Intel Developers' Forum
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Female Voice: Ladies and gentlemen, please welcome vice president and general manager of Digital Home Group Don MacDonald.

[Applause]

Don MacDonald: Well good morning everyone. It's great to be back here with you at the Intel Developer Forum. And yesterday we heard from Paul who said that growth was back in fashion, and nowhere is that truer than in the digital home space. So what I'd like to do this morning is to take you on a little journey and show you what's happening in Intel's digital home group. So first I'd like to start with quick demonstration, but also ask you a question. At the end of this demonstration I'd like you to ask yourself what's changed, okay?

So over here we have some traditional entertainment devices. We have the radio and the television. Let's turn on the radio. [Music plays]. And I'll also turn up the volume here on this television. [TV dialogue] Ask yourselves what's changed. Actually quite a lot has changed. In this case this is a radio program, but it's not streaming over a radio, it's actually streaming over the net to this xScale-based cell phone, and here it is indeed a television program, but it's actually streaming here onto the Internet again, over onto a Centrino mobile technology based notebook.

So you're watching TV, and you're listening to the radio, but again we ask, 'What's changed?' Well, what's changed is that we experienced traditional entertainment content, but absolutely not on traditional devices. The reason for that is very simple: most of the media, most

of the content have gone digital. And now pretty much any type of digital entertainment can be played back on any type of device. This gives you immense flexibility. Whether it's audio, video, whether it's live or recorded -- you no longer need a dedicated playback device. And that change has actually brought us to what we call the digital entertainment era, and more importantly I would contend that that era is giving way to a new digital entertainment industry.

So the key thing to understand is that transition is actually happening right now. If you look at the chart up here, all entertainment industries on the chart began with one fundamental technology. And then the interplay, in this case, of content, distribution, and exhibition drove the growth of each new major industry over the last 150 years. And I would contend that you can tell the difference between a fad and a fashion or indeed, a truly new industry when you can identify changes in all four vectors.

So for example, the technology that brought us television truly did spawn an entire new industry. You have changes in the technology, the content, the distribution, as well as the exhibition. But contrast that with the addition of color technology. That was exciting and new, but it did not drive changes in content, distribution, or exhibition. It was a fabulous addition, but it did not spawn a new industry. Those other factors remained the same. So against that backdrop, let's see how the digital entertainment industry measures up.

Well, we certainly have new content forms. We've got digital technology through the Internet. We've got new forms of distribution,

and obviously that is through the Internet. And essentially anybody anywhere in the world can acquire their content. We also have the new distribution including things like time shifting, and also in terms of the exhibition, as I demonstrated, you can basically set his content on pretty much any digital device.

Dramatic changes in all four of those vectors suggests that this really is indeed not only a new digital entrainment era but in fact a new digital entertainment industry. Why do we care about that? Well, the fact remains that as developers and people who run our own businesses, the media industry – the television, radio, and movie industry – spawn some of the biggest wealth-creating industries ok in our history. They are very pervasive, very dynamic industries ok and generate a great deal of wealth. And not just for the content companies themselves, but for the entire ecosystem. For the retailers, OEMs, for the content, the service providers, the producers, the broadcasters, et cetera.

So if you can find a truly new industry, then I would contend that the opportunities we face are very significant. Again, the digital entertainment industries we're showing on here represent opportunities for everyone in this room. And I think the indicators are everywhere. You can see things such as cell phone ring tones, et cetera. Who would have thought Beethoven's Ninth would have become part of a ring tone on your cell phone? Or, for example, the Seoul Broadcasting Service are now downloading episodes of Korean dramas for forty cents an episode. They did over four hundred thousand, which may not seem like a lot, but at forty cents an episode, that's a hell of a lot of downloads.

Indeed if you look at the legal music downloads. Awhile ago, it was no more than a battle between lawyers and pirates. But now we're seeing significant increases in the number of people who are legally subscribing and legally paying for legitimate downloaded content, and more than a third of those 2.2 million users actually did that this year alone. So we're seeing a tremendous growth in the space.

And then as you can tell from my accent – I have a British accent – so I come from a cricket-playing nation, and I would contend that cricket is the grown-up version of baseball, but even here in the U.S. – [Laughs] that was the Brits clapping, so – even here in the U.S., you have more than half a million subscribers downloading and paying for games through the Major League Baseball. So, although we're at the very beginning, these things are truly happening, and the indicators are pretty much everywhere.

And of course what's driving this growth, it's very much the adoption of home networks and it's very much the adoption of broadband. And by various estimates, we would guess that there's probably – depending on your definition – somewhere in the neighborhood of about 300 million homes with broadband. 300 million homes, and depending on where you go in the world, whether it's Korea, Japan, et cetera, you can get some pretty tasty broadband spectrum.

So let's just do some quick math. If that's 300 million broadband-enabled households, and let's just make a crass assumption that there's roughly, say, four people in each household, each person has access to

roughly two digital devices – that's more than two billion devices that we have an opportunity, as developers, to develop for. What a fabulous target for you, as developers.

The advantage that you have if Intel implements this plan, which I'd like to outline, is that you have a huge advantage because a growing number of those target devices either are or will run on Intel-architecture-based platforms. Obviously this is great for Intel, but it's also really good for every one of you in this audience. You already know the Intel architecture, you know how to build to it, you know how to program to it, and as Intel architecture moves into these new spaces, two things will happen.

The first is that we get to re-energize the PC category. It's already great, it's already exciting, but this ability to have digital and connected content interfacing with PCs will get a burst of adrenaline. 86 million consumer PCs this year, rising to more than 100 million consumer PCs every year in the next couple of years. So that's the first thing.

The second thing is that the category that you develop for can be expanded into such areas as digital television, digital set-top boxes, or digital video recorders. So your opportunity is exactly Intel's opportunity, and I think we're perfectly aligned. And the commitment from Intel and from the Digital Home Group at Intel particularly, is that we're committed to create these new opportunities for you to innovate around Intel architecture. That's really what I want to focus on today.

I'd like us to just take a step back, and I would suggest that we have to start with people. We're dealing with consumers, and we have to understand what they want and perhaps more importantly, what they don't want. Within Intel, we took a fairly stiff look at the IT approach that we'd applied towards consumers, and we decided that knowledge of the consumers has to drive Intel development.

Some of you may know that Intel is actually invested in and has been developing an ethnographic research capability. I think Bill mentioned some of this yesterday. So, we actually observe what people truly do in their lives, not what we want them to do. Also, we observe what they want to do with their lives, not how we want them to use our technology. Here's another person with a funny accent from yet another cricket-playing nation to tell you about what people want is Intel's Director of Domestic Designs and Technologies Research, ladies and gentlemen, please welcome Genevieve Bell.

[Applause]

Don MacDonald: Hey, Genevieve.

Genevieve Bell: Hey, Don, It's nice to see you again.

Don MacDonald: So, Genevieve, you spend your life observing people. Tell us what's different about developing technology for the home.

Genevieve Bell: Well, I don't know about you, Don, but my home is really messy and one of the things -- we don't talk about your domestic, so -- My house is filthy most of time. But I don't mean that kind of messy, I actually mean the messy where things are kind of complicated. You don't know what's going to happen next; your kid gets sick, the telephone rings, the dog runs away, the garbage doesn't get collected. The challenge about living one's life is that it doesn't run to plan; it doesn't run like one's Outlook schedule. You just don't know what you're going to do every sort of second of the day. I think the challenge for all us is how do you design for that kind of messiness of life?

Don MacDonald: So, when you're observing this, how do you actually learn about this stuff? What do you do?

Genevieve Bell: That's a good question. As an anthropologist, I actually spend my time in people's homes. So, as you said, we've had an ethnographic capability at Intel now for a decade. In that decade, we've spent time in about 600 homes in 20 countries around the world. Really, what we do is we go and hang out; I mean we actually spend time with people in their homes, getting a sense of what makes them tick. I wish I could tell you all about that, but we'd be here long past closing time. So, what I thought I'd do instead is show you a little piece of video. So, we actually went out on the streets in London and D.C. and asked people what they loved in their living rooms. And, I wanted to show you just a piece of that.

Don MacDonald: Let's have a look at the video.

[Video plays]

[Laughter]

Don MacDonald: Okay, so the fish tank; I really like fishing, so I get the fish tank. So, what an interesting mix, Genevieve.

Genevieve Bell: I think one of the wonderful things about doing ethnographic work and about getting to hang out with people is you see this extraordinary diversity -- from people who tell you that they love their seven-foot sofa to their fish tank. I think what you start to see is this extraordinary richness in people's everyday practices. And, it's clearly different in different countries. You're English, I'm Australian; we have very different cultural practices. I'm sure those of you in the room who are Americans would know that we're very different from you, too. So, there are all kinds of different cultural practices that go on. There are different ideas about family, different ideas about space.

All of those things lead us to actually having to think about things like reliability; what does it meant to talk about reliability in the home? Clearly, you don't have an IT guy lurking in the basement of your house ready to just troubleshoot everything at the drop of a hat. So, you think about reliability really differently. I think we need to think about things being more robust.

Clearly, homes are full of all kinds of dangers for technology, the sorts of things that, again, don't tend to happen in offices. So, the challenge is how do we think about that? You talked a little bit about this, but I

think we also need to think about how to make things desirable. It's not enough to make them useable and useful; people have to actually care about it. People actually have to want the stuff that we're building. Fundamentally, I think what it comes down to is it actually has to "just work."

Don MacDonald: So, in summary, what else did you learn from this?

Genevieve Bell: I think, for me, it really boils down to this one key point: I think it's about how we humanize all this technology here. How do we make it something that people really care about? I think, is some ways, the challenge is not how do we build a digital home, but how do we make the home digital?

Don MacDonald: So, if I just paraphrase what you've said and the work that you've done, you're really saying that for everybody in this room, unfortunately we no longer get to set the bar. That the consumer sets the bar for us, and perhaps, whether we like it or not, that bar is much higher than we've traditionally been used to.

Genevieve Bell: And that's absolutely the case.

Don McDonald: Okay, thanks Genevieve. Ladies and gentlemen, Genevieve Bell.

Genevieve Bell: Thanks, Don.

[Applause]

Don MacDonald: Can you believe we actually pay Genevieve to do her job? Okay. Did she just make a gesture at me? [Laughter] Okay.

Yesterday Paul spoke about how technology needs to intersect people's needs in his opening address. And as you heard from Genevieve just now we're putting a lot, and I mean a lot, of effort into understanding those consumer needs. Because unless we do, the traditional PC roots and heritage we have will probably inhibit us from being successful to truly make that vision of a new entertainment industry with consumers.

So once we understand what consumers care about, the next step is working with you in this audience. We have to make sure that both Intel and the developer community innovate on top of the platforms that hopefully we have designed and architected to meet those consumer needs, and your innovative development efforts also have been architected to meet the very rigorous standards of consumers.

So what I want to do is give you a quick update on progress since spring of IDF. I'll go through this fairly quickly. The first thing is we demonstrated the Anchor Creek platform and we introduced that in the second quarter. The success of Bridge Creek we demonstrated is still very much on track for the first half of '06. We also announced the introduction of the Intel 854 chip set for consumer electronics designs, and since then a number of companies have actually adopted the chip and brought products to market. And what I'd like to do is hear from one of the companies. In this case it's Thompson. Can you play the video, please?

[Video plays]

Don MacDonald: So just some feedback from one customer. Time-to-market advantage, 18 months ahead of where they would normally have expected to be. That's a big advantage for developers based on Intel architecture.

So continuing with our theme of where we were in the spring IDF, we also announced the DMI. We launched the version three of DMI in March, and will continue to enhance and evolve the software suite. We also mentioned that we were committed to driving the delivery of compelling content to be delivered on these Internet delivery platforms. And we did that. We put our money where our mouth was. We formed a new joint venture with Morgan Freeman, and that manifested itself in this new company called ClickStar that is committed to acquiring and delivering content that will be available, day and date release, concurrent with theaters. That's a big deal. That's earth-changing, that's game-changing. And that will happen on the platforms that we're developing for. We think that's a very important step.

We also mentioned we were working very closely with Microsoft, to add the Microsoft DRM capability, again, to make sure that this stuff just works. And we did that. We're very much aligned, and very much on track with Microsoft there.

So that was, very rapidly, the scorecard from the spring. And you know for us to be successful with consumers, we have to execute. And

I feel very happy that we did every single thing that we said we would do when I stood up here at the spring IDF. But you know a lot of other things have been happening, as well.

Let's just take a look at some of the standards initiatives that we've been working with. The digital home standards group grew significantly. The DLNA now has 249 members spanning 22 countries. That's a big deal. And since the spring IDF, although standards are necessary, they're not sufficient, we've been actively engaged on plug fests, and we've had six plug fests so the various companies involved in the initiative can make sure that their devices and services are interoperable. We've actually had more than 50 companies so far, and growing, testing more than 150 devices.

You know, that's good, but there are other areas we have to address as well. And one of them is related to device display. You know, although it's great that we have this plethora of different devices that you can show content on, the fact remains that the proliferation of devices and screen sizes drives the need to have a unified display interface that works across both the CE and PC product lines. And just like with DLNA, Intel is committed to working closely with the industry to harmonize on a unified display interface solution. So stay tuned for some more there.

The other area is home connectivity. That's obviously a huge deal for us. There's been a lot going on there as well. Clearly we're committed to both wired and wireless solutions to enable this better, digital entertainment experience in the home. So you've heard in detail from

Sean and Paul about how WiMAX can address some of the needs for long-range broadband wireless and about how Wi-Fi is reaching mass maturity in and around the home. We're also heavily involved in both ultra-wideband and wireless USB for short distance but very high bandwidth streaming between devices within the home.

Wireless is great, but it's not always the right tool for the job for every one of those 300 million broadband-enabled households around the world. What we need is a good wired solution in the home to compliment the wireless technology, and I'm pleased to announce that Intel is rejoining the HomePlug Powerline Alliance. As many of you know, HomePlug takes advantage of the existing electrical wiring that's already in your home. It takes advantage of it as a home network connectivity solution. The Alliance has just recently ratified the HomePlug AV spec, which in turn will increase the amount of bandwidth available for us to do some of these funky things in the digital home.

Just to put this in perspective, although the HomePlug AV spec has a theoretical max of about 200 megabytes per second, [gas] mileage leave in gas but put in () or [] to show it was added for clarification will vary obviously, but we expect it to have around about 70 megabytes per second. That's more than three high-definition video streams, so to put it in context, that's a significant improvement. For those of us who've actually been messing around and using some of this stuff in our own homes, it really is a superb wired solution for connectivity between different rooms in the house.

So as you can see from that rapid tour, the digital home ecosystem is an exciting – it's pervasive, and there's a lot of players working together to deliver the various solutions.

What I'd like to do is now talk about some of the things that Intel is doing. One of those areas is on the dual-core technology. You've heard from many of my colleagues here about how important dual-core technology is, not just for Intel, but for everyone who is developing high-performance but low-power solutions. So let me share with you where dual-core is going within the digital home environment next.

Well, as you can see on the roadmap, we already released the first digital home platform called Anchor Creek, and in the first half of '06, we'll release the follow on which is codenamed Bridge Creek. We'll then follow the cadence of the digital home platforms and take advantage of many of the new CPU architectures that both Pat and Paul Otellini outlined in the last day-and-a-half. So we'll be able to take advantage of higher-performance and lower-power solutions, including Merom, Conroe, et cetera.

As the roadmap plays out, you'll be able to take advantage of an increasing amount of performance, but also be able to deliver that into smaller and smaller form factors. What I'd like to do is to show you an example. This is the “Golden Gate” PC. Now Paul stole one of these and stole some of my thunder yesterday, but that's the CEO's prerogative, I guess. If you remember, at spring IDF, I held up one of these, and it was a lump of plastic. And what we said was we'd turn this into a real, working reference design. So this one is based on the

Yonah dual-core CPU. So, this is full-blown, dual-core performance in an absolutely elegant and gorgeous box. You can take it in whatever color you like. I really like the yellow.

This one is actually a full, working platform. It has a TV tuner integrated, of course, because it's a consumer platform, you need those kinds of things as a basic. High-definition audio support, the video interface, et cetera. DVD recorder, et cetera. This is a fully functional, fully equipped power hog in a very sleek form factor. So what we have – or what we should have had running here – I'm not quite sure where my game is running, but it would have been City of Villains from NC Interactive, and this was a prerelease version of the game. I'm not sure if it's showing on the screen. Yes it is. It's not on the system yet, thanks.

Taking advantage of the dual-core capability, you can truly create this very immersive world. It can have the intelligence and creativity to enable both the developer but also the user to take advantage of every mip of that dual-core performance. When we actually talk about gaming, the ability to take advantage of great looking systems, the ability to take advantage of the full range of the performance we're delivering, is obviously pretty exciting. But if you thought that gaming was somewhat niche when it comes to the Intel platform, that's not true. Last week I was in Shanghai, we met with, one of the world's fastest growing gaming companies, called Shanda. Now, Shanda has got 20 million subscribers in their first year of operation, and they can host more than 2.7 million concurrent players on their online gaming system. 2.7 million; and all of it running on Intel architecture. So think

about that. 20 million subscribers, 2.7 million – that really is an audience to build for. So the opportunity for innovation in the gaming space is absolutely incredible. And what I invite you to do is to learn more in the remote gaming class that we're running here at IDF. So, fabulous performance, very small form factors, high performance, low power.

Now, as the number of cores increases, we obviously have to step up and deliver more tools. And so what you can expect to see from Intel in the Development Tools side is you can –we've already released the Intel Thread Checker, which helps you check the bottlenecks in your environment. We also released something called the Audio and Image Content Recognition Library. And basically this is a tool that helps you manage the proliferation of various media types in your applications and services. You can also learn more about the digital home capabilities assessment tool out by the VT zone.

And as the consumer raises the bar, we really have to sort of take advantage of these tools to help design multi-core based systems that will help us get over that bar. Use that performance with the user interface, use that performance to overcome and mask some of the complexity that lies behind the technologies that we have.

Now, we spoke about the PC side, but you also need building blocks to ensure that the entire system meets the consumer expectations. So what I'd like to do is to give you an update on our consumer electronics roadmap.

Since Spring IDF, we completed the acquisition of a company called Oplus. Oplus delivers world-class video processing technologies. And today I'm pleased to announce the introduction of a new display processor from Intel. In this case it's the Oplus MN301, and you can see it here if you can get a shot close up. Basically this is a 32-bit integrated display processor. It combines the advanced video processing capability, along with the compute power and I/O in a single chip. So, the development opportunities include things like, obviously, LCDs, front and rear projection TVs, but also for various types for AV receivers, or set-top box, where you need to get that enhanced, or you can develop to deliver that enhanced level of video, technology. So, big development – you should have seen on the screen as it swept through some of the ability to deliver and improve razor-sharp images with true-color, mode reduction, et cetera. What I'd invite you to do is to go to the show floor afterwards and have a good up-close and personal look at the Oplus MN301 processor.

So, where are we going with all these piece parts? We've already discussed the uptake on the Intel 854 chipset, we showed you another piece part, which is the Oplus video processor –obviously our CPU roadmap. You've seen the quality of the Oplus MN301, well, our commitment is to continue to take advantage of Moore's Law, and to integrate much of those CE capabilities and the processing power into a system on a chip, or an SOC strategy, that intersects the ultra low power Intel architecture roadmap that Paul mentioned yesterday.

And so what this means is that over the horizon, Intel is committed to delivering consumer electronic solutions for the CE market. And it's

that system-on-a-chip roadmap, taking advantage of the Intel architecture core that will allow you to target those one billion devices that I mentioned earlier. And in this respect, your development needs and our platform strategy demands that we do this.

But best of all, as we mentioned, this approach and this change in strategy for the CE market is ideally suited to the skills that you have in this room. It will allow you apply all of your expertise into a much, much, much broader market. So we're really excited. System-on-a-chip roadmap, based on the Intel architecture core, hitting the price points, hitting the performance, and the feature sets that that consumer electronics industry demands.

So, the good news is, as I mentioned, the PC industry alone is a fabulous business. As Paul mentioned, we'll cross 200 million PCs alone this year, and on the consumer side, as I mentioned earlier, 86 or so million consumer PCs this year. And in the next couple years, that alone will cross the 100 million PC threshold. But after that, the potential of the one billion CE devices – and then you begin to put into perspective Paul's comments: 10X the performance in Intel architecture, one tenth the power consumption of Intel architecture, and 10X the market opportunity for you in this audience with Intel, based on Intel architecture. So make no mistake about it. We will make this happen, and we will lead the industry with leading system-on-a-chip solutions. We’re excited by this.

Those are some of the opportunities looking forward with our new SOC roadmap and our existing PC roadmap. But let's just take a quick look at some of the innovation that we're already experiencing.

And so here's some great examples. High definition; we don't need to wait for HD DVD and Blue Ray to be resolved. We already have personal content on high definition from devices like the Sony camera, working obviously with the HD video editing capabilities on this Centrino notebook from Sony – it's a Sony Vaio. Or here we have an integrated entertainment PC from Fujitsu with a 30-inch panel. It's fully integrated, very few cables, absolutely ideal to fit into any type or size of home.

Here we have another entertainment PC. This one – this is actually very interesting; this is from a company called Onkyo. Onkyo's heritage, for those of you who don't know, is in very high-end consumer electronics. So the fact that companies like Onkyo recognize the opportunity that this new digital entrainment industry represents delivers us some fabulous opportunity and some experience in this space. As you remember at the last IDF, I said we needed to make sure we have new partners; we needed to make sure we have new form factors, and we needed to make sure we have new capabilities. And I think with all the various announcements of people moving to Intel architecture, including Onkyo and others, is that we're very much on track for that.

And then the innovation is not only just restricted to the hardware. Over here we have a Hitachi user interface. This is absolutely

gorgeous. It's more than one PC -- very much a 3D user interface. I don't have time to go through, but it's a new way of navigating through to get your content and manage your content. It's very intuitive. The other thing it does on here is it takes advantage of the dual-core. It has a capability where it can use the intelligence of the PC to take, say, a 90-minute soccer match, and you can set the slider so it will find the most exciting five minutes or 15 minutes of whatever you want it to do. In fact, this is actually very closely becoming the best example of the need for dual-core and multi-core because we put it to task to find any interesting aspects of baseball, and it really works that CPU. So, anyway . . .

[Laughter.]

Don MacDonald: I guess I'm not getting invited to SBC Park anytime soon.

So . . . what I'd like to do now is talk about another group of people who are part of the equation, and that's the service providers. What I'm going to ask you to do is to please give a loud welcome for an Intel fellow – he's got more patents than I've had hot dinners. Ladies and gentlemen, Brendan Traw.

[Applause]

Don MacDonald: Hey, Brendan.

Brendan Traw: Hey, Don, how are you doing?

Don MacDonald: I'm doing very well. So we've heard about the challenges we face with consumers, but what are we doing to make the Intel architecture platform more suitable and desirable for a service provider?

Brendan Traw: Good question. When a service provider goes to provision a new service or virtual appliance on a PC, they may find a variety of different operating system versions, application versions, and drivers. What the service provider wants to find is a predictable software environment. They want an environment that's isolated from other service providers as well as from the traditional PC applications. They also want to have a platform that is manageable once they've provisioned the service or virtual appliance on that platform.

Don MacDonald: So what exactly are you doing to meet those needs?

Brendan Traw: Well, we're working on a number of technologies. All this week I'm sure everyone's heard a lot about the *Ts (star technologies). Two *Ts are particularly useful in this space: VT and AMT. You know, VT, as an example, I think is going to provide some really exciting opportunities on the consumer PC to enable the creation of a variety of virtual machines. These virtual machines can be used by different service providers, and they can also be used to support the traditional Windows applications as well, in a very robust and isolated way, and also keeping users' private data separate from the different partitions that would be used for service providers.

Don MacDonald: So if I could just remind you about Genevieve's comments about how were developing for consumers. These are not for an IT audience, so what kind of applications are you thinking of?

Brendan Traw: Absolutely. Let's switch over to looking at a demo here. In the back here behind the curtain we have a VT-enabled PC running VMware, and we have three different partitions created on this particular machine. We have the “My Home PC,” which is running your traditional Windows applications. We have “My Entertainment,” which is a special partition that we've created for a set-top box-like service, basically delivering a great entertainment experience. And the final partition we have here is our “Fix My PC,” and I'm actually, in the interest of time, just going to focus on that particular one today in this demo.

I think this is a really exciting opportunity for consumers. My mom, for instance, she has her PC. She doesn't know a lot about it, but she likes to surf the net, and do some email and all. I end up fixing that for her, helping her install new software when she needs it. The problem is I'm in only in Kentucky, where she lives, around the holidays each year.

Don MacDonald: You're a bad son. You only see mom on the holidays?

Brendan Traw: Well, it'd be nice to get there more often, but I live in Oregon, she lives in Kentucky, it's a long ways away, and you keep me pretty busy.

Don MacDonald: My mom lives in the UK, and I visit her at least four times a year. So you should be ashamed.

Brendan Traw: This service, though, I think will help her and her PC quite a bit, because if she encounters a problem, for instance she wants to play a media file that I've sent to her, and she doesn't have the right media player, she gets an error message. But with this 'Fix My PC Service' she'd be able to basically pull up an IM window and instant message with the service provider that we see over on this side. That service provider would be able to, with her permission, come on to her machine. Say I've got this problem, I've got this media file I can't play, the service provider is then able to take a look at the person's system to see if there's any viruses or any problems, and then determine that the actual issue is that we need a new media player installed, push that application down the wire, instead of having my mom go and surf the web to try and find the right place to download the application, automatically install it, and basically resolve the problems in a matter of minutes in a way that's pretty comfortable for a person like mom who isn't too computer savvy to actually get a great experience and get these new capabilities on her machine.

Don MacDonald: So in this case, obviously, it's very cost effective. It prevents [Service Provider] truck rolls or perhaps even worse, returns to the PC store. The other thing is that this is an opportunity that anyone in this room could do, or perhaps the 150,000 Intel dealers scattered around the world could also take advantage of. They could provide that service as part of this new digital entertainment industry. Is that right?

Brendan Traw: Yeah, absolutely. I think this is a really great opportunity to satisfy customers and actually make that PC experience the best it can possibly be in people's homes. And going forward we're going to continue to develop this technology and bring it closer to market, and look forward to be being back at a future IDF to actually show some real services taking advantage of these capabilities.

Don MacDonald: Okay Brendan, just as friend as a colleague and so on, when you go off stage, go by a shop, get some chocolate, some flowers, book a ticket, go visit your mom, because once a year and just helping her to fix her PC is interesting from a technology point of view, but you've got some work to do. Ladies and gentlemen, Brendan Traw.

[Applause]

Brendan Traw: Thank you.

Don MacDonald: Thanks Brendan. Okay, so as you've heard from several speakers, VT will be available this year, so please start planning now. It's wonderful. It's a new business opportunity and it helps deliver the bar that we're trying to set with consumers. You can get more information on both VT and AMT in the classes and sessions today and tomorrow.

As we said in building the next stage of the digital entertainment industry we came to the conclusion that the services, the content, and the devices that we briefly refer to really require a new intersection point. A point where all that innovation can come together for the consumer and that they can identify it.

So let me remind you of Genevieve's comments. The consumers are truly our harshest judges. They get to set the bar, not us, and we have to adapt to them. So with that in mind, just as we delivered and communicated the best mobile experience with Centrino mobile technology brand, we plan to deliver and brand a premium entertainment experience. And today I'm pleased to announce that the brand name for Intel's best consumer PC platform is called Viiv. Viiv has been architected from the ground up for this digital home experience. And here to tell you more about Viiv is the Viiv program manager Merlin Kister.

[Applause]

Merlin Kister: Thanks Don. Great to be here on this exciting day.

Don MacDonald: Yeah, it's absolutely fabulous. Hey, so a question for you Merlin. When some of us were involved in the Centrino mobile technology we identified four vectors -- they were performance, mobility, wireless, and form factor -- for the Centrino for the best mobile experience. What are your equivalent vectors for the Viiv brand?

Merlin Kister: For Viiv PCs we focused on ease of use, performance, and connectivity, all in the context of delivering a great entertainment experience for consumers.

Don MacDonald: So what exactly have you done around ease of use, for example?

Merlin Kister: For ease of use we wanted to focus on making it easier for consumers to access their content, easier for them to enjoy the content, and easier for them to connect devices. Why don't I show you a couple of things?

We wanted to make sure that you interacted with all Viiv PCs more like you do your CE devices at home; like your TV and DVD player. First thing is that all Viiv PCs come standard with a remote control. Easy access to all your entertainment content. We've also added a new feature called Intel Quick Resume Technology. It allows you to turn your PC on and off just like you do your TV or your DVD player. So, it can instantly go on and off after you do your first initial boot up.

Don MacDonald: So, consumer level has instant on/off?

Merlin Kister: Here's instant off, and then it's instantly on; it comes right back.

Don MacDonald: That was the PC, not the screen?

Merlin Kister: Yes, that's correct. Actually, the PC goes into a visual off.

[Laughter]

Donald MacDonald: Just checking.

Merlin Kister: We've also added an integrated media server with automatic transcoding ability. So, consumers don't have to fumble around with file formats, wondering, "Well, will the content that I have play through to a device?" Personal content is really a problem today.

Don MacDonald: Most consumers don't even know what file formats are. So, that would be a problem if they ever had to encounter an issue.

Merlin Kister: They do. Maybe some of you in the audience have experienced this. In short, we really don't want consumers to see any more of this. And we want them to experience a lot more of this.

[Showing something on the screen]

Merlin Kister: Let me quickly explain what we're doing here. I took some video with my digital camcorder of my son's soccer game. It's in a DV-AVI file format, and it's located on this Viiv PC. We're stringing over to this digital media adaptor. The digital media adaptor supports DLNA file format types like MPEG2 for video. What our media server is able to do is talk to that device and automatically transcode the file format. The best thing for consumers is that it happens on the fly, in the background; no consumer intervention necessary.

Don MacDonald: So, it meets the ease-of-use standards, but I guess the transcoding also requires high levels of jewel core performance?

Merlin Kister: It does. In fact, we've required dual-core processors in all Viiv PCs. But, it's interesting that as we were developing, we didn't think of it as performance. We thought of it more as capability for consumers and quality of experience. We wanted to make sure that Viiv PCs not only delivered what consumers were looking for to do today, but more importantly, what they're also going to be doing tomorrow.

Let me give you an example. We showed you a quick one here. We wanted to make sure the consumers were able to stream media throughout their home. Here's what I'd like to do with my family. My son could be up in his bedroom streaming music from the Viiv PC into his bedroom, while my daughter could be in her room watching a slideshow of her slumber party that she had with her friends. I think you know where I'm going to be. I kicking back on the couch, kicking back, enjoying a movie, all served up from my Viiv PC. The best thing is, though, you can do all these things simultaneously.

Don MacDonald: So, it sounds like easy connectivity is a big part of the user experience here.

Merlin Kister: It is. In fact, I think we've taken connectivity to a new level. We've worked with a broad range of industry and ecosystem providers – OEMs, ODMs, software and hardware developers, and even some people we really haven't spoken too much before like entertainment, service, and content providers and consumers electronics device manufacturers. We want all Viiv consumers to be able to access the latest and greatest entertainment services, and then be able to share them throughout their home.

Don MacDonald: Let me be a little bit cynical here. Standards are necessary, but they're not sufficient. We learned that with 802.11, we learned that with Bluetooth, et cetera. So, what are we doing to make sure that we get interoperability above the standards?

Merlin Kister: Well, as you said, we started with a base for all Viiv PCs of DLNA and DTCP-IP. You've covered some of those today. But, we've also wrapped it with a comprehensive testing and certification program so that each piece of our ecosystem – the devices or the services – has been tested by Intel to make sure they work well with the Viiv PC. I think the result for the consumer is going to be that they're going to be able to experience a lot more of their content anytime, anywhere throughout their home.

Don MacDonald: Thanks, Merlin. Ladies and gentlemen, Viiv PCs are going to be an exciting addition to the Intel platforms. So, I'd like to give a big thank you to Merlin Kister. Thanks, Merlin.

Merlin Kister Thank you.

[Applause]

Don MacDonald: You know, let's just put this in context. The Viiv brand is just one example of our new focus in the Digital Home Group. We're focusing entertainment really as a big and exciting first step. So, we have the base platforms using Intel silicon and software drivers. We then have the digital home technologies including the home networking and the user displays that we mentioned. Then, we have the fabulous work that we do with the whole ecosystem. Viiv brand is actually predicated on the presence of the jewel-core CPUs. Whether it's Yonah or the desktop CPUs, it requires the chipset and the LAN controller. It also requires an approved operating system -- in this case it's Windows MCE. Then, we take advantage of that wealth of ecosystem that our

partners, including the people in this room, will bring to bear, to deliver on that brand promise, that it delivers the best entertainment experience. So we're committed to making this successful, and we really are excited as the second big extended ingredient brand, as we call it – Centrino was the first, Viiv is the next one -- we're really excited that together we can make this very, very successful.

But I'll ask you to imagine, past today -- that product, I should point out, Viiv will actually launch in the first quarter of 2006 – but just imagine what happens when all of these technologies and services start working together, and working for your digital life. So let's take a very quick look at what happens when multi-core technology, the amazing displays in the connected world, all come together. So please look with me now.

[Jetson's theme song plays]

Don MacDonald: Okay, so what we have here is, I think it's actually an image of Lake Powell, but it can be changed to fit pretty much any mood. Let's just bring this up. This is controlled by touch. In this case it's using a remote control, so it's real simple. When you start talking about consumers, now we're talking about consumer-simple. And you know, no keyboard required, the keyboard is really not appropriate in this environment. So, you know, you can do the usual things. If I want to play my play list – [acoustic guitar plays] – I'm going to Madrid next week so I'll get into the mood a little bit of Madrigal here. But you know, it's getting a bit warm in here as I run out of time, so I need to just check that the temperatures, and so on, are good.

[Computer voice says, "Down temperature. Security. Lights on."]

Don MacDonald: Okay, so now that everything is the right kind of conditions, I'll kick back and finish reading my book.

[Computer voice says, "Language lesson, or reading from your current novel?"]

Don MacDonald: I'd rather continue reading the book.

[Computer voice says, "Chapter eight."]

Don MacDonald: We don't have time to go through chapter eight, so we'll just give that a rest. Unlike Brendan, I really care about my mom, and I've got a conscience, so – [Laughter] – you know, I'm just a bit concerned. So the kind of initiative that Louis Burns is driving is absolutely fantastic, and the challenge is how do you integrate them into a fully-integrated simple consumer experience? So this is actually not my mom, but you know, either way I still care for her. There's an alert coming up here that says actually her medication is not quite correct; she hasn't taken some of her pills, and there's one – but it basically identifies there's a very valid reason [her card game ran late], so I can relax even though I'm 5,000 miles away from mom.

So now we have the video reminder. I'm not sure what that is, let's have a look. Oh, Formula 1. Some of us Brits really like Formula 1 racing and, "Would you like to watch it?" Yes I would. So I can get access to my content very simply. In this case, we obviously have the

ability to, as I mentioned earlier, not just passive entertainment but also interactive entertainment. And so here, because, you know, we're Intel people, we like to have multiple windows open at once, we can also look at the bike racing, for example, if we choose to do so.

But the interesting thing is, because it becomes interactive – you know, Formula 1 racing fans tend to be really into their sport, and they want to know all sorts of things such as, you know, what kind of engine does this have? So not only are you watching the content, but you can make it truly interactive and identify the capacity of the cylinders, the brake, horsepower, and all those kinds of things. You know, now I've got a calendar alert while I'm mucking around here, and apparently I've got a voice mail, in this case from Rita. Rita is supposed to join me later on today.

Rita: Hey, I'm running late. I'll meet you at the theatre. Will you double check our reservations? I'll see you there.

Don MacDonald: Okay, I just noticed something here, which is – forget the reservations, but my boat is not for sale. My wife must have got Kathy to put that one in there, but we're not selling it, so anyway. . . So we can close this. You know, basically just need to confirm the theatre tickets, and of course I'm a big lad, I need to eat, so of course I want to eat afterwards as well. So there we go.

You know, these are the kinds of things that, as you get fully-integrated, truly deliver on the opportunity for a new industry and not just a fad or a fashion. But they're requiring incredible levels of

interaction. In this case obviously, I'd like to download my technology into a handheld or mobile device, which will give me the instructions and so on that I need. So, I kind of rushed through this. Obviously it's recommended that you leave now to arrive on time, let alone to finish my presentation on time. And so I'm going to do just exactly this. So, that was a good example of where this combination of networking, solutions, services, and content, all wrapped up in a truly consumer acceptable way, could lead us. So that is the future.

[Applause]

Don MacDonald: So let me take you back here.

[Jetson's theme song plays]

Don MacDonald: Okay, to basically, get over there on the demo, you know, we need several next steps. Some of those next steps we invite you to attend some of the classes where you can learn more about the technologies that underlie some of the capabilities that we showed. We also invite you to take advantage of the tools; the thread checker, theSSPR 2006 digital home capabilities assessment tools.

We absolutely are committed to developing on top of standards. I ask you again – at the very beginning of this presentation, I said, "What's changed?" And I think, quite frankly, your opportunity has changed. It's not just 200 million PCs or 100 million PCs for the consumer market. It's now those one billion devices you have the opportunity to develop for, to take advantage of this new entertainment industry. So

hopefully your mindset has changed also, and I ask you, how are you going to take advantage of that market? How are you going to develop these things in your business plans?

So as an Intel architecture developer, you are better placed than any of the people who participated in the formation of the movie, the TV, or the radio industries. They couldn't possibly have imagined the magnitude of the industries that were unfolding before their eyes. But history has shown us that you guys can see this opportunity unfolding and more importantly, you're at the very beginning of this opportunity. So it's a big opportunity, and you're very much at the beginning. So I invite you, let's build this next new digital entertainment industry together. Ladies and gentlemen, it's been a pleasure. Thank you very much.

[Applause.] [Music plays.] [End.]