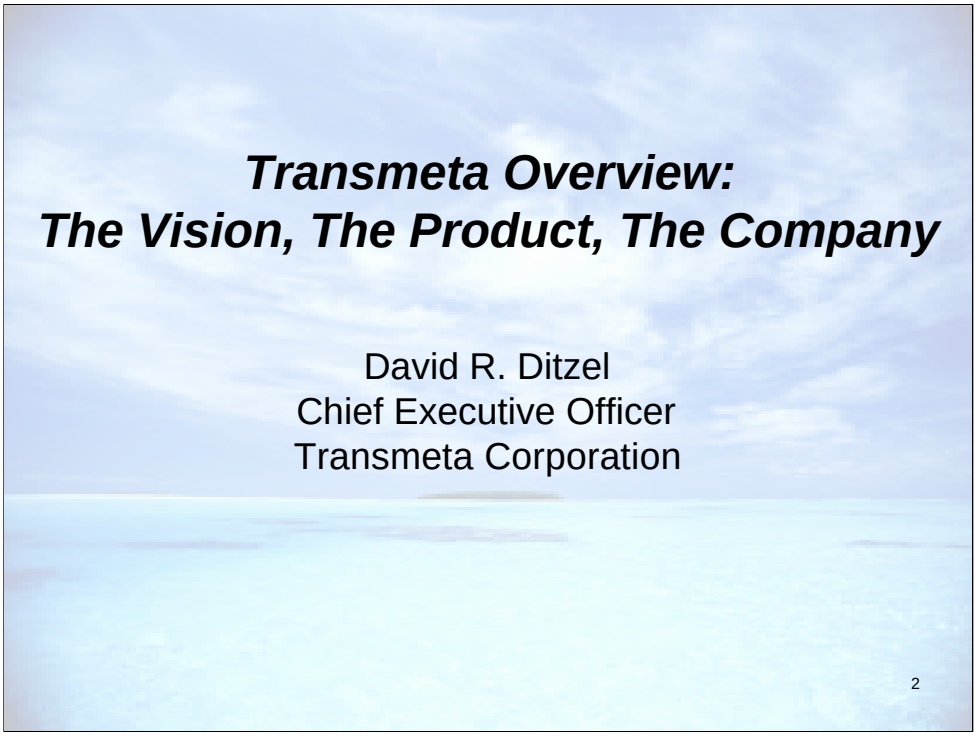
# *CRUSOE*
# *Product Launch*

***Rethinking the Microprocessor to create a new world of mobility.***

***January 19, 2000***




Good Morning.

I am Dave Ditzel, Chief Executive Officer of Transmeta Corporation, and this morning, if you have any interest at all in the future of computing, I promise you something exciting -- something that is going to change the future of microprocessors as you know them, and change the world of mobile computing as well.

I would like to start by thanking all of you in the audience, who have waited patiently to see what it was that Transmeta was working on. I know there has been a lot of curiosity.

Today, we're going to reveal it all, and tell you what Crusoe is all about.


Here is today's agenda.

First, I'm going to give you an overview of the Crusoe Product Vision, the Crusoe product and a bit about Transmeta Corporation.

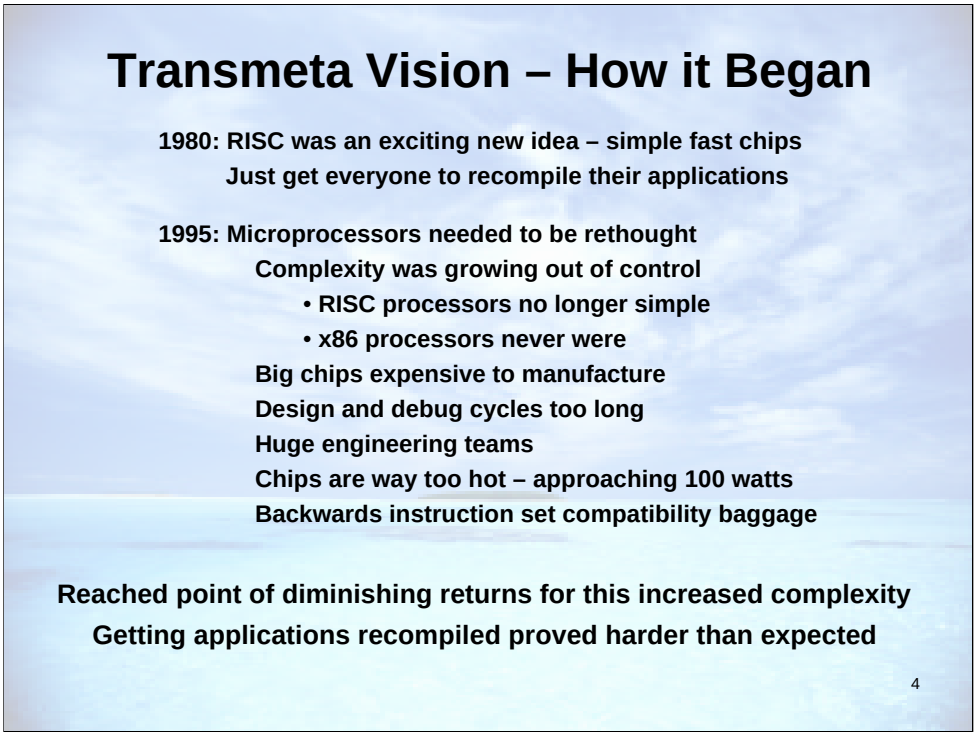
You'll meet Doug Laird, our VP of Product Development, who will tell you about how we built Crusoe and provide more details on how Crusoe works.

You'll also meet a few of our engineers, including Linus Torvalds, who will demo the capabilities of the Crusoe processor, and Dave Taylor, one of the authors of the popular computer game QUAKE.

Next, Jim Chapman, Transmeta's VP of Sales and Marketing will give you a picture of how Crusoe fits in the marketplace.

Finally, we'll have a Q&A session to answer your additional questions. And if you forget something today, don't worry, all the details will be up on our website, after all, this is the internet age. There will be demos outside after this morning's session, and interviews this afternoon, after lunch.

We hope that by the end of today, you will be convinced that Transmeta has indeed rethought the microprocessor.



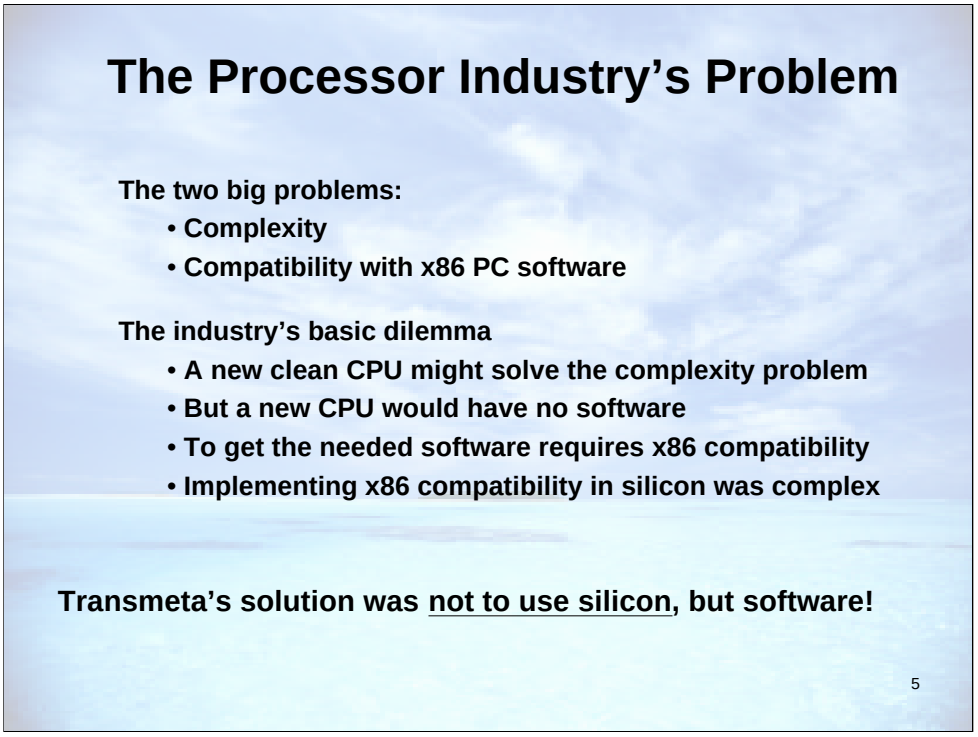

I'd like to start with the story of why we formed Transmeta, and the vision of computing we came up with.

In 1980, Reduced Instruction Set Computing (RISC) was the biggest change in computer architecture in a long time. RISC was an exciting new idea as it promised simple and fast chips. All you had to do was get all of your applications recompiled, and we thought we could take over the desktop.

By 1995 though, things weren't quite as exciting, and it was clear to a lot of us that Microprocessors needed to be rethought.

Complexity was growing out of control, RISC processors were no longer simple, and x86 processors never were. There were many problems associated with this growth in complexity. The chips were getting bigger every year, and getting expensive to manufacture. Designing and debugging these complex chips was taking longer and and becoming less predictable. The engineering teams were growing out of control as well, with 200 to 1000 people on a project. The chips were getting WAY TOO HOT, and we can see today that some chips are approaching 100 watts, and that's hot! And each new chip generation had to be backwards compatible with the prior one, which added yet more complexity and baggage.

Overall, designs had reached the point of diminishing returns for this increased complexity. And for RISC designs in particular, I learned a valuable lesson, that getting all those PC software applications recompiled proved far harder than expected.

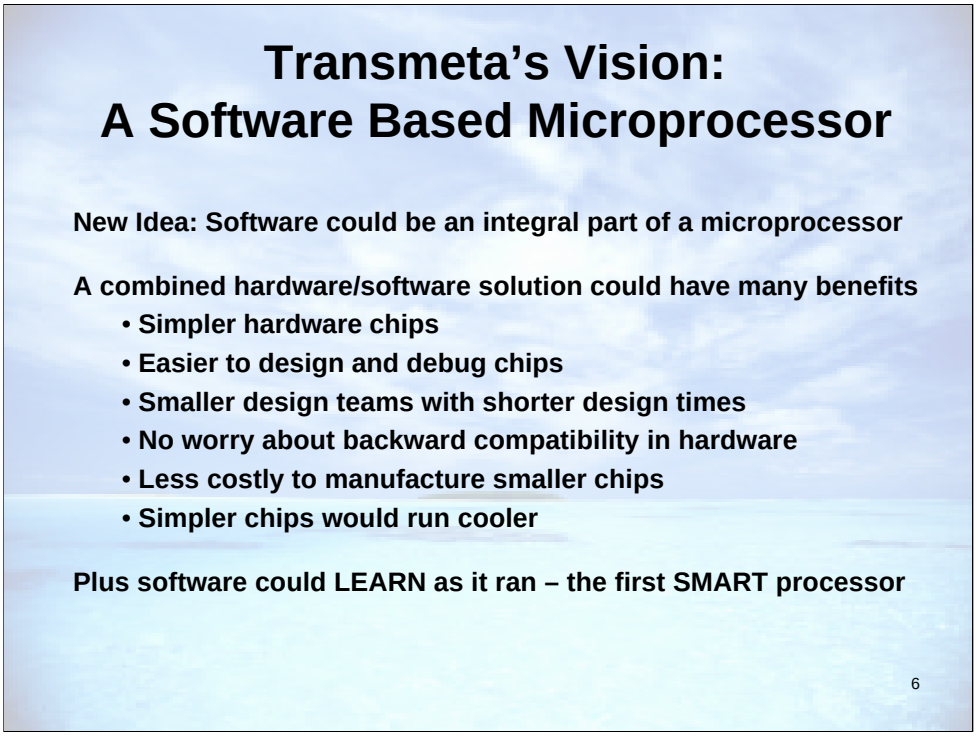



It can be boiled down to two big problems: Complexity and Compatibility with all that x86 PC software. These problems were, and still are, endemic to the entire microprocessor industry.

The industry's basic dilemma was how to get out of this box. On the one hand, a clean new CPU design might solve the complexity problem. But a new CPU, with a new instruction set, would have no software, and we learned painfully from RISC that this is not an easy problem to solve. To get the needed software requires full x86 compatibility. But in turn it was clear in turn that implementing x86 compatibility in silicon would just add to the complexity problem. The industry appeared caught in this vicious cycle without any apparent solution.

You've probably heard that saying that if the only tool you have is a hammer, everything looks like a nail. Semiconductor companies have their fabs as the hammer, and they couldn't imagine any solution that wasn't semiconductor based.

By "thinking outside the box", Transmeta came up with the idea that the solution was to not use silicon to solve the problem, but to use software to solve the problem!

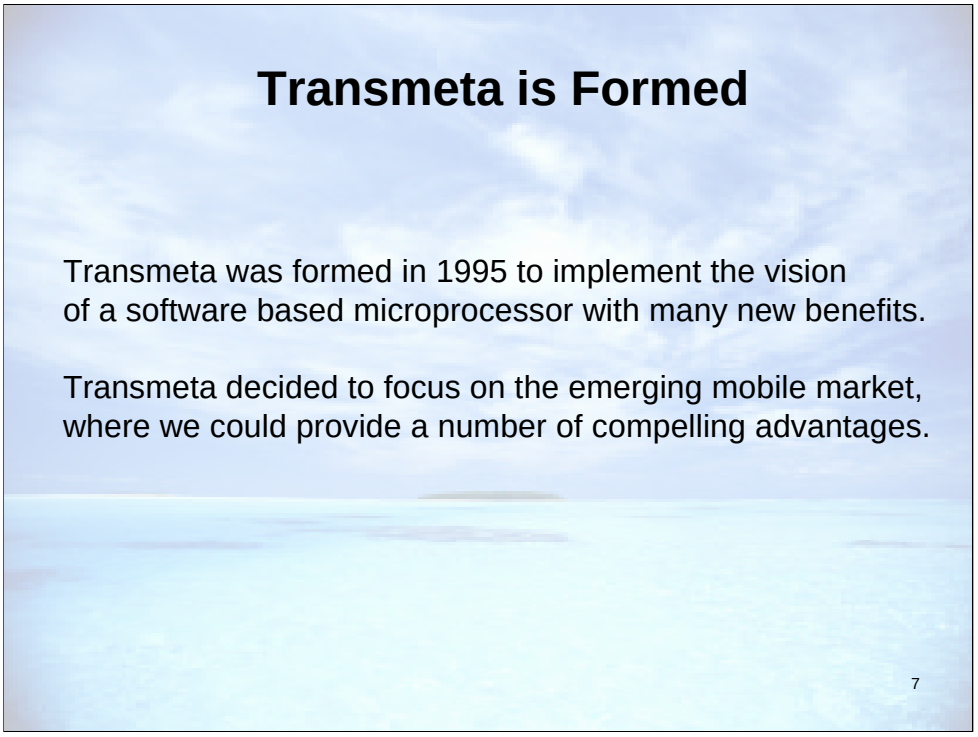



Transmeta's new idea was that software could be an integral part of a microprocessor. What we realized was that processors had become so fast, that software could do many of the tasks typically done in hardware, not only with no adverse effects, but with actual benefits.

A combined hardware/software solution could have many benefits.

Primary is that the underlying hardware could be vastly simplified. Simpler hardware is far easier to design and debug. Simpler hardware chips can also be designed with smaller design teams and in less time. This new technique would mean that hardware designers wouldn't have to worry about being backwards compatible with the prior chip generation. Simpler hardware means smaller chips, which are less costly to manufacture. And best of all, simpler chips have fewer power hungry transistors, and hence chips would run much cooler.

Plus software itself brings the ability to do things that one could simply not imagine in hardware. For example, the ability to learn about a program as it runs, which could lets us build the first truly SMART processor, that could adapt and improve its own behavior based on what it learns.

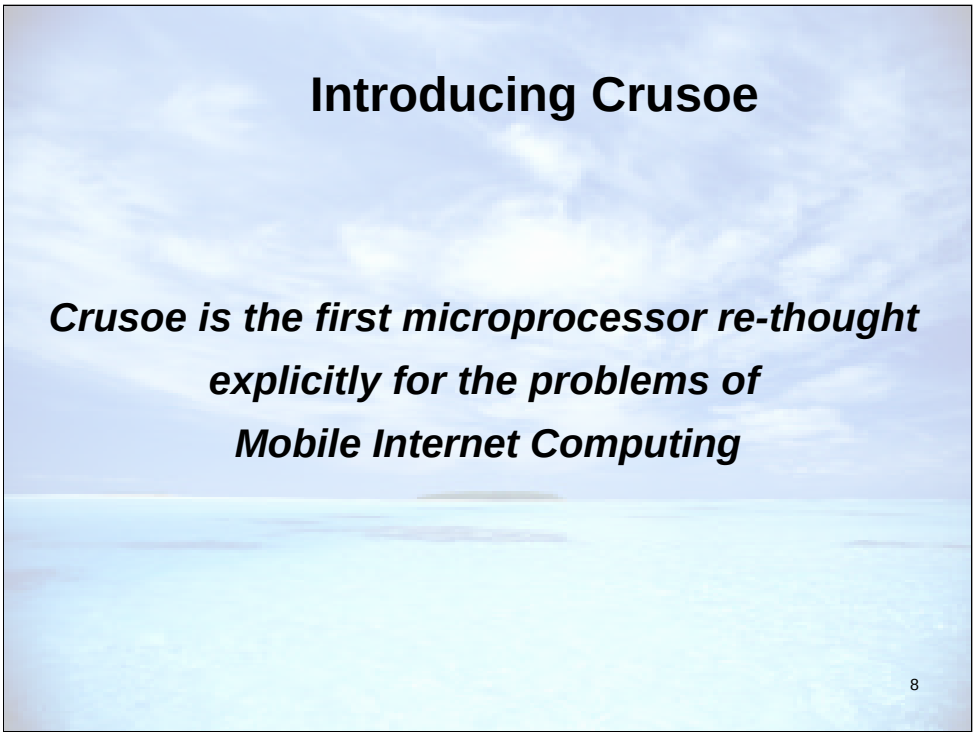



So in 1995 we formed Transmeta Corporation.

We dedicated Transmeta implement the vision of a software based microprocessor with many new benefits.

And as I went around and got advice from some of the experts I knew in the industry, I was surprised to find that most of them had the same reaction “wow – that is the neatest idea I’ve heard in a long time – could I join your company....”

We decided to focus on the emerging mobile market, where we could provide a number of compelling advantages for the end user.




Introducing Crusoe.

The first microprocessor re-thought explicitly for the problems of Mobile Internet Computing

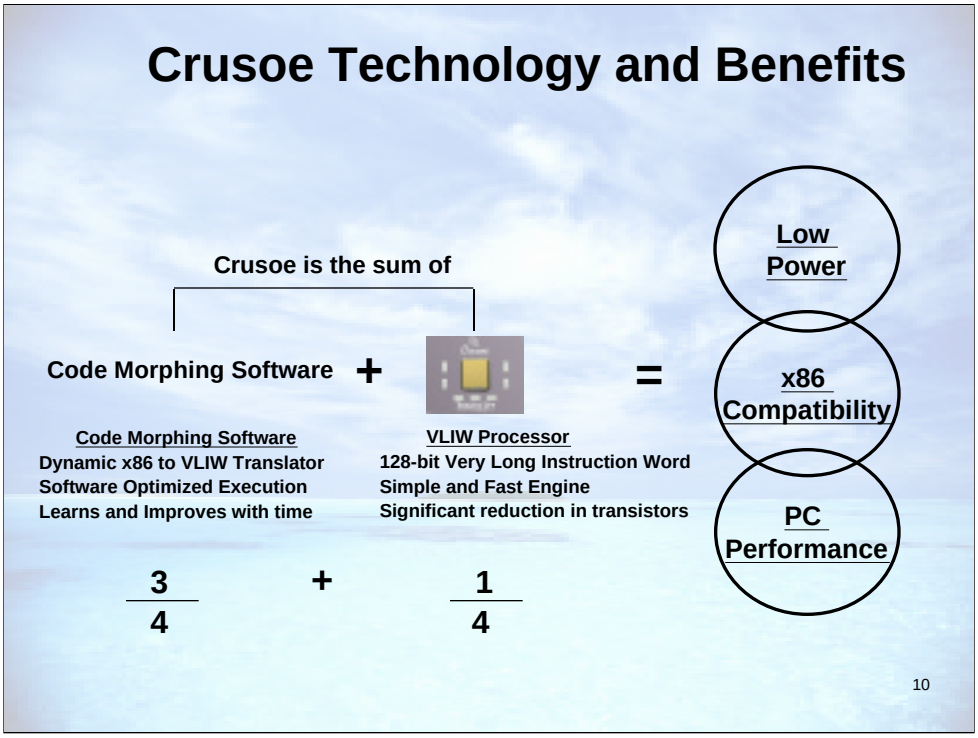
I'll tell you more about Mobile Internet Computing as we go along, but first, let me tell you more about Crusoe.


So what is really unique about Crusoe, is that

Crusoe is the first microprocessor whose entire instruction set is implemented entirely with software.

Let me be clear on what this means. I'm not talking about running an operating system or user application on top of the microprocessor. I mean that the basic functionality and compatibility of the microprocessor is built from software.

This has never been done before. And it will give Crusoe a number of advantages that simply cannot be obtained from a pure hardware implemented microprocessor.




Here's a simple description of how it works.

The Crusoe product has both a software and a hardware component.

Crusoe is is the sum of Transmeta's Code Morphing Software and a VLIW silicon chip. About _ of the functionality is actually in the software, which means that the underlying hardware engine can be very simple and very fast. The VLIW engine only needs about _ of the logic transistors of a traditional PC microprocessor. Simple hardware is a great thing. Simpler chips can be designed in less time, and also its easier to design them to run fast. Simpler chips have fewer transistors, which means that they burn less power, and are cheaper to manufacture. This is a big deal.

The VLIW engine has a unique proprietary instruction set designed by Transmeta, that includes special support for Code Morphing.

Code Morphing Software dynamically translates x86 programs into instructions for the underlying VLIW engine. It does this so fast that the translation is completely transparent to any user. As the program runs, Code Morphing Software actually learns what the program is doing, and as it runs, it continues to improve it using a technique we call "Software Optimized Execution". Software Optimized Execution can not only improve the programs performance, but also reduce the amount of power it uses as it learns.

Crusoe's hardware/software combination provides a complete microprocessor that has low power operation, 100% x86 compatibility, and PC levels of performance.

Now that I've told you about the new invention, let me tell you about the actual product.

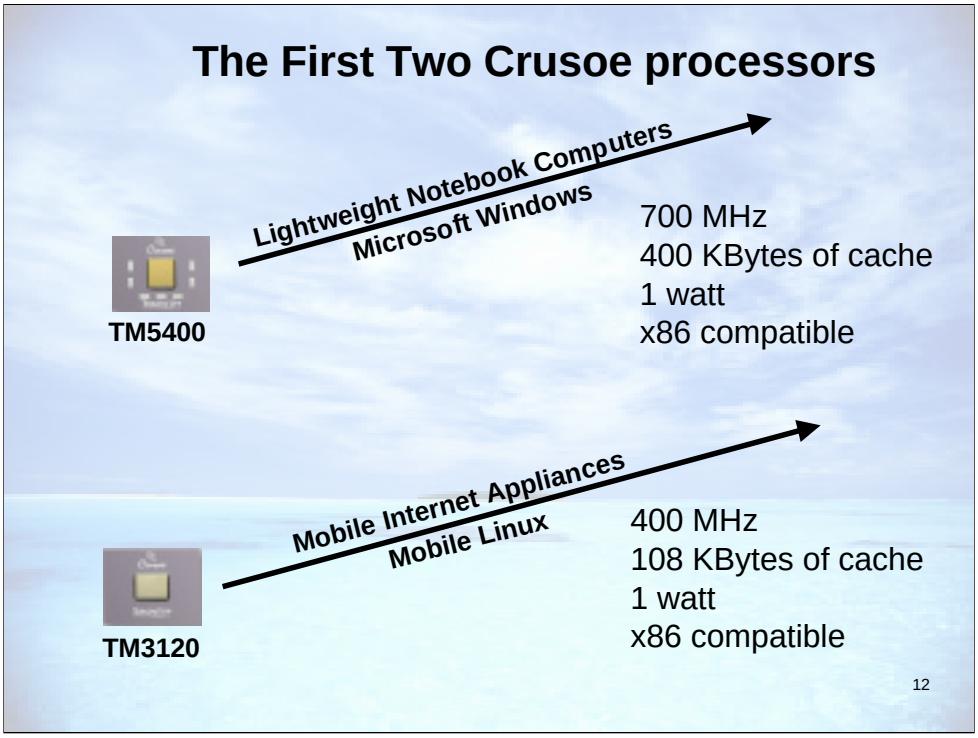

Now with everyone in the press trying to guess what we were doing, one of the things you didn't figure out is that Crusoe is not just the name of one chip, but its the brand name for an entire family of chips.

Today Transmeta is introducing the first two members of the Crusoe family, designed to capture two different segments of the mobile computing market.

We refer to Crusoe as a Mobile Internet Processor.

Mobile Internet Processors are a new category of processors that have a few common characteristics:

- They are low power – hence mobile.
- They are compatible with what you find on the Internet, namely x86 PC software.
- They have sufficient performance to deal with all the rich content you find on the internet, such as streaming video.




Transmeta's first product, the TM3120, is designed for Mobile Internet Appliances. It runs at high speed for a mobile device, 400 MHz, has over 100 Kbytes of on-chip cache, and dissipates about 1 watt of power on average when running typical applications. The TM3120 is fully compatible with all x86 PC applications and operating systems, though we have found the greatest customer interest is for mobile internet appliances running a version of the Linux Operating System that we call "Mobile Linux."

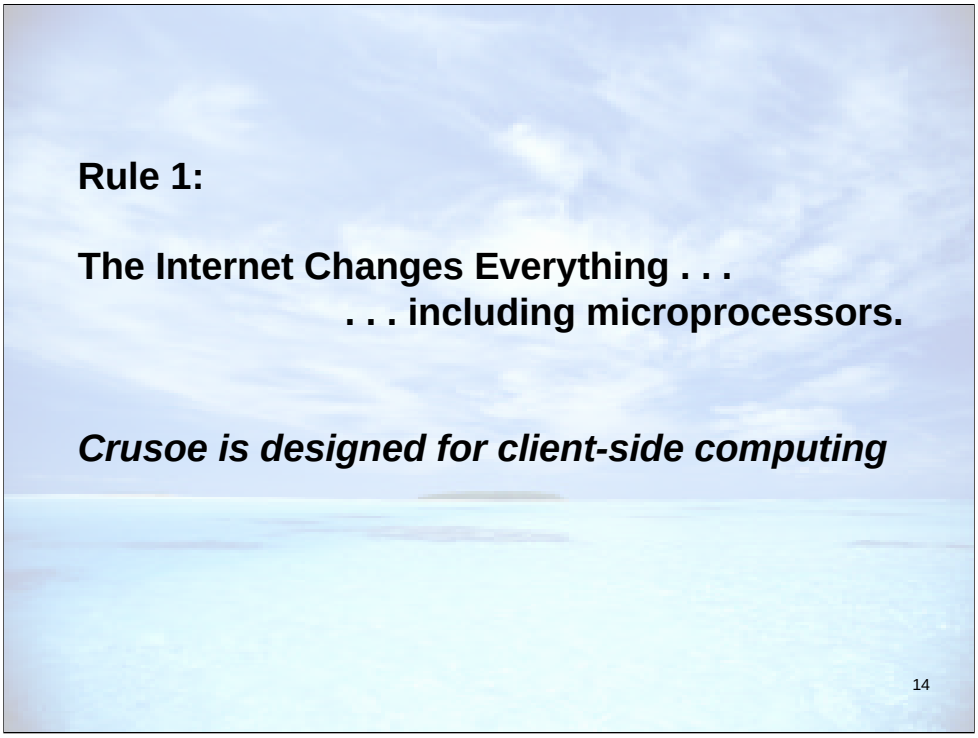
Here is an example of systems using the TM3120 (show web pads).

The second Crusoe processor, the TM5400, has a completely different internal design, and is designed for lightweight notebook computers that we expect will most often be running Microsoft Windows. The TM5400 runs at up to 700 MHz, has 400 Kbytes of on-chip cache and can also run at about 1 watt average power. The TM5400 is also fully compatible with all x86 applications and operating systems.

Transmeta has put a lot of effort into advanced power management techniques, and you'll hear a lot more about those today.


Let me tell you about 4 rules that we used to guide the design of Crusoe, and which are key to the future of mobile computing.

If you understand these 4 rules, you will understand the direction that Transmeta will take in the next decade in creating an entire new world of mobility.




Rule 1 is that the Internet changes Everything, including microprocessors.

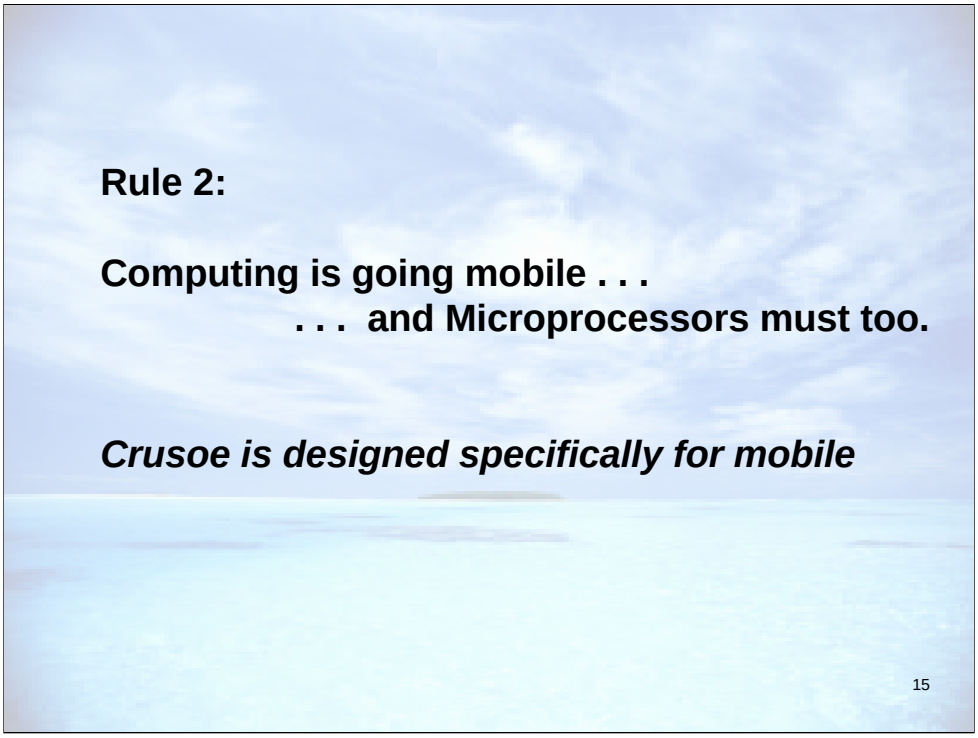
The Internet computing model is one of Client/Server computing. Large servers connect through the internet to a range of client computers. So far, clients are either predominantly desktop or notebook PC's. The world has some great computers for the servers, but so far the microprocessor for notebooks is just a microprocessor originally designed for servers crammed into a smaller box.

The world needs a microprocessor designed from the beginning to handle the type of computing for the client side of Internet computing. For example, only the client side needs good multimedia performance, for streaming video and audio.

Crusoe is designed for Mobile Internet Computers that are

simple, lightweight, multimedia capable, compatible, flexible, scalable, ...

Crusoe is designed to handle the kind of computing most typically done by internet users. One where computing is driven by mouse-clicks. When you click on the mouse, you want the full performance of the machine, fast response, and then have the machine go back into battery saving mode until the next mouse-click.



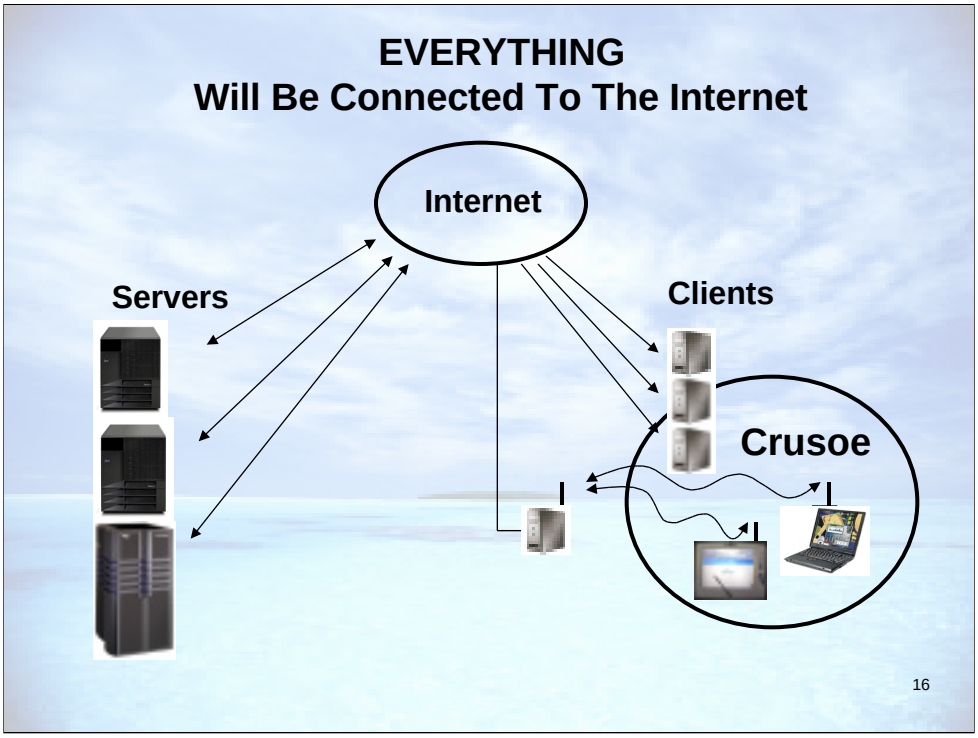

You know, People themselves are inherently mobile.

Rule 2 is that the world of computing is going mobile.

In the future there will be an insatiable demand to bring the same kind of mobility to computing that the cell phone brought to telephones.

You wouldn't leave your cell phone at home, so why leave your email and web site at home? For me personally, if I had to choose, I'd probably take my email with me rather than my cell phone.

Crusoe was designed specifically to enable a new world of Mobile Internet Computing.




A number of semiconductor analysts, such as Dan Niles of Robertson/Stephens thinks that the world of mobile internet computing is wide open, waiting for the right kind of processor solutions to appear, with no clear leader in the Information Appliance space.[Niles footnote]

Mobile is where the innovation is happening

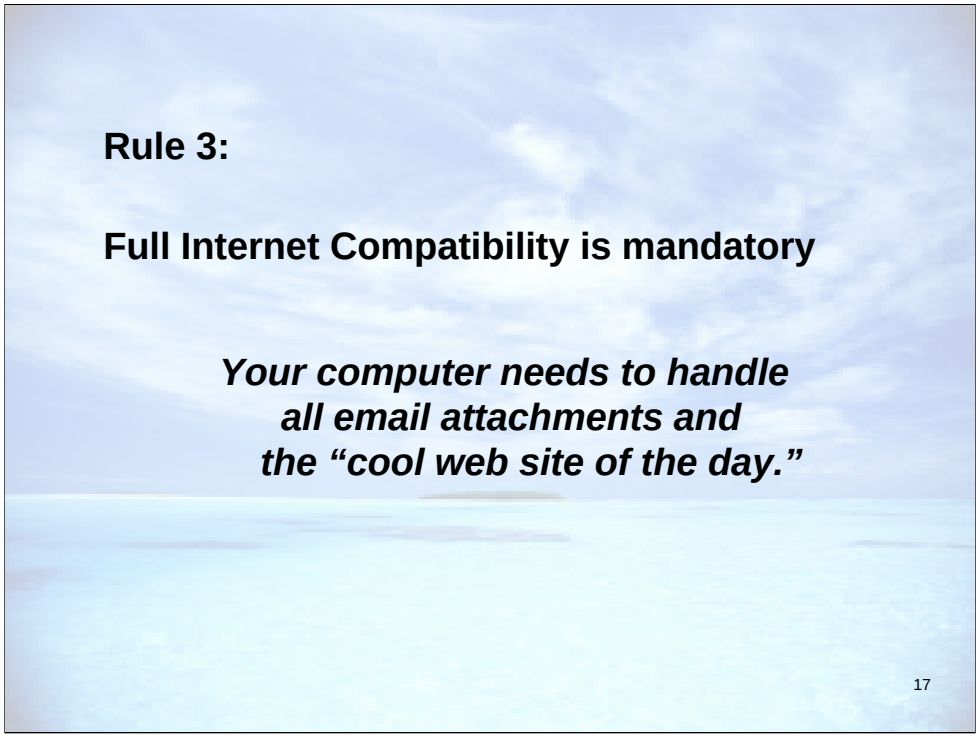
Mobile is where the growth is happening.

Mobile is the future.

Crusoe is designed specifically for the mobile computing space.

The opportunity is enormous.

Niles, Chanda, Graham and Benjamin, The Silicon Opportunity of the New Millennium, Robertson Stephens research report, August 1999.




Rule 3 is about compatibility.

We like to use the words “Full Internet Compatibility”.

20 years ago people tried to get away with computers that were “almost” PC compatible. The world quickly learned that you are either 100% compatible, or you simply aren’t compatible.

In real terms, this means You better be able to handle “the cool web site of the day”.

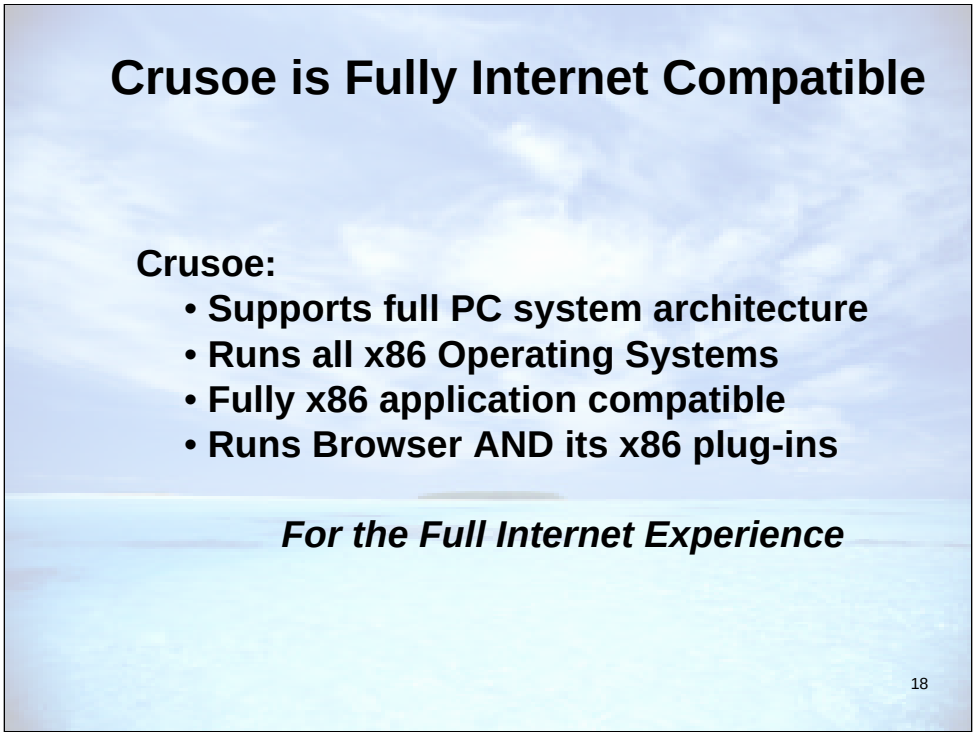
Full compatibility is mandatory.

It’s not just about connecting to the Internet --

You have to be able to run everything that the website provides.
You have to be able to open every email attachment file type you get.

You have to be able to play audio and video at its full rate, not half speed.

You have to be able to load every PC compatible plug-in for your browser.




This is why we designed Crusoe to be fully Internet compatible.

Everything you expect out of an internet connected desktop computer today can be done with Crusoe in the future.

To do this, Crusoe

Supports the full PC system architecture

Runs all PC operating systems

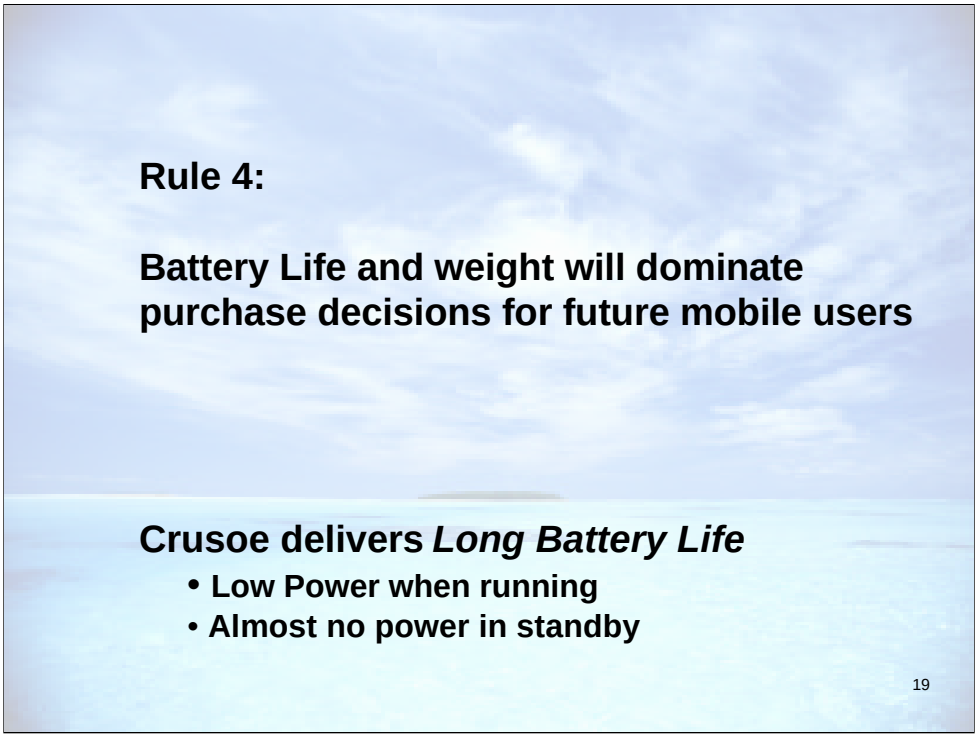
is 100% x86 application compatible,

so you can read any email attachment

and can run all of the x86 plug-ins with your web browser

such as MP3 or RealAudio.

So with Crusoe you can have the Full Internet Experience.




In the future, Battery life and weight will dominate purchase decisions for future mobile users...more important than MHz even.

It's about the battery, stupid!

Crusoe has the 2 secrets of Long Battery life.

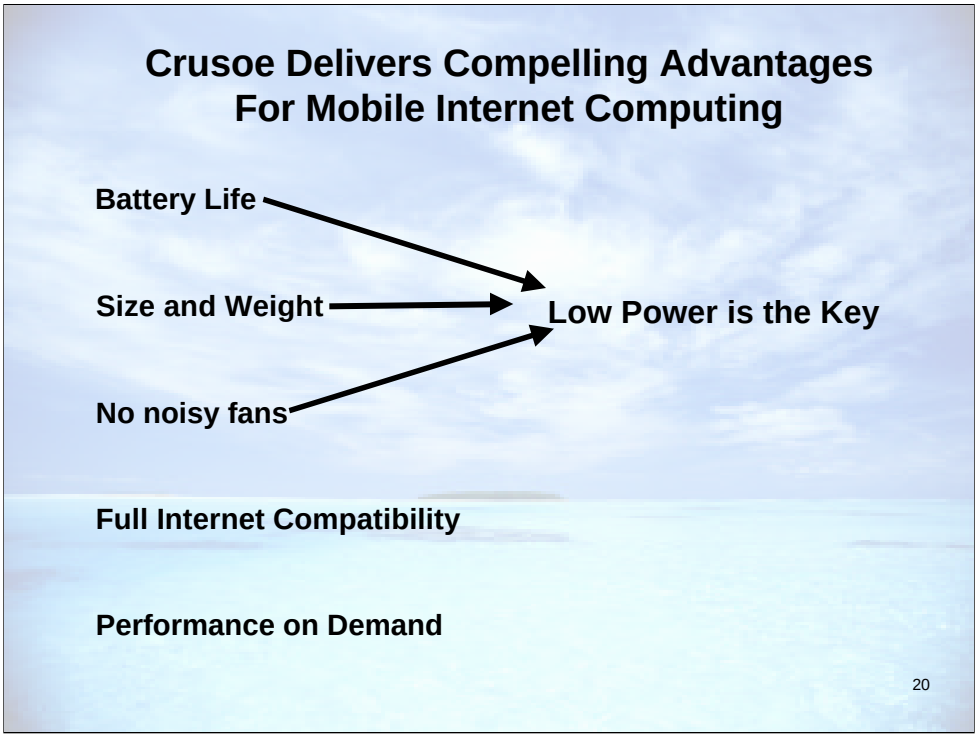
Secret 1: Low power when running, typically under 1 watt.

Secret 2: Use almost no power when in standby.

Crusoe has a special "deep sleep" mode where it burns only 10 mW of power once you have left it alone for just a few seconds.

That's low enough power that you could come back weeks later, and be able to resume right where you left off, without having to reboot your machine and start all your applications over again.

~~Crusoe has many features that deliver on the promise of Long Battery~~ Life.

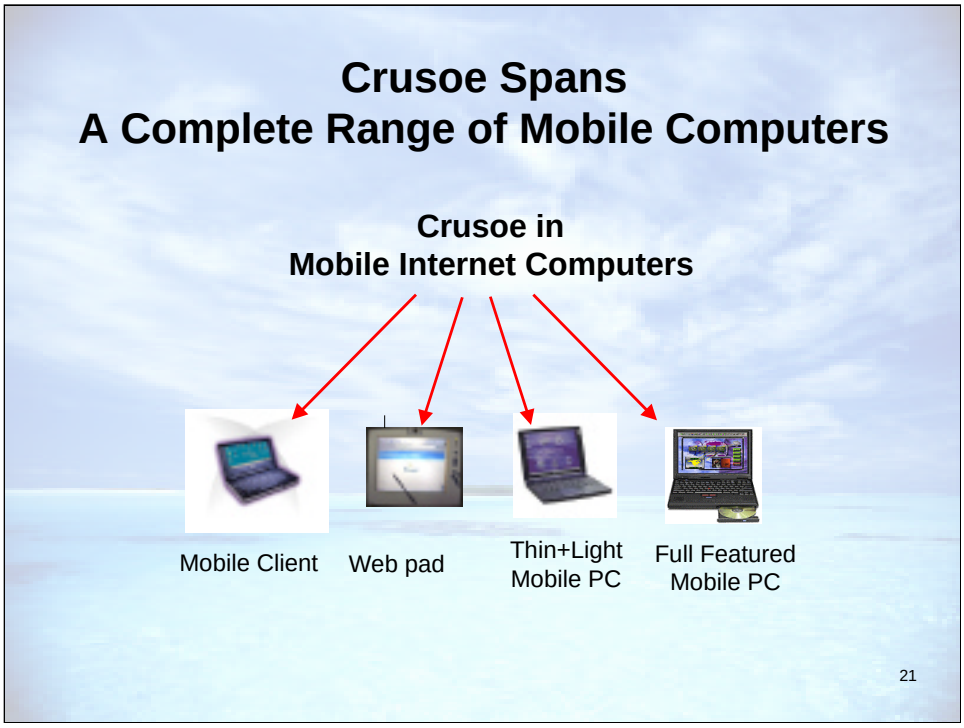



By following these rules, we built to Crusoe delivers compelling advantages for Mobile Internet Computing.

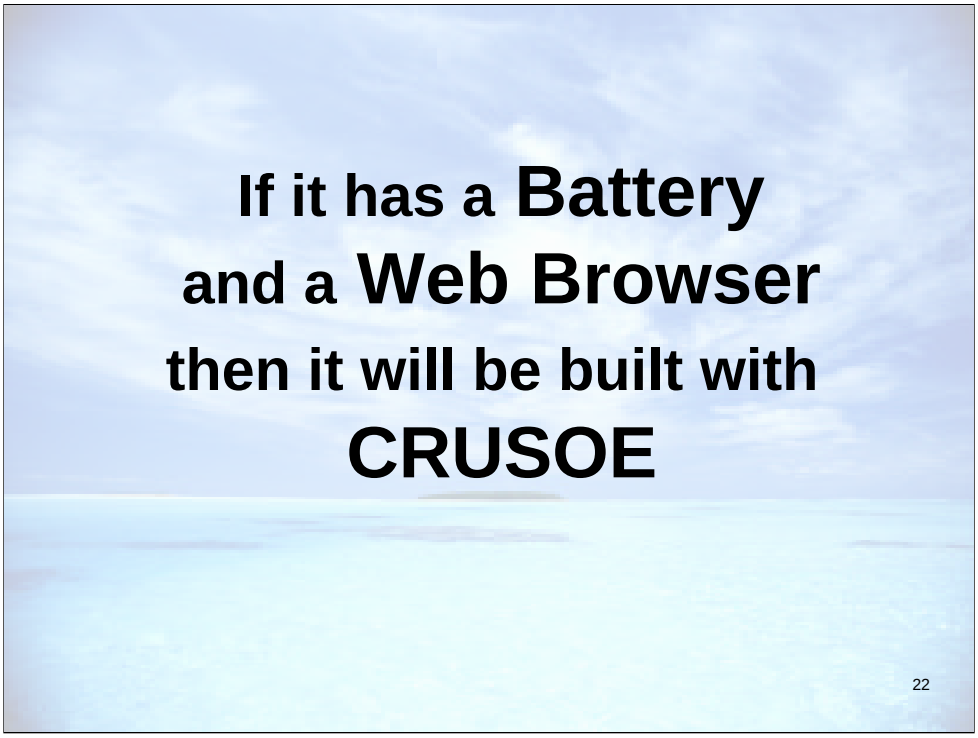
Longer battery life, reduced size and weight, and elimination of noisy fans are all enabled by Crusoe's low power operation.

And all of this can be done with Full internet Compatibility. Compatibility with any x86 PC operating systems, application, and plug-in compatibility to get the entire experience off any internet web site.

And finally, Crusoe has the ability to deliver what we call "Performance on Demand". That is the ability to deliver the full performance of the machine, whether on on batteries or AC power. Its also about the ability to deliver the precise amount performance, only what is demanded by the user application, so as to not waste battery life.




Crusoe processors an enable a wide range of internet capable devices, from mobile clients and web pads, through thin and light notebooks all the way up to full featured notebook computers.

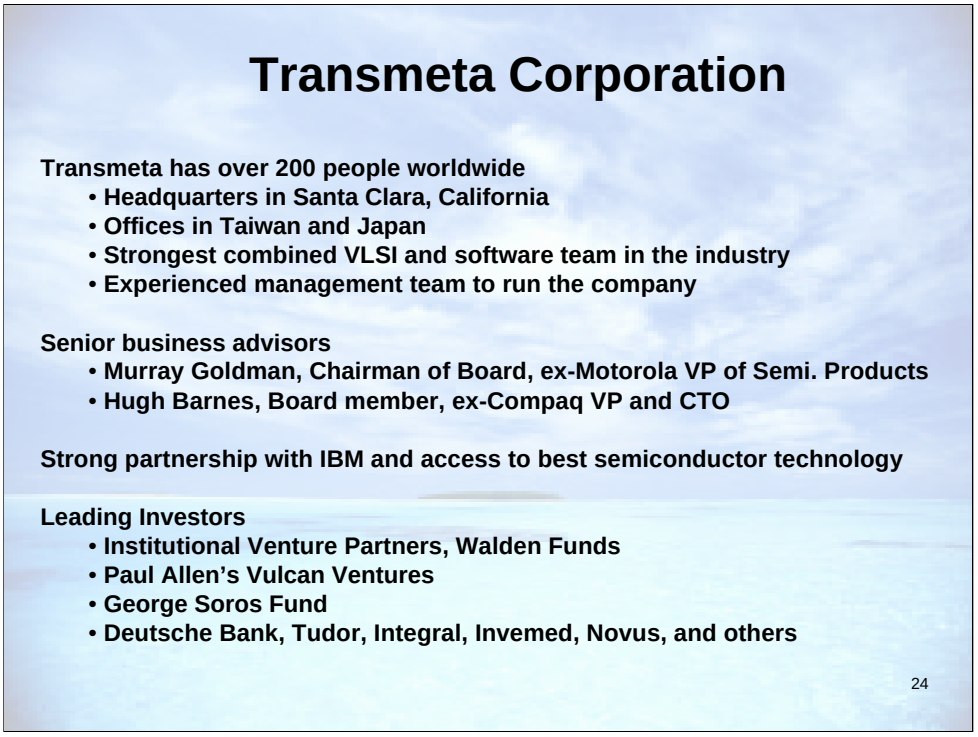



So what's a simple way to remember where will Crusoe be used?

If it has a Battery and a full screen Web Browser,
then it will be built with Crusoe.


I would like to conclude my initial remarks by saying a few words about Transmeta Corporation and the team.

It is my particular pleasure to announce that Transmeta has just hired a President and Chief Operating Officer. Mark K. Allen joined Transmeta two weeks ago and is a very strong addition to our management team. He has the reputation as the best operations manager in silicon valley and we're glad to have him on board. You will meet Mark during the Q&A session.



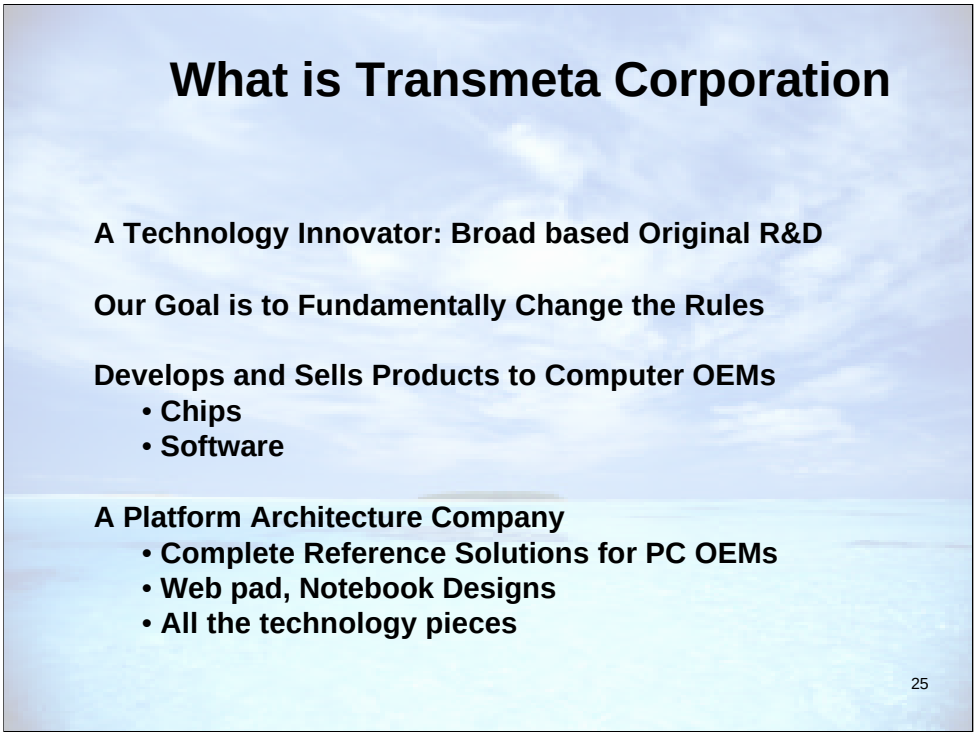

Started almost 5 years ago, Transmeta now has over 200 people worldwide. Our headquarters are in Santa Clara, California, but we also have offices in Taiwan and Japan. We have the strongest combined VLSI and software team in the industry, and an experienced management team to run the company.

I would like to mention two of Transmeta's senior business advisors. Murray Goldman, Chairman of the Board of Transmeta, was someone I knew as Mr. Microprocessor at Motorola, having lead Motorola's efforts behind the M68K and PowerPC efforts, and eventually co-heading the Motorola's entire semiconductor organization. He has lived and breathed microprocessors as long as anyone on the planet, and has been a tremendous asset in guiding Transmeta and has been a mentor to me personally.

Second is one of the best minds in understanding the totality of the PC business, Hugh Barnes, who before joining Transmeta was the Chief Technical Officer of Compaq Computer, where he had held a number of senior management roles over the years. Hugh has helped guide Transmeta from the viewpoint of the customer.

Transmeta has a strong partnership with IBM. Transmeta's first chips are being fabricated at IBM in their most advanced semiconductor processes, second to none in the world. And IBM has a team in Burlington Vermont dedicated to the Crusoe effort.

Transmeta has an excellent set of investors. IVP and Walden were the first round investors. Paul Allen's Vulcan Ventures, the George Soros Fund, IVP, Walden, others.




So what kind of a company is Transmeta?

First, a technology innovator. We are doing fundamental broad based original research and development.

We like to think outside the box to solve problems in new ways, to fundamentally change the rules of technology and business

Transmeta's business model is to develop and sell products directly to the large computer OEM's. That will include selling both chips and software.

But Transmeta is also a platform architecture company.

Transmeta does not only microprocessors, but complete reference solutions for computer manufacturers. That web pad computer you saw earlier was based on a Transmeta processor with Transmeta Code Morphing Software, using a Transmeta originated reference motherboard design, using a BIOS tuned for Crusoe by Transmeta, and running a version of the Linux operating system tuned by Transmeta with applications written at Transmeta.

Transmeta will do technology development, enabling others to manufacture and sell the end computer systems based on Crusoe.

And now to tell you more about Crusoe is Doug Laird, Transmeta's VP of Product Development.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# CEO Summary

# Transmeta and Crusoe

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# Fundamentals

**Transmeta has re-thought the microprocessor**

**Crusoe processors are here today**

**Crusoe is the only CPU software upgradeable over the Internet**
- **New Features**
- **More Performance**

**Advantages from software approach are long term sustainable**
- **Basic Physics says: Power = C x $V^2$ x F**
- **Fewer Transistors**
- **Enables LongRun to vary voltage and MHz**

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Low power really is the Holy Grail for enable a new world of mobile computing. Today, you've seen a completely new way to build a microprocessor, one that has been rethought from the ground up for mobility.

This new approach is no longer just a theory. Crusoe is real. We have demonstrated the first two generations of Crusoe processors here today.

Crusoe really is an Internet processor, in several ways. And let me tell you what really defines it for me. Jim Chapman just told you a story of a customer of ours in Japan that had a bug that needed be fixed. Normally, to get a new cpu would take weeks of fabrication time, testing and shipping it to them. What Transmeta did was to send them a new CPU over the Internet. In fact, we simply emailed it to them. Crusoe is the only CPU that is software upgradeable over the Internet. Just imagine. We might decide to offer new CPU features over our website. Or have new Code Morphing Software that offers improved performance, all with a software download. Now that is an Internet CPU.

We think that software offers a fundamental advantage, that is sustainable. Doug talked about three simple variables that basic physics says control power, the number of transistors, the frequency and the voltage. And software is the key to reducing each. So Transmeta's software based approach will have an advantage over pure hardware approaches, that is, unless someone figures out how to change the laws of Physics.

So we expect that for mobile computing, Crusoe processors will have an advantage today, tomorrow and as far as we can see into the future.


In conclusion, I'd like to point out that Transmeta has built more than just a new product.

Transmeta has Built a new company 100% dedicated to Mobile Internet Computing. That's all we do.

Transmeta has Built a revolutionary new approach to processor design

Transmeta has Built fundamental new Intellectual Property

Transmeta has Built an unparalleled engineering and management Brain-trust

Transmeta has Built strong business partnerships and investors

Transmeta has Built an enabling technology for the mobile internet industry


We hope you'll agree that Transmeta has re-thought the microprocessor, and that

Crusoe is the Future of Mobile Internet Computing.

That concludes the formal presentation.

Thank you very much for listening.


Begin Q&A.


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