

ALL PROGRAMMABLE

ANY MEDIA

5G

4K/8K

ANY STANDARD

ANY MACHINE

ANY NETWORK

5G Wireless • Embedded Vision • Industrial IoT • Cloud Computing

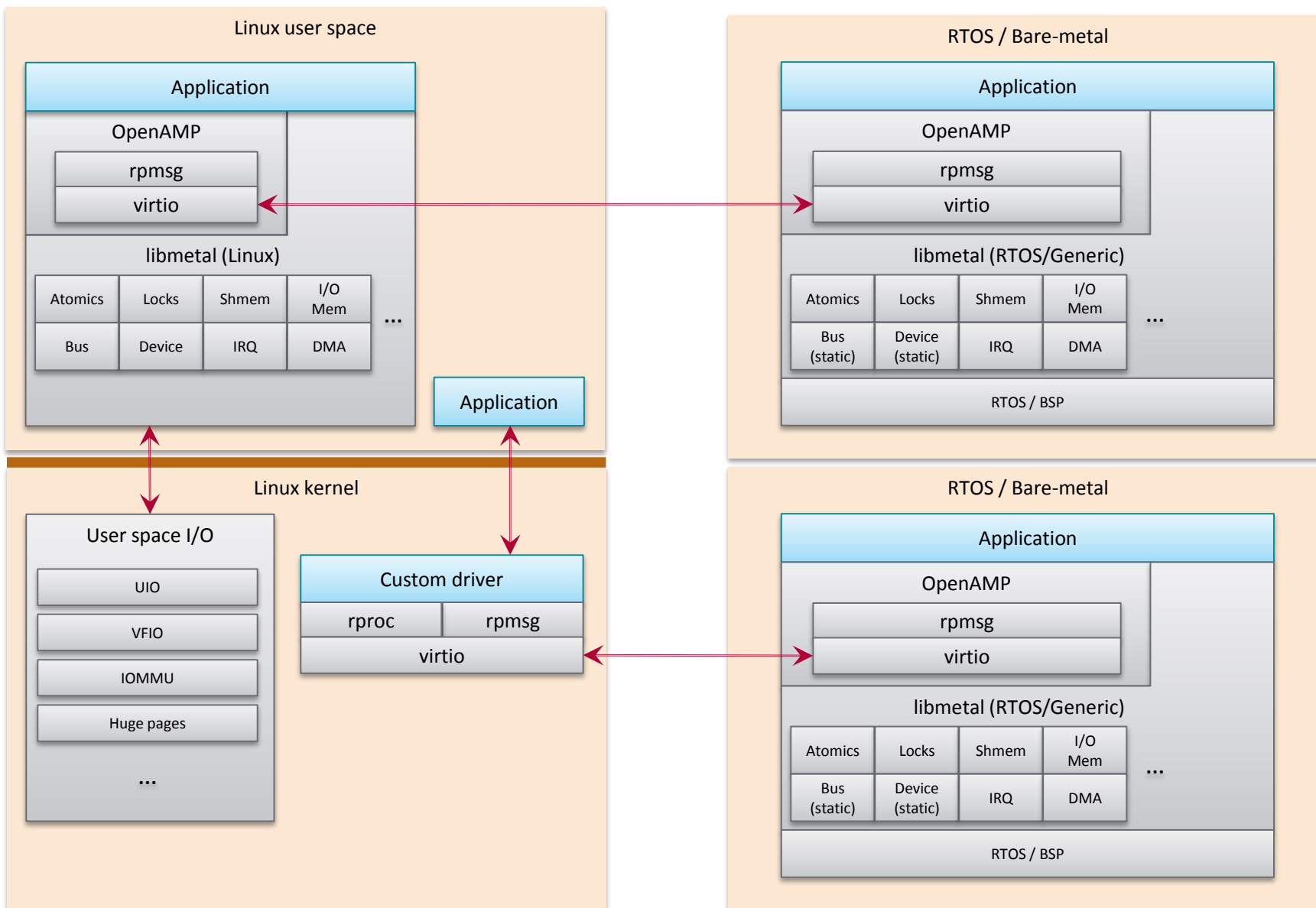


OpenAMP in Linux Userspace With Libmetal

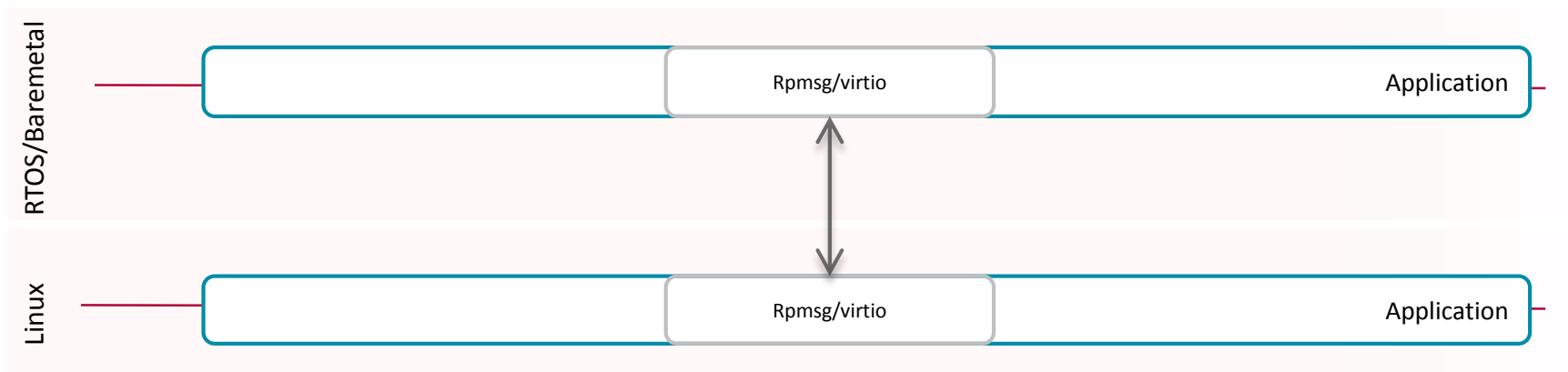
Motivation

- There is no userspace API to rpmsg kernel module
- Decouple rpmsg and remoteproc
- Linux doesn't have to be the rpmsg master
- Easier to add new feature

Components



Flow – Linux userspace <-> RTOS/Baremetal



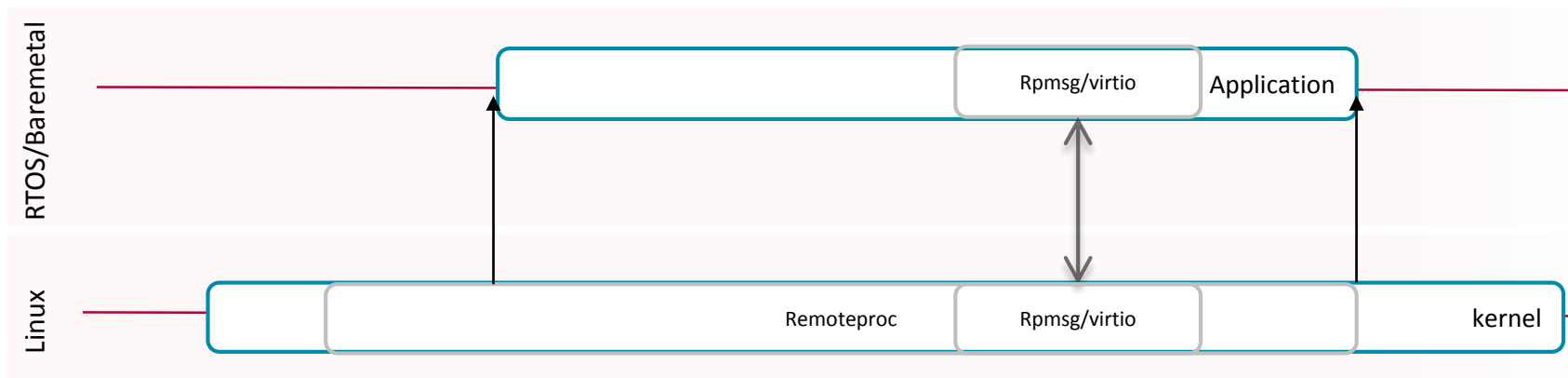
➤ Linux Userspace

- Vring:
 - virtqueues
 - UIO through libmetal
 - Shared buffers
 - Memory request and DMA through libmetal
- Rpsmg over libmetal

➤ RTOS/Baremetal Application

- Vring:
 - virtqueues
 - I/O memory through libmetal
 - Sharebuffers
 - Memory request and DMA through libmetal
- Rpsmg over libmetal

Flow – Linux remoteproc master <-> RTOS/Baremetal (The same as current implementation)



➤ Linux kernel

- Remoteproc driver:
 - Start and stop the remote processor
 - Attach to virtqueues
- Vring:
 - sharebuffers
- Rpmc driver
- Rpmc user driver
 - Rpmc callbacks

➤ RTOS/Baremetal Application

- Vring:
 - virtqueues
 - I/O memory through libmetal
 - Sharebuffers
 - Memory request and DMA through libmetal
- Rpmc over libmetal

2016.10 limitation

- No remoteproc implementation in Linux userspace
 - Cannot start/stop the remoteproc processor from Linux userspace
- Linux userspace cannot handle soft IRQs

Roadmap

- Rpmmsg/virtio in userspace and remoteproc in kernel space
 - Use remoteproc kernel driver to load firmware
 - remoteproc driver to register multiple virtio UIO/VFIO devices