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Subject: Driver update coming

Posted by [mikeaudet](#) on Thu, 11 Feb 2021 22:25:15 GMT

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Hi Everyone,

I just thought that I would share some progress on PARIS work I've been doing. I was planning to do this work last spring, but COVID has changed everything.

I started reading a book on the Windows Driver Foundations last spring, the latest standard for Windows drivers. I read it cover to cover, taking notes as I went. I'd looked up WDM power management a few years ago, and at the time, it was daunting. WDF has power management just built in, so that seemed a better way to go. The book was huge. I got to the end, and opened up Microsoft's latest sample audio driver. That's when I realized that Windows still uses the pre-WDF driver model for audio drivers. Back to the drawing board.

So, I went through my old driver books, and started looking up how to add the power management code to WDM drivers and found what I needed. I sat down over the Christmas break to get started. I had to piece together a PC out of parts in my basement because my son is using my PC for online school and playing online with his friends while we're stuck at home because of COVID. I put together a Phenom X4 with 8 GB of RAM.

I put two EDS card in, and attached MEC worked fine, but the 442 didn't initialize. It took about a week to figure out what was going on, but it turned out that the 442 was transmitting bytes faster than my 2 GHZ Phenom X4 could pick them up. To make a long story short, I had to figure out a way to detect if a 442 is present in a new way because the "Who is out there" command would come back scrambled because of the 442 writing bytes too fast. A 442 and an MEC need the "slow down your transmit" command sent differently. While I was in that section, I rewrote the init code so that all interfaces are initialized in parallel on separate threads. I also got rid of all the time delays and replaced them with events. Start-up is amazingly fast. Then, I got to work on the power management in the Scherzo. My first draft blue screened within seconds, but I just got it working last week. The driver can now handle a sleep or a hibernation, and upon wake, PARIS can be loaded without needing to restart the PC. It also sends commands to prevent sleep while the PARIS hardware is in use. I wish I could support hibernation and sleep while using the PARIS hardware, but the effects loading and a bunch of other things weren't designed with this in mind.

Next, I'm going to add code to allow the checkbox in the device manager to select turning off the hardware when it's not in use. Finally, I'm going to see if I can get rid of needing to run PARIS as administrator, but I'm not promising anything. I may not be able to get all that done by April.

April is when Microsoft's cross signed driver certificates expire, and they've decided not to renew them. Going forward, only EV certificates will be allowed for driver signing. Plus, all drivers will have to be submitted to Microsoft for their signature, too. To submit the driver to Microsoft, one needs to be a Certified Microsoft Partner. I'm now a Certified Microsoft Partner, but I don't have an EV certificate, and they are ridiculously expensive and hard to get. After April, I will likely only be able to provide unsigned driver updates, so I want to get as much done before then as I can.

That's all I have to share. I hope everyone is staying safe!

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Subject: Re: Driver update coming  
Posted by [Rich.Kelley](#) on Fri, 12 Feb 2021 00:37:05 GMT  
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Wow, Mike. That sounds fantastic. Can't wait.

Rich

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Subject: Re: Driver update coming  
Posted by [RonA](#) on Sat, 13 Feb 2021 23:58:04 GMT  
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Once again, our PARIS community owes Mike more than we could every repay. I would encourage everyone who wants to keep PARIS alive to purchase Mike's many wonderful processers, effects and drivers at [ensonq.ca](#). Very worthwhile expenditures indeed. And I also want to acknowledge Kerry Galloway's tireless efforts to keep the forum alive. Perhaps we could all Paypal some funding to Kerry for his invaluable contributions, as well.

Thanks, Mike and Kerry!

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Subject: Re: Driver update coming  
Posted by [Rich.Kelley](#) on Sun, 14 Feb 2021 03:17:23 GMT  
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I'm in. Sign me up.

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Subject: Re: Driver update coming  
Posted by [Ted Gerber](#) on Sun, 14 Feb 2021 15:36:47 GMT  
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Fantastic Mike.

Sorry to hear about future restrictions beyond this April. Practically speaking, does that mean servicing what we have now to work with current operating systems without facility to work with future operating systems? (Yes it's quite presumptuous of me to assume that you would even work with future operating systems but...)

Ted

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Subject: Re: Driver update coming  
Posted by [mikeaudet](#) on Sun, 14 Feb 2021 17:13:38 GMT

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Hi Ted,

My certificate expires in the fall, but the cross signed certificate that it relies upon expires in April. So, in April, I'll still be able to sign a driver, but Windows won't load it unless integrity checks are disabled. It's an extra step to disable integrity checks in addition to disabling secure boot, but it might be workable. I might be able to renew the certificate in the fall, and we can just keep working like that, having to disable secure boot and integrity checks. Alternatively, I can self sign the driver, and using the driver will require installing my certificate on the root certificate on the PC and putting Windows in "Test Mode" so that it will accept any certificate. This puts a water mark in the corner of the screen, but the driver will load. Some programs that rely on copy protection, like say a blue-ray player, may be programmed not to work in test mode.

It's basically a huge pain.

Maybe if I have time to move things forward enough, we might fund-raise to buy one year of EV certificate and cover any legal fees when we feel the driver is basically finished. But, after the year, I lose the ability to address bugs or adjust to OS changes in the kernel driver without coming up with another \$500 US for the cert and whatever additional legal fees are involved. It's all a huge pain.

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Subject: Re: Driver update coming  
Posted by [Wayne](#) on Sun, 14 Feb 2021 18:27:17 GMT  
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Amazing! Your decoding/coding knowledge just blows me away. Many thanks for your efforts. I will definitely purchase your next driver/scherzo/exe product you develop, even if I stay on Win7-64bit for PARIS.

Many thanks to Kerry too.

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Subject: Re: Driver update coming  
Posted by [Kim W.](#) on Mon, 15 Feb 2021 11:16:49 GMT  
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Count me in!  
More than happy to contribute!  
You have given so much to the community Mike.  
I can donate now if you like. (PM me).  
Kim

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Subject: Re: Driver update coming  
Posted by [Rich.Kelley](#) on Mon, 15 Feb 2021 15:42:16 GMT

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I'm with Kim. This sounds like something we can crowd source, and I'm definitely in to contribute. PM me, or just tell me what I need to do.

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Subject: Re: Driver update coming  
Posted by [mikeaudet](#) on Thu, 04 Mar 2021 22:09:01 GMT  
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Just an update:

I have the power management code finished. I had wanted to allow powering down the EDS cards when they are not in use, but that doesn't appear to be possible. I wrote all the code to do it, but when I send a request to the PCI bus to shut the power off, nothing happens. I've looked at the card's software interface, and there is nothing at all about power management. I've archived the code in case I discover something new. The driver prevents sleeping when it is in use.

I've also updated the INF file so that running as administrator is no longer needed. There might be an advantage to running as administrator still because it is supposed to allow raising the thread priority of the main buffer switch thread. On my old Phenom X4, it doesn't seem to make much of a difference, though. Reaper does 64 sample buffers about the same either way.

That's it for now. I'm going to take it as far as I can before my April deadline.

All the best,

Mike

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Subject: Re: Driver update coming  
Posted by [mikeaudet](#) on Fri, 26 Mar 2021 13:55:49 GMT  
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I have an update - I was able to get an updated certificate from Comodo (now called Sectigo) that is good until November. Microsoft claims that they will not allow cross signing as of July 1st, but I'm not sure how they intend to enforce that since all the certificates in the chain appear to be good until 2025 or later. Maybe they plan to revoke them. I don't know.

I have two months off classes from April to June, so this is a big deal in terms of what I can get done before I lose the ability to sign the driver.

I'm super excited to get this out because PARIS just loads so damn fast. I think it's going to be noticeable for people.

All the best,

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Mike

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Subject: Re: Driver update coming  
Posted by [Ted Gerber](#) on Sat, 27 Mar 2021 18:54:38 GMT  
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Yeah Man!!

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Subject: Re: Driver update coming  
Posted by [Rich.Kelley](#) on Wed, 31 Mar 2021 14:44:01 GMT  
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Sounds really good Mike. Keep us apprised.

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Subject: Re: Driver update coming  
Posted by [chasduncan](#) on Tue, 18 May 2021 00:43:06 GMT  
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Amazing, Mike. Big thanks.

I've been sleeping on my 2005 Paris rig for quite a while now, but am seriously considering a re-build, on the newest mobo I can find with at least two PCI slots -- or maybe try the expansion-chassis route. Could not/would not even begin to contemplate such a step without all your excellent work "under the hood" to bring out old Paris system along into 64-bit modern times. My hat is off to you -- and best of luck with your ongoing work.

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Subject: Re: Driver update coming  
Posted by [mikeaudet](#) on Mon, 07 Jun 2021 13:28:37 GMT  
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Hi all,

I'm just posting an update.

Things are taking longer than I'd like. Part of that is because removing the "run as administrator" option means that I have to consider the security of the driver more carefully. That involves a lot of kernel mode changes.

I've been working on getting into the Microsoft Hardware Program so that I can submit the driver for their signature. A few months ago, I became a Certified Microsoft Partner. Last week, I got a

Global Administrator Account on Azure (which is needed for the hardware program account), and just now, with the help of a fellow Parisian, I just order an EV certificate. As soon as that is issued, I'll apply for inclusion in the hardware program.

I'll keep you guys posted on progress of the both the driver coding and signing situation.

All the best,

Mike

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Subject: Re: Driver update coming  
Posted by [ronj\\_91602](#) on Mon, 07 Jun 2021 14:04:01 GMT  
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Great you are the best!

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Subject: Re: Driver update coming  
Posted by [steelayz](#) on Mon, 07 Jun 2021 17:13:21 GMT  
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Great news, Mike! I plan on getting my system back up soon. I still miss the mixing quality of PARIS...

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Subject: Re: Driver update coming  
Posted by [mikeaudet](#) on Tue, 08 Jun 2021 14:11:03 GMT  
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Here are a couple of testing updates.

I rewrote the voice scheduling code in the PSCL a couple of weeks ago, and I finally got to test it today. This is the code that creates a list of sound buffers that make up a track of audio. Sometimes it has to tell the card that a new buffer has arrived, and sometimes it doesn't because they link together. It worked first try, which is really nice. I had to revise it because a version of it will soon be running in Kernel mode as well. That work starts later today.

I also just tested the power management code in Windows XP. I was able to put the machine to sleep, wake it up, and run PARIS. Previously, the PC would need to be restarted after it was put to sleep for the EDS cards to be accessible. It worked.

That's all for now, but it's progress.

Subject: Re: Driver update coming  
Posted by [Ted Gerber](#) on Tue, 08 Jun 2021 15:42:32 GMT  
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Thanks Mike!

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Subject: Re: Driver update coming  
Posted by [Wayne](#) on Tue, 08 Jun 2021 15:58:25 GMT  
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Hi Mike,

My wife I have moved from Las Vegas to south Texas just a month ago so I've got a lot items going on at the moment. Once I'm settled in and our remodel is towards completion I'll pay pal you some \$\$ to help on your certificates. It is much appreciated what you do for our community.

Wayne

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Subject: Re: Driver update coming  
Posted by [Will The Weirdo](#) on Wed, 16 Jun 2021 14:28:46 GMT  
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Wow Mike, it's great to see you are still hard at keeping PARIS up and running in 2021.

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Subject: Re: Driver update coming  
Posted by [mikeaudet](#) on Mon, 30 Aug 2021 14:37:13 GMT  
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Just an update - I'm still trying to meet the requirements of the EV certificate. I met with a lawyer this morning, and he filled in some forms. Hopefully, Sectigo will accept them. I say "hopefully" because I written them twice asking for clarification, and they haven't responded. So, I don't know if what I just sent them will suffice.

As for the code, I've decided to keep the "run as administrator" requirement for now. The whole design would need an overhaul for me to be comfortable allowing any process access to it. I may have time to work on that in the fall. It depends on how things go with schools staying open.

That's all I have to report for now.

All the best,

Mike

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Subject: Re: Driver update coming  
Posted by [Rich.Kelley](#) on Wed, 01 Sep 2021 05:32:41 GMT  
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Go Mike!!!

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Subject: Re: Driver update coming  
Posted by [Ted Gerber](#) on Wed, 01 Sep 2021 22:36:26 GMT  
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Thanks Mike!! Hope things are well in your world : )

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