

The case of the missing USB controllers

Source: <http://unix.derkeiler.com/Mailing-Lists/FreeBSD/current/2005-10/0812.html>

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I have a Sun w2100z dual Opteron workstation which, like many machines these days, uses a USB keyboard and mouse and has no legacy PS2 keyboard port. The machine has several USB controllers and FreeBSD likes them just fine -- `_when_` it actually manages to detect and attach the controllers correctly. Unfortunately, it very often doesn't.

Now, it's not that the `ohci` or `ehci` drivers are causing problems: it's that the PCI bridge code fails to find the devices when enumerating the PCI bus on which the controllers reside. It happens it's an ACPI bus, which I'm sure is part of the problem.

Right now, I have three different OSes installed: Solaris 10/amd64, FreeBSD 6.0BETA4/i386 and FreeBSD 6.0BETA4/amd64. I typically see the following behavior:

- FreeBSD 6.0BETA4/i386: successfully finds the controllers the majority of the time, but will occasionally miss them. Failure rate is maybe 1 bootup out of 10. Note that this behavior has improved from earlier 6.0-current snapshots, where I had maybe a 50-50 chance of the USB controllers being found on any given boot.
- FreeBSD 6.0BETA4/amd64: completely fails to find the controllers the majority of the time, only successfully maybe once in a blue moon.
- Solaris 10/amd64: always finds the controllers successfully

I have the verbose `dmesg` output for a successful boot here:

<http://www.freebsd.org/~wpaul/opteron/dmesg.boot.good>

And a verbose `dmesg` from a failed boot here:

<http://www.freebsd.org/~wpaul/opteron/dmesg.boot.bad>

Note that the only major difference is the absence of child devices (the USB host controllers) on bus `pci1`.

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The only pattern I've noticed is that 6.0BETA4/amd64 stands a better chance of probing the USB controllers if I do a warm boot following an easlier session with Solaris or FreeBSD/i386 where the controllers were found correctly. For example, when I first did the 6.0BETA/amd64 install, the initial bootstrap from the CD was successful. But once I completed the installation and rebooted to start up the freshly installed system, the USB controllers went AWOL again.

This las led me to think that problem might be related to some sort of ACPI fiddling that occurs during shutdown which is not properly un-done during startup. Unfortunately, I can't really prove this. The only evidence I have to support this theory is that when I warm booted the system after capturing t