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CHERI

Portable CHERI OS APIs

**Unifying OS interfaces across CheriBSD, Linux
and other POSIX-based systems**

Paul Metzger, Brooks Davis

Portable CHERI OS APIs – University of
Cambridge



○ Divergence between CHERI Linux and CheriBSD

Different CHERI-related OS design decisions have been made across CHERI/Morello Linux and CheriBSD, including:

- ◆ Error reporting on capability violations:
 - CheriBSD → `SIGPROT` vs. CHERI/Morello Linux → `SIGSEGV`
 - Differing usage of `errno`s
- ◆ Missing capability-related flags for `mmap()` on CHERI Linux.
- ◆ Capability formatting with `printf()` and `strfcap()`.



○ Converging CHERI-related design decisions

- Problems with divergences:
 - Increased porting and maintenance costs of userland software.
 - May indicate that neither OS has found the optimal solution.
- It is therefore necessary to
 - examine differing CHERI API designs and behaviours across CheriBSD and Linux,
 - and unify them where possible.



○ Vision and initial steps

- POSIX aims to help portability across OSes.
- Vision: A CHERI extension to the POSIX standard to avoid divergences across future CHERI adaptations of POSIX-based systems.
- We started to
 - develop a portable OS API test suite,
 - and catalogue differences between CheriBSD and CHERI/Morello Linux.