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Runtime ownership transfer of platform devices

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Platform devices are those that are discovered via something like a device-tree. Once discovered, the device is typically available for the life of a VM. IOW platform devices can't be hotplugged in its typical sense. Qualcomm however is having usecases where platform device ownership need to be managed at runtime between VMs. A VM that has ownership of a platform device is required to temporarily pass ownership of the device to another VM. An example of this is display and touch screen. Applications like mobile banking handle sensitive information like password obtained from user via touch screen. It may be desirable to have a confidential VM processing such sensitive information. That would require the confidential VM to temporarily gain ownership of touch screen and display from the main OS.

How can this transfer of ownership for platform devices be best accomplished by Linux? One naive option is to unload/load drivers or unbind/bind the device from its native driver, which however leads to increased latency and in some cases may not be even possible (given dependent drivers). Other option is for platform drivers on both OS to synchronize access to device, so that a driver in one OS "stops" accessing device while its "in use" by driver in other OS. The hypervisor would ensure that an erring VM gets a fault when it tries to access a device after having relinquished ownership.

Rather than relying on individual platform drivers to synchronize on this ownership transfer, can the platform bus driver (on receiving VM side) and VFIO platform driver (on host side) provide a generic mechanism here?

Also what mechanism can the IOMMU driver use to transfer ownership? For example, hypervisor would need to recognize the ownership transfer of a platform device using particular SID (stream ID) by switching to use of different translations tables for transactions related to that device.

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