

# **NC04Q1 Keynote with Scott McNealy**

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Male Speaker: Ladies and gentlemen good afternoon. Ladies and gentlemen before we begin we would like to mention that during the following presentations we may make projections or other forward looking statements, which are just predictions and involve risks and uncertainties such that actual results may differ materially. If you would please refer to Sun's periodic reports that are filed from time to time with the Securities and Exchange Commission, including our annual report on Form 10-K for the fiscal year ended June 30<sup>th</sup> 2003 and our quarterly reports on Form 10-Q for the fiscal quarters ended September 28<sup>th</sup> 2003 and December 28<sup>th</sup> 2003. These reports contain and identify important factors that could cause actual results to differ materially from those contained in our forward-looking statements. Ladies and gentlemen please welcome Scott McNealy.

Scott McNealy: It's fantastic to be here again. This is NC04 Q1, our first Network Computer launch of the year. I have a lot on the agenda here to cover, so I am going to be fairly brief. We have about 25 new innovative features that we are launching today for NC04 Q1. There are hundreds to date that we have launched since we started this whole program. We are in the 100-plus kind of category of new innovative features so let's jump right into that. One of the things that you will see is we have made a very strong commitment to R&D in this company. There are no holes in our

product calendar going forward over the next three or four years because we have invested and committed to our programs. The payoff is going to show up big time here every quarter as we launch and crank out a new product environment so stay tuned. You are going to see on our web page, when all of this will be available. Then people visit after so it is quite an online event also. We have quite an agenda here. We are going to re-define the enterprise class server environment big time. You are going to like that. You are going to see our first Opteron systems, which make Solaris and Linux go way faster and Neil will be up to talk about that. You will see our 2P Blades with mix, match and manage functionality that is just the best out there. You are going to hear a lot about what we are doing in the software space with the next generation of Solaris and our N1 grid containers, our whole N1 grid management environment and Rev 2.0 of our Java Enterprise System, which is catching everybody by surprise out there in the marketplace. Finally I am going to step down for a little while and let you get the product announcements and then I've got a special announcement to make, so don't leave early. I am going to come back up. It is one of the most exciting days I have had in a long, long time in 22 years at Sun Microsystems so stay tuned. This one I have not seen one leak on, so none of the reporters or analysts figured this one out, that is pretty exciting.

What I would like to start off by doing is to discuss what Sun has learned to do a little better over the last few years, which is talk to our customers and figure out what they are after. In the old days it used to be cost or performance or availability or whatever. Right now everybody is scared to death. Post 9/11 with all of the viruses, with everybody getting online, with who knows who is doing what and where from what anonymous site. Security has really popped to the top of the charts in terms of issues. You have all seen the numbers. You have all quoted the numbers. One in 12 e-mails out there on the Internet is a virus because of My Doom. In fact I just read this morning there is a new Doom virus that is out there that is a derivative of the Teenage Mutant Ninja derivative of the My Doom virus. They are going to keep coming. We believe that we have a pretty interesting story. We anticipated this one basically by understanding that the network is the computer and that network security has to be a big issue. Clearly right behind security is the whole cost and complexity issue. We are still very focused on taking costs out as we call TCO. We have done some pretty interesting things. A lot of customers have said, "Hey, take advantage of the commodity industry economics out there" and we are doing that. Very few customers have said, "Please stop innovating." I know a lot of folks have given me a lot of advice over the last year or two. I appreciate all of that. Keep your cards and letters coming, especially the open letters; I really appreciate those.

I am talking to customers and not one of them has said, "Spend less." Jonathan and I were just in with a big Wall Street customer yesterday and they just said to me, "Why did you not get us Solaris 10 two years earlier?" I looked at Jonathan and said, "Why not; what have you been doing the last couple of years?" People want the innovations we are driving and we think we have got a very nice calendar of products here. Our strategy is still focused on attacking cost and complexity for those folks who have to operate the data center. We are accelerating network service deployment for developers, who are creating the services. We are focused in on mobility -- the killer application for the user of this computing environment. Safe, secure, trusted, authenticated mobility with security. If you look at what we are talking about here today they all fit very nicely into addressing these three major constituencies in the computing environment. So you will see all of these. I will not go through them all right now. We are going to go into them in quite aggressive detail later.

Allow me to introduce some of the new things we are doing here. For the people who want to create that next generation Java Enterprise System, Java Web Services architecture, we have got an unbelievably cool platform. You will get a free Opteron server if you sign up for a three-year software subscription at \$1499 per year. That gets you all of the development software, all of our

tools, all of JES on a regular updated basis and the hardware comes for free. Like when you sign up for a telephone service and they give you a cell phone or you sign up for a cable environment and you get the box or whatever. We are using that model -- moving people to the subscription model. The beauty of \$1499 per year is that in the first year you pay less cash than you would for the software alone and you get the hardware at no extra charge. It's pretty interesting. Let's see Microsoft do that. Neil Knox will tell you a little bit more about that. Let's see Dell do that. Will they give you the software for free? It is nice to be a Sun Micro "Systems" company.

We are not just hardware and software in the systems model. We also have worked very hard over the last couple of years to innovate in bringing 'systemsness' to the customer in a way that they can receive and implement this technology effectively. We start with systems, we also work very hard on our solutions methodology. AIM stands for Architect, Implement and Manage. We have worked aggressively across all of Sun through our Professional Services, our Training, our Services, Sales and Pre-Sales organizations, creating a common implementation methodology for end to end architecture. You all know about our iForce Centers where we will do free of charge a proof of concept. This is very much less expensive than signing up IBM Global

Services to darken the skies and start billing you. We will actually allow you to prove that the solution will work, will scale, with load generators, with our partners in a room. We do not allow our partners to bill you for the work to do a proof of concept. It is a great effort. Then we build the system for you. We build that data center for you so that you do not have to. We have got great stories of customers who have gone from weeks and months of install time to hours by using our factory to assemble these data centers. Why buy the car parts when they will deliver the car? Then we have our Advanced Services, which Pat and Robert are driving out in our field organization very aggressively through Professional Services and Practices both with Sun and with our partners. We now have 30-plus reference architectures. We are going to launch five more reference architecture solution stories here today. We have got a warehouse solution, a messaging solution with Oracle, spare parts planning and a consolidation effort and a secure network access platform. We call it SNAP. These are pretty interesting. I would like to talk about SNAP. This is a particular favorite of mine. Obviously we use this inside of Sun and everybody carries their Java card around and you have secure authenticated access to your Sun Ray's. We have about 25,000 Sun Ray's deployed inside of Sun. They are also deployed in lots of places around the world. I was just working very hard meeting with an important partner of ours Sony recently at the Sony Open in

Hawaii; a full disclosure here. I got a chance to sneak over to see Admiral Fargo, who runs the Pacific I am not quite sure what the right term is. He runs all of the Pacific, all of the Armed Forces in the Pacific, a pretty big job; the biggest geography, the most number of boats, lots of employees of the Defense Department. They have a project there where they have to work with the Allied Forces. Typically what you end up doing is you put 10 PC's in a room because each PC is connected to a separate network. With SNAP what we have allowed, over the same wire using Smart Card authentication, is people to share a common network, a common screen and have virtual networks. The British can come in and have access to their servers and their networks over the same equipment as the Australians, the Spanish and as the US Armed Forces and in fact within the US Armed Services. So you truly get conditional access from a common infrastructure. It is a pretty amazing environment and they believe the five-year savings will be \$100 million plus. Instead of an average five PC's per user; which is the average -- some people have banks of PC's in their rooms -- we can get down to a single Sun Ray client. This is running Trusted Solaris through the Java Security model. The thin client is very, very safe and secure. There's no state on the client and a Java Card authentication environment. This is the way to be secure and JICPAC is very excited about this new technology.

Messaging consolidation; it is Sun's Java Enterprise System messaging architecture. It is obviously a clear leader in the service provider market. I do not think there is anybody close to what we are doing in the service provider market. But we are now making very good progress in the enterprise. This is Outlook compatible and has all of the features, and more, than you should have in this environment. We implemented this in Schlumberger and they were able to get a 100 to 1 server consolidation by moving from Exchange to the Sun messaging environment. This is just a huge, huge opportunity for savings. By the way, most companies are not going to innovate by having better mail than the next company. The opportunity to take \$3 million of cost out of your operation is a big deal. This serves over 50,000 people in 140 nationalities working in 100 countries lowering TCO big time. These are big time plays.

So anyhow we have got a lot more to talk about here. I just wanted to give you a little flavor of how we are focused on implementing the data center for our customer. Let us not get too focused on the car parts. Let us focus on the fact that Sun is delivering very effective, complete data center solutions that provide an end to end architecture from the card to the phone to all the other environments. You are going to see some very, very interesting technology. But before I sit down I did want to share with you

more of what you are going to see today. You are going to see Opteron-based systems and the silicon exists, here it is. You are going to see machines; you are going to see demos and all the rest of it. But we have launched some very interesting Ultra SPARC IIIi products that are gaining unit volume share in the marketplace. Last quarter we gained unit volume share in the server space big time against the industry much on the strength of the Ultra SPARC IIIi product that we are launching in our volume systems product. I am holding up here the next generation of Ultra SPARC IIIi in silicon. It is here in silicon. That is in 90-nanometer from our very good silicon partner Texas Instruments. We have the silicon in-house and we are in full de-bug and verification and certification mode, which will approximately double the performance of what we are currently seeing in these very, very successful products. Neil will talk to you about how hot the current products are today. I just wanted to show you a little of the future because that is what us CEO's do. Now we are also going to be showing you this new chip multi-threading next generation Ultra SPARC IV product, which can double the performance per slot on our four-way to hundred-way machines. It is pretty impressive. I am also holding some silicon in my hand. This was the Ultra SPARC IIIi (next family member); this is the Ultra SPARC IV (next family member), which is going to again potentially double; we believe it will double the performance again in 90-nanometer technology -- double the performance per

socket. With investment protection again, also with plug and play capabilities again in the current equipment.

So if you are wondering, that is what are we doing with all our investment. You cannot do this with Itanium technology. This is chip multi-threading technology that is here and real and we have got an unbelievable future here for the next few years, already laid out, already in silicon and in full verification mode. David Yen and his team have just done an unbelievable job and I am holding some of the most interesting technology here in my hand with Opteron Ultra SPARC IIIi and Ultra SPARC IV. We are very, very excited about the future of technology as we move forward here. So stay tuned; you will see lots more in future versions. We are very excited about just plain old Ultra SPARC IV. It is a pretty hot chip, not in watts but in performance. It is an awesome technology and here to talk about how we are going to leverage that with absolute investment protection is Clark Masters. He is the Executive VP of our Enterprise System Products, thanks Clark.

Clark Masters: Well it is a big day and I really appreciate everybody's interest and enthusiasm and thanks for the great introduction and the unveiling Scott. We have my product family portrait here in the background. Those of you who attended the analysts conference a year ago may remember me standing onstage showing the chip like Scott

did and saying that I expected to be introducing the whole product line a year later. We have in fact delivered on that commitment and we are introducing a full-fledged upgrade and enhancement to our full enterprise product line, from \$50,000 price points on up through multimillion dollars. Before I get into the specifics I wanted to do some context setting for you. We always talk about horizontal scaling, Blades, Intel chips, low-cost computing. My partner Neil Knox will be talking about Opteron is building a huge and a great business based on the horizontal scaling technology. That does not mean that vertically scaled technology is dead. It is in fact thriving. We build systems in my product group to run workloads that cannot be run in any other manner. We have built systems to share resources, large physical memories and run huge workloads. ERP, CRM, technical computing; all of those workloads is what these systems are about. They compliment the horizontally scaled workload and build the network computer. That is why we have these quarterly launches. Not to talk about car parts as Scott says but to talk about the network computer and how we are evolving it. To do what we are announcing today we have been investing in these technologies for a long, long time and have scaled where nobody else has scaled before. We have designed a platform of servers with the Uniboard concept. The idea is we can take enhancements forward and protect the customer's investment and continuously move the ball forward here. We were also the

first to introduce enterprise class features; dynamic reconfiguration, hot swappability and all of those at very low price points and we are leveraging that throughout the product line. I wanted to set the context a little bit to what we have here.

This is the chart that Greg draws all the time. I think it is important for people to understand what the network computer is. It starts with things talking to devices talking to the network talking to the data center and then all of the platform and software and infrastructure to build it. So again, the stuff we are announcing today is aimed at various pieces of this but it is all in one overall architecture and context and that is the right way to think about it. What we are announcing today and talking about is the servers that go into the network computer. We have got data center class machines that have the world's largest databases. They are big SMP's and simply run things that cannot be run in any other way. We have also got products that are application servers. So that family picture that you see back here is in fact just a component of the network computer; it takes storage, software, networking, infrastructure, devices, the whole chain. That is what we are building, what we are talking about today and how it fits in to the whole launch scheme.

These are our new babies; come on, smile a little bit. Conceptually what we are doing with the Ultra SPARC IV is doubling the performance in the same footprint. We have always been the leader in throughput computing, scalability, threading from the Inner-connect through the Solaris operating system, through our networking, through our bandwidth, our I/O devices, the Java Virtual Machine, the JES stack. The whole system has been optimized for throughput top to bottom. What we are doing today is taking the Ultra SPARC IV and it is the first instance of threaded architecture going into the microprocessor. Expect to see more. David will be talking about that and always does. That is how we are driving success and that is what we are delivering today. It is double the performance and price performance leadership. We are pricing it aggressively with investment protection. So customers -- and I will talk about it more -- can take a Uniboard based on Ultra SPARC IV and upgrade it or add it into their existing compute environment without interrupting service. It is not only a whole new family that you see today but it is also upgrade technology into our existing base and that is what we are announcing. I am happy to be here representing it. Scott is better at this than I am.

I am going to talk about the top line on what Sun does right. You do not get this investment protection. You do not get the compatibility without engineering it and it is tough, tough

engineering. We fight the battle daily. The design is to be compatible, to be upgradeable, to be simple, easy to use, highest value to our customers and this is unprecedented, investment protection in upgradeability to our customers. IBM cannot do it. HP cannot do it. There are multiple architectures, multiple technologies and they are not building the network computer and we are. Expect to see the compatibility to continue and the realm that we can manage, handle, quickly and easily upgrade and keep expanding. This is not the full product line. I tried to pull out just a couple of examples and this is the E6900, which is our mid-range computer compared with the P690 and also our rack optimized E2900. We are introducing five models; 2900, 49, 69, the 20K and the 25K and again we believe and we know that these products have capabilities that none of our competitors have plus we are offering as upgrades into the base. Since we launched the Ultra SPARC III based products we have set 40 world records from a performance perspective. With this new product we have already set three and these are just examples. One is 2X on retailing applications and there are details in the press kits on each application; I will not dwell on it. Another is for manufacturing on SAP 25% faster. The last one is in high-performance computing. So I always hear people say "SPARC that is not good for high-performance technical computing." I will show you some other examples. This is general purpose, applies to multiple verticals

and is applicable to every customer we have and all the new customers we are going to have as a result of the technology. Stay tuned; more world records to come. This stuff is real. We are building it. We are delivering it. We always run beta Sun on Sun so we always run on our IT infrastructure and the customer sites. This is just a couple of customer examples. One is Oregon State University. They are doing a 50-year weather model calculation and it took them 28 days to do it prior to going to the new technology and now it takes them 13 days. In this case it is over double the productivity improvement on weather simulation for this university. Bloomberg has it installed and is running it. They were concerned about headroom and having to propagate platforms and all those sorts of things. Now they have accepted the technology, it is installed, it is running, it provides them the headroom; a huge value to our customers. These are just a couple of examples. You kind of have to be cool to be in software so Jonathan Schwartz made me promise that I had to get cooler before I could talk about Solaris. I cannot do it Jonathan, I just cannot.

Another thing that we are bringing out and announcing today; we announced the early access program or Solaris Express about three or four months ago for Solaris 10 and actually all future technology. The thing I am excited about is in February we are adding really significant enterprise technology to that release.

Solaris already has been optimized for Neil's space on scaling out and low cost and also from my space on simply huge physical memories, lots of processes, just huge capacity. It is world class and leadership and a huge strength for Sun Microsystems. Through the early access programs or Solaris Express our customers, our partners, our ISV's can get access for free today to get familiar with it, to kick the tires and get early access to Solaris. There are four big things; I will just overview them and I will talk about one in particular that is in here. We have defined a Sun Reliance architecture for proactive support, proactive maintenance, predictive, remote online network, network computer, all of those things. To self-heal and inform the operators, the other systems that need to be informed and an entire architecture for predictive computing as well as any remedial maintenance that may be required. It is very cool. It is not just software but Solaris provides the framework for communicating with the world going forward on our Sun Reliance architecture. Performance; it has got lots of enhancements on performance on huge physical memories and memory placement algorithms and all of that with a completely rewritten TCP/IP stack for performance so that is industry leadership. Military grade security; we have had Trusted Solaris and it has in fact been the leader and has protected our national defense for well over a decade. What we have done with Solaris 10 is taken those capabilities into the base Solaris because now

the commercial requirements are there. It has role-based administration, access lists, common criteria certification; all those things now that enterprise companies need to run their major data centers are available in Solaris and were pioneered with Trusted Solaris. Expect to see that continue to be driven by Sun.

The last one that I am the most excited about and I believe this is the most significant technology introduction since we moved from 32-bit to 64-bit computing is our N1 grid containers. Let me talk about this a little bit more. What we have here Sun led in virtualizing the hardware with dynamic domains and I will talk about this more, hot swappability and all these sorts of things, Solaris scaleability. Now what we are adding is think about it is software blades. As we build these systems to scale up and handle huge workloads they are capability computers. They largely run one application, whether it be an ERP or a CRM or HP TC workloads. Now with efficiency we can provision software blades so it scales horizontally. As we get more efficient in handling the other workloads we can stack applications easily. The application thinks it is running on its own dedicated server but it is truly just a software blade or an N1 grid container. As you expand that out then you can provision against multiple platforms. You can provision software blades, hardware blades, storage, network; all of those capabilities through this technology. This is superior enabling

technology that we are offering to our customers in Solaris 10. At this point I have talked a lot and tried to give you an overview and a sense of context. I would like to introduce Tony Hillman. Tony is going to help demonstrate some of the capabilities for you.

Tony Hillman: Yes. We thought we would demonstrate just how easy it is for customers to upgrade with the Ultra SPARC Four. I have here an administrative application, which is showing us all of the machines that we have networked and we are going to talk in particular about this 6800 right here. Clearly this is one of our previous generation machines.

Clark Masters: So, this is an existing Ultra SPARC III 6800.

Tony Hillman: The first thing I can do with the application is take a look and see that it is divided physically into four separate hardware domains and I can inspect the number of processes and the amount of memory allocated to each one. What I would like to do is in particular take a look at this domain number one. This has a very heavily multi-threaded Java application running in it. You can see flashing squares in the bottom left. These represent thread completions and at the top we have got a graph representing overall the number of thread completion's every second. This is pretty good performance. It is holding steady. It has got two

Uniboards in the domain; they are Ultra SPARC III based. What we are going to do is boost the performance.

Clark Masters: It would be really good if they went faster.

Tony Hillman: Let us see what we can do. Here is a Uniboard that is Ultra SPARC IV based.

Clark Masters: Again, that is by design years ago. We planned this upgrade path, this migration and designed the system for this capability.

Tony Hillman: So, in goes the board and now all I have to do is tell the system that the board has been added so that the memory can be mapped in and the processes brought online.

Clark Masters: It is more than just domaining it or physical isolation. What you have to be able to do is hot spare it so it can plug into the system in a reasonable way and then allocate it so it really takes significant technology and this is unmatched by anybody still to this day. We are in our fifth generation of dynamic system domain, dynamic reconfiguration to now without a reboot, without an interruption introduce it in a workload.

Tony Hillman: At this point the dynamic reconfiguration routine has completed.

The new Uniboard has been welcomed into the family as it were. The new processors are coming online and you can probably see the thread completion is happening a lot more quickly and most visible of all that graph. It is now arching upwards very, very steeply. It is not going to stop until it gets to twice where it was before. We have doubled the performance of this domain with just one Uniboard based on Ultra SPARC IV.

Clark Masters: So, that is how difficult it is. That is the performance gain that you can get. Literally it is no pain big gain as a way to think about it and you can upgrade over lunch. This is huge and our customers are going to love it. Thank you very much. We have talked about hardware virtualization, live upgrade, introducing new technology and all of those sorts of things. The cool thing with Solaris 10 and again what I talked about is software blades and virtualization and all this. Now, we have a whole new dimension of manageability, simplification, a way to dynamically manage the network computer and John Loiacono; he is our Senior Vice President of our Platform Software. Can you come and help me a bit?

John Loiacono: So, Clark what I would like to do now is actually walk you through just a couple. There are literally hundreds of new features coming in Solaris 10 that will dwarf the performance and functionality.

Clark Masters: John remember you have to be cool; you cannot be too slick here.

John Loiacono: We have some happening software. We have a number of new features that we are just really ecstatic about and I am only going to show a couple of these things. We are going to show a couple of the features that are appearing in Solaris 10.

Clark Masters: I am not smart anymore.

John Loiacono: We are going to reference the 6800 we just talked about. If I can get this screen on the screen up above that would be great. As Tony pointed out we have a 6800. Can I get this screen up there please?

Clark Masters: So I screwed up. Let us get the DR screen back rather than the N1 grid screen; there we go.

John Loiacono: Tony pointed out that we actually have a four-domain system here on the 6800. Now, if I actually go into let us say the second domain we are going to view the containers within that domain. In fact what we are looking at now is we have four CPU's in this domain on a single system. Now what I am going to do is actually determine that we have actually established 40 independent containers. These are isolated applications or isolated (inaudible)

etc. for this space. If I scroll down here you can see we have actually installed 40 independent containers. We can do this on a large scale system such as this that has four CPU's in it or we can do this even on a single CPU system such as the rack mount systems on the side there we can do that. Now, if I want to go inside I will show you the granularity that we have inside the containers. For example I can go into a container and see that the way it has been configured on the left-hand side I have about a gigabit of main memory allocated and I have a minimum of a half of a CPU allocated. I can then go in and I can actually change that to be a single CPU allocated for this particular container, this particular application. You notice on the bottom it has its own IP address; it has its own host name. The application or applications running in this container believe they are running on a dedicated piece of hardware. As you also know we have done some things recently with our N1 grid system. In fact what the N1 grid system does is the ability to actually manage the single system, N1 in a box where you can do virtualization, provisioning and management of the system. You can scale that to actually manage an entire data center and then you can actually manage the multiple data centers over time.

What I want to demonstrate today is one of the things we are doing on a single system. What I am going to do now is actually show

you a demo that actually demonstrates how containers work in this environment. Now, the first thing we are going to do is we are going to look at our Solaris based system and a copy of the Solaris operating system Solaris 10. What this window represents is actually the N1 grid console. We now want to create containers. We have a graphically oriented, simple to use point and click device that actually enables you to install containers on the system. Then the second thing we are going to use is N1 also...

Clark Masters: Sorry. Do those containers have their own instance to the operating system like LPAR's?

John Loiacono: No. We are actually running a single copy. Unlike LPAR's that IBM does where you have to actually run multiple copies of AIX. If you had three containers you would have to have three copies of AIX and then the overhead associated with managing three copies, the footprint for memory and disk and also the CPU utilization required to run those.

Clark Masters: Or 40 or 1000.

John Loiacono: That is right; it multiplies up. In this case now we have used the N1 provisioning engine to actually then provision applications into the containers. Now, one thing I will point out is that there is a

promotion that we just announced today as well where we are actually...the N1 provisioning server is specially priced now at \$1000 per new SunFire class system. That is about half the price of its normal list price so in fact we have a great promotion going to actually kick start this program. Now, what I am going to do here is use the process and I have now created three containers and each of these containers represents an independent application. On the far left-hand side you are seeing an e-commerce application, in the center a web-based application a web server and on the far right you are looking at a streaming server. Again, I could go to the center system here. I could get root access. I could take that container down. I could reboot it. I could reconfigure it. I could patch it; anything I wanted to do and it would not impact the containers around it. I have total isolation and in fact I could not if I had...let us give an example. If this center application happened to be the slammer virus running in a web server it would have taken that one container down but all the other containers around it would have kept running and the system would have kept running.

Clark Masters: Completely isolated; it cannot pass container boundaries and those sorts of things.

John Loiacono: Absolutely. Now, the second thing I will point out is again we talked about LPAR's. What happens in LPAR's is I have different copies

of the operating system. If I wanted to do something like patching I would have to patch three 30 or 300 independent copies of the operating system. The overhead for ManageNet is very complex and very costly as you would imagine. With containers that we have in fact you patch once. You patch the operating system; all three, all 30, all 300 containers have therefore been patched and updated so it makes it much simpler. Now, let us take it the next step, which is now when we talk about predictive self-healing. What happens in that?

Clark Masters: Our Sun Reliance architecture.

John Loiacono: Exactly. In this case now a very simple example is we are defining the inner-dependencies between the application and the component or services. This simple example taking the commerce application that has a requirement inner-dependency with a piece of memory; in this case a memory module. Now, as you can see it is interacting back and forth and everything is functioning properly. Now what we are going to do is we are going to say, "Well we can set parameters." You might have a parity error on occasion. We are going to set a threshold that says after three parity errors we are going to assume this is a bad memory module. I am going to simulate here what happens. In that case we flag it. The diagnosis engine logs the fact that we had a parity error, then a second parity

error and finally a third parity error. When that occurs it assumes the memory is a bad piece of memory so it transfers the state from the left module over to memory module number two. Notice the application kept up and running the entire time. The memory module is taken off line. We then alert the system admin saying, "There is a required action that a memory module has been taken off line. Please go service that and replace it during the next servicing."

Clark Masters: That is great and with our technology that can be hot serviced and at your convenience without interruption. I just recently as a matter of fact had one of my big enterprise customers in Europe send me some e-mail describing this technology. It did not happen to be a memory error but it happened to be a processor that was indicating failures. We proactively off-lined it, warned the customer, serviced it and repaired it without an interruption and they just stayed online. This stuff is real and happening today and again significant technology. The container, the software blades fit right into then.

John Loiacono: The summary here is that again there are literally hundreds of new features. We are showing you just a couple. There are many more that go into great sophistication. In fact customers are demanding that right now. The final points I want to make here is one, everything I am showing you now will be available prior to the

actual production release, which comes later this year. In fact most of the features that we talked about are actually available today in Software Express for Solaris. You can get that downloaded today at no charge. It is free for any customer who wants to do so. The second point is that everything I am showing you will be available on Solaris on SPARC, Solaris on x86 and Solaris on Opteron shipping on the same day with the same functionality. We will have a 64-bit version of Solaris 10 shipping in the same time frame we do the rest of the product later this year.

Clark Masters: Impressive; thank you very much John. I am going to summarize that again this is huge technology. We are building the system and the network computer. We are enhancing it significantly. Ultra SPARC IV is available. It is price performance leadership. We have the best technology. We are providing the simplest operating environment and the best value for our customers; thank you very much. At this point I would like to introduce Neil Knox.

Neil Knox: That was very impressive Clark. I must admit I do not know what is in your gene pools. When you breed babies you breed them big and powerful. It is pretty impressive. As Clark focused on the vertical scaleable model we in Volume System Products focus on the horizontal scaleable model. Our place is to take relatively low-cost high-performance systems in the two, four and eight-way

space and couple them together and make them as reliable and secure to operate in a mission critical 24-hour data center. Our enterprise customers look to us as a strategic vendor to provide both the vertical scaleable model as well as the massive horizontal scaleable model. They look to run applications like web services or security apps, even database applications and ERP solutions on massive, scaleable, horizontal systems, volume systems from Sun Microsystems. We have clearly established ourselves in the last year plus as a major category player in the volume system space. We are a leading provider now of one, two, four and eight-way systems. In the last year alone, calendar year 2003 we have introduced 12 new products in the sub \$10,000 category of server. We are still the number one 64-bit technical workstation provider, a very important marketplace for the company and one we continue to do very, very well in. Lastly we have introduced a record-breaking product called the SunFire V440, which really set a new price performance product range for this class of server. That all happened in 2003. In fact we put in a brand new product line from top to bottom for volume systems and Sun Microsystems. But we did not just stop there with the technology. We saw an opportunity with a company called AMD to take this engine called Opteron and build an entire set out of this series of engines. At COMDEX in November of last year we announced a strategic relationship with AMD to do just that. Not a point product, not just kind of a play in

the marketplace as some of our competitors have done like IBM, which is said, "Okay, we will take this little Opteron thing and we will play with it over here." We actually believe that the Opteron engine is highly compatible and complimentary to what we are doing with SPARC. It allows us in fact to increase our investment in the next generation SPARC architectures if we are able to take this Opteron engine and put it into an entire product line. It is with great excitement that we launch today the SunFire V20Z platform. This is the industry's lowest cost 64-bit server. It is the industry's highest performing 64-bit low-end server. It gives the capability of the customer to run Solaris x86 64-bit apps while maintaining the investment that they already have in the 32-bit environment. Just think of the value proposition that our customers, our mission critical enterprise data class customers are looking for from their strategic vendor. Two tough issues today; one, reduce cost and complexity. This allows them to do just that. Safeguard my investment but allow me to go where Sun went four, five or six years ago with 64-bit computing so if I choose to develop new apps I can do that. This platform will come fully supported with Solaris x86 as well as Linux 32 and 64. We really believe this will give the company a compelling set of products for our commercial based customers.

Now, if you look at the product itself and compare it to others out

there you see a compelling value proposition. Not only is it high-performance, not only is it priced at an incredible entry-level price of \$2795 but it comes configured with more memory, it comes configured with more OS's. It basically comes configured with more choice for our strategic customers. That is what they are looking for from a company like Sun Microsystems. It is not only however about the value proposition. There are two elements to be successful in the volume system space. One is clearly value, price and what comes at that price. Not an a la carte model where you have to buy your hardware and then add various nodes of software and you conceal the price of the system but a system that is introduced at a very aggressive value proposition. Then you have the other element and that is performance. What we have in the SunFire V20C is a screamer of a server. We are now the world record holder with the SunFire V20 platform of the Spec Web 99SSL performance. We produce 60% more transactions than its nearest competitor on this web site. That is what it is all about. Now, what I would like to do is invite Tony back up here to talk to us and show us some of this really compelling performance.

Tony Hillman: We are going to look at an application, which is called Tachyon. This was created by John Stone at the University of Illinois and it performs ray tracing.

Neil Knox: What is ray tracing? As you know I am not the most technical of all of these product people so help me out here.

Tony Hillman: Ray tracing is taking a large amount of data and transforming it into a highly accurate three-dimensional animation. In fact we have got an example right here for you to take a look at.

Neil Knox: Now, this is a technical application but it could also apply in the enterprise environment because what you are demonstrating here is horsepower.

Tony Hillman: That is right, absolutely. Any kind of computationally intensive activity is going to be benefited by this platform. Ray tracing is just one particular example.

Neil Knox: What is this picture that we are showing up here?

Tony Hillman: As a matter of fact this is the common cold.

Neil Knox: This would be the bug that my poor body is fighting with right now.

Tony Hillman: It could be and thanks for letting me know about it. This is the sort of thing at any rate that researchers have to look at in great detail. The point is it is very, very difficult to create. Can the V20Z create

this kind of animation more efficiently and more rapidly than its principle competitor the P4?

Neil Knox: How do we show our audience the real performance of the SunFire server?

Tony Hillman: We thought we would have a bake-off so perhaps we can bring up the bake-off applications right now.

Neil Knox: So, a bake-off here between?

Tony Hillman: We have a Pentium P4 with chips with clock speed just over three-gig against the SunFire V20Z. Perhaps you would like to do the honors and actually start the process of ray tracing.

Neil Knox: Let us give the Pentium IV a start; let us be fair. We do not want to humiliate it. Let us get it a start; off you go...and now let us start our SunFire.

Tony Hillman: What you are seeing here are the individual frames of the animation being rendered one at a time and the question is who can get to the end first? Already the lead that we gave to the P4 is being eroded. The rendering that is going on in the SunFire on Solaris x86 is appreciably faster. It is now in the lead. It is going to

extend that lead every time we do this. It is a 40% performance improvement over the competition.

Neil Knox: And the software that the SunFire V20Z is running is what?

Tony Hillman: It is Solaris x86 and this is a 32-bit to 32-bit comparison. There is no 64-bit involved in this yet.

Neil Knox: I win; I love it when I win. There is only one way to do it in life and that is win; that is awesome.

Tony Hillman: When we go to 64 bits you are going to see a 50% to 60% performance improvement so that is what we are so excited about.

Neil Knox: This is running a 32-bit. What is going to happen when we have 64-bit Solaris?

Tony Hillman: All of these applications are going to go much faster. You think of encryption and decryption. You think about the streaming server activity. You think about every scientific application; they are all going to run fast across the board 32-bit and 64-bit.

Neil Knox: A true screamer of a server and that is why we did the relationship with AMD and produced the SunFire V20Z server. Tony thanks

very much; awesome stuff.

Tony Hillman: Thank you.

Neil Knox: Now as I said at the start of the presentation it is important to note that we are not just doing a point product. We are not doing a one-way or a two-way server. We are going to do an entire line of servers and you will see us announce throughout this calendar year and beyond additions to this product line. We will roll out four-way and we will do eight-way servers. We will also do workstations and other products up and out from there. It is a commitment to have an entire Opteron-based product line complimentary to our SPARC based line that we have today. It is not just about the hardware and by the way I do not need to wear the ponytail so I am quite comfortable with my balding state and quite looking forward to the fact of a reduced hair bill when it finally all goes. But it is important to note that the value add that Sun brings is much more than the platform. This is not an initiative to build white boxes. This is an initiative to take an engine and build the Sun value add stack, the whole software capability that we have in our portfolio and have it on the Opteron line as well as on the SPARC line. We will have the N1 capability, JES, everything will be ported simultaneously to the Opteron line as we have on the SPARC line today. Oh by the way, Solaris x86 is starting to take off. We have 600-plus

application ISV vendors committed and signed up developing to that operating environment as well as our commitment to Linux 32 and 64-bit. It is a very exciting time for our company and this set of technologies. As Scott introduced at the start of his presentation what we would like to do in true Sun fashion is bring a Sun promo. If you sign up aggressive software subscription for three years at a price of \$1499 here is all the software that you get and all the features and all the support of the Java Enterprise System. We will throw in a SunFire V20Z server at no cost to you. I do not know what other element of commitment that you can see from us but the value add of a Sun software stack is really what will make the difference from Sun in the volume system marketplace. I have talked a lot about this SunFire V20Z but let us not forget our SunFire Blade product that we launched some year ago with SPARC Solaris running next to an x86 1P blade. Today we are also announcing our 2P blade; all managed in a mix, match and manage environment, a heterogeneous environment giving the customer choice and selection of those technologies, whether it be Solaris x86 or Linux. That is what we are announcing today. We also have a very vibrant and very healthy SPARC volume business. This is our wildly successful volume server the V240 server and V210 server and we are announcing the new SPARC chip in that product giving it a speed bump. We are also taking the price down because frankly the customer acceptance of the product has been

outstanding and we are able to drive additional volume, which is even further lowering the cost of this highly successful volume server. The reason I have Raytheon the name up there is I am asked a lot in my travels around the customer base and with industry analysts, "Are you really a player in the volume space?" Do you know what? The proof in the pudding is talking about customer references. This one is hot off the press. Yesterday Raytheon won a major federal contract to deploy a new series of systems for the FAA and we received an order for a multi-thousand unit order for members of the SunFire V240 family; a very exciting time. Again, they chose SPARC, they chose Solaris, they chose Solaris for its security, its robustness and its networking capability. It is a very exciting win and one of the most elementary signs of the fact that we are clearly a player in the volume space. Two weeks ago you may have seen a press release from us. This is a very important acquisition for volume system products. This is one where we acquired a company called Nauticus Networks in the Northeast of England. Nauticus Networks is a small stop reflecting our interest in IP. Not only IP that we develop in-house but also IP that we can see that we can go out there and acquire simply and efficiently. Nauticus builds a content switch with network functionality of FSL, security, load balancing and virtualization in an element in the rack. We believe that data centers and networks are going to converge sooner rather than later. Again Sun's vision

and value add is to be able to deliver products that will give that functionality and capability to the customer base. We in Volume Systems while today Nauticus is an element in the rack as you can see here in the picture; today that will move tomorrow to that functionality, that network functionality actually residing within the volume system server. That is one of the most exciting things that we see in the next generation of products coming from volume system products of network functionality residing in the server because we are practicing, not just preaching. We are practicing that the network is the computer at Sun Microsystems.

It has been a phenomenal year for Volume Systems. We have announced a lot of products. We are so excited, not only because of our SPARC volume servers and the success of our two, four and eight-way servers but also of our new Opteron line. But one of the most exciting announcements we have kept until the very last and this is one of the most significant announcements for Sun in total and to make that announcement I would like to invite Scott McNealy back to the stage.

Scott McNealy: There is some pretty exciting stuff going on here and I do not quite know how to set this one up. But in a place far, far away in a time a long time ago I was 27 and I was on campus and I got a chance to meet this guy who had invented the Stanford University Network,

hence Sun workstation. Little did I know that he would turn into what I consider to be absolutely the most prolific and exciting and talented workstation and single-board computer designer on the planet. I do not think anybody has come close to being able to pack as much stuff into a 1U box or a pizza box as we used to call them or design a desktop with the kind of power and elegance and performance that employee number one at Sun Microsystems did for us. He left a few years back to do a little start-up called Granite and that got bought by Cisco and he ran a pretty good chunk of Cisco's business. Then he left and started a little company called Kealia and Kealia started off doing some media server technologies and other technologies and Andy started doing what he did normally and naturally; it is in his DNA. He started building the world's coolest computers; 1U, 2U, 4U and bigger, all based on single board designs that Andy does better than anybody else. He and I, in fact we had a little founder's reunion of Bill Joy and Vinod Khosla and Andy or Andreas von Bechtelsheim depending on how you want to say it; I prefer Andy. The four of us were sitting in a little restaurant out in Portola Valley and Andy I started talking and I was asking him what he was up to and what he was doing. One thing led to another and all of a sudden Sun bought Kealia and I would like to reintroduce the founder of Sun Microsystems Employee Number One -- Andy Bechtolsheim. Where are you Andy? Now, the badge has changed a little bit since...

Andy Bechtolsheim: Wait a minute; I still have my old badge.

Scott McNealy: Can you get a close-up on those? We now have a Smart Card. The badges have changed a little bit. Mine is a little more modern. The hair is a little lighter now. As Employee Number One we saved your employee number and you will have to get a little bigger badge holder for that particular badge. But we are very excited about having Andy back on stage as Employee Number One. Congratulations, welcome home. Tell us a little about what Kealia has been doing and how this is going to fit so naturally with what is going on at Sun.

Andy Bechtolsheim: We have been working on a bunch of next generation Opteron servers that seem like a really good fit for Sun.

Scott McNealy: You have a whole bunch of interesting products we have not announced yet right?

Andy Bechtolsheim: Nothing we are announcing here today but we are working on higher performance CPU's, IO, memory, packaging density. All of these systems I should mention will run Solaris, Linux and even Windows.

Scott McNealy: We will have to decide whether or not we want to ship Windows. That will be a very easy decision I think. But for investment protection they will be certified to run Windows and we will ship Linux on them as well as Solaris. The Java Enterprise System will run naturally. This will all connect to the Sun NetConnect architecture, N1 compatible environments.

Andy Bechtolsheim: All based on industry standards just like the good old days.

Scott McNealy: It is pretty interesting. You are a group of how many employees and how many engineers?

Andy Bechtolsheim: Fifty-eight engineers.

Scott McNealy: All of that will be able to leverage Sun's worldwide brand, all of our software investments, all of our services and distribution capabilities. Instead of Kealia we are going to have Sun Microsystems.

Andy Bechtolsheim: We had a little trouble with the name. Nobody knows how to pronounce it so we had a little trouble.

Scott McNealy: I had to keep looking at it; not a problem. So, are you working hard these days?

Andy Bechtolsheim: I actually got up at 3 o'clock this morning and felt a little tired because I was just thinking of all this work we have to do to get this stuff out the door.

Scott McNealy: I asked Andy if he would stick around for the analyst conference and he gave me exactly the right answer, as a new employee he said, "No. I have too much work to do." So he will be here for Q&A for those of you who want to ask Andy this afternoon any specific questions. Andy and I have had a chance to kind of work and compare ideas and all the rest of it. This guy is prolific beyond anything you have ever seen and we are very, very excited. It is kind of nice to have him running up the steps and lighting the torch again here for what we are going to do and as chief architect I could not be more excited. I just do not know if you can tell how excited I am to have Andy back onboard because I will follow this guy anywhere and do everything I can to help him be successful. You had a chance to look and I know a lot of folks have always trusted and understood kind of the inability for you to say anything other than absolutely what you are thinking and what you believe. You had a chance to go look at Niagara, our chip multi-threading strategy with the mini cores and mini threads. Is that going to be an interesting chip for you to design product around?

Andy Bechtolsheim: So I had a chance to meet with the SPARC design team last week and they were really great working with. As you know including the 90-nanometer you heard about today as well the multi-threaded throughput computing chips. They are modeling performance levels that are really unmatched in the industry. So there is nothing out there, whether it is AMD or Intel or anyone else that has that level of throughput for the throughput computing type of applications.

Scott McNealy: So you are going to be designing for Ultra SPARC, you are going to be designing for this chip multi-threading and for Opteron.

Andy Bechtolsheim: Well I hope to work with the rest of Neil's Volume Server System team to get this all done. But this is all part of the volume story, which I should point out. Obviously we will do all of SPARC volume throughput computing and Opteron.

Scott McNealy: And including x86 so your packaging architecture can be used for all of this. Traditionally you got your teeth cut in doing workstations and we have got a pretty interesting desktop business with JDS, with the SunRay, with our Sun Blade workstations. May I ask you on stage in front of everybody to go look at that product line and see if you cannot update that and put a little of your magic on that stuff too?

Andy Bechtolsheim: I guess I should summarize by just saying I am really excited about the opportunity here before us. If you look back in history there have been few times where you can see that much of a cost performance, performance bandwidth improvement in any single point. It is an integer factor that is definitely going here. All of these things need to get out to market of course and I look forward to working with that as hard as I can.

Scott McNealy: Andy one other thing; you look great, not necessary. Thank you very much buddy. I can see the e-mail servers at Sun buzzing right now as everybody is sending mail around; it is pretty exciting. I think Neil and Andy are going to make one of the great design and execution teams in the history of the computer industry. We are very, very excited about that. I am going to finish up here quickly and just kind of recap with a little bit of a call to action and a suggestion to our customers out there, a set of suggestions. I will just race through them very quickly.

First of all go ahead and double the throughput of your data center. Go ahead and upgrade. Just do the live lunch time upgrade; do the Clark lunch time upgrade there and try our throughput computing systems. Make Linux and Solaris go faster. If you are a developer get one for free. If you are a customer just make your

operating environment rock. Just go for it with our new V20Z, the SunFire V20Z. Go for built-in security. Go to Java Enterprise Systems in the Java Security model. Run it on Trusted Solaris and pick your hardware; Ultra SPARC 3I, Ultra SPARC 4, our chip multi-threading architectures as they roll out, Opteron and the x86 architecture. The only interesting silicon investments that we are not taking advantage of are Itanium, which is not so interesting and Power. So we have got mankind against Power. I like what we are doing and I like how we are leveraging all of that. Do not start from scratch. Leverage your Reference Architecture. Do a proof of concept. User Customer Ready Systems. Use our SunTone certified service providers. We have got a lot of help. You do not have to invent your own data center. That is what we do. You all have other businesses. Let us help you with that. Save money with the Java Desktop System. If you have not seen JDS you might have noticed we ran the demos on JDS. Did you notice that it had kind of a familiar look but instead of saying, "My computer" it said, "This computer" in the upper left? That is more accurate because you know what? That is a Sun computer, not your computer. Did you notice it did not say restart in the lower-left hand corner? It said launch. That is more...well at least with JDS that is accurate. It is a very, very familiar environment and that runs on Solaris on workstations. It runs on Solaris on SunRay's and it runs on Linux on your x86 laptops or PC's. The same

environment, same Microsoft inter-operable and Microsoft familiar environment and you can do it for \$50 per employee for all of your employees. It is a pretty cool opportunity. Definitely sign up for the Java Enterprise System. You get world class features in an entire web services stack for \$100 per employee per year, blow away, running on any of our five major microprocessor investment architectures; Intel, AMD, 3i, IV and the chip multi-threading environment. You get choice, a common environment that runs without reengineering on all of those platforms. Mix, match and manage using the most innovative blade platform on the planet that Neil talked about; pretty exciting. Also get safe secure and automated provisioning and authentication. Go Java Card and the JES Identity Directory Provisioning environment. The most important thing you can do for security is authenticate and know who is out there -- on your network, on any network and we have the best capabilities to go do that. Take a test drive. Go to an iForce Center. Check it out. Before you sign an agreement with an integrator that starts with an 'I' and ends with an 'S' do not go to IGS and spend your money. Come to an iForce Center and make some progress.

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