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August 24-28, 2020

Enabling PCI Features via Device Driver vs. IOMMU implicitly

- Ashok Raj & Lu Baolu

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Device Driver vs. IOMMU Enabling PCI capabilities

- Some PCI capabilities are automatically enabled by IOMMU sub-system during attach_device()
  - PASID is enabled before ATS
  - Driver responsible for pci_restore_state() after an flr()
- Moving to Device Driver enable preferred for the following reasons.
  - Some devices have issues with certain features. Requires some quirks which otherwise could simply be driver managed.
  - Some devices like SRIOV requires knowledge about IOMMU.
    - Features like PASID/PRI/ATS require IOMMU. We have no such discovery for device drivers.
    - Devices might require ATS for functionality vs optional for performance only.

Proposed Extensions

- Check if IOMMU is present and enabled
  - `iommu_cap_supported(dev, features);`
  - Features – PASID, PRI, ATS
- Enable features through iommu
  - `iommu_enable_caps(dev, features);`
  - Will help some shared code for PF/VF checks for instance.
- Drivers continue to use `pci_restore_state()` during resume or flr flows.

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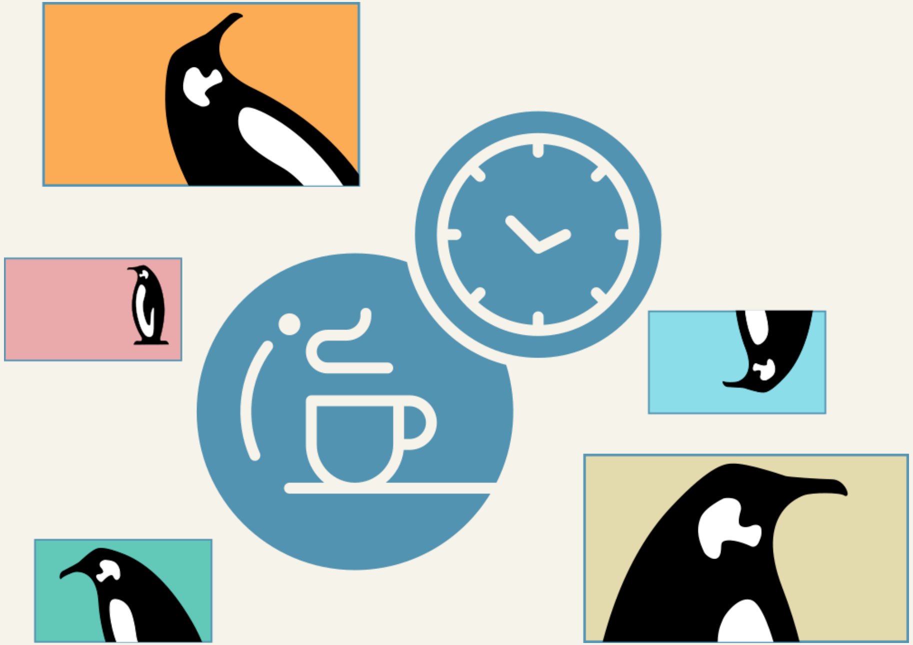

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