MicroTCA and PCIe HotSwap under Linux

Tuesday 10 December 2013 16:15 (30 minutes)

One of the main characteristics of any computer architecture is reliability and uninterrupted operation. This important if a system allows a possibility to add and remove devices in run.

The Hot-Swap service is irreplaceable not only in the process of development of final devices but also in the use, thus ensuring continuous functioning of the system as a whole. Such feature plays an important role especially in control systems.

In the uTCA systems the Hot-Plug is generaly provided by the Shelf Manager and the Hot_Swap services of the PCI Express Bus. One of especially important features of this bus is a possibility of hot replacement of the devices without reseting an operating system.

The PCI Express Hot-Swap service is being used relatively long. However, the uTCA system makes its own amendments into general architecture of the PCIe Hot-Swap and in the methods and ways of use.

For MicroTCA systems using PCIe as the base link, the Hot-Swap provided by the following various subsystems:

1. PCIe Hot-Plug controller enclosed in the PCIe root or switch ports, with the Standardized Software Interface
2. MicroTCA Shelf Manager, MMC controller
3. Hot-Swap services supplied by IPMI
4. Hot-Plug services supplied by OS (Hot-plug driver and user notification subsystems)

The specificity of the MicroTCA systems is in fulfillement of certain tasks of the HotPlug Controller by the MCH and AMC.

Interaction of these subsystems leads to the following three important capabilities:

1. a method of replacing of failed expansions cards without turning the system off
2. keeping the OS and other services running during the repair
3. shutting down and restarting software associated with the failed device

Effective functionality of Hot-Swap system requires adjustments of all these Basic Elements.

Our experience of the adjustment, starting and testing aswell as use of the PCIe Hot-Swap in uTCA architecture will be presented.

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Session Classification: Tutorials by experts

Track Classification: Tutorials by experts