* Say that we will look into this, and not make it sound impossible.

* On the other hand, do not appear to be an instant push over and commit to anything. We do not want SGI graphics chips or GL to become plan of record with Compaq before we can have SOME idea of the feasibility, which includes both the deal to get access to the technology, and the schedule.

* On the topic of evaluation, they should say that the Advanced Technology group has been working for some time on 3D graphics. We will not be there for that meeting, which helps position it so the details can happen off line (i.e. in an MS-SGI meeting). We clearly cannot give an answer on this until we know how to build it into our plan - and this includes both the technical details AND closing the contract without which we have no guaranteed access to the technology.

Note that this means striking a balance between being too gung ho (and thus giving SGI a reason to beat us up for better terms) and being too negative (which could convince Compaq that we'll be a distant second to UNIX in taking advantage of their hardware). We should agree to evaluate the SGI chips and GL as an interesting possibility for Advanced Windows, not say anything which could derail our deal, and not commit to anything other than giving it a good tire kick.

Nathan

From nathanm Thu Feb 28 21:00:24 1991
To: billg bradsi jeremybu joachimk mikehal minye paulma raleighr robg
    steveb stevesh
Cc: johnsa karenh tonya
Record-folder: C:\NATHANM\FOLDERS\WSENT.FLD
Subject: IBM & DSP Operating System
Date: Mon Mar 16 13:02:32 PDT 1992

One of the few sour notes in the IBM meeting the other day was their disclosure on their Digital Signal Processor plans - it has the potential to be very dangerous for us, and I think we have to take defensive action immediately.

It is well known that I and others have many reservations about DSPs and the degree to which they make sense in many configurations (although they are good for some). This has NOTHING AT ALL to do with this email. The technical merit is beside the point - this is a politics and strategy issue. The problem is that they are on the verge of (accidentally) creating a system software platform that we are not involved in, and which could grow into something significant.

The key points are:

- They have very ambitious growth plans for their DSP. Although all they have at present is a fairly dorky 16 bit fixed point DSP (with a few good points), they are planning an entire dynasty of DSPs - first 32 bits, then fixed point, then real time video then... They showed a road map with what looked like nearly a dozen follow on chips with all sorts of applications.

- An important element in their plan is a DSP operating system. There are two reasons for this. First, they have such a long laundry list of potential uses that they must multitask them. Second, the primary way that they "prove" that their chip wins over TI and Moto DSPs is that theirs "multitasks better". You can't claim multitasking as your primary benefit unless you also push something to multitask with - namely a small multitasking operating system.

- Furthermore, the advocates of the IBM DSP have gotten the idea that one way to ameliorate industry concerns about using an IBM proprietary chip is by using a "vendor operating system" which is "available from the vendor to others". This is the RS/6000 strategy - IBM chip with "open" operating system. The DSP people are going one stage further by talking about licensing the chip, but there is a clear current of buying an OS for the thing to trade off with using their design.

- This might play into our hands, with one key exception - they have been evaluating a DSP operating system by another company - Spectrum.

- It is also clear that at least some people are pushing for opening the DSP, and the DSP OS to ISVs. Once people start writing code for the DSP, its APIs become part of the mainstream standard. Whoever supplies the OS becomes our "partner" in setting ISV standards and controlling the system.

I think that the DSP operating system is a vitally important thing for Microsoft to control, and losing it could cause us no end of grief. Here is why:

- There is political sentiment inside IBM to get a vendor OS. The guys fighting to use the IBM chip have made this their cause, as part of their strategy for being selected.

- They will proliferate the DSP into all sorts of places. The operating system will tag along and become more and more important to their plans as a direct result - this is not a little one off code purchase. The OS will evolve and mutate over time, to meet requirements of the chip, to meet IBM requirement and so forth. Getting a snapshot at one point in time will not be enough - either for IBM or for us. The have to either take charge of this, or have a long term relationship with the vendor.

- Compatibility between this OS and Windows will be at risk every time each of them evolve. How do they communicate? What new features go where? Once an app starts using a DSP by downloading code to it, and coordinating between the DSP tasks and the Windows tasks, the app quickly becomes a hybrid. Many of the

features of the Windows Multimedia programming model could be dictated by the DSP OS.

- Many people who are not thrilled with us already (Cannavino, ISVs, some OEMs...) would welcome a chance to "balance" things by putting somebody else in the OS business. This gives them an opportunity.

- Even if the IBM DSP chip is garbage, the endorsement given to the operating system will be high, and it will be widely licensed. Spectrum (or whomever else) will certainly have versions for commercial DSPs, and we could find that their API becomes a standard with ISVs. There is a vacuum for a DSP operating system and this could fill it. If we had such a thing we could license it to half a dozen OEMs overnight, and pick up the rest as soon as IBM shipped a machine which included it.

- Finally, there are all of the OTHER uses of DSPs. Lots of people are using processors for neat new things, including DSPs. The development environment for DSPs is terrible, in part because there is no OS services and no standards. Once a standard is created for a DSP OS in the PC industry it has a lot of potential to migrate to other uses. ISVs that write games for PCs will want the same DSP OS to be in the next generation game machines. People using DSPs in consumer electronics will find it convienent to use PC industry tools (which will sprout once the thing is an IBM standard). This has potential beyond the PC market.

Perhaps this is all overblown paranoia, but the stakes are too high to casually reject the notion. If you think that Multimedia and audio are unimportant and will amount to nothing, then clearly this does not matter (we are not acting that way with our investments). Although I can easily doubt some aspects of our strategy it is hard for me to accept that the whole field is doomed. IBM is very hot on multimedia, and whether or not a DSP is a good technical choice in all cases, they certainly do fire the imagination. An IBM move to put another company in the OEM business with a DSP OS has the potential to introduce a new player to the mainstream OS business. I'd rather have that be us.

Before you go and dismiss the DSP OS as a weird area which most people do not understand, consider how many people understood the potential of PCs. How much enthusiam did we have for productizing handwriting before Go? The fact that this seems like a funky little technical nit today does not mean that it will stay that way. If we make audio into a second "mouse", and if multimedia with a DSP take off this could be important.

So, what should we do? Here are some ideas:

- In the short term we have to block any firm decision for IBM to go with Spectrum or any outside vendor other than us. One way to do this is by "looking deeper at the technical issues". This includes exploring questions like "what is the programming model for multimedia applications?", "do you

really need a DSP?", "what is the synchorization model between DSP tasks and host PC tasks?". These may sound like gobble-de-gook, but they actually are serious questions which do need to be answered, and which will take some time and energy to answer. We should use them to our advantage, especially to buy time.

- We should look hard at trying to get them to move to an industry standard chip. This has to be done with extreme care, otherwise we will become the blood enemies of the IBM DSP group, which could prove to be a bad move. The obvious place to start is with their previous chip evaluations. It is likely that a winning plan will allow IBM Burlington to (nonexclusively) manufacture the thing, and some IBM lab should get an architecture license to play with extensions (ideally in a way which is unlikely to cause any harm).

- We almost certainly have to come up with a plan for a DSP OS to hedge our bets. Regardless of the precise technical merit of using DSPs in multimedia, it is very hard to fight the existence of a DSP or having an operating system for one. In the event that this does become part of IBM's plan we must have our own project - either written from scratch, or bought. Note that buying DOES NOT help us unless it is utterly exclusive - we can't just have one snapshot of the code while IBM and the originators go off and create new versions. Fortunately, the level of OS that is required is tiny (a few Kbytes of executable) compared to what we are used to so this isn't a big deal. We will have to make sure that it has some salable points over Spectrum and any IBM internal efforts. I have not examined this, but I believe that this should be easy because we can leverage our expertise with Windows and PM - a good connection to them is key, and we are the guys to do it.

- We have to get our DSP OS to be their Plan of Record (unless they have no DSP OS in plan). I think that this is possible, but it depends on a lot of things coming together.

Here are a few things that we should NOT count on:

- We can't count on just getting a license. We need to be able to sublicense so that we can offer "one stop shopping" to OEMs. We also need to be able to make derivative works. If IBM wrote the thing and licensed it very broadly to us (which was the plan with the old IBM MM machine a year or so ago), then we are probably OK. If the rights are not broad enough then we are up a creek. The last thing we need to to have some hungry young company dreaming of our OS gold mine - armed with an IBM endorsement to help get it (or part of it).

- We can't stop this by saying that ISVs won't get to download code. This is something to try, but we cannot rely on it. First, IBM will start writing DSP tasks from a dozen different labs. The IBM internal ISVs are almost as much a problem as external ISVs. Second, shutting ISVs out is an unstable and indefensible position. People will wheedle and beg and IBM always finds it hard to say no, especially when the people begging are ISVs saying how much they would love to show off IBM hardware and sell a lot of it. We almost never

won a "don't expose something" point like this in OS/2 - we often thought we had them licked, but at the last minute or in the next release they yielded. Finally, if it is there internally and has some benefit, people will discover it and use it no matter what is said, the same way they bypassed the ROM BIOS and Dos screen output calls.

- We can't count on stopping this by stopping DSPs. Again, this is indefensible, quite apart from whether it is correct or not. We might be able to delay a while by examining the long term consquences of various DSPs, but the idea is too attractive. The PC installed base has slow enough processors that it makes sense, there are a few very demonstrable uses of DSP... This is highly likely to happen.

- We cannot count on war with IBM, or on their failure. One attitude one might take is that we may not be working with IBM in the long run anyway, or at the very least it will be very different. A weaker form of this is that any OS/2 based MM solution they without us do is irrelevant, including the support structure such as the DSP OS. First, I was very encouraged by the rest of the meeting that we DO have a future of working with them at least to some degree. Second, an IBM war, or failure on their part does nothing to diminish our problems. The DSP OS could become a standard even if IBM's initial machine or initial software is not very good. If they are at war with us the issues are just more heated, not nullified. In just about any event we need to get a DSP OS strategy.

Nathan

Non-responsive Material Redacted