn't sound that exciting. So let me say this again. Let's party. Entertainment by superstar – yeah, okay, let's give it up – entertainment will be by superstar apl.de.ap for the Black Eyed Peas and DJ Elmo. Join us. The location is up here and in your pocket guide, and don't forget your IDF badge that's going to let you in. So thank you, good morning, and have a great IDF.

[Video plays.]

Female Voice: Ladies and gentlemen, please welcome Paul Otellini.

Paul Otellini: Good morning. Thank you. Thank you. Good morning and welcome to IDF 2011.

My theme today is about fundamental transformations. All of you in this room have been part of these changes. You've seen the dramatic evolution of computing and its impact on the world, from how we communicate with our kids and our colleagues to how we experience life's most memorable moments. The transformations in computing have unleashed wave after wave of business and personal productivity, and have provided billions of people with their first real opportunity to participate in the global economy. Yet, today, I would submit that we are still at the very early stages in the evolution of computing. We've just begun to see its impact on the course of history.

Two years ago, I described a major transformation taking place, a shift from the age of the personal computer to an age of personal computing, a view of the technology future that we at Intel call the compute continuum. It's a world where no single device sits at the center of the computing experience. Instead, it's the user who sits in the sweet spot wherever he or she goes. In this new environment, computing means a lot more than just computers. Computing is about experiences, about how we work, how we communicate, how we experience everyday life from shopping to driving to learning. And these experiences are available to us no matter which device we carry under our arm or in our pocket. The device is important, but this experience is more so. This is a transformation in computing and an incredible opportunity expansion for Intel and for everyone at this conference.

I'd like to start by talking about the transformations that got us to where we are today. I'll then share my thoughts about where this transformation in computing is taking us next and what the implications are for our industry. You know, we've always been a very innovative industry. Faster processors and better software unleashed our collective creativity and made us all more productive. The Internet and pervasive connectivity led to more devices and broader uses. And the growth of more sophisticated and capable clouds has enabled even more engaging experiences, anywhere, anytime, and on any device. The result of this evolution has been simply stunning. Forty-eight hours of video are uploaded to YouTube every minute. That's the equivalent of 160,000 full length feature films uploaded every week.

Social media has grown to billions of tweets and Facebook photos being shared every month. With more than 4 billion connected devices, it should be no surprise that the amount of data generated each year exceeds some 900 billion gigabytes. And the datacenter spend to manage, store, and serve all of this content is projected to be over $455 billion this year alone. Taken together, these trends are creating a very unprecedented demand for the most fundamental enabler of the digital age, the transistor.

At Intel, we've been driving this exponential growth in demand for transistors for a long time. The transition to mobility and pervasive connectivity led to the first significant uptick in the early 2000s, reaching 5 quintillion transistors by the end of 2005. The explosion of connected devices and the corresponding datacenter build-out grew transistor use to 80 quintillion between 2005 and 2010, a 15X increase in just five years. But the growth in transistors needed to manage, interpret, and store the data that we're going to create in the next five years will take us past the 1 sextillion mark. Now, for those of you not familiar with a sextillion, a sextillion is a thousand quintillions, or for the scientifically-minded out there, it's 10 to the 21st. That's a lot of transistors. And this makes the transistor usage over the last three decades look like a flat line by comparison.

As Gordon Moore predicted over four decades ago, the transistors enabled computers to become faster and more efficient and more pervasive each succeeding generation. But Moore's Law is not a

scientific principle. Rather, it's an observation of the pace of human innovation. And almost from the very moment of the implications of Moore's Law being posed and becoming understood, there's been speculation that this will someday end, approaching the limits of physics as many of the quotes behind me suggest. Yet each time the Intel engineers have found a way to innovate, past, around, and through perceived obstacles, using new materials, inventing new technologies along the way.

The most recent of these is the invention of the 3D transistor on Intel's breakthrough 22-nanometer process. This enabled new levels of performance and power efficiency across the computing spectrum. The world needs Moore's Law to continue and Intel is committed to make this happen. To that end I can tell you that we already have line of sight to our 14-nanometer technology. In fact, we are well into development of this technology and are beginning to build and to tool our factories to support it.

If Moore's Law has been the beat rate for innovation, Intel architecture has been the engine behind it. And just as computing has evolved, so has Intel architecture, providing the developers with a vibrant set of capabilities to innovate on.

In fact, this is one of the largest and most innovative communities in our industry. Over 14 million developers have harnessed the power of Intel architecture to create the largest installed base of consumer and commercial applications – 14 million. Together, this community has

enabled more than six million applications for Intel architecture. To put it in perspective, that's about ten times the number of apps in the largest app store in the world. The net result of all these innovations over the past decade has been astounding. Over a sixty-fold improvement in server performance powering the datacenters, over a 30X increase in client performance at one-half the energy consumption, and the pervasive growth of Intel architecture solutions across many applications in the embedded world. Of course, looking backwards, it's easy to see where computing has been, and that's the easy part. It's always much more challenging and perhaps more interesting to look into where we're going, though.

So, next, I'd like to shift and give you a glimpse into where Intel sees the evolution of computing headed and what we're going to do to enable it. Computing, as I've described, has become more diversified. As computing evolves, though, it must also adapt and enable what we believe are three essential capabilities in computing. The first is that computing must be engaging. The second is that it must be consistent. And third, above all, is that it must be secure. Let me start with engaging. Look around. We live in a visual world. We expect that our computing devices provide us with lifelike, engaging experiences. We expect that computing offers us new ways to explore, share, and connect with each other. And we expected our devices to engage with us as fast as we think.

The best experiences that we've got are those that are highly integrated. Moore's Law has made this possible through integration at

the chip level. And this has delivered increasingly sophisticated integrated capabilities, starting with math and multimedia functions, caches, multiple cores, and more recently graphics and video acceleration, all on single chips. And the reduced electronic footprint resulting from this integration has resulted in thinner, lighter, more mobile computers of all types. Even so, the full capabilities of the computer as the ultimate personal companion haven't really been realized until now. At Intel, we're enabling a new computing experience that is more engaging than ever. It's what we call Ultrabook.

The Ultrabook is our vision that delivers the most satisfying and complete computer experience. It's lighter, sleeker, lasts longer on a single charge, so you can carry it almost everywhere that you need it. It's more responsive and engaging, so you can unleash your creativity and potential without compromise. It'll be secure, so you can connect it without concern. And perhaps equally important, it will be affordable, such that it becomes the new norm for computing. Intel has defined a roadmap to deliver against this vision over the next few years. The first Ultrabooks are now shipping from several of our partners, and you'll see more and more as the holiday season this year approaches. We expect to transition next year to Ivy Bridge, Intel's first 22-nanometer processor, and we expect this transition will accelerate the trend of Ultrabook over the course of 2012.

Ivy Bridge is a very important achievement, and it brings a new level of engagement to the Ultrabook, and you'll hear more about that from

Mooly in his keynote tomorrow. But I wanted to go one generation beyond that and talk about Haswell. We've already completed the design of Intel's next-generation microprocessor, Haswell. Haswell was designed to enable a 30 percent reduction in connected standby power over the currently shipping notebooks using our second-generation core microprocessors. But we can do more than that. We can do much better than that. We've targeted Haswell's design not just for lower power, but we're architecting a system-level power management framework that's supported by efficient systems design throughout the ecosystem that has the opportunity to reduce the platform power by a factor of more than 20 over our current designs.

What does this mean? This means that we'll be able to enable all-day usage and more than 10 days of always-connected standby capability on a single charge from the power grid. And we'll do and deliver all of this without compromising any of the performance you've come to expect from today's mainstream notebooks. The implications for the Ultrabook are huge, and from my perspective the timing couldn't be better. We've been working with our partners in Microsoft and believe that Windows 8 on Intel architecture will transform the personal computing experience, not only in Ultrabooks, but also in tablets. It will do this while preserving the benefits of legacy and compatibility that over a billion users worldwide demand.

What we're targeting with Haswell is a result of our longstanding obsession with power reduction. Ultrabook is just the latest example of this, but not the last, for sure. And to help make that point I've

challenged our engineers at Intel Labs to come up with a demo that would give you a glimpse of what might be possible when you're committed to really pushing the limits of transistor technology. The ultimate goal, of course, is the most power efficient devices known to man. Good morning, Sriram. How are you?

Sriram: Good morning, yeah, hi, Paul, yeah. You're right. It's not exactly an Ultrabook, but what we have here, which I'm going to show you, is hopefully a technology that will make its way into future Ultrabooks and a whole bunch of other devices.

As you correctly pointed out, Intel Labs is committed to generating and improving dramatic gains in power efficiency, and we've been experimenting with low-voltage circuits.

So what we have built is a microprocessor. It's an experimental prototype which is capable of operating near the threshold voltage of the transistors, and is still capable of running Windows. As you can see on the screen, you have Windows and a couple of applications, including a funny animation.

Paul Otellini: Well, hardly funny. But yeah, it's an animation. [laughter] Exactly what happens here? What powers it? How low can the power go?

Sriram: Extremely low. In fact, the processor consumes so little power that we have it running off this small solar cell, which is only about the size of a postage stamp.

Paul Otellini: Solar-powered computing.

Sriram: Exactly, yeah.

Paul Otellini: That's fabulous. What happens if you cut off the light source?

Sriram: That wouldn't be too good. But what I'm going to do is – let's see what happens as I try to cover this. Watch the animation. I'm slowly going to shut off the light to the solar cell. Here it goes.

Paul Otellini: And it froze up the system.

Sriram: That's right. Yeah.

Paul Otellini: We've killed the cat.

Sriram: We sure did. [laughter]

Paul Otellini: Sorry about that.

Sriram: It is just a quick glimpse as to where we intend to take our near-threshold voltage technology. And on Thursday, you're going to see Justin delve into this technology a lot more deeper, and highlight this, and describe it a lot more.

Paul Otellini: That's fantastic. Thanks, Sriram.

Sriram: You're welcome, yeah.

Paul Otellini: I really appreciate it.

Sriram: You're welcome, yeah. [Applause]

Paul Otellini: So this was obviously just a technology demo, since we have no plans to productize solar-powered computing yet. But it's a clear statement of the direction and the capability of what we can do with our transistor technology.

I wanted to shift and talk a little bit about servers. Servers play an important role in enabling an engaging experience, as well. And there's an example today I wanted to show you in terms of demonstrating what I mean. Recently, researchers at the University of Washington have developed software that takes images from a photo-sharing site, like Flickr or Picasa, and creates a 3-D reconstruction of the entire site based upon the millions of individual pictures that users take and post to the site.

You can see what's happening here. What's happening is that – it's very fascinating. It's how this process harnesses almost the accidental intelligence of the Web that's growing by the second as people take more and more pictures. This cannot be done without very complex algorithms and very powerful hardware. In fact, at the university, the cluster that created this demonstration is based upon the Intel Xeon

5600 processor, and it rendered the model of St. Peter's Basilica from the individual photos that were out there on the Web.

Our next-generation microprocessor, which is called E5, a member of the Xeon family, is actually running today. This will increase the render throughput time for the university and for commercial applications by 50 percent. So it's not too far-fetched to think about what YouTube did for video, this kind of technology may do for crowd-sourced 3D modeling.

Think about fans at a concert or people watching an inauguration speech of a president – being able to take all of those pictures that they individually take and create an immersive 3D experience out of that through the collective content.

Let me now shift and talk a little bit about the second essential attribute of computing. As computing grows in diversity and uses, people expect a consistent experience across the multitude of uses that they have. They want their familiar and favorite applications to work across almost every platform and every device.

Art's here to show us a few examples of how Intel is working with our partners to enable a consistent experience across different kinds of devices. Good morning, Art.

Art: Good morning. Our industry moves so fast that it's easy to forget that there's some things that haven't changed much over the years. For

example, the office phone. In most enterprises, it looks and works pretty much like it did 10 years ago. But Intel and Cisco are out to change that with a new kind of enterprise collaboration device called the Cius. And it is built on the Atom processor, and you can see that it's running Android.

Now, it's designed to accommodate the wide variety of ways that businesses communicate today. And let me show you an example of that. If I go into my contacts list and I go into My Favorites – and I'm happy to say that, Paul, you made my Favorites list – and if I click on the Communication bar, it comes up with all the different ways I can communicate with you. I can do a phone call; I can do a video chat; I can send you an email; I can do an IM; I can start a WebEx session; I can see where you are in the world; and I can even go to your Web page. And that interacts with other phones, PCs, tablets, whatever, all seamlessly and easily.

Users also have access to many different applications built for the business environment on Cisco's app, HQ. You can see here -- lots of apps. And if the IT manager approves it, they actually have access to thousands of apps on the Android Marketplace right there. Just a great example of how all the ways that businesses communicate can come together in a consistent way on one device. And, oh, by the way, Paul, this is a tablet, as well, so you can take all that great functionality on the go with you.

Paul Otellini: Wow, that's pretty neat. This is a neat form factor. I think it's a great example of an enterprise-class tablet, and combined with a reinvention of the office phone. It's remarkable.

Art: Thank you.

Paul Otellini: Thank you, Art. [Applause]

So our view is that any device that extends the experience across the continuum of uses is important here. At the same time, users expect a very consistent level of experience, no matter what device they use. I talked about this earlier in terms of Intel helping enable this vision. We've developed a Compute Continuum framework that our customers are now using to enable them to have different devices seamlessly interact with each other.

And beginning this holiday season, you'll see products shipping with this capability into the marketplace. But rather than talk about it, let me have Craig come out and show you how this all works together.

Craig Raymond: How you doing, Paul? Let's go ahead and take a look at some of these new features. So just like you were saying, here at Intel, the Continuum is extremely important to us. And what we've developed is this great new application-connected framework for all of our applications and devices to go ahead and work seamlessly together, and also have the same look and feel so that you're not clumsily moving around depending on whatever device you're on.

So let's go ahead and – if you wouldn't mind just humoring me really quick, Paul, with a quick picture – look less CEOish. All right. Here we go. And I just snapped off a real quick burst of photos there, because I'm a terrible photographer. So if I take 10 really quick pictures, maybe one will turn out okay.

And as I can see here, this is just an Android phone that I have in my hand. And with a quick little point of my application here, I'm able to bring up – and this is called Intel's Pair and Share. And it's pretty self-explanatory, Paul. Just as far as I've now securely paired my device up to this centrally located Acer all-in-one that I have here, and – oh, will you look at that? We'll just go ahead and throw that right up on the screen.

But we can also go ahead and do this with multiple devices, as well. You guys might be familiar with this one. I forget what they call this. Oh yeah, the iPhone, right? Okay. Anyway, I'm going to go ahead and securely pair it, because we're all in the same session here. Oops, just fat-fingered that guy really quick. Let me try it one more time. There we go. And this is some [this-and-that] photo. So it's the same exact experience that I have across here. And we're playing some video from this phone, as well.

Sorry, Paul. I just got a little bit of an interruption here. It looks like I just got an SMS from our second product, which is called Intel –

Paul Otellini: [crosstalk] SMS onto your PC.

Craig Raymond: It seems kind of strange, right? But using Intel's Teleport Extender, I've actually securely paired my phone to this PC, as well, so I can get all the notifications and all that good stuff. "Can you get Paul's autograph for me?" We'll work on that, David. Thank you very much.

But as you can see here, all of my calls/notifications are coming up directly into a little application. So if I'm watching Netflix or getting some work done on PowerPoint, that sort of stuff, I don't have to be scrambling for my phone when it's just inconveniently out of reach. And these two features, Intel Teleport Extender as well as Intel Pair and Share, are going to be available from our OEM partners coming out this holiday season.

Paul Otellini: This holiday.

Craig Raymond: Yep. Pretty cool stuff.

Paul Otellini: That's very cool.

Craig Raymond: But I got one more thing to show you. We'll move onto here. We want to talk about kind of the next step on some new applications that we're going to see next year. And this is what I have as far as the Raymond family wall. And the gist of this here is a centrally located PC – as you can see, all these nice decorations that I have here in front of this one –

but as centrally located on a kitchen counter or in a little alcove, so we can use it as general computing.

But when it comes up with a screen saver, it also works as a digital bulletin board, basically. So I have a couple of devices here. And the real gist of this, Paul, is now we want to take this outside. Now that we've securely paired all these devices, no matter where you're at, you're able to do some really cool stuff. So, say my daughter is in the back riding around in the car. She has an Android tablet like this, we'll do a quick doodle, and she can throw it up on the digital dashboard there just like she'd be magneting something onto the refrigerator. So, we see it show up right there, but also we're just not limited to that device as well. We can also share pictures, as I have here. I have a nice little 10-inch tablet. This happens to be a [unintelligible], so this happens to be brand new, and we shared a nice little picture of Haystack Rock, nice slim form factor, pretty sexy too. And obviously, this is running Honeycomb, which is Google's latest and greatest tablet-operating system.

And let me go ahead and put that one down, and of course I have here next is a nice little Toshiba Ultrabook. That's pretty thin and sexy, right? Pretty light, too, not bad, but as I'm – let's say I'm preparing at the airport, and I'm just about to head off, but I want to go ahead and update the wall with a couple of messages for the family. So as I can see here, I wanted to make sure that they know I can go ahead and update the list, what my last shopping trip before I just sent out, so we'll go ahead and update those items there. But the kids always want

donuts, so we'll go ahead and just really quickly send them a coupon so mom can take them to Krispy Kreme. Send that up to the wall, and then of course we can go ahead and send some messages, okay, make sure to do the dishes, kids. We don't actually have the technology to make them do the dishes, but we can go ahead and send those notifications along.

But as you can see here, this is kind of the next step on the evolution we want to bring, all these devices working together from multiple vendors. Truly creating myriad experiences and usage models, and you developers are really going to be the ones that make it happen. We can't wait to see what you guys are going to be able to come up with using all this great connected application framework. So, thank you very much, Paul.

Paul Otellini: Thanks, Craig. So at Intel, we think that these capabilities are going to go a long way in providing the kind of consistent experiences that we think are required to make the Compute Continuum real. Our partners tend to agree with us on this, so let's see a video from them.

[Video plays.]

Paul Otellini: That brings me to the third essential attribute of computing that I mentioned at the outset, something we call protected computing. Now, given the high-profile nature of a number of the cyber attacks you've seen in the first few months of this year, 2011 may be remembered as the year that the industry got serious about security. But at Intel, we've

been serious about it for a long time. With computing becoming more pervasive, so are the targets for security breaches and malware intrusion. In this environment, the only way you can have an engaging and consistent experience is to make sure that your devices are protected, really protected. Let me talk about what that means.

You've seen the headlines – security breaches are impacting every industry. Every type of device is vulnerable -- smartphones and tablets are not immune from this. And while the estimated trillion dollars in lost productivity is alarming in itself, in many ways the impact on privacy and reputation is much more bothersome. We at Intel saw this trend; we also saw the need for a holistic approach to this. We wanted to rethink the entire approach to security, which led to our deep partnership with McAfee. To demonstrate the progress we've made along these lines, I wanted to introduce Candace Worley, who's senior vice president and general manager of Endpoint Security at McAfee to join me on stage today. Candace? Hi, good morning.

Candace Worley: Thank you, Paul.

Paul Otellini: How are you, Candace?

Candace Worley: Good, thank you. Behind us you see the McAfee Threat Map. This is a map of recent threat activity from around the globe with about a 30-minute delay. Each of the red dots you see on this map indicates a thousand instances of the indicated malware occurring at that time, and any country changing from dark to light indicates that the recent threat

activity in that region has become large enough to justify one of those red dots.

Paul Otellini: That's really unnerving. It seems like the real effort to stop malware is just a race to keep up.

Candace Worley: That is in fact true. As you can see from this map, traditional security approaches are having a very difficult time keeping up. The traditional approach is really a software-based approach, and the challenge with that approach is that malware – for example, root kits – will often embed themselves at the kernel level of the operating system, making it very difficult for antivirus products to actually see them and clean them. Additionally, root kits will often pretend to be part of the operating system and may also additionally cloak malware that's already present on that device. Traditional software can detect known root kits using signatures, but frankly at that point, the system's already infected and it's too late.

Paul Otellini: Is there a way to detect unknown root kits before they occur?

Candace Worley: Yeah, that's actually the basis of much of the work that McAfee and Intel have been doing together for the last couple of years. Using a combination of hardware and software allows us to monitor system memory and processor activity, giving us a way to detect the intrusion of unknown threats. This is a fundamentally new approach to the next generation of security. Today, I'd like to introduce the McAfee Deep Safe Technology Platform. Using VT capability in the Intel Core I3,

I5, and I7 processors, Deep Safe gives us a new vantage point on security that allows us to prevent unknown, i.e. zero-day attacks. The Deep Safe Technology Platform will become the foundation of a number of future products for McAfee.

Paul Otellini: How close are we to seeing Deep Safe in action?

Candace Worley: Actually today. Here's a system running being us with the Deep Safe technology on it, and it's going to be used to actually detect an unknown root kit. But before we take a look at that, let's see how a root kit will actually launch on the system, and the kinds of malicious actions it might hide. Many attacks are triggered when we launch, say, a video or an application from one of our favorite sites. And oftentimes, users will see a warning and just kind of click on through it and ignore it. If you noted, this video doesn't actually run. Most users would assume that that was a glitch with the system. They'd try to relaunch the video, maybe bail out on their Internet surfing session, but there's been very malicious activity happening on the background. Essentially the Agony Root Kit has installed itself and is copying files off of that system. For the purposes of this demo, we've actually exposed some of the activity of the root kit that would typically be hidden from the end user's view.

Now let's take a look at a system that's actually running the Deep Safe technology. Here, running on top of Deep Safe is beta software for a soon-to-be-announced product from McAfee that will do kernel-mode root kit prevention. Once again, the user clicks through the warnings

and unknowingly installs the Agony Root Kit. But because the Deep Safe technology and beta software is utilizing the VT technology from Intel, we actually recognize the root kit as it attempts to load into memory, and we block the attack in real-time. With the Deep Safe Technology Platform, we're actually able to protect our customers and save them time and money.

Paul Otellini: That's great. That's an exciting product, can't wait to see it launched. Thanks, Candace.

Candace Worley: Thank you so much.

Paul Otellini: The technology that Candace showed isn't just conceptual, but, in fact, it will launch as a McAfee enterprise product later this year. And when it does it will offer a better level of protection to the hundreds of millions of Intel-core-processor-based PCs that have already shipped. Our teams are working together on joint products to better protect every segment of computing, every phone, every tablet, every PC, and every server. It's part of our vision towards enabling a worry-free and protected computing experience.

I think the evolution that I've described today, the shift from computers to computing is something we've all been watching and discussing. It's been part of our conversation over the last couple of years at IDF. This era of ubiquitous computing is now here and well established and presents all of us in this community with a tremendous opportunity. It means new devices, for sure, but, more importantly, it

means new experiences that are more engaging, more consistent, and more protected than anything we've shipped before. It also means new opportunities across industries from healthcare to entertainment, where computing is driving fundamental transformations around the world.

At Intel, we're putting together all the pieces to leverage this opportunity. Advanced silicon, supporting software and tools, standards-based designs, and Intel's unique scale to really seize these opportunities. We believe that this new era of computing expands the boundaries of the digital revolution. This is true even in industries where it was once believed that technology was going to be their biggest threat. But the best-known innovators see through this and see the new possibilities. Let's take a look at one of them.

[Video plays.]

Paul Otellini: Well, thank you, Jeffrey.

Before I conclude, I have one more thing I'd like to share. Over the last few years, Intel has learned a lot of things about smartphone silicon and system design, and how to best apply the strengths of what we're learning to Intel architecture into these new devices. Our goal here is not easy, but it's very simple. We want to make Intel architecture the platform of choice for smartphone ecosystems. I'm happy to say today that we're making real progress on this goal.

This phone that was used earlier in the demo, the continuum demo, is a Medfield-based phone, Intel architecture phone, running the latest version of Android's phone software. And it's a full-reference design, which means that it's available to our customers to take into production as they see fit, perhaps with different skins and so forth. This is a significant step forward in our commitment to bring Intel-based phones to the market in the first half of 2012.

Today, I'm also very pleased to announce a development partnership with Google around Android. And to describe the details of this partnership, I'd like to have you join me in welcoming to the stage Andy Rubin, who's senior vice president of Mobile at Google. Hey, Andy.

Andy Rubin: Hi, Paul, how are you?

Paul Otellini: Good morning. Good morning, Andy.

Andy Rubin: Good morning.

Paul Otellini: As you know, Andy, Google and Intel have been working together as partners in computing solutions for many years in the datacenters, on Google TV, on Chrome OS, and now our smartphone design teams have come together on optimizing our silicon, our design, for Android, through the collective work of our engineers. And I'm really excited about it.

Andy Rubin: Oh, thank you, yes. Absolutely. We – that was my cue – the partnership has been great. We've optimized a lot of our products, including what's running in the datacenter. Every time somebody types a query, it's obviously being handled by the IA architecture. I'm really excited to be here at IDF, looking forward to what we have in store in the future.

Paul Otellini: Well, we have lots of products coming out that I hope you guys can take advantage of in phones and tablets, and we're excited about optimizing our silicon and reference designs around not just the current releases of Android but the future ones as well.

Andy Rubin: Very good. Well, let's talk about the future a little bit. We can talk pretty openly. We have a pretty tight knit family of developers here.

Paul Otellini: They're all under NDA.

Andy Rubin: Okay, sounds good. Well, look, we're here to announce a continuation of the strategic alliance between the two companies. We're going to collaborate very closely to make sure that Android is optimized the best it possibly can be for the Intel architecture. Going forward, all future releases of Android will be optimized – you know, everywhere from the very low levels, at the kernel, and taking advantage of memory management and all the great features of these low-power IA architecture, all the way up to multimedia, 3D graphics, everything that's part of the system on a chip today. Very excited to be here, and

very excited about working closely with colleagues and engineers at Intel.

Paul Otellini: Well so are we. Every time we've collaborated with Google, good things have come out of it, so I'm excited and have high expectations around this as well.

Andy Rubin: Very good. And I'm eager to see the innovation that the developers create as well, so thank you very much for having me.

Paul Otellini: Thanks, Andy.

Andy Rubin: See you.

Paul Otellini: [Take this back.]

Andy Rubin: [Oh.]

Paul Otellini: What I talked about today was the evolution of computing and how we can all participate in it. Computing is undergoing the most remarkable transformation since the invention of the PC. The innovation of the next decade is going to outstrip the innovations of the past three combined. At Intel, we're investing in it, we're partnering for it, we're preparing the technology that will drive it, and we see the developers at IDF as our essential partners in this journey. But as amazing as it may seem, we're truly just at the beginning.

Thank you, and I hope you enjoy the rest of IDF.

[Music plays.]