Eric B. Kim; senior vice president and general manager, Intel Digital Home Group

[Start of recorded material]

Female Voice: Ladies and gentlemen, please take your seats, we're about to begin. Please take your seats. Thank you. Ladies and gentlemen, please welcome Deborah Conrad.

Deborah Conrad: Good morning, and welcome to IDF, day three. We are really excited to have you guys here again today. It's really going to be a really great day. We really wanted to just also say thanks for just sticking it out for a couple of days. We hope that it's been worth your while. Yesterday we heard from Dadi Perlmutter who gave us our vision for mobile computing, and we were also very excited to announce that our new Core i7 mobile processors, the Clarksdale processors, are shipping.

Then Renee James described all the work that we're doing to enable you to build better Intel solutions using our various software developer programs, and we introduced the new Intel Atom Developer Program and the Media Software Developer Kit (SDK). She also talked about the continuing momentum around Moblin. Ticky Thakkar hosted a technology session and talked about the future of MIDs and smart phones. And then we had an industry session that featured astronauts, scientists, and educators who were talking about how we can better manage our resources. Hopefully you also got a few minutes with some of the Intel Fellows who were live and uncensored. I can attest to that.

And last but not least, we finalized the code breaker challenge, and we have three winners that we'd like to acknowledge today. It was a very tough challenge, and it was one that we hope that we can continue to do in years to come. The first person that I'd like to recognize is our third place winner, Martin Wosick of Bayer Healthcare, who is taking home an HP Media Smart home server. Thank you. In second place is Alan Yi of Cisco Systems who will be getting a Dell netbook. Congratulations, Alan. And then finally in first place is a computer science student and that is [Tariq Safe], and we're very proud of him as well, and he'll be taking home an HP notebook. Congratulations.

Today is about consumer electronics. And in just a few minutes I'll be turning the stage over to Eric Kim. He's got some very exciting developments on interactive TV. And then Justin Rattner will come up and do the closing keynote, and he'll take that TV theme one step further and describe for you some exciting developments, as we see TV moving outside of the home, outside of the living room, into places far and wide. So, with that I want to say thanks again for sticking with us and for being here at IDF day three, and we'll bring out Eric Kim. Have a great day.

[Video playing.]

Female Voice: We now join Eric Kim and a friend in Eric's living room, as they discuss the future of the television experience.

Eric Kim: Transformers 2, you know what an impressive movie that was.

LeVar Burton: It's sweet. Especially on your TV, Eric. It's a nice little media room you've assembled here.

Eric Kim: Yeah, thanks. It's very comfortable. I love my media room. Thanks for joining me. You know, let's do some channel surfing here.

LeVar Burton: All right. How about some Big Bang Theory? Can you find that?

Eric Kim: Good choice.

LeVar Burton: It's distinctly appealing to my inner geek.

Eric Kim: Yes, we must feed our inner geeks here. You know, I used to be a physics major in college, and So, I sympathize with these guys. But, you know, when I was at college, I never had as much fun as these guys do.

LeVar Burton: Hey. Now, you launched a new notebook chip this week. Does that notebook there use it?

Eric Kim: You know, you can actually check it out, here. I can have it send information to my email.

LeVar Burton: Cool, So, you can actually get more information about the products you see on your favorite TV shows. I will definitely check that out

later. Ah, numbers. More nourishment for my inner geek. Empirical proof that even the brainy guy can get the girl.

Eric Kim: You know, I never watched this show before. Why don't we save it for later?

LeVar Burton: All right.

Eric Kim: Here.

LeVar Burton: I'll see it next time.

Eric Kim: You know, we're building up our watch list here.

LeVar Burton: That's amazing. What else can you do with this?

Eric Kim: Well, let's look at our visual tumbler here. As you can see, all my video content is available, whether it's from the broadcast, or from Internet, or even my own personal PVR.

LeVar Burton: Cool. All my content is spread over every last device I own. I am so happy that you've made it easier.

Eric Kim: Do you want to see something really cool?

LeVar Burton: Absolutely.

Eric Kim: Watch this. Search. NCIS.

LeVar Burton: Nice. My TV only talks at me.

Eric Kim: Wow, look at this. Do you know Justin Rattner?

LeVar Burton: Intel's CTO.

Eric Kim: Yeah, you know, he's also, a real Star Trek fan.

LeVar Burton: Really? Well, I've attended a convention or two in my time.

Eric Kim: Well, let's watch this with him.

LeVar Burton: Maybe I'll learn something. Ah. This is, I think, exactly -- The Mirror Universe. One of my favorite episodes from the original series. I love Spock's evil twin.

Eric Kim: You know, Justin says that in the mirror universe, his evil twin is a marketing guy. You want to meet Justin?

LeVar Burton: Absolutely.

Justin Rattner: Hey, how was your daughter's wedding?

Eric Kim: Hey, Justin. Yeah, it was really great. Would you like to see a little video clip of that?

Justin Rattner: Oh, that would be excellent.

Eric Kim: Okay. Here, I'm sending it to you right now. It's coming. Here we go.

Justin Rattner: Perfect.

LeVar Burton: Sweet.

Eric Kim: You know, Justin, you're right now watching Mirror, Mirror with you, right? Do you have any wisdom that you'd like to share with us?

Justin Rattner: Sure. You know, this multiple universe thing, I mean, how many multiple universes can one story line support?

LeVar Burton: Oh, man. All right. So, the gauntlet is flung. Go on, Justin.

Justin Rattner: Well, I mean, here we have the evil Spock universe, then you've got the new movie with the old Spock universe, and the young Spock universe.

LeVar Burton: And you perceive a conflict therein because . . .

Justin Rattner: Well, what I'm saying is you can't just sprout a new universe with every cast change.

LeVar Burton: Justin, actually, the plot of the new movie depicts an alternate timeline from previous Star Trek incarnations, but it's simply a plot device. It's an invention of the screenwriters. It's not an actual fracture of the space-time continuum. For God's sake, man.

Justin Rattner: But is that a quantum physicist's argument or just a rationalization by a devout Trekker?

LeVar Burton: Well, you don't have to take my word for it.

Justin Rattner: Eric, who exactly is your friend?

LeVar Burton: Well, Justin, I'm not actually Star Trek Next Generation's Lt. Commander Geordi La Forge, but I did play him on TV.

Eric Kim: LeVar Burton, ladies and gentlemen.

Justin Rattner: Geordi! Hey, how do you like my media room? Pretty cool. It's the bridge of the enterprise.

LeVar Burton: Your inner geek is really scaring me, Justin.

Justin Rattner: Hey, it's cool. Eric, I never knew you had such cool friends. Maybe I should come over to where you guys are. Should I bring some popcorn?

Eric Kim: Yeah, you know, bring lots of popcorn, because I've got thousands of my best friends here, and we're talking about the cutting edge of television.

Justin Rattner: I don't know if I have the power, captain.

Eric Kim: You know, you need to come by here. And this is very exciting here.

Justin Rattner: All right, well tell them to stick around and I'll show them a whole future beyond that.

Eric Kim: Okay. This is my keynote, So, Justin, say goodbye now.

Justin Rattner: All right, see you later.

Eric Kim: Bye.

Justin Rattner: Bye now.

Eric Kim: Thank you for joining me.

LeVar Burton: Oh, my pleasure, Eric. Thank you very much for having me. You mind if I borrow your audience for just a second?

Eric Kim: Make it so.

LeVar Burton: All right. I am a geek, avowed, self-professed, and I'm a geek in part because of my love for literature. I grew up in a house with my mother who was an English teacher, and for my mother, Irma Jean, reading was not optional. In my mother's household, you either read a book or you got hit in the head with one. And for me as a kid the body of literature that I gravitated toward more than any other was always science fiction. As a kid growing up in Sacramento, California, it was rare for me to see heroes in the pages of those novels who looked like me.

There were hardly back in the day any heroes of color. And So, Gene Roddenberry's vision of the future was critically important to me. What it said to me was that when the future comes, there will be a place for you. And to have grown up and become for people dealing with physical challenges what Nichelle Nichols represented for me when I was a kid had been phenomenal. Science fiction literature and science fiction representations, depictions of the future in the popular culture, have for me always been inspirational in nature, because science fiction dares to ask what I consider, Eric, to be two of the most important words in combination.

And those words are, what if? What if? The link between that which we imagine and that which we manifest in third dimension is inextricable. There isn't a thing that you can think of in creation that did not begin first with a thought in the mind of Man or in the mind of God. And I believe those two to be exactly one and the same. I firmly believe that there was some kid who watched those original

episodes of Star Trek and saw Captain Kirk continually reach back to that secret Velcro place -- because there are no pockets in the future -- whip out that communicator, flip it open, and call, Scotty, pick up!

Eric Kim: Now, I feel like I need to be beamed up right now.

LeVar Burton: You need to be beamed up?

Eric Kim: Right.

LeVar Burton: And I believe that that kid became a scientist, an engineer, a designer, and is responsible for a piece of technology that is more common today than the toaster. Show of hands, how many people have either used one or seen somebody use a flip cell phone? That which we imagine tends to be that which we manifest in third dimension. Human beings are manifesting machines. It is what we are hardwired to do. And so, my message to you this morning is you, developers, are the dreamers in our culture. So, I encourage you to not be afraid to dream that big dream. What if? What if? What if? What are the contributions that you are going to make to our present that lead us to our future? And as my friend Patrick Stewart, who plays Jean-Luc Picard, likes to say: make it so.

Eric Kim: Thank you, LeVar. We'll make it so.

LeVar Burton: Make it so. Have a great day. Thanks for letting me hang out with you in your living room.

Eric Kim: Thank you. Welcome to San Francisco, the home of IDF and the Star Fleet Academy, place where the techies and the Trekkies gather for inspiration and for insight. What I just showed you over there was a concept demo, but it was a concept demo based on all the technologies that are either available today on Intel CE SoC, or will be available within the next 12 months. As you can see, with those kind of technologies, TV is very exciting. TV brings new kinds of capabilities and user experience, blending the broadcast video contents, Internet contents, even personal contents within the context of social engagement and enjoyment.

I showed you new ways to navigate video contents using rich 3D user interface and even using visual and voice types of navigation. I showed you new advertising where the ad message appears that is context relevant to what you're watching So, that it is more meaningful to you as the audience, as well as for the advertisers, where their ad dollar impact is much greater.

I also, showed you a social networking way of engaging in television enjoyment. It helps you discover new content with your friends and share your content.

Welcome to the future or television. It's not that far away. Last year, in this very spot, we introduced the media processor CE3100, the

world's very first purpose-built CE system-on-chip (SoC) with an integrated full Intel architecture microprocessor core. It had a number of very unique capabilities that are critical to delivering these kinds of rich interactive television products. But many of you may not be aware of some of the really great underlying technologies behind it. So, to help explain the technology, I want to invite our lead architect Suri Medapati, one of Intel's rock stars, to join me onstage.

Suri Medapati: Thanks, Eric. Thanks, Eric.

Eric Kim: Okay. So, to help level set the audience here, can you give us a little insight into how the traditional SoCs in the CE device deal with the video and user interface aspects?

Suri Medapati: Yes. Sure, Eric. Typically what you see on the screen today, right, there's a high-level block diagram typical of the majority of the CE SoCs that are in the market today. Historically, these chips have been built for one primary task, essentially processing digital video and audio. To ensure great quality, the video and the audio pipelines are isolated from the non -- real time components, like the application processor and the graphics processor. And these two domains result in a video plane. Then at the compositor, these two video planes get blended together, they get blended together and it results in the experience that you see out there today.

Eric Kim: Okay. So, what's the problem?

Suri Medapati: The problem is this architecture by design constrains you to a two-dimensional integration of the video plane and the user interface. The other problem is that the graphics are typically at a lower resolution than the video. So, you get a 1080p video blended with a 540p video, and the result isn't that attractive. You can see it on the screen.

Eric Kim: Okay, got it. So, how does Intel's CE SoC architecture differ?

Suri Medapati: Well, fundamentally all the building blocks are still the same. What we've done is, we've architected them to be much more powerful and much more flexible. For example, our video decoders are multi-stream, multi-format. They're capable of processing two high-definition decodes at 1080p rates at 60 frames a second. We have dual audio DSPs that process the latest high-end audio that's demanded by things like Blu-ray devices.

                   But fundamentally instead of isolating these components, we have interconnected them using a high-performance shared memory architecture. We've also, integrated a 3D video decoder that's capable of 1920 by 1080p resolution.

                   Even more importantly, you can take a video playing and blend it as a texture onto the surface. So, this allows developers to create a lot of cool new experiences by using technologies like OpenGL to manipulate these surfaces.

Eric Kim: Now, that's really cool here. So, that's how you were able to create the kind of effect that we just showed. Right?

Suri Medapati: Yep. Exactly, Eric. But the advantages don't stop there. Our architecture allows you to integrate seamlessly a lot of emerging Internet video and audio products. Things, for example, that are not integrated in hardware or implemented in hardware, we have implemented them on the Intel architecture application processor. As a result, we have implemented a wide variety of audio and video products, and more are coming along all the time.

We have enabled a lot of digital rights technologies. A good example of that is the recent addition of Widevine. Widevine, as you know, enables high-quality premium video experiences for our Internet-connected CE SoC devices. As a result, this is a great example of, you can see where the power and performance of the Intel architecture processor gives one the flexibility to implement new technologies as customers demand them.

Eric Kim: Okay. So, what else can you do with Intel architecture?

Suri Medapati: Well, really, lots of things. It's really up to the product developer. In your demo, for example, you showed advanced content aggregation and voice searching. That requires a lot of processing power. The other things are, you showed video conferencing integrated with social media. And then there are emerging technologies like gesture

interfaces. These require a lot of horsepower, a lot of processing power, a lot of memory bandwidth. And we have lots of all of these in our SoCs.

Eric Kim: Outstanding. Thank you for helping us.

Suri Medapati: Thank you, Eric.

Eric Kim: Suri Medapati, everyone.

Suri Medapati: Thank you.

[Applause]

Eric Kim: Well, you know, the key thing to note here is that CE 3100 was just the beginning. It enabled Intel to start to work deeply with the CE industry players for the first time, and really create this innovation spiral on the CE platform.

But, you know, we all know that to create a real market phenomena, you need more than just great technology. You need innovations in user experience and also, in business model. That's been true with every medium that spawned an industry around it.

[Video playing.]

Eric Kim: So, we need innovations along all three vectors, technology, experience, and business model. Advancing all three vectors is the challenge facing us now, and we need the biggest brains behind this. And that's why you are here.

Today I'll be showing you some examples of companies using the CE SoC platform to deliver some brilliant innovations on television devices. But before I get there, let's start with Intel first.

The CE 3100 is a great product, but Intel is not standing still. We're applying Moore's Law to the C space. So, today we're announcing the next generation of the CE SoC, the first CE SoC with the Intel® Atom™ processor core integrated. It's called Intel® Atom™ processor CE4100, formerly code-named Sodaville. This will be Intel's very first delivery of 45-nanometer-generation, single-chip CE SoC.

It is optimized for IPTV set-up boxes, connected media players such as Blu-ray and PVRs, as well as, of course, digital TVs. You can expect this to be fully backward compatible with the CE 3100. You all know that software compatibility is the hallmark of Intel architecture. In fact, we were able to utilize the same platform drivers and foundation software that was running on CE3100 directly on CE4100 when we first got the silicon back from the fab.

It has a hardware decoder to handle dual-stream HD videos, high-end audio capabilities, everything that you need to build very high-

end AV system that incorporates such things as Blu-Ray. It has advanced 3D, but we've doubled the clock rate of this 3D graphics engine, effectively increasing the performance of 3D graphics.

It also has hardware support for MPEG4. Also, it's got fully integrated 1080p uncompressed AV capture capability, So, that you could actually bring in HD videos from outside, whether it's your own private streams or from other external sources, as part of your product. It also has integrated NAND controller for a very fast boot directly from the memory. It supports DDR2 and DDR3 for great flexibility in product design.

So, just one year after Intel's CE 3100 delivery, we're executing on the Moore's Law. We're now gearing up to deliver the next generation CE SoC, the CE4100. As you could see from this comparison, you can see dramatic improvement in the overall size, which has huge implications on the products that could be designed and the overall cost of the device.

We've been sampling this silicon to a number of OEM partners, and the response from the CE industry has been very, very strong. We're clearly delivering on the outstanding and incredible performance and software reuse. We're also delivering on the overall and continuing improvement of the overall BOM cost of the device, which is So, important in the CE industry.

But the CE SoC is just one part of the overall innovation that is needed. Industry requires innovations across the TV service infrastructure. And no company really knows the end-to-end service infrastructure better than Cisco.

So, please welcome Malachy Moynihan, Cisco Vice President of Video Products Strategy, to tell us how Cisco is handling the video demand challenge on the infrastructure. Welcome.

Malachy Moynihan: Eric, good morning.

Eric Kim: Thanks for joining me.

[Applause]

Malachy Moynihan: Thank you very much.

Eric Kim: So, what did you think of our little concept demo here? Do you think that's possible, to deliver that kind of product in near future?

Malachy Moynihan: Oh, absolutely. This is a progress. We've come a long ways. From our perspective, it's an evolution from the early days of technology to where we are now. We're building on the experience that we've had in the acquisition of our Scientific Atlanta in 2006, adding, of course, much of our core IP networking capabilities to that. And in addition, really adding very much of a consumer perspective on

that. We've acquired Linksys a few years ago, and Flip Digital is the latest acquisition that you've seen.

I think you know, Eric, delivering premium video isn't easy. It requires advanced quality of service. It's important to note that we are seeing an amazing move of video to IP networks.

We believe, based on our studies, in 2013, 90 percent of all video on the Internet will be delivered over IP. Or, I should say, IP traffic will be 90 percent composed of video.

So, having to add things like intelligent content storage and distribution, much better content protection for IP networks, and compliance with all of those regulatory networks will be very important in this.

Eric Kim: So, will this require the service providers to change their infrastructure?

Malachy Moynihan: Undoubtedly. Another statistic is 60 percent of all video will be consumed by consumers. 60 percent of their consumption will be over IP networks.

So, service providers, of course, have been investing for decades in the traditional architectures, building now onto data, and continuing with us to invest in new technologies like [Doxus 3.0], enabling 100 megabits per second over the traditional or old coax.

We're helping to leverage and update this architecture, whether it's the cable companies, the telcos, or broadcast, with IP in the core and as overlay increasingly as well.

Eric Kim: So, I'm sure you've seen a lot of changes happening in the video space. So, what do you see as the key trends right now? And how do you see that shaping the future?

Malachy Moynihan: Obviously, the trend is in terms of a huge move of the consumer's experience to the Internet, and the content moving itself to being delivered over IP. But there's a lot of fragmentation still in this industry, both in the consumer experience with different business models being supported by all of the different video content providers.

There's also a device and screen fragmentation. We don't think exclusively of the TV any longer, but, also, the PC and the mobile phone. And really, this integration of broadcast video, premium content, and user-generated content is one of the things that's causing the consumer probably some concerns and giving us the increasingly new opportunities.

Consumers really value a unified experience. That was the original promise that we saw on TV. They want that ubiquitous access to their content, the ability to seamlessly move from the TV to the PC, to their mobile phone, in the future.

And this is going to drive content providers who have compelling content and service providers with better distribution and monetization opportunities to deliver it for them. We can help them bring all of these disparate experiences together in a way that makes it possible for service providers and content providers and, of course, a very important monetization partner, the advertisers, all together in a way that they can increase their revenue and their profit.

Eric Kim: I know that Cisco has been making some very big moves in the video space. Give us a little background on Cisco's involvement in the video space.

Malachy Moynihan: Well, we've come a long ways. The first moon landing was televised using Scientific Atlanta equipment 40 years ago this summer. It was used for ourselves most recently in the 2008 Olympics where it was the really first all-IP Olympics, where content was being moved from all of the events happening simultaneously in Beijing, edited in New York, and then streaming out to users on the Internet across the world who could watch their particular sport of interest, regardless of the time or whether it was being broadcast on one of the major channels or not at that time.

So, ,you're going to see us, and probably us at Cisco, using much more the term MediaNet to describe that ideal video network, something we introduced last December. And so, by evolving

networks to a MediaNet, an all-IP next-generation network optimized for this rich media experience, service providers will become experience providers. They're going to use their networks as platforms to offer experiences that are more visual, more personal, more social, and, for sure, more interactive.

We've had immense success with this innovative approach. And you begin now to see some of the leading service providers recently announcing some of their next-generation video infrastructure. Publicly, we've talked about opportunities at Mediaset and Virgin Media in the UK.

But, remember, Eric, it's not just about infrastructure. Cisco has a long history. We've now delivered over 50 million set-top boxes, digital set-top boxes, worldwide --

Eric Kim: We like that number.

Malachy Moynihan: And over 16 million DVRs shipped to date.

Eric Kim: So, now speaking about the client, what needs to happen there?

Malachy Moynihan: Well, obviously, we're going to have to see clients that really blend that existing broadcast video network and these new IP content networks together. We need to be able to deliver on the experience that you showed, having high-resolution 3D graphics capability and, of course, a really good applications processor.

And then, really, for real innovation, we have to take our cues from some of the other industries and make sure that we develop that robust developer ecosystem to make sure that they can deliver these great applications and services beyond the imagination that we talked about earlier. And those developers need to know that this is a platform that has legs, something that will continue to evolve, and that's something that their capabilities will continue to be available on.

Obviously, I think, you have something very interesting with your Intel architecture and with your new CE4100.

Eric Kim: So, it sounds like with Cisco and Intel driving this industry, neither the infrastructure nor the client will be the bottom leg for the industry's growth into the next generation.

Malachy Moynihan: Absolutely. I'm very hopeful about that.

Eric Kim: Great. Thank you, Malachy.

Malachy Moynihan: Eric, thank you.

Eric Kim: Malachy Moynihan, everyone.

[Applause]

Eric Kim: You know, there's one simple truth about television: it's simple it's easy. People do not want to lose that relaxed kick-back experience of television, even if you're a geek. "Don't make my TV act like a PC." This is what we heard consistently from the consumers. Putting PC Internet directly on TV does not work. We know. We tried it.

But, increasingly, people want rich, immersive and social experiences on their television. The PC was all about giving power to the individual. TV is the family-and-friends unifying force, with its electronic heart and simplicity attributes.

So, the key challenge is how to bring the power and the richness of Internet, but keep it TV simple.

Last year, as you know, we launched Widget Channel as the first application paradigm for television. Single-click access to the applications and the content service that you want.

That was a great start. And, right now, we have a number of players writing Widget applications for TV. But now it is clear that what's needed is a full, unconstrained Internet application-development framework targeted for television.

One extremely popular, rich media application framework is Adobe Flash. It has an extremely large Internet developer community behind it. It is exclusively focused on developing rich media

applications with blended video, 3D animation, rich graphics and interactivity.

We believe Flash will play a key role in shaping the interactive TV-user experience. To tell us more about this, I'd like to invite David Wadhwani, General Manager and Vice President of the Platform Business Unit from Adobe. Welcome, David.

David Wadhwani: Thank you, Eric.

Eric Kim: Thank you for joining us.

David Wadhwani: Oh, my pleasure.

Eric Kim: So, tell us from your application development perspective?

David Wadhwani: Sure. Yeah. Over the last few years, we've seen two undeniable trends. The first is that consumers are starting to demand access to content and applications, regardless of the device that they're using. And the second is that device manufacturers are starting to introduce an entirely new set of exciting devices into the market, some already in market and some about to hit the market, that meet those demands.

And, while this is generally I think great news for both the industry and for consumers alike, it does cause some challenges. Content publishers, for example, are struggling to reach those demands. The

cost of building one-off implementation to their content or their applications is simply too high for the audience that they reach with one individual device.

So, a few years ago, we set off to address this for our customers, the content creators and content publishers, and quickly realized that this is not something that we could do alone as a single vendor in the industry and, as a result, created the Open Screen Project. The Open Screen Project is a collaboration between content publishers, device manufacturers, operators and chip vendors. And the goal is very simple, to provide a consistent runtime across PCs, netbooks, mobile devices, and digital room devices, living room devices as well.

As part of the Open Screen Project, Adobe has opened up Flash. We've published the file format associated with Flash and removed all restrictions on that format. We've opened up all of our protocols, both our data protocols and our media protocols, like audio and video. And we've removed all license fees associated with distributing Flash.

The one thing we require of our other Open Screen Project partners is that they create and open platform that's addressable for third party developers. The results of this we hope is that the millions of content creators and publishers will be able to reach the billions of consumers, and that the billions of consumers can access their favorite content, regardless of what device they happen to be using.

And we're of course thrilled to be working with Intel to make the Open Screen Project a reality.

For those of you who don't know, we've been working with Intel for quite a while on PCs, and now we share the same vision across screens. Intel's chip architecture is a great multi-screen architecture, spanning PCs, netbooks, mobile Internet devices, phones, and television just like Flash.

And the areas where we've been cooperating have spanned from the graphics to the video. We've done hardware acceleration for video decoding. We've done some hardware acceleration for graphics. And of course, binding the HD video support and the interactive content and delivery is what we think we can really bring to market to move the needle. And we think this will fundamentally change the way people consume content in the living room.

There are three primary use cases that we're addressing with this. The first is that we think together we can unlock the wealth of information that's already on the Web today. Intel's new platform combined with Flash is going to enable full Web browsing directly in your living. And what you're seeing behind me right now is the first ever demo of full Flash 10 running on the CE 3100 [formerly codenamed Canmore] processor.

We believe that this is going to enable consumers to access their favorite Web content directly in their living room -- this obviously

being an example of rich content from Disney -- showcasing interactive composited video with animation. But we think that the future of TV experience goes well beyond just simply accessing the Web. It's about immersive TV interfaces. So, Eric, the demo you showed earlier when you were talking to LeVar. What was that built with?

Eric Kim: Interesting that you asked that. I didn't talk about technology. The entire concept demo was built using Flash 10.

David Wadhwani: Right. So, there you have it. The power of CE 3100 and the combination with Flash, and what the design community and Flash is able to bring out, I think really positions both of us and the consumer to reshape the way people interact with their televisions.

And lastly, I just want to touch on the fact that I think that it will be commonplace in the near future for consumers to be able to access third party applications and content directly in their living rooms.

With Intel and our other Open Screen Project partners, we can unleash the power of the millions of Flash designers and developers -- whether they're sitting in the smallest game development shop or the largest media brands in the world -- and enable them to create immersive experiences for the television across a variety of content types, whether they're casual games, social widgets, or Internet videos. And things that I think we haven't even started to dream up yet. So, we're thrilled to be working with Intel on this.

Eric Kim: This is exciting, having this kind of application run all natively on the CE device. This is really cool. Thanks for joining me. David Wadhwani, everyone.

                   [Applause]

Eric Kim: So, with a strong platform in place, we can expect many new innovations to take place throughout the TV industry value chain. Another key player in that innovation value chain are TV networks. They have a lot of stake here, with an incredible opportunity to really evolve the user experience with their content.

                   So, what are their challenges here? We all know that the content industry is driven largely by revenue generated from advertising. When you look at the chart back here, in fact today the fastest growing advertising revenue is the Internet video advertising. It's gone from like, $350 million this year to $1.6 billion. But you know, it is still dwarfed by advertising spent on television, which is like $59 billion dollars this year.

                   As more and more consumers embrace online, on demand interactive video on television, and the TV devices enable this directly, there is this huge challenge for the industry. How do you prevent trading off of what's called analog advertising dollar to digital advertising dime? We all know that advertising revenue is critical to the content industry.

We also believe strongly that an interactive foundation will be necessary to enable the tremendous innovation that will be required in the TV advertising of this online video world. Ads that are context relevant, interactive, telescoping, actionable, like the example that you saw in our concept demo. just to name a few.

But you know, there is an even more fundamental problem here. How do networks attract the audience in the first place? In the world of a thousand channels, and now with TVs going online interactive, literally infinite choices for the consumer.

Attracting the audience in the first place in order to create the opportunity for advertisers is a huge challenge. What can the TV networks do to leverage the capability that we provide on our SoC platform to innovate to tackle this challenge?

To tell us more about this, I'd like to invite George Schweitzer, President of CBS marketing, to join me on stage. Hi, George. Thank you.

George Schweitzer: Thank you, Eric.

Eric Kim: I know you're a real techie.

George Schweitzer: That's it.

Eric Kim: So, tell us about technology from your perspective.

George Schweitzer: Well, thank you, and it's great to be here. I'm happy to be here.
                     Considering all the changes that you're spelling out for our industry,
                     I'm happy to be anywhere these days. But we do love technology at
                     CBS, as you know. We love it so much that we have created a hit
                     show about some fun loving, brilliant technophiles like many of you
                     here in this room, and the constant desire to innovation. Let's take a
                     look.

                     [Video plays.]

Eric Kim: My wife knows that's me.

George Schweitzer: That's you. Well, you get the point. I can identify with that technical
                     triumph, because my hobby is home automation. And so, for you're
                     all good here, at the end of the talk I'll show you how I can open my
                     garage door back in New York from my Blackberry here and scare
                     the hell out of my wife.

Eric Kim: He's not joking. He did this last night.

George Schweitzer: Or you can read about it on my blog. I do a blog on CNET where
                     they asked me to write about the digital home and television
                     market. So, a lot of the things we do together, I do that.

Now my main job at CBS is to get people to watch television. And it gets more exciting and obviously more challenging all the time thanks to Eric and our friends at Intel -- and a lot to all of you -- because technology has given us many, many more platforms for our content.

And technology will be integral to helping us get around that age old philosophical riddle. You know, if a tree falls in the forest and there's nobody there to hear it, did it make a noise? Well, the corollary of that is because in the world of content, if a great show goes on a platform but nobody is there to see it because nobody can find it, then we've got problems. And when we've got problems, the tech world has problems too.

So, my world basically works like this. Here's the formula. R equals ratings. When ratings are good, people are happy. Very simple. More people watching means consumers, advertisers, everybody here who participates in the entertainment industry is happy. We like happy. Of course there is the inverse. Ratings down, people are sad.

So, this is the formula we want right here. Ratings growth equals happiness, which equals money for you and me, and we invest in development, which leads to food and jobs. We keep our jobs. Our kids are happy. And we can all buy really cool stuff to watch all our content on. So, there's a whole lot riding on having people discover and navigate our new shows.

And it's particularly important this very week because this is premiere week. It's premiere week in network television, when the TV networks will introduce over 40 new programs. That's the network TV grid of all the new and returning shows. There's a lot of new stories, new characters, new things to dive in to. But for the viewer, the very act of finding the new shows has become a journey of absolute epic proportions.

Navigation is our number one challenge, and the challenge for the viewer. How do people find the shows that they want to watch? How do they find the content? How do they discover new material?

It used to be very simple. You looked up the listing information in the TV Guide or a newspaper, and then you watched the program at the designated time. But thanks to the genius of people like you and everybody here, consumers today have an infinite set of options. People can watch virtually anything anywhere on any device when they want it. That's me in my man cave.

Eric Kim: Wow, you have a great media room.

George Schweitzer: I know. You come over. You can come over anytime. There's a lot to manage. The experience has evolved from watching television in a linear world – 8:00, 9:00, 10:00 – to managing video, managing video in a world where the consumer is always in control.

Now, in theory, that sounds great. But in reality, people are totally overwhelmed by the sheer range of choice. And this brings to mind one more formula for you. Einstein wasn't exactly right. Its MC-squared equals MC-squared, which is more content, more choice equals more chaos and more confusion. He was just ahead of his time.

So, consumers find themselves engaged in a game of what we call high-tech hide-and-seek. The shows are out there, but we need to make it simpler and easier to find them. That's why we like what Intel is doing with connected television and all the implications, and where it's going in the future. It's a big part of our future as an industry, and it starts with the TV Widget, which you introduced last year and provided the update on today.

The CBS Widget is about to go live. It will give the viewer easy access to our schedule, to our shows, and to all kinds of related information. It makes navigating easy. We love easy. We love what's coming up next with the next generation of the Widget.

Tonight is the season premiere of The Mentalist, so I want everyone back to your rooms in time to watch that tonight at 10:00. You can give us good ratings, and we'd be happy again. So, here you can get everything you need to set up for your viewing tonight. Maybe you want to recommend the episode or see what your friends have recommended. It's very simple.

The TV Widget is just one example of what is possible. It enhances the viewing experience. As a content provider, that's very important for us. It also points the way to many more innovations.

Our job at CBS is to make the case that spending one hour, or two hours, or three hours with our programming is the best, most fulfilling entertainment choice out there. Your job is to make the TV user experience everything people want, and more. When we both do our jobs well and the love match happens, people get connected with the shows and the content they desire, and everybody is happy, so Eric, we can spread that TV love. Thanks a lot.

[Applause]

Eric Kim: Thank you. TV love. That was my theme last year. It's great the message is going out there. That's great. You know, it's great to see how a major media player like CBS is embracing this new connected paradigm to deliver what their audiences want.

Consumers love their experience with TV. That's why it's so popular. From the very beginning, TV was all about digital storytelling. So, because of that, especially from the hardware standpoint, there was tremendous focus on increasing the display quality and the quality of the sound. But now we're adding

interactivity and application capabilities to television. This will lead to a new innovation in the platform and the business model.

I want to actually talk a little bit about innovation that's happening on the other side of the pond – not this pond, but the other side of this country. You may know that last year BBC of United Kingdom released a product called iPlayer on a personal computer. It enabled the U.K. consumers to essentially watch any BBC content, which, as you know, is very, very popular, over the Internet anytime they want on demand on their PC. It was so popular that literally on the first day it brought down the entire broadband backbone of the U.K.

Let's hear from the person who is largely responsible for iPlayer, Erik Huggers, Director of Future Media and Technology of BBC, on what he has to say regarding the innovation happening on television.

[Video playing]

Eric Kim: TV as a gateway to infinite choice. A new way to think about TV, isn't it? This is just the tip of the iceberg. With Widgets and Flash running on TV, you'll see TV-centric applications proliferate, just as what's happening right now on the smart phones.

What is really interesting is that the most compelling and immersive application that consumers use today through the TV device is what? Is games. Today, in order to play a really a good game, you

either need a full PC or you need a dedicated game console like
PS3, Nintendo Wii, and so forth.

Direct PC game playing on a CE-device like a set-top box or Blu-
ray Disc media player in most cases is not possible. Even if it is
possible, we know that it's distinctly uninteresting today. But the
fact is that there are many very interesting, an amazing array of
Flash-based games on Web today. So, with full Adobe Flash 10
running on CE-device, enabled by Intel architecture platform, you
can expect that a lot of customers will enjoy playing games on the
CE device.

But even more than that, last year when we delivered our CE 3100,
because it's a full Intel architecture microprocessor core, we were
very intrigued with the idea of running the true native PC game on
our platform, even though the game was written for Windows OS
and our platform was running Linux, because of the full x86 Intel
architecture compatibility.

The fact is that there are many older games right now that are being
played by consumers on a regular basis that are loved by
consumers, but these games are not available in the retail channels
anymore, because it just is not economical anymore to deliver in the
physical format. So, suppose if these PC games were readily
available through your, let's say, TV service provider, could this be
an interesting business for TV service providers as an additional
service? And could this be beneficial for the users at home?

So, to give us a better view on enabling true PC gaming possibilities on this CE device, please welcome Vikas Gupta, CEO of TransGaming. Hello, Vikas.

[Applause]

Vikas Gupta: Thank you, Eric.

Eric Kim: Thank you for joining me.

Vikas Gupta: It's great to be here. At TransGaming, we specialize in the development of software portability technologies for the electronic entertainment industry. Our technology allows games designed for one platform to be deployed across alternate platforms and operating systems without the need for arduous redevelopment.

We started out in 2001 with our Cedega product, which allows us to enable games for the Linux operating system. Over the years we've enabled hundreds of great top-tier content for Linux. Back in 2005, when Apple transitioned to the Intel processor, we saw another incredible opportunity to innovate and dominate the Mac gaming market. So, we very quickly adapted our technology and we created our Cider portability engine. Many of the Mac games in the marketplace today that consumers love to play and enjoy utilize our Cider technology. And many of those games would never have made it to the Mac had it not been for our technology.

Earlier this year when we first learned about the Intel CE architecture, we saw an incredible opportunity to innovate yet again by bringing great gaming content directly to the television. So, we requested an Intel innovation platform and the SDK, and within a few days we had a number of great titles up and running very quickly. We're actually very excited to finally see a digital home architecture with a true applications and graphics processing capability to enable a wide assortment of games.

Eric Kim: You know, when I first saw what you did in such a short time, I knew we had something very special here.

Vikas Gupta: Well, Eric, I'm very pleased to introduce to you TransGaming's Game Through TV gaming service. Our Game Through TV service is designed to provide a full and comprehensive gaming experience directly on the television. What we're striving to deliver is a service that can be easily integrated into digital home architecture products that are based on Intel architecture.

We're developing a service that allows CE manufacturers, service operators, and content creators to capitalize on the real success of the digital home experience that you mentioned earlier today. Our gaming service also seamlessly blends the innovation of technology with a compelling consumer experience on a business model that allows for new monetization strategies for the entire CE industry.

Eric Kim: So, how will content creators be ensured their titles can be part of the CE products out there?

Vikas Gupta: Great question, Eric. TransGaming is developing a Game Through TV SDK, which will allow game developers and publishers to either adapt their existing content for the service or develop brand new content. Once a game developer is ready, they simply submit their games and titles to TransGaming, and we'll take care of validating and provisioning those games on the Game Through TV service, thereby making them available to a CE consumer audience worldwide. We've already partnered with leading content creators, and a number of titles can be experienced here at IDF.

One of the other important elements of what we're delivering is that we're also providing a wide array of pricing models for content creators. That includes purchase, rental, subscription, and even ad-supported.

Eric Kim: So the game developers could actually try different pricing and promotion ideas.

Vikas Gupta: Exactly. That model's actually worked very well for the mobile platform. Plus, since game developers and publishers have a large volume of back catalogue content, we provide them with a vehicle to generate incremental revenue on existing assets.

Eric Kim: Great. So how does the service actually work?

Vikas Gupta: Well, the best way to explain that to you is to show you an example. So, right now we're sitting here on my personalized homepage. If we navigate from my homepage experience to the store, you can see that we've got a great variety of different genres of games and a number of great titles that certainly have appeal to all family members in the home. If we scroll back to the top of the list – let's choose World of Goo. I've heard great things about that game. A single click and the game immediately begins to download. Now, the game is being downloaded directly from TransGaming's content delivery networks.

And as you can see once the game has been downloaded, the button immediately changes from buy to play. A single click and the game immediately begins to launch. Now, Eric, while the game is launching, let me point out one other very important element of the service. We recognize that consumers don't necessarily want a keyboard and mouse in their living room. So, part of the experience that we're building includes the integration of custom peripheral devices that enhance the game-playing experience in the living room environment.

Now, World of Goo is a great game developed by two fabulous independent developers. The object of the game is to grab balls of goo and build bridges, to build towers, and ultimately have as many of those goo balls suctioned out by the pipe as possible in the fastest time as possible. So, let's take a quick look.

Eric Kim: This looks a lot of fun.

Vikas Gupta: This is a great game. It's available on a variety of platforms. It's actually been recently released. So, we're very happy to be able to make that available on the Intel architecture.

Eric Kim: Can you imagine this playing directly on set-top box or TVs?

Vikas Gupta: In the living room – and it's a family-oriented game as well. So, this is something that certainly has appeal to absolutely everybody.

Eric Kim: That's great. So it's very exciting to see a PC title run on the CE platform like this, you know?

Vikas Gupta: Well, we're always very excited to bring great gaming content to new platforms. It's the very essence of what TransGaming is made up of, and it's a core foundation of what we're exceptionally proficient in.

Eric Kim: You know, that really shows the value of Intel architecture. So, you know, when do you expect these kinds of games to be available on the CE products in the marketplace?

Vikas Gupta: We expect to deliver the service in early 2010 with a select number of partners. And then we expect to scale very quickly, adding new

CE device manufacturers as well as content creators and service providers in the second half of 2010.

Eric Kim: That's great. I can't wait. Thank you.

Vikas Gupta: Neither can I. Thank you very much, Eric. It's been a pleasure.

[Applause]

Eric Kim: Vikas, everyone. Thank you very much. It's clear that to create new growth for the TV industry, it's all about innovation. We are delivering a powerful platform with robust application development tools, enabling the creation of applications and services with compelling, rich user interfaces, with full web-like interactive services, all designed to enhance the television experience that we know and love. You now have the power to build the best of all possible worlds on television. Intel can build silicon, underlying software, and work with a few key players to create a foundation for innovation in the CE industry.

But the real innovation potential can only be realized through the efforts of developers around the world like your self. To help you get started, we're announcing the CE reference platform and software development kit available for order right now.

So, in conclusion, the future of TV is here. We've been talking about what is real. Real technology, real consumer needs and

demands, and real markets to be created. The breakthrough innovation for television is just about to begin.

For the longer term great phenomena and interesting ideas, please stick around for Justin's keynote. He'll give you some really great insight to it.

The future of home entertainment is on Moore's Law's now. You all know how Moore's Law's creates new opportunities, and we have new places to apply our creative juices. All of us, on the TV, in the living room, everywhere in the house. It's a world where no one has gone before. So, let's go there together. Thank you very much.

[Video playing.]

[End of recorded material]