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To: nathanm
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Interesting memo. I have a number of comments, but I'll talk about Apple in this one.

I actually think Apple and Novell are the main competition. Apple in the shorter term, Novell in the longer term. We have a great opportunity to kill Novell if we can take the wind out of the sails in the server market over the next three years. If we fail at that in the timeframe given, well, I met these very smart guys at the Workshop on Object Oriented OS who let it slip (not knowing I was from Microsoft) that they were working on a Cairo-like OS at Novell.

Apple, on the other hand, is more dangerous sooner. I think they are in better shape than we might think in the Macintosh area. First of all, alot of their very smartest, but weakest guys are no longer there. They are on Newton, or Pink, or some other random project. This is good for the Macintosh, because they now have stronger, more focused guys like Kurt Piersol running the show. Even good guys like Darrin Adler (who went to General Magic) leaving helps because there are fewer guys to argue. That might sound weird, but I know for a fact that this kind of thing prevented alot of interesting progress on the Mac.

The second thing is that their applications are well-architected from the standpoint of moving them cleanly. Yes, they have problems, but far fewer than we have with things like Win3.x, and OOS. Just look at WOW. It's amazing. I am not certain we have a good strategy to get applications to be better architected since we are carrying forward all the grunge into the future in Win32. Particularly for networking and programmability support, the Macintosh just has a better story. If they can get their gateway story together...

The third thing, which you mention, is their hardware leverage. They are one of the few remaining companies that can do "interesting" things in hardware to support their software architecture -- they have a nearly unique software/hardware synergy. With their work with IBM-Motorola (which I hear from people at Apple is going incredibly well -- better than expected for them), and their interesting porting approaches for the Mac (e.g. the assisted binary recompile technology), I think they are in pretty good shape to have a high-performance system running soon. Of course as we have more hardware abstraction in Windows programs, it becomes easier for them to slip their hardware into our markets because they, too, can do WoW-like things (although with Win32 rather than Win3.1, which would be cleaner). This wouldn't, of course, be the reason they will sell their machines, but it's an additional checkbox they can claim.

Most importantly, they have reasonable plans. OCE, Quicktime, AppleScript, multiple imaging models and the System 7 component architecture are powerful weapons. They are limited as long as System 7 is built on top of the current underlying OS services. But they have a

plan in place to go in two steps toward something better. The first step is to move to preemption and dynamic multifinder partitions (a process model) by insulating low-memory globals from apps. The second step is to put a microkernel underneath. Apple has a team working on this (about six months, I understand), based on some of the old Pink team work on moving the Toolbox onto the Pink kernel.

Of course Microsoft is the thorn in their side since we can do a good job thwarting their progress by virtue of our Macintosh applications presence. On the systems side, we can FUD nearly as well as IBM in their heyday, which keeps apps on our side. But the equation could turn if Apple somehow strikes a chord with applications by offering some new functionality at a performance level we cannot achieve.

This all comes back to this notion of hardware leadership, as you mention in your paper.

We could have an Architecture Design Lab like Intel's, except whereas theirs is a group in a hardware company that produces software prototypes to show off the hardware, ours would be a group in a software company that produces hardware prototypes to show off the software. This is a risky and expensive venture, but lacking an Apple or NeXT on our side, I would go for the gusto. Why not hire the best and brightest hardware engineers from all over (there are alot of dying or dead ex-innovative companies) in a small core team charged with just producing the coolest hardware in the world and moving the software to it? Portables, handhelds, TV computers, desktops, servers, etc, .etc. There is so much we could do with this. We could license cheaply to (at least) the major Japanese concerns, who would eat this up. Anyhow, what top-flight engineer wouldn't work on something like that here at Microsoft?

I'm sick and tired of not seeing the coolest hardware running Windows. I agree that in the long term this will be a MAJOR problem. This is why I'm so interested in getting the object model running on all kinds of small hardware. But this is other people's exsiting hardware -- the leverage situation is like pushing mountains with string.

I say: Just do it!

I'm interested in your comments.

P.S. Will Tera really run NT? If so, when?