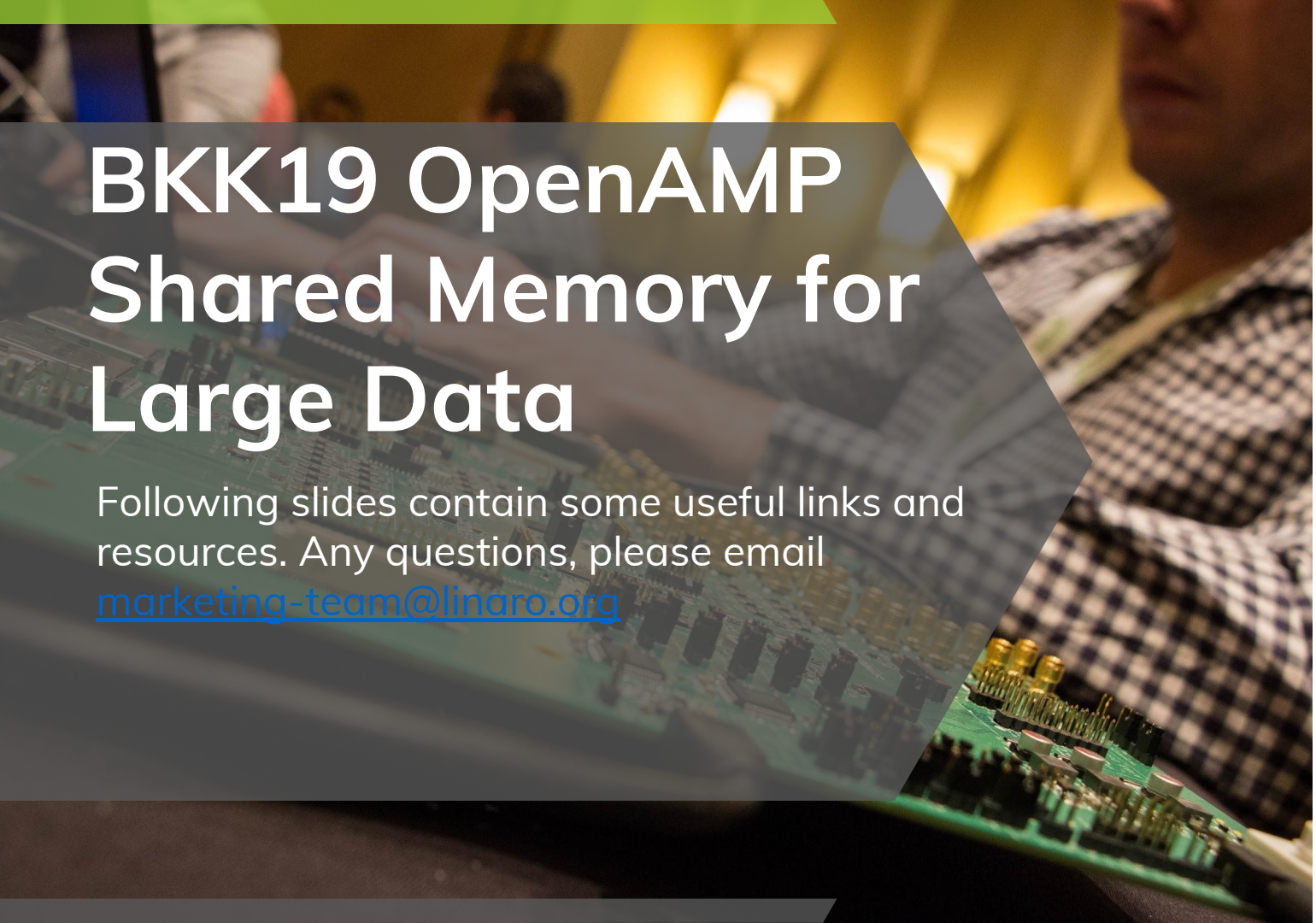

BKK19 OpenAMP Shared Memory for Large Data

Following slides contain some useful links and resources. Any questions, please email marketing-team@linaro.org

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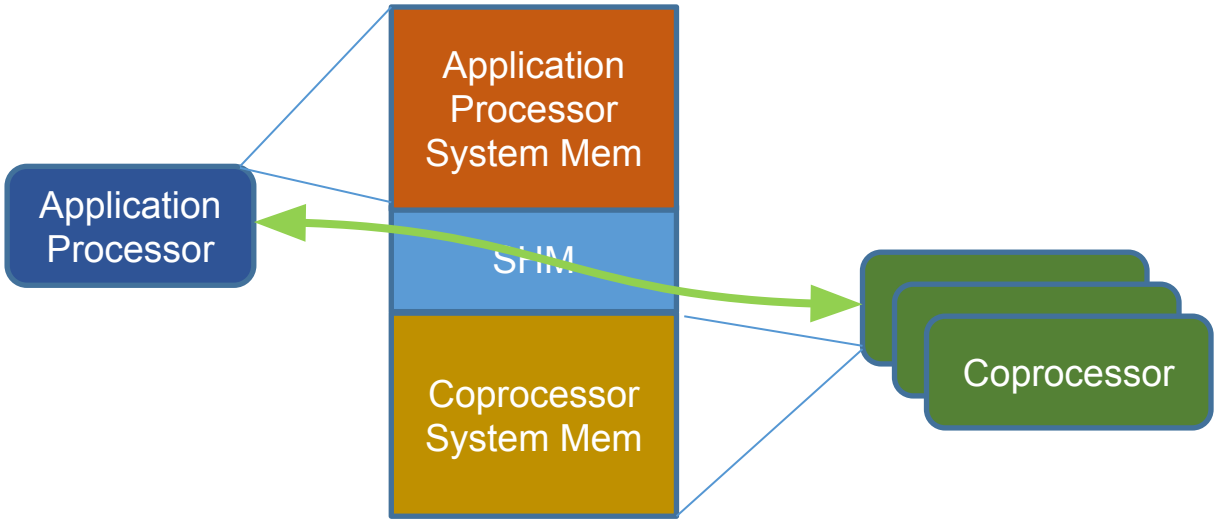
Large Data Shared Memory Issues in OpenAMP

- huge data memory allocation
  - Accessible by both application and coprocessor
  - Zero copy
- memory address mapping for coprocessor
- memory synchronization

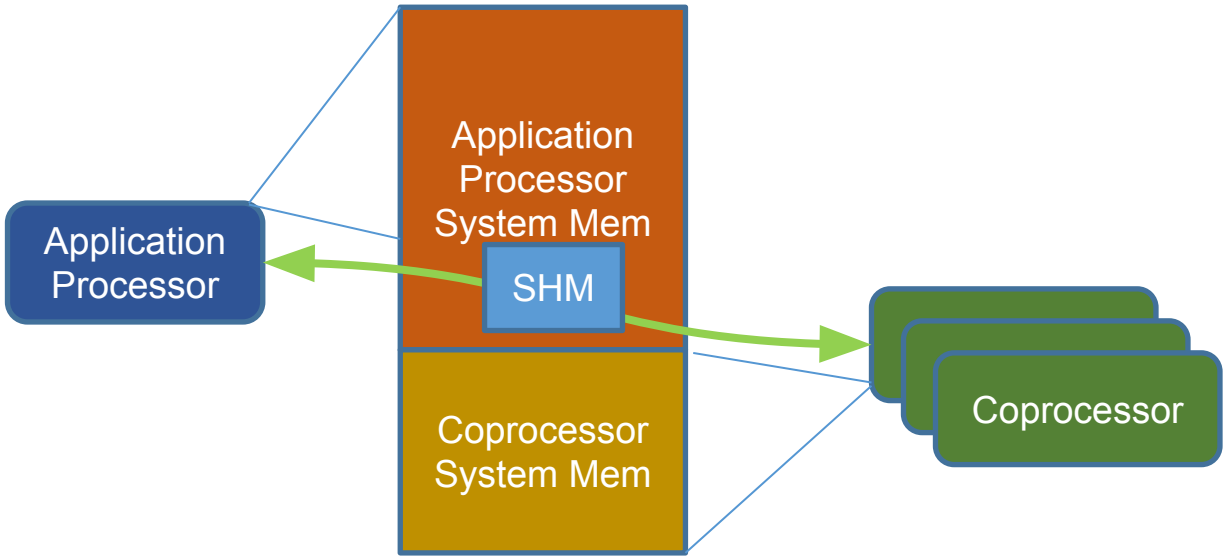
Huge Data Shared Memory Use Cases

- Shared memory is statically-defined



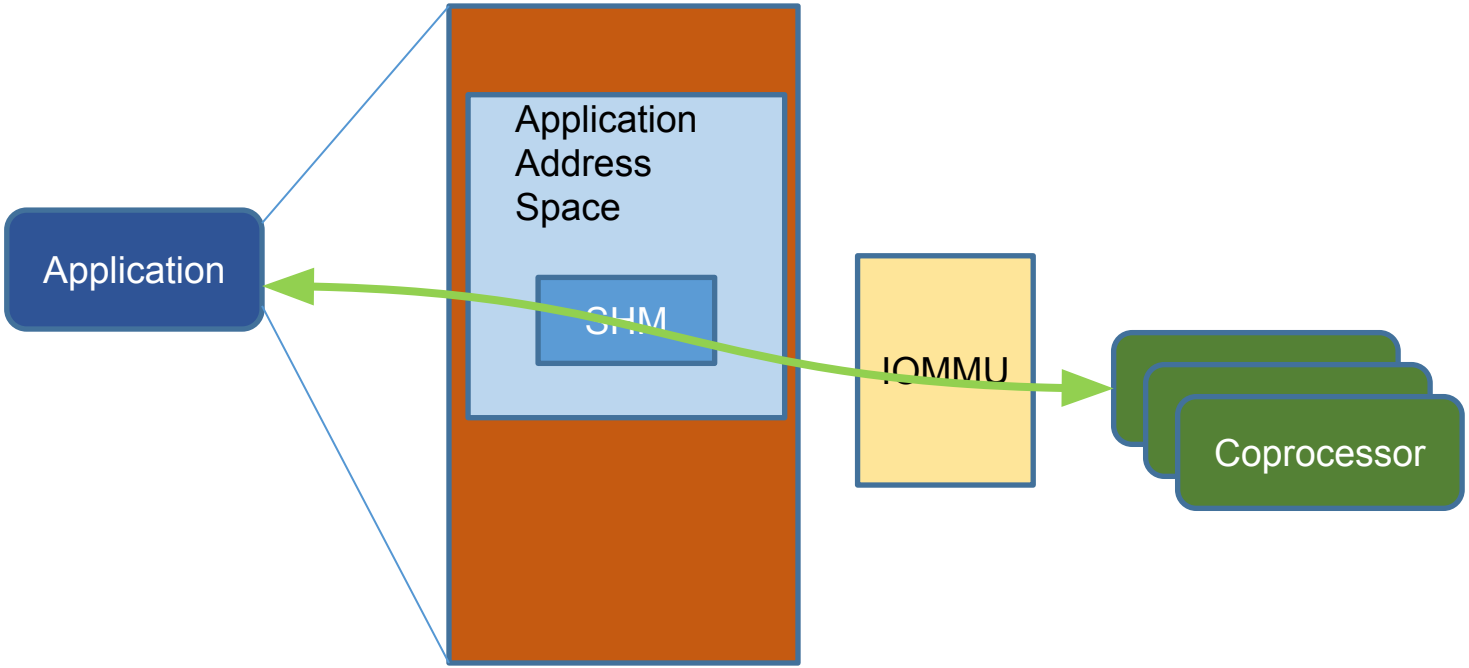
Huge Data Shared Memory Use Cases

- Shared memory is from the application processor system memory

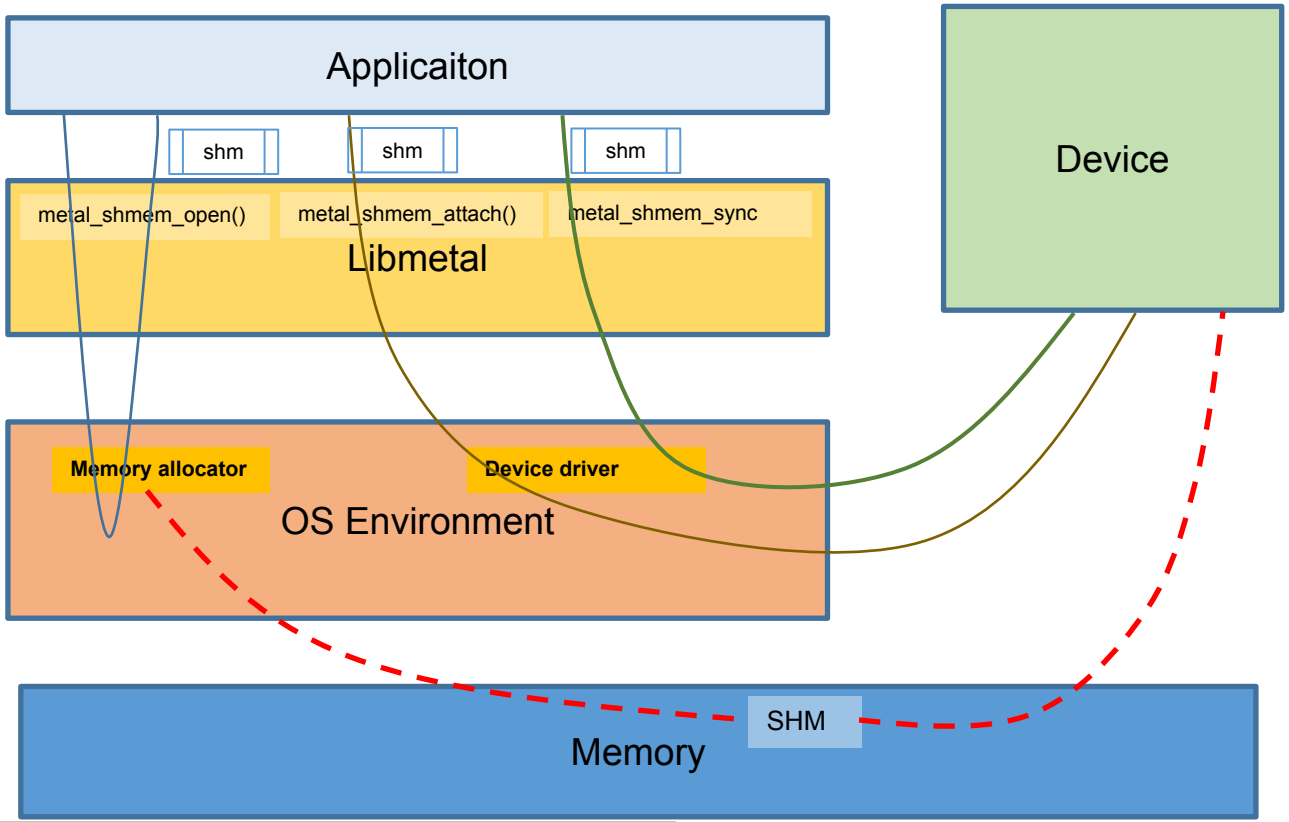


Huge Data Shared Memory Use Cases

- Shared memory is from the application address space



Libmetal Shared Memory Abstraction



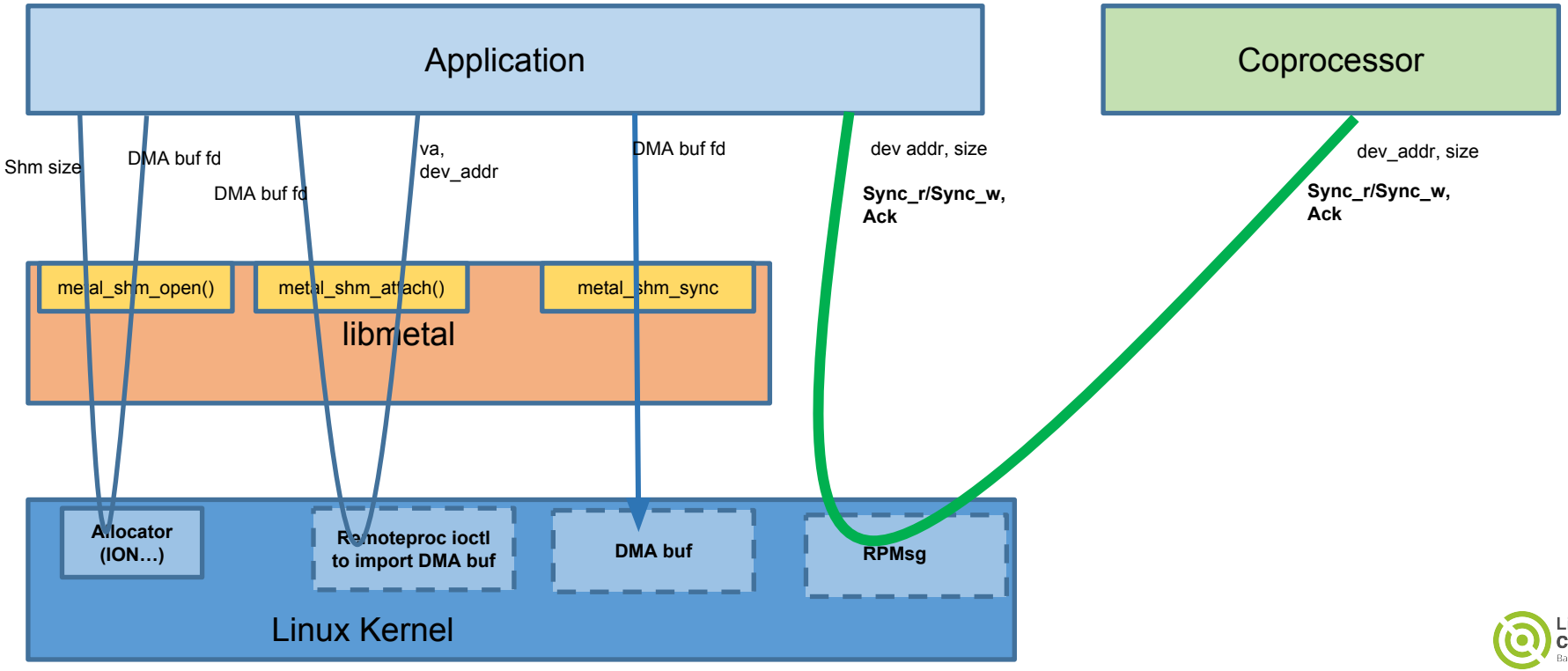
Libmetal Shared Memory Abstraction

- metal_shm_open() – allocate shared memory if it is not allocated
- metal_shm_attach() – attach shared memory to device, mmap the memory for the device driver, allocate locks, etc.
- metal_shm_sync_for_cpu() – stop device shared memory access, and allow CPU access.
- metal_shm_sync_for_device() – stop CPU shared memory access, and allow device access.

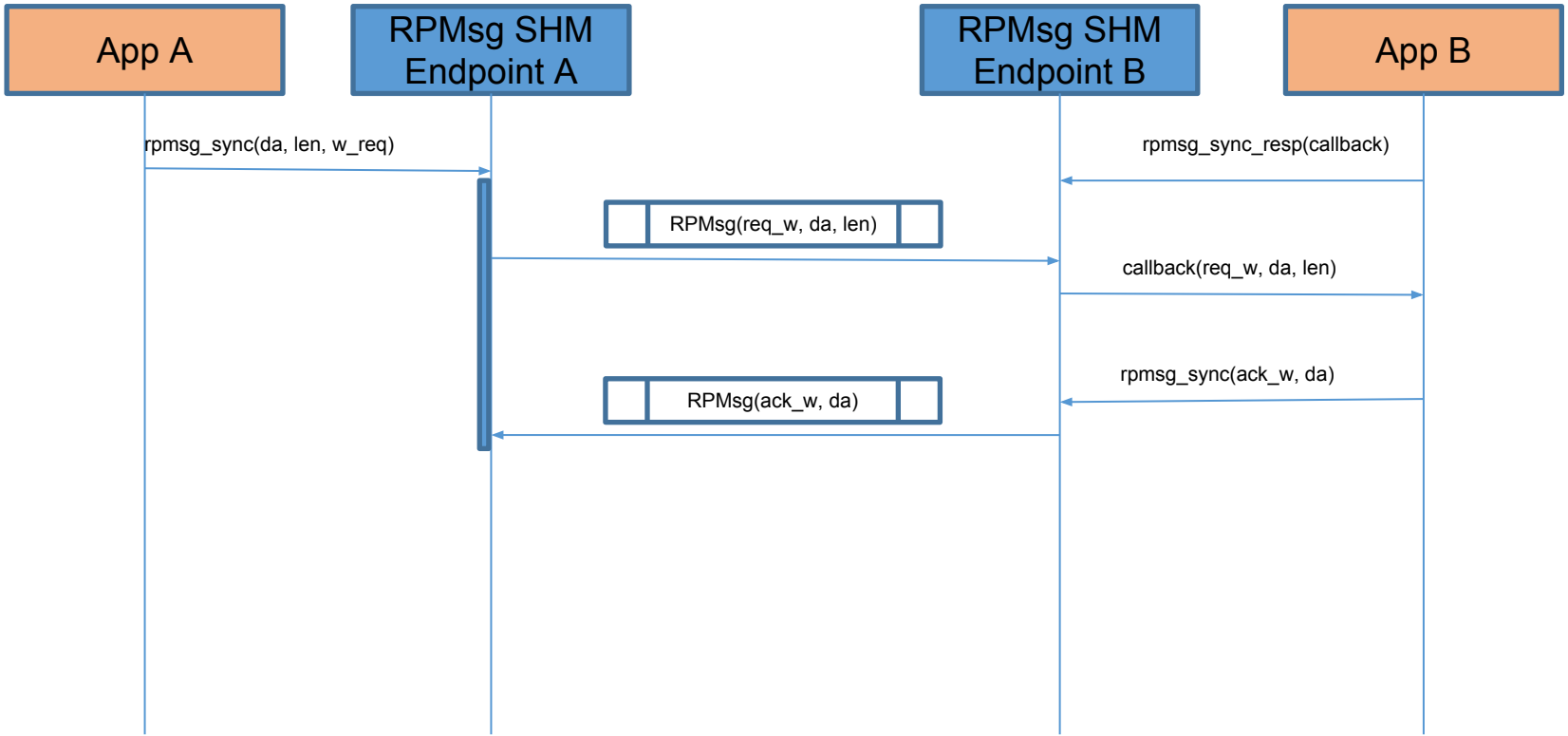
Libmetal Shared Memory Abstraction With RPMsg and Remtoeproc Option

- RPMsg: Remote Processor Messaging
  - Pass shared memory information to coprocessor
  - Memory sync
- Remoteproc: Manage coprocessor resources
  - Coprocessor shared memory management
    - Only remoteproc knows about the device address of the shared memory
  - Low level IPC (notification)

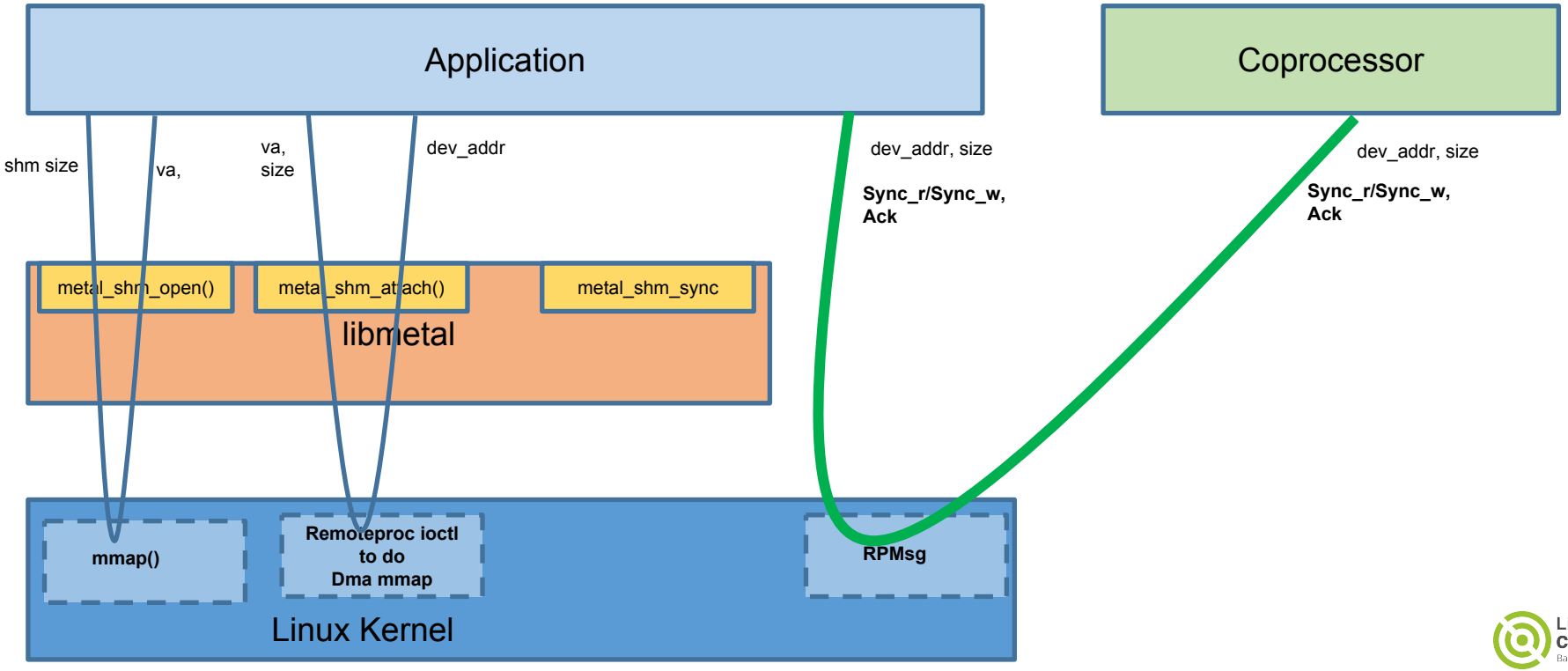
Libmetal Shared Memory With Remoteproc in Linux – DMA buf



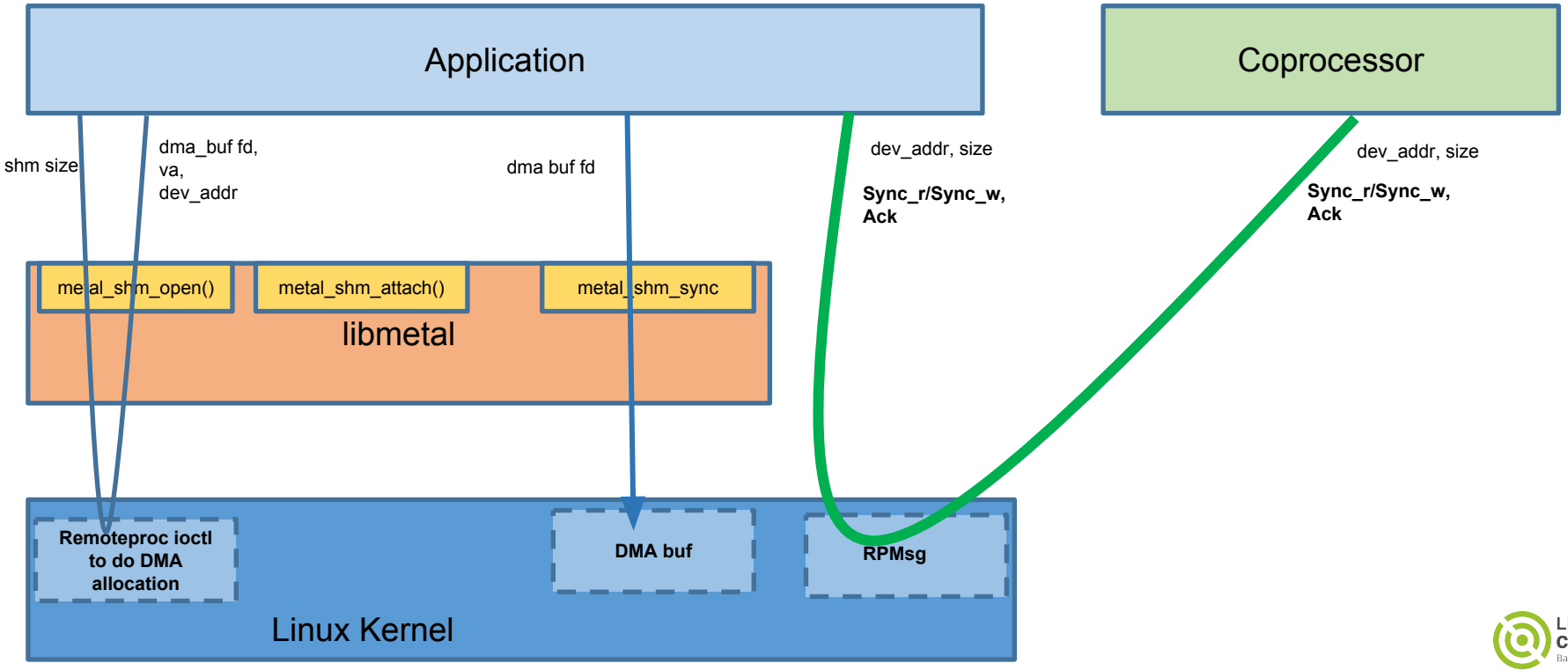
RPMsg for Shared Memory Sync



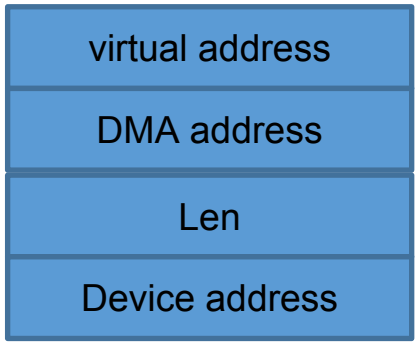
Libmetal Shared Memory With Remoteproc in Linux – IOMMU



Libmetal Shared Memory With Remoteproc in Linux – Remoteproc Static Shared Memory

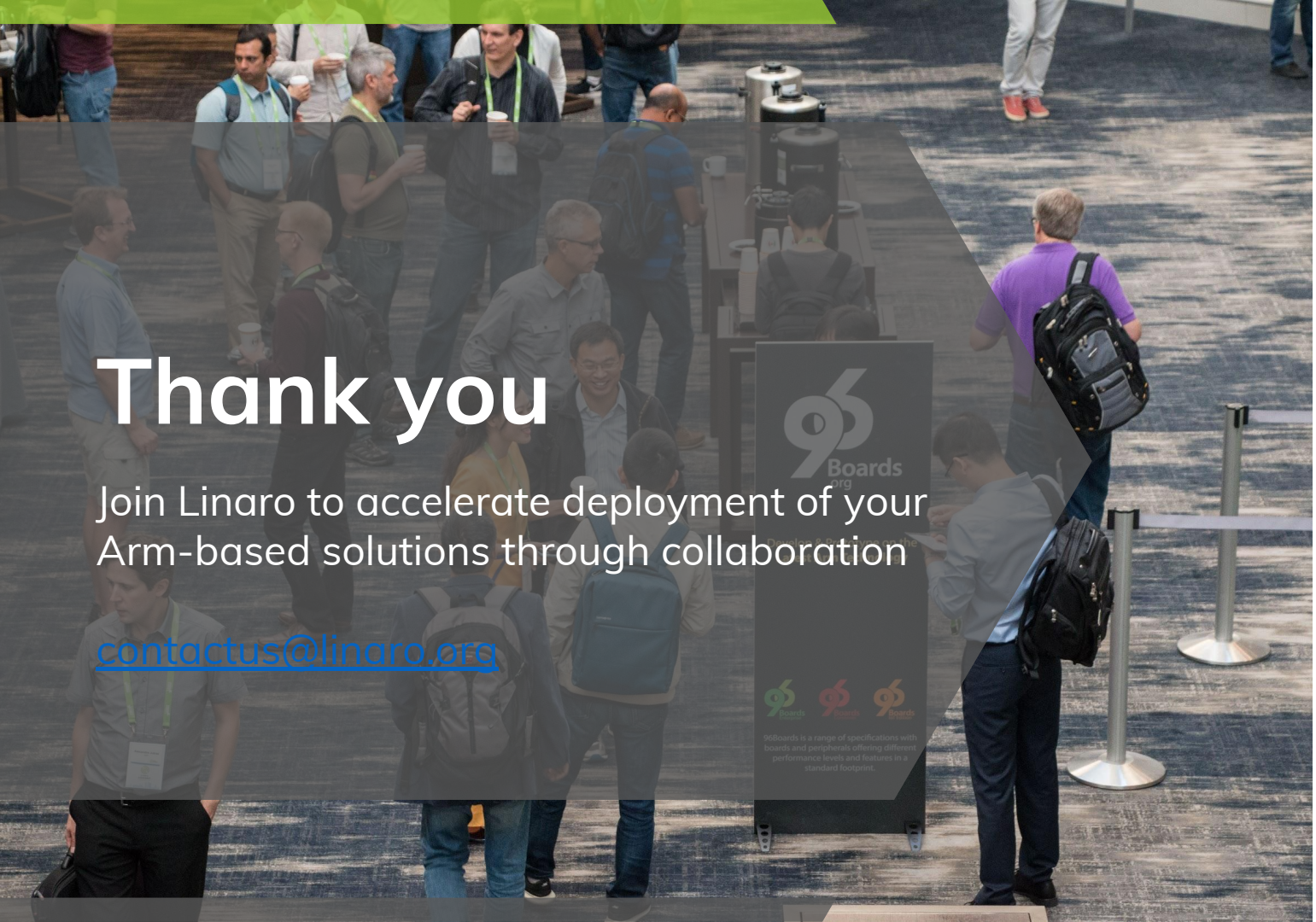


Remoteproc Carveouts



Open Questions

- Is there a way for a RPMsg device to know about its attached remoteproc device?
  - Remoteproc can verify the shared memory and returns the remote address mapping.
- Userspace remoteproc and RPMsg?



Thank you

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