Wednesday, September 14, Mooly Eden Keynote

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[Start of Recorded Material]

[Music]

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 take a moment to silence all electronic devices, especially cell phones. Thank you for your cooperation.

[Music]

Female Voice: Ladies and gentlemen, please welcome Johan Jervøe.

Johan Jervøe: Wow. Good morning and welcome to day two. What a long evening and what a short night. Did you enjoy the party? It was a long night. What a great start to IDF 2011. Paul showed us the phenomenal growth that the computing industry has had and how that is just the beginning. It's all about the computing essentials, the engaging and enjoyable experiences, but it's important that that experience is consistent across all of your devices. And, of course, it needs to be a secure experience by design. I think we're all extremely excited about the strategic partnership with Google. I can't wait till my first IA-based phone.

Now, you know, in a quick clip, Justin Rattner had invited will.i.am here yesterday to the tech showcase. And Will got a question from a journalist how he found his, you know, first IDF. You know what he

said? He said I feel like I'm in a candy shop. And I think that's a great description of IDF. And, when I walked out here, Mooly said to me be short. And I said, Mooly, don't worry. I'm 28 words. So let's try this. Wow, what a great first day to IDF 2011, and day two is going to be even better. So, here he is, Mooly Eden. Enjoy.

[Video]

Female Voice: Ladies and gentlemen, please welcome Mooly Eden.

Mooly Eden: Hi, everybody, and good morning.

Crowd: Good morning.

Mooly Eden: Good morning.

Crowd: Good morning.

Mooly Eden: Now it sounds it. I was told never to go onstage after animals and kids, but in this case I didn't have any alternative. They just told me backstage, "go." So what was the clip all about? It was about us, it was about our curiosity, it's about our aspiration to create. We are not only consumption animals, but first thing first, let me tell you what I'm going to tell you about today. I'll come to it later on. I'm going to touch on the state of the business. I'm going to speak about what consumer wants. I'll elaborate on the transformation that Intel is going through and we are still going. And it's not an easy one, but I'll share with you where we are. I'll speak with you about the new kid on the block,

about the Ultrabook, and at the end I've got a very [in tech] surprise for the geeks in you, so don't leave in the middle because you're going to lose it. So fasten your seatbelts and enjoy the ride.

First of all, as you can see on the screen, PC is growing steadily since the '90s. Today we are selling more than 1 million PCs every day. Let me repeat, 1 million PCs every day, and the number keeps going. There are more than 1.5 billion PCs out there, which are functional. On some of them probably they're watching this presentation. It's true that, in order to create this growth, we in the ecosystem and our partner -- many of you are sitting over here -- will have to do some evolution of the PC, and I'll touch on the evolution that we went through and the one that we are going to go through in the near future.

So let's, first of all, try to understand where the future growth is going to come from.

Emerging market are on fire. In looking at the PC, two major event happened this quarter. First of all, China outgrew U.S. as number one consumption country in the world. Brazil outgrew Germany as number three consumption country in the world. So two out of the top three consumption countries are emerging markets. Sixty-five percent of the PC growth in the coming four years is going to come from emerging markets. And as the disposable income will grow, so will grow the consumptions.

But even if we have the affordability, people ask will the people in the emerging markets buy PCs? And my answer is yes, a big yes. And I'll use the coming 50 minutes to share with you my opinion and persuade you why I believe that we are in the beginning of the ramp, as Paul put

it yesterday. People discuss the future of the PC -- you can read a lot about it. Let me remind you that the personal computer has been the most adaptable device and it change itself several time during the last two decades. Its form and functions have been constantly evolving. We have done several transformation in the past, and I would like to take you through few of them.

One of the transformation -- of the mega transformation -- 1995, Pentium MMX, it was a transition from enterprise to consumer, for people that thought with their brain to people that thought with their hearts. We added CD-ROM and MMX, and we say, you know, we are going to enable video, people are going to watch video on the PC. And the reaction was PC is a productivity device, who needs to watch video on that? We know the truth today.

Eight year later, we had another transformation, which was the Centrino. The Centrino transformation actually was a transformation from desktop over to notebook. We had the consumer, they want four things, which we called the four mobility vectors. They want great performance, desktop-like performance, in a notebook. They want to have light form factors so they'll be able to carry it with them. They wanted long battery life. And if they're away they want to be able to wirelessly connect to the database. Interestingly enough, eight years later, our customers still wants us to excel on these four mobility vectors.

In exactly eight years after 2003 when we did the last transformation, we are creating the next transformation, which is the Ultrabook and

elaborate it. It will be a great consumption device, but, at the same time, it will be a great creation device. We'll fulfill both needs. We'll bring back the personal into the PC, where the C will stand for creativity. People will not only work with their PC, people will love their PC, and I'm not ashamed to use this word.

Let's look what's people are doing today. When I'm looking at our current generation of microprocessor, the Sandy Bridge, I am very proud. It deliver 47 percent more ISPEC, 34 percent more FSPEC, almost 2X [3D-mark], and this is really impressive. And then you go to the consumer and say that's interesting but what is there for me? What am I going to do with this? So rather than speaking about ISPEC and FSPEC and the benchmark we like to speak so much about in our forums, especially the technical forum, let's see how people use their PCs. We can see several usages over here. We can see Excel, we can see PowerPoint, we can see Picasa, we can see people playing games, people editing video, and the question is -- and there's a lot of debate in the technical community -- what is more important, the CPU, the GPU, the media?

In each one they've got something better, definitely we'll try to highlight this component. If you're trying to understand what's important, I believe the best thing to do is to map these usages into the different component. If you do it, you'll see that some of the applications will map into the CPU. Some of the applications, like video editing, with done by media, and some of the applications, like playing games, it's graphics. And the question, again, which one is more important? And it's interesting to know, and it's not trivial, that

actually your experience is not defined by the best component in the link. Your experience is defined by the worst component in the link, because you can have a great graphic, but if your CPU is lacking performance, when you use a CPU-intensive activity, you'll be behind, you'll wait, you'll be impatient. If you have a great CPU and you try to do media editing, you'll stay forever.

So the magic is to deliver a balanced system, a system that's got the CPU performance, the graphic performance, and the media performance, all of them at the same time. That's what we tried to do with Sandy Bridge, with the second generation core microprocessor, and indeed it was the fastest ramp ever for Intel. And as we speak we sold more than 75 million units. But enough about Sandy Bridge. We move forward, and let's see what is the performance that we can get or what is the experience that we can get by using it. For this, I would like to invite Mark onstage. Mark?

Mark: Hey, Mooly.

Mooly Eden: How are you doing?

Mark: I'm doing good. How about yourself over here?

Mooly Eden: Doing fine. Enjoying every moment. Can't wait for the next 45 minutes. Yes? What do you have to show us?

Mark: All right, so you talked about content creation, and we're going to show a simple example using an application everybody's familiar with.

Mooly Eden: So when you try to run it -- we say that people like to create content. People are not only consuming content. Let's look at the example. What you're doing over here?

Mark: So we just took a collection of about six photos, and we're just going to create --

Mooly Eden: Run Picasa.

Mark: -- a slideshow movie in Picasa.

Mooly Eden: And you take just picture, you click one button –

Mark: Yep.

Mooly Eden: And you want to create the movie out of it.

Mark: Exactly.

Mooly Eden: We can see the performance is take 42 percent of the CPU, but we don't care about it, do we? We just want to see the result done. We see the turbo kicks into 3.1 GHz.

Mark: Exactly.

Mooly Eden: And in a second it's going to be done, and we'll be able to watch the pictures as a movie.

Mark: Yep, yep. But you can see the level of performance that's needed even to do something really basic and simple like that.

Mooly Eden: And if I have a basic PC this would've taken ages to do.

Mark: It would've taken quite a bit longer, and if you don't have a short attention span, you know, you're off to watching Jerry Springer on the couch and are not going to even bother with this.

Mooly Eden: And it'll be disruptive for your creativity. Okay.

Mark: Yeah.

Mooly Eden: So that's Picasa, that's simple. Can you show me something more sophisticated?

Mark: Yeah. Let's talk about high-dynamic range, and so, for this demo, we're going to go ahead and compare it to a three-year-old Core 2 Duo system, and --

Mooly Eden: High-dynamic range.

Mark: Let me go ahead and get it started here, and then we can explain what we're actually doing. So I've got a photo here of typical weather in Ireland, right, overcast, not really the best. Image isn't necessarily the most eye-popping image that you might want to have. With HDR, you

can actually take three images, combine those together to create a much better one.

Mooly Eden: So I take three images, different exposure, whatever, and then I let the computer combine the three images and try to get me the best image out. So this an example, we take --

Mark: Yeah.

Mooly Eden: Three images, and then the computer need to do the hard work real time.

Mark: Yeah.

Mooly Eden: Why won't you show us the results while the computer is trying to do it?

Mark: So there we just finished, actually, on our system here, and let's just go ahead and take a look at all the different examples that we have here. Let me go ahead and pull up a variety of different examples of HDR --

Mooly Eden: And we can see before and after.

Mark: Yep.

Mooly Eden: This is the picture before, this is the picture after. You can see the difference of the quality as we do it, so I don't want to scare you -- all the guys in the first row -- but pretty soon you'll be redundant. We'll be

able to replace the photographer with some smart compute power. No, no offense, guys. Now everybody -- okay, fine. Let's go on.

Mark: All right --

Mooly Eden: But, you know, this is still -- but, you know, we're speaking about the fact that the people are moving over to video.

Mark: Yes.

Mooly Eden: And let me tell you, I like to wander around the world, I've got hours of video that I don't know what to do with it.

Mark: What to do with it.

Mooly Eden: How do I make something -- make some sense out of it?

Mark: Yeah, so we have an application here from CyberLink called PowerDirector, and they actually have a nice little feature called Magic Cut. So all we have to go in is tell them, you know, put the collection of clips that we want on our timeline, say let's, you know, go ahead and just create a 30-second quick clip here, and then it's going to go through and do all the analyzing and all the hard work.

Mooly Eden: So, amazing, I've got a 6-minute video, I say I want 30-seconds or 1-minute video, go and do it. How does it know? There are algorithm -- if you zoom in and zoom out, probably it's interesting. If you go to the same object three times, probably it's something you are interested. It

analyzes the video and gives you a clip, which it believes is the best one to feature, and you can change the knobs, if you don't like it. But it can be done real time while you are sitting next to your computer, and we just finished it, I believe?

Mark: Yeah. Let's go ahead and pull up the clip.

Mooly Eden: And what we see over here is a clip that was just generated, so those of you that've got hours of clip and you want to test the computer, how smart it is, and try to compact it, it's one click. You don't need to be computer wizard or you don't have to have hackers as a friend in order to be able to do it. There's another thing I believe that we see more and more because still people say, would you need all this great performance? What we have over here is an application which is ready for everybody, this is for shopping. You can just look at the computer and try glasses.

Mark: I look pretty good in these, huh?

Mooly Eden: Try to imagine how beautiful it is. By the way, we're trying to slow down the dresses because it will have major impact on our income, but . . . cut . . . but overall, you can see -- and this is done in 2D. Try to imagine the same picture, three-dimensional, and it's not if, it's when. You tried the glasses, so you tried the dress, you are trying to do it, and, guys, there's no alternative. You need to do it on the computer, locally, real time, otherwise you will not have the experience that you get right here. This is the one that I like, the red one. I tried it. It looks awful.

Mark: You like those, really?

Mooly Eden: By the way, you look weird, if you don't notice. Thank you.

Mark: All right, thanks, Mooly.

Mooly Eden: All right. Ivy Bridge. We saw about Sandy Bridge. We are ramping to 75 million. What about Ivy Bridge? Ivy Bridge is coming to the market pretty soon, so Ivy Bridge, let me tell you, have got 1.4~~8~~ billion transistors designed, innovated, on our 22-nanometer 3D [lamench] transistors that I'm sure you'll have a deep dive in the technical session in the near future, but remember the number -- 1.4~~8~~ billion transistor in our chip. Those of you who are trying to take a picture of this beautiful [die], let me tell you, I play with this. It's not the real one. You can read the disclaimers down there. So you'll see it at the intro.

But people try to understand what it is, and let me tell you, Ivy Bridge is not a tick. I believe most of this community know about the tick-tock. Tock is the new architecture, tick is a compaction, tock, new architecture, tick is a compaction. And this tick is actually a tick plus. It's more than a compaction. We did much more into this. So what we did in Ivy Bridge, some of the things we took from the previous generation. We've got high performance, low power, and you'll see it's lower power than its predecessor. Graphic media and display engine, we've made some revolution. Integrated memory controller, and we reduced the power, as well. Should [last little cache] between the

graphics and the processor in order to be able to feed this animal with all the instruction and data that's in it.

And not less important, in order to make it simple for our colleague, for the rest of the ecosystem, Ivy Bridge is pin-to-pin compatible with Sandy Bridge. Sounds simple. It's not. Which means if you've got a system, if you've got a motherboard populated with Ivy Bridge and you want to expand to a different price point, et cetera, in the future, you'll be able to take Ivy Bridge out, you'll be able to put Sandy Bridge inside, and you'll get exactly the same system without having to put any additional engineering effort into it. If we take a deeper dive and let me just give you just a few examples, because I know that there's going to be a technical session down there that the geeks over here will enjoy today, I've got no doubt.

Let me just speak with you about PAIR, Power Aware Interrupt Routing. You know that when you are working with accessories, with external device, you get the interrupts, and what's happening, the CPU or the core is sleeping, and the interrupt wakes it up every time, and the minute you wake up, you start consuming power and you try to go back to sleep, and it wakes you up. And you know how annoying it is when you wake up and you sleep, you wake up and sleep. Traditionally, if you look, Integrated Gigabit NIC, for example, gives 2 to 5k interrupts per second. If you look at the USB, USB gives you approximately 3,000 interrupts per second. And all the time it interrupts, interestingly enough, it's always interrupt core zero. And if the core zero is asleep, you wake it up.

In Ivy Bridge -- this is only one of the things; they develop much smarter things -- we can dynamically route those interrupts based on the policies. And if you want to save power, you'll actually route it to the code that is awake. So if core zero is asleep, core two is asleep, core three is awake, and core four is asleep, when you get the interrupt, rather than waking a core and creating dissipation of extra power, you'll go to the existing one. Yes, only [250, 300] milliwatts, but the low-hanging fruit are not there anymore. We need to have the 300, and the 300, and the 300 in order to extend the battery life and give us what we want.

The biggest advantage, I believe, that you'll see will be in the graphics. This is a [unintelligible] that I borrowed from the session that's going to be following me, the deep dive of the architecture. And as I say, it's not a tick, it's a tick Plus. And we are speaking about the graphic, the media engine -- it is redesigned to deliver the next level of experience.

We added the X11. The X11 is not going to be in high-end. It's going to be available on our PCs, whoever wants to play this game. We approved the geometry performance. We significantly improved the shader array. We increased the sampler's throughput. And not less important, we improved the pixel operation by adding hardware accelerator.

So actually, we redesigned a lot of it, and we'll have a deep dive into each one of these sections in the technical part of this day, and you'll be able to see that it's a totally new animal. So those of you who have been surprised by the performance of Sandy Bridge graphic, I believe

you'll be delighted when you see what Ivy Bridge is going to deliver. But definitely it's not a tock, and the performance advantage you'll see is not a tock. What does it let us do? With Sandy Bridge, we played most of the mainstream games, and with Ivy Bridge, we'll continue and do it even better. But why should I speak about Ivy Bridge? We've got already the engineering sample. We've got so much outside. So why won't you look at some of the Ivy Bridge demos over here?

What we see over here on the screen -- on both screens, I see -- we see 20 high-definition [1080] pictures stream simultaneously to be able to get this picture. And if I would like to look at the graphic performance -- [laughter] What was funny? [laughter] You're just waiting for the blue screen, aren't you? I'm not going to mess with the demo god, sorry. [laughter] The other thing we can show you is also the graphic is fully functional. If you can show the graphic performance . . . this is the gaming that can be played on Sandy Bridge. [video]

Male Voice: Ivy Bridge.

Mooly Eden: On Ivy Bridge. Yeah, thank you. See, we are collaborating. Beautiful. And you can see the level of realism that you can get. This is Ivy Bridge. Pretty soon, you are going to be able to see it. Those of you who come later on onstage definitely will be able to see what we are having. Let's speak about the transformation we are going through. This is really traumatic for us. People that used to be engineers, or people that are still engineers, we had to go through a major transformation, because for us in Intel, the god, the head of the

operation, was the microprocessor designers. These are the smart guys. They knew what to do. They design microprocessors.

On top of the microprocessors, we put operating systems. It used to be Windows. Today, we've got some additional operation systems. And then you just throw it into the market for the developer to write applications. And the application is eventually what gives the user experience. So we designed a microprocessor that will give us performance [within the workforce], and then somebody is doing the user experience.

Today, the majority of the market is not enterprise; it's not productivity. It's about user experience. They want to consume it. They want mainly user experience. We start everything upside-down. We start by asking ourselves what the user wants. And this is really weird, because we've got anthropologists, psychologists -- all these kind of [fields] that we didn't accept to Intel. They don't have a double-E degree. They're not computer science engineers. These are people that are sitting at people's houses trying to figure out what people want to do.

Then we asked ourselves, "What is the software that will be required in order to fulfill it?" And only then we go and design the microprocessor to support this process, this software. Now, don't be confused – these microprocessors still need to be very, very powerful. But if you want to know, if you want to do the graphics, or the general CPU, or the media, we get this information from these guys.

So while defining the next notebook processor, we stepped back and ask ourselves what really people would like to have. In order to cover it, let me invite one of our marketing research managers, David Ginsberg. David, come onstage. Thank you. [applause]

David Ginsberg: Hi, Mooly.

Mooly Eden: Do you know that you're onstage in the geek festival? [crosstalk]

David Ginsberg: I know. I'm usually not allowed here.

Mooly Eden: Please.

David Ginsberg: Well, you know, my team, we spend a lot of time listening to people, talking to people, trying to understand what it is they actually want out of technology. And not just at a functional level, but also at that deep emotional side, what is it that people are trying to do? And when we step back, we really notice that there are two things that we need to satisfy. We all have two sides to ourselves, whether it's our left-brain side or our right-brain side. So I'm going to talk a little bit about that.

Our left-brain side -- this is the more rational side. This is our planning side, our doer side. And what we want out of technology are some basic things. First, we want to be productive and get things done. So when you're working on an office application or an Excel spreadsheet, this is the part of your brain that you're satisfying. The second is that we all want to learn and advance ourselves. We all use technology to help become more a part of the world and to move on and move up in

our world. And then the third, with so much of our life online today, being secure and having everything safe and secure is a critical part of what the left-brain is trying to get out of technology.

Mooly Eden: So the left brain is kind of the engineering, the common sense part of our brain.

David Ginsberg: Well, I think we have – all of us, even engineers, have both a left-brain and a right-brain side to ourselves.

Mooly Eden: Thank you. Okay. Go on. [laughter]

David Ginsberg: But then, for the right-brain side, we have a whole other set of things that we care about. The first is we want to create. You know, we're all creators. It's a part of the basic essentials of human existence. Since the beginning of time, when people were drawing on cave walls, this has been part of what we try to do. The second then is we want to take those creations and we want to share them with our friends, with our family, and with the whole world, if we can, to connect in deep and meaningful ways. And the third is we want to lose ourselves in an experience. When we're in that act of creation, we don't want to be thinking about other things; we just want to lose ourselves in that moment.

So then the question is: Is there one device that can really satisfy the needs of both the left and the right side of our brains, that can do all these things, and do it with the performance that we've come to expect to get the experience that we're looking for? And so, Mooly, when we

started talking about what the next generation in computing needs to deliver, it came down to satisfying both sides of the brain with six simple things.

And the first is mobility without compromise. You know, we love mobile computing. We love our laptops. But we don't want to sacrifice on the performance in order to be productive, and get things done, and satisfy that left-brain requirement. The second is that we want to have peace of mind. Security is such an essential thing, we don't want to have to think about it. We just want it built right in. And the third, because we're talking about the rational side of our brain, is that it needs to be at a price that works. We have to satisfy that side of ourselves.

But then we want to make sure we're meeting the other side of our brain. So we want to have the power to create. So whether creating a simple photo album or a feature-length movie, we want to make sure that we're delivering the power that enables our users to do all of those things. The second is that when we express ourselves, it's not just about expressing ourselves through what we create. It's also about expressing ourselves through what we're creating on. So design today is a huge part of the overall experience. So we want to make sure we've got design that reflects my own sense of style. And so we want to have beautiful devices on which we're creating.

And the last one is an immersive and responsive experience. You know, when you're in that act of creation, when you're in that flow of creation, there's nothing that interrupts that experience more than when

you're sitting there waiting for an hour-glass, or some error message comes up. So these devices have got to deliver that immersive and responsive experience, so that people can enjoy that act of creation. And if we deliver these things, we're going to be delivering on both the left and the right-hand side of the brain and allow people to have experiences that they'll love.

Mooly Eden: Left and right brain. That's our challenge.

David Ginsberg: Yes.

Mooly Eden: Thank you very much, David.

David Ginsberg: Thank you, Mooly. [applause]

Mooly Eden: And by the way, guys, don't be confused by this love fest. We had a lot of fights. [laughter]

David Ginsberg: Yes, sometimes.

Mooly Eden: Okay. So that brings us over to the Ultrabook. And people ask me, "What's an Ultrabook?" And we say, "We are going to tell you what's Ultrabook," but first I want to tell you what's the revolution. And if I'm taking a five-year-old computer, which is a nice one, I believe the revolution can be summarized in two words. This is the revolution. That's an Ultrabook. The Ultrabook is the new device. It's the device that you hold in your hand, the device that you like to show, the devices you put so much effort in order to deliver of what David was

speaking about. But let me show you in a second what we are trying to deliver in this category.

So, first of all, it was very simple. David told us what we need to do, and the guys -- just said guys, you need to make sure that we can create to express ourselves. We don't want to wait for the computer, we want the computer to wait for us. We want peace of mind, they don't even know to say the word security. We want the reflection of me, always available, at the price that's available. And I say, well, how do you want us to do it? He say, that's your problem, you're engineer, I finish my job, and just left the stage.

So the big challenge for us is, how do we take this work, these usages and translate it into engineering, because at the end of the day, we need to design it. And I believe the way that we design is the following, guys. In order to deliver this creativity and [responsiveness] or anything, we need to deliver, to design the system in such a way. In order to do the protection, we need to do the security embedded into our solution [unintelligible], we need to speak about form factor. It's not about style, we need to create this style. Very thin system, you'll see the challenge. We need to have power, and reduce the power constantly in order to be able to deliver long battery life, and on top of all of this when you do it, you need to do it in a very affordable price so many consumers will be able to do it.

So, let's start first things first. Let's look at the performance. It's true that the performance is very important for our creation. People do not recognize sometimes, but you need the performance the same way that

in the car, you need a great engine in order to have a great driving experience. People speak about the driving experience, they do not know what's exactly under the hood. Same thing, when you want to do the creation, when you want to be real-time, when you want to be next to your computer, it's important what you have under the hood, especially when you want to create. And I started my presentation when there was the video, and say yes, people speak about creation, and I'm not against -- people speak about consumption, and I'm not against consumption. I like the consumption devices, they are beautiful.

But we are not only consumption animal, somebody writes and we read, somebody takes a picture and we watch the movie. We would like also to create ourselves. It starts at a very young age, and I believe that eventually, if you want to fulfill the left brain and the right brain and you don't want to be left with no brain, definitely we need to be able to do some creation as well. One of things that we held when we delivered the CULV into the market, people claimed that there's still not enough performance to fulfill what they want. We redesigned the CPU in such a way that even in a very small form factor at a low voltage, we'll be able to deliver this great performance. And if you look at the Ultrabook that we are delivering today, its performance is better than the two or three years' systems' standard voltage that exists over there in the market. But the biggest challenge was, how do we make sure that the responsiveness, that speed is going to be so fast that when you're interacting with the device, you'll get the right performance? And for that, we extended the turbo, and let me go a little bit into technical detail, not too much, to share with you.

What we see on the right-hand side is a standard voltage 30-volt watt microprocessor dual core. On the left hand side, we see a ULV 17-watt solution. You can see that the frequency's slightly lower. But when we hit the carriage return, when we want to see an application, we need the performance on demand, both of them with turbo. And as you can see on the right hand side, it will turbo [unintelligible]. On the left hand side, the turbo will be much higher. So, rather than looking at the screen, please look at me, if I can get the [iMac]. If this is the frequency of the standard voltage, if this is the frequency of the ULV, once we turbo them, both of them will turbo almost to the same frequency. So when you look at the responsiveness, the responsiveness for the same systems is going to be pretty much identical. And indeed, we get great feedback from our customers when they start playing with the Ultrabook. They say "wow, it's amazing, the response that we get."

But it's not only about that. We added additional solution that's additional technology to fulfill what people want. So . . .

Female Voice: Hello, Mooly.

Mooly Eden: How are you doing?

Female Voice: Good. So, I have two technologies here to show you that are going to make your PC or your Ultrabook even more responsive. Now, the first technology I have is rapid start technology. Now, not a lot of people use hibernate today, because it just takes so long to get out of hibernate. But hibernate gives you up to 30 days of battery power.

Mooly Eden: So, we like the hibernate, but getting out of hibernate is pretty annoying.

Female Voice: Right. Now, I'm going to go ahead and start the system. I had put it in hibernate before.

Mooly Eden: So, let's count. One, two, three, three and a half -- that's good.

Female Voice: There we go.

Mooly Eden: So, you did it, you almost did it. You start counting too early. So, actually you can see that the system will come out of hibernate in less than five seconds. Quite a few times you'll see I'm not speaking about how fast we come from sleep mode, because you'll see it in a second or in a few minutes later on in one of our demos, and you'll have the wow. So, this is running on this Acer Ultrabook.

Female Voice: Yes.

Mooly Eden: And we have seen how fast the system is coming out of hibernate.

Female Voice: And it picked up exactly where I left off. So, the video started playing, and . . .

Mooly Eden: I see over here a Toshiba Ultrabook.

Female Voice: This is our new Toshiba Ultrabook.

Mooly Eden: Which is the one that they took from this notebook over there. What do you want to show us over there?

Female Voice: So, I have Intel smart connect technology installed on this. Now, before you started your keynote, I went ahead and put my system into sleep state.

Mooly Eden: The system is in sleep before I started the keynote.

Female Voice: Right. Now, what it did during the -- while you were giving your keynote is, it woke up for a brief period of second, brief time, downloaded all your latest updates, and you know, so when I am ready to go, I don't have to worry about synching my system, I can be sure that I have my latest updates on my machine.

Mooly Eden: Great. So, let's try to understand, when we opened the system, not only the system would turn on very fast, it would be already updated, because while it was asleep, it just wakes up every few minutes, collects the data that was there for the system. So, I open it. So, let's see, you open it.

Female Voice: So I went ahead, I'm coming out of sleep right now.

Mooly Eden: It seems that you've got -- oh, beautiful.

Female Voice: And there you go, I have your picture from the keynote that you've been giving.

Mooly Eden: I look upside down. It looks better. So, this picture was actually taken while I was onstage, sent the email, and while the computer was in the sleep mode actually added the information.

Female Voice: Intel smart connect technology.

Mooly Eden: They got it, thank you.

Female Voice: Thanks, Mooly.

Mooly Eden: All right, security is one of the top consumer concerns. The market survey that was done by marketing find out that consumers really care about the security, and there's two kinds of security that we needed to address. First of all, is security, physical security of your asset. If somebody steals your notebook, what do you do? And between us, we know that the most important thing for us is not only the asset, it's the database, it's the contacts, it's my data, it's the Excel spreadsheet that you have, right -- the one that you calculate how much money you have, you know what I'm talking about? Some of them understand.

So definitely, you don't want this data to get to somebody else. You want to make sure that this data is protection, your personal data. The other thing is, when you're doing transaction with the bank, you want to make sure that you do the transaction by yourself and nobody's joining the party, copying your numbers, trying to redirect the money and doing these things. So, one is transaction, the other one is the asset.

To really discuss it, let me invite on the stage, or to the stage, one of the cyber warriors, Todd Gebhart, copresident of McAfee. Todd?

Todd Gebhart: Morning.

Mooly Eden: How are you doing?

Todd Gebhart: Good, good.

Mooly Eden: It seems that I forgot to tell you what the dress code over here, but you see we're working.

Todd Gebhart: Yeah, I can see I underdressed for the event, my first IDF.

Mooly Eden: All right, McAfee, you know, is a leader in the client [point of] security. How does McAfee see this issue of theft and things like that?

Todd Gebhart: Yeah, it's a growing, growing concern. With the thousands and thousands of PCs and mobile devices that are going to be lost and stolen every year, we're seeing a growing concern among our consumers about device and data security.

Mooly Eden: You told me some scary number about the airport, because it's happened to me already.

Todd Gebhart: Oh, really? Yeah, well, the numbers show that about 12,000 devices will be left in an airport each and every week of the year.

Mooly Eden: One of them was mine. I almost got a heart attack. But I retrieved it, yeah.

Todd Gebhart: So, device and data security is becoming a bigger part of our strategy, our product portfolio, and our partner opportunities in the marketplace.

Mooly Eden: Well how important do you see the cooperation between the two companies, because everybody knows that you're a security software company, we're mainly hardware company, although we're growing our [unintelligible] in additional areas. How do you define our cooperation, what does it bring to the market?

Todd Gebhart: Oh, it's great. We've been working on a project called anti-theft for the Ultrabook, and the teams have been collaborating very, very well. We have some great technology that gives the consumer the peace of mind that their data is secure. Whether they want to lock the data or whether they want to wipe the data, if that data becomes lost or stolen, they have control over the safety of their pictures, their music, their data, their documents, their tax returns, whatever it is, they have the peace of mind knowing that it's locked or it's wiped.

Mooly Eden: That sounds very interesting. I'm sure some people in the audience will probably ask, so when can they expect to see it?

Todd Gebhart: Well, we're going to be shipping in the first half of next year, but you can actually see what we're working on downstairs in the McAfee booth at the showcase.

Mooly Eden: Thank you very much.

Todd Gebhart: Mooly, thanks, great being here.

Mooly Eden: Thanks. And for those of you how need simple application or simple explanation, it's very simple. You lose your PC, you go to the internet, you give an instruction, you send a suicide pill, and the PC commits suicide. Literally like that. It get the information, shut down, locks, and that's it. And, by the way, at least in Brazil they told me that they'll have this technology engraved into the cover of the PC, so people will know it doesn't make sense to steal this PC because once you steal this PC, you've got it, but you will not be able to do it anything that looks like a PC.

Next, I speak about securing your transaction to the Internet. You know, when I'm working with the bank, if I want to do a transaction, I don't want anybody to join me. So rather than speaking, let me show you a demo, and we've got Mark over here.

Mark: Hi, Mooly. Yeah, so what we're going to do is demonstrate IPT, and in order to do that we're going to do a little online banking.

Mooly Eden: Just a minute. What is ninja doing on the stage?

Hacker: You guys can see me?

Mooly Eden: You look like a ninja.

Hacker: No, no, no, I'm a hacker.

Mark: He's supposed to be invisible.

Hacker: I'm a hacker.

Mooly Eden: Oh, you're a hacker?

Hacker: That's right, these hands right here, baby.

Mooly Eden: I understand, but, if you're a hacker, why do you look like a ninja?

Hacker: Well, I mean, this is actually very comfortable. Maybe not as much as a muscle T and Kangol hat, but it's very comfortable.

Mooly Eden: All right.

Hacker: And, you know what else, I can sneak up here and come onstage, and I'll hack the system here, and we'll take care of this banking transaction.

Mooly Eden: So you are the hacker, and you're trying to do the transaction with the bank.

Hacker: Exactly.

Mooly Eden: Go ahead, guys.

Mark: So on the screen on the right you can see my login page, so let me just go ahead and log in to my system.

Hacker: And I have a keylogger here, and I can see his password, so let me follow along. Okay, so I should be in . . .

Mark: Yes --

Hacker: Hold on a second, here, I think it needs to send a security code to your cell phone, so if I could just borrow your cell phone, we'll get on with this.

Mark: So with IPT 1.0, my system has been authenticated, so it sends a secure token every time I log in, so just having my login credentials isn't enough to actually log in to my account.

Mooly Eden: So [even if he'll know] your password –

Mark: Yes.

Mooly Eden: And your user name, because you installed your Intel Protection Technology, identity protection technology, on your system, you'll be able to log in, he will not be able to log in.

Mark: Exactly.

Mooly Eden: But he still does another thing. So why won't you try to do the transaction?

Mark: Let's see if we can give him another chance to do something here, you know, because he's all dressed up over there, so let me go ahead and initiate a transfer, and I'll go ahead and transfer some money into my daughter's college fund account. So I'll type that in, and, once I click on the transfer button, I'm actually presented with this PIN pad with randomized numbers on it.

Mooly Eden: So this is actually to transmit [from] the server –

Hacker: Hold on a second here. The randomized number thing, no problem at all, I sneak onstage, I hack your display driver, and I come in, and I can see your PIN pad. Hold on a second. I have the frame grabber over here.

Mooly Eden: He's trying to copy the frame buffer. And, voila, there is a slight problem.

Hacker: Okay, can we start the demo again? I'm having a black square.

Mark: So with IPT 2.0, we actually have the secure portal, so the server is actually able to display that image directly to my graphics controller and nothing else can see or interact with that. So the operating system, the frame buffer, doesn't see this information, and because the graphic information on there is randomized with the PIN pad, only the server would know where I actually clicked to authorize this transaction.

Mooly Eden: So why won't you click the number, make the transaction, that makes the other guy miserable? Good.

Mark: There we go.

Mooly Eden: And we finish the transaction in a very simple way. Even if he sniffed to the other system and copied the frame buffer, we get to this pad, which was the secured -- the encrypted pad, he will not be able to do anything with this. This is the codename that we called it WYSIWYS, very simple to remember. What you see is what you sign, and they change it to another name. But you can see that for a normal user, for the consumer, he doesn't need to understand all this technology, to elaborate later on, he just knows that when he makes the transaction, the transaction will be much more secured and pretty soon I believe you'll hear very interesting announcement of credit company which are going to adopt this technology in order to make our transactions more secure. Thank you, guys.

Mark: Thanks, Mooly.

Mooly Eden: And reflection of me, make it much nicer, reduce the cost. In order to do it, we had the challenge -- we -- it's we in the ecosystem, in our OEM and ODM, everybody together, what do we need to do in order to reduce the size, to make it thinner, sexier? We need it to have thinner panels. We have to have a thinner, lighter keyboard. Chassis manufacturing start being complicated because if it's very thin, it still need to be rigid. We need to have smaller hard drive, thinner hard

drive, and battery technology -- we cannot use the cylindrical. We need to have prismatic batteries. That's [got to be] huge effort for the overall ecosystems.

In order to drive it, we went over and we assembled all the OEM, ODM, and the supply line people, companies that we were working with, over to Taiwan, and we had the conference with more than 700 [of these] in Taiwan. We move over to China, we have more than 600 people in China. And we discuss the channel, we said what's the opportunity, and we announced that we're going to invest more than $300 million -- we've got a $300 million fund in order to accelerate these things, in order to resolve some technical problem in order to accelerate the economy of scale to drive the prices down and to make sure that these devices will be available at the consumer-affordable price point. Let's roll the video and see what was there in the Taiwan approximately a month ago. Roll the video please.

[Video]

Mooly Eden: Wow. This is the effort that we are going to work on in the coming year and our challenge, collectively, as the industry, is to drive the price down to affordable. We already started it. As we speak, the prices are much down. Some of the systems that I'm going to show you are going to be available in holiday refresh in the pricing below $1,000. And we are going to drive it down, down. I don't want to say the final prices, because I leave it for the OEMs, but you'll be surprised when you see the affordability of this system.

What I have over here is the early bird that are going to be available in holiday refresh, and what we see over here is a beautiful system, and you can see them later on, from Toshiba, Lenovo, very thin system from Asus. We see the Samsung over here. And we see the Acer system over there. All of these systems are Ultrabooks, all of the [things] are unbelievably thin, and I don't know if you can look and take a picture of it. These systems are much thinner than my finger, and trust me, guys, my finger is not fat.

So what you see over here is the thickness of this system, of this system of really, really, really thin systems. But there was a lot of discussion lately about Windows 8, and Intel and Microsoft have been collaborating closely for the last 20 years. We had several deep partnership between Intel and Microsoft through the development of Windows 8, taking full advantage of the performance, making a huge amount of effort together to reduce the power because its interaction between the software and hardware. To take advantage of the media and graphic capability and take advantage of the whole X86 ecosystem. In order to show you a demo, I would like, first of all, to thank -- and I would like to invite onstage Bret Carpenter, director of [portal manager] for Window Ecosystem Group that flew directly from the BUILD Conference in order to be onstage with me here. Give a hand to Brett.

Bret Carpenter: Good morning, Mooly. How you doing?

Mooly Eden: I'm great. And, by the way, really appreciate you coming over here with such notice.

Bret Carpenter: Yeah, great, that's great. What I have here is an example of how we've reimagined Windows from the chipset to the user experience by enabling Windows 8 to run on this 32-nanometer Intel Atom SoC developer platform.

Mooly Eden: But this is a tablet.

Bret Carpenter: That's right. This is tablet, so we can touch it back and forth here. But I brought this up from BUILD yesterday where we demoed it in Anaheim and generated a lot of excitement.

Mooly Eden: But I'm in the middle of the Ultrabook section.

Bret Carpenter: Oh, that's a good point.

Mooly Eden: So can we move over to the Ultrabook?

Bret Carpenter: You bet.

Mooly Eden: Thank you.

Bret Carpenter: Okay. So with Windows 8, we've also ensured that it will continue to run on the breadth of hardware that exists in the market today, as well as the innovative hardware that you and our development partners in the audience will continue to create. So what we have here is an Acer Aspire S3. It's got a 13-millimeter profile and a 13-inch screen. And

it's got great battery life. And more importantly, it resumes very quickly. We'd like to see that.

Mooly Eden: So this is not hibernate; this is sleep mode.

Bret Carpenter: This is sleep mode, right.

Mooly Eden: Let's see how fast you can resume.

Bret Carpenter: Okay. Are we ready?

Mooly Eden: Yes. One, two, voila.

Bret Carpenter: There we go. All right.

Mooly Eden: Hold on, hold on. Where did you get this picture? I believe this is the only picture of me without a beret.

Bret Carpenter: Well, you know, I did a lot of searching on the Web. And sure enough, I found one.

Mooly Eden: That's amazing. Some people think that I was born with this beret. Let's go on.

Bret Carpenter: All right. Okay.

Mooly Eden: Log in and move forward.

Bret Carpenter: All right. Let's go ahead and log in. It doesn't like the password.

Mooly Eden: Somebody changed the password?

Bret Carpenter: Caps lock maybe. There we go.

Mooly Eden: Rule number one: If you've got cap locks, the password doesn't work. [laughter]

Bret Carpenter: Yeah. And it was a very easy password to guess, as well, too. So what you see here is the new Windows start screen, utilizing the Windows Metro Style UI. And I can come down here, and I can navigate through using the keyboard. You can see it's fast and fluid. We take advantage of accelerated hardware graphics. And what I'm going to show you here, Mooly, is I am actually able to use a keyboard and mouse with this. Even though we did design this for touch, we've made sure that all the existing keyboards and mice work, because -- go ahead.

Mooly Eden: Yeah, yeah. Because that's interesting. It was touch first. But eventually, we can use anything on a touch if we want to use a tablet, but we can get a similar experience and similar capabilities if we used the mouse.

Bret Carpenter: Absolutely. Plus the keyboard, because everybody out here taking notes is using a keyboard today.

Mooly Eden: Yeah.

Bret Carpenter: So one of the things I want to show you is these are tiles that represent all your content, your applications, people that you're interested in. And you'll notice that they're live. So I'm going to show you one of these now. We'll look at the weather one. Okay? And what this is is an example of a Metro Style app where we've enabled developers to use HTML, JavaScript, or ZAML, as well as C#, C++, and Visual Basic to create Metro Style applications. Now, you'll notice there's no Chrome. We give developers full access of every pixel on the screen so they can take advantage of that in their application.

Mooly Eden: Yes. But many of the people here have got a huge amount of software, of batteries --

Bret Carpenter: That's right.

Mooly Eden: -- that the traditional x86 -- what is they supposed to do without this [IE] architecture?

Bret Carpenter: Well, if I go back to press the Windows key -- if I go back to the start screen, what you see here is a desktop. So we do support all the existing Windows 7 applications running in desktop mode. Now, let's go find one of those here. So I'm going to go -- oops, well, I'll go back here. Okay. Let me get this here. Where did it go? Okay. So we're going to go search for an application I know is on here, Visual Studio. Okay. There it is.

So now I've launched Visual Studio Express, which is something we gave away at the Build Conference. And you can see we have a desktop application running. I can also go back over here, and I can go here, and I can click through the existing applications that are running. And even if I wanted to, I can take this application and I can drag it out, and I can drop it on the screen. So if I'm a developer who's sitting here working on code and I want to get out to the beach, I want to see how warm it is in San Francisco, I can go ahead and I can go do that.

Mooly Eden: So actually, you can have the hybrid of the x86 and the new experience both on the same thing.

Bret Carpenter: Absolutely.

Mooly Eden: Thank you very much.

Bret Carpenter: All right. Thank you, Mooly.

Mooly Eden: I cannot wait to play with this operating system.

Bret Carpenter: Okay.

Mooly Eden: Thank you very much. [applause] So I'm sure that all of you are going to test it in the near future. What we are trying to do together is Windows 8, Microsoft's newest operating system, and Intel's new platform solution together provide a no-compromise-based user experience. And I would like you to test it and see it for yourself.

But there's another thing I believe you don't know. We are working already on the next generation. What I told you about the holidays, that you are going to see Sandy Bridge in the Ultrabook. But as we speak, we are working on the next generation. And what you see over here, courtesy of our ODM -- and if I've got any one of them here, I would really thank you very much, guys -- normally we don't get it -- what you see is the next-generation Ultrabooks – all these Ultrabooks are featuring Ivy Bridge. Let me repeat. All these Ultrabooks are featuring Ivy Bridge. [applause] Thank you.

I believe this is definitely amazing, because we are speaking about the first generation is going to be in the market. We've got our engineering sample. It's not in production yet. But you can see the functionality. You'll be able to play with them. And you can see the form factor that we are going to have. And guys, you'll see many of those, more than what most of you think, because a lot of the OEM, a lot of the ODM -- [we're] already cooperating to deliver it, and it will be there with the next generation, as well, at a more affordable price point.

But our effort is not stopping there. We continue to innovate in order to continue to excel in what people want. And one of the things that people want is we want more battery life. And one of the things which is impacting our battery life is the screen, which consumes so much power. So in order to show it, let me show you what we can do and how can we save power on the screen. Hi, Corey.

Corey: Good morning, Mooly. How are you doing?

Mooly Eden: Alive and kicking.

Corey: All right.

Mooly Eden: Ten minutes to go. What are you going to show us?

Corey: All right. Here we go. What we've got here are two identically configured systems. The only difference between these two systems is the system on your left is using a traditional LVDS panel.

Mooly Eden: This is a traditional screen that people are using today?

Corey: Absolutely. The system on the right is using an EDP 1.3 panel, which includes this new technology called Panel Self-Refresh.

Mooly Eden: So this is the Panel Self-Refresh.

Corey: Yes.

Mooly Eden: This is the traditional. But I don't see any difference between the two.

Corey: Yes. What's really happening on this system on the right is that this image that you see right here, the static image of the desktop, is actually being shown from memory on the panel electronics itself, whereas the system on your left is showing this image using system memory and waking the CPU up 60 times a second just to show this image that's not changing.

Mooly Eden: So actually, when I've got a static system over here --

Corey: Yeah.

Mooly Eden: -- the CPU is actually asleep --

Corey: Yeah.

Mooly Eden: -- and the Self-Refresh is working in the screen itself, letting the CPU and the rest of the system [crosstalk.]

Corey: Absolutely.

Mooly Eden: Why don't you show us what you can do with this?

Corey: Well, what I want to draw your attention to first is the power. So the power savings that you get when you have these -- storing the image statically is going to be about 500 milliwatts between this LVDS system and this [panel] --

Mooly Eden: 500 milliwatts between the self-refresh and the standard. If I speak about Ultrabook kind of a solution notebook, how much time will it be translated to?

Corey: You're probably talking 45 minutes to maybe an hour, depending on the exact average power.

Mooly Eden: 45 minutes or an hour, it will be able to move together with our partners from the traditional panels to the self-refresh panels.

Corey: Yep.

Mooly Eden: Why don't you show us [crosstalk]?

Corey: Let me just show you a quick demo of how this works. What I'm going to do is launch off a slideshow right here. So what's going on right here is every time the image is static, we're in Panel Self-Refresh. And you can see the LEDs are green. Whenever the image changes, you'll notice the LEDs went red.

Mooly Eden: So now the CPU is asleep, woke up --

Corey: Just came up, yeah.

Mooly Eden: -- refresh, went to sleep again.

Corey: Yep. You get all these power savings --

Mooly Eden: Now it's sleeping, having a good nap, woke up -- [okay.]

Corey: Absolutely.

Mooly Eden: Now, how can you persuade the audience -- I've known these guys for years. There are many skeptics over here. How can you persuade them that this is really self-refresh and it has nothing to do with the CPU?

Corey: What I'm going to do is -- I just paused the slideshow so that we stay in self-refresh.

Mooly Eden: Now we've got a steady picture. We're not moving it.

Corey: Yep, a static picture. We're staying right here. What I'm going to do is I'm going to reach around and actually pull out the display cable and prove to you this image is going to stay put.

Mooly Eden: Do it slowly so the camera will be able to capture it. Yes.

Corey: And there we go. The cable is disconnected.

Mooly Eden: And now we've got this panel not connected to the PC. You can still see the picture. Self-refresh.

Corey: Move the mouse, nothing [moves].

Mooly Eden: And that's how we can get [450] milliwatts improvement. We really need to work together in order to make it a standard in the industry. And I've got confidence that in less than two years this will be the new standard. Thank you, Corey.

Corey: Thanks, Mooly. [applause]

Mooly Eden: But I believe many of you heard a lot about the other technology, about the Thunderbolt. We've seen Thunderbolt running on Apple.

And people ask me, "When are we going to see Thunderbolt running on Windows?" So what we have over here is another demo. Mark.

Mark: Yeah, Mooly. Just like you said, we had the first demonstration of Thunderbolt, which was called [Light Peak] at the time, and now you can find it on almost the entire lineup of Mac products. Here we've got our Windows-based PC, and then we're actually connecting via this Thunderbolt cable here over to an Intel SSD technology device. And we're streaming four uncompressed HD videos. And just to make sure that you can tell that these are uncompressed, we've got the resource monitor up here that's showing that it's streaming at a rate of over 700 megabytes per second.

Mooly Eden: 700 megabytes per second in order to deliver.

Mark: Exactly. And we've got Acer and Asus, who are going to be delivering platforms with Thunderbolt technology on them next year.

Mooly Eden: They are the first ones, and we believe that this technology you'll see in more and more systems as we move forward. [applause] Definitely.

Well, you heard Paul yesterday in his keynote, and he said that by 2013, we'll deliver our next platform based on Haswell. We'll completely reinvent the PC, and we'll complete the Ultrabook transformation. Not that we'll be able to rest. The next transformation will be ahead of us.

Before I'll end my presentation, I would like to share with you some information about Haswell, the next-generation microprocessor. It's going to deliver 20x power improvement, more than 10 days connected standby, all-day battery life. It will not have to use the power supply. And this is enabled by the Intel power optimizers, where we'll have to work with us and with the ecosystem in order to deliver this great experience. Trust me, you'll love what you will see. As they say, we're going to put the personal into the PC, and the C will stand for the creativity and the consumption.

What you see over here is the first test stage of Haswell, the microprocessor that we are going to deliver by 2013. And it's not only a chip. For the first time, I would like to show you the new baby, because it's up, running, and breathing. And what you'll see over here, and you can imagine the functionality, is actually the working system of Haswell. And I'm sure we'll spend a lot of time in order to cover all this new innovation, because this product is brilliant, and the design team is brilliant, and they're the reason we can show such functionality at such an early stage.

So to summarize, the PC market is growing, and it will continue to grow. Ivy Bridge that I showed you is more than a tick, it's a tick-plus, and you'll see it, and I'm sure that you'll know to appreciate the performance that you'll see, both on the graphic, on the media, and the overall solution. Ultrabook will transform the PC category, and if you're still skeptical, step on stage, touch the Sandy Bridge Ultrabook, touch the Ivy Bridge Ultrabook, feel it for yourself and see if you would not like to adopt a few of these. In Ivy Bridge -- Haswell will

complete the Ultrabook revolution and we'll be ready to go to the next one.

But before I end, let me give you just one more reminder. Roll the video.

[Video]

Mooly Eden: So, ladies and gentlemen, let's go, and let's build wonderful things together, because I believe we've got great opportunity, we've got great components, we've got the crowd, the consumers waiting for our solution. Let's go and do wonderful things together, thank you.

Female Voice: Ladies and gentlemen, the technical sessions will begin at 10:15. Press and analysts, we invite you onstage for a photo opportunity. Thank you.

[Music]

[End of Recorded Material]