

# Linux Plumbers Conference

Vienna, Austria | September 18-20, 2024

# The Future of Memory Protection Keys

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# Protection Keys - 10,000 Ft View

- What?
  - Assign a key to some memory (in page tables)
  - Change memory permissions without page table changes
- Why?
  - Truly thread-local permissions
  - Performance
- Existing Support

	Merged	Keys	Access	Write	Execute	Kernel
x86	2016	4	Y	Y	N	Y
powerpc	2018	5	Y	Y	Y	Y
arm	<a href="#">2024?</a>	3	Y	Y	Y	Y



# Rough Edges

- Tricky Register Management Bugs
  - x86 register (PKRU) is a user-controlled XSAVE-managed state but that affects kernel execution
- Can pkeys be used to harden applications? ([patch series](#))
  - Signal handling needs to save the old PKRU before writing
  - Signal handling needs to write to PKRU before saving
- What do you do when there's a PKEY but no register? ([link](#))
- Kernel Protection (page tables, high-perf. read mostly)

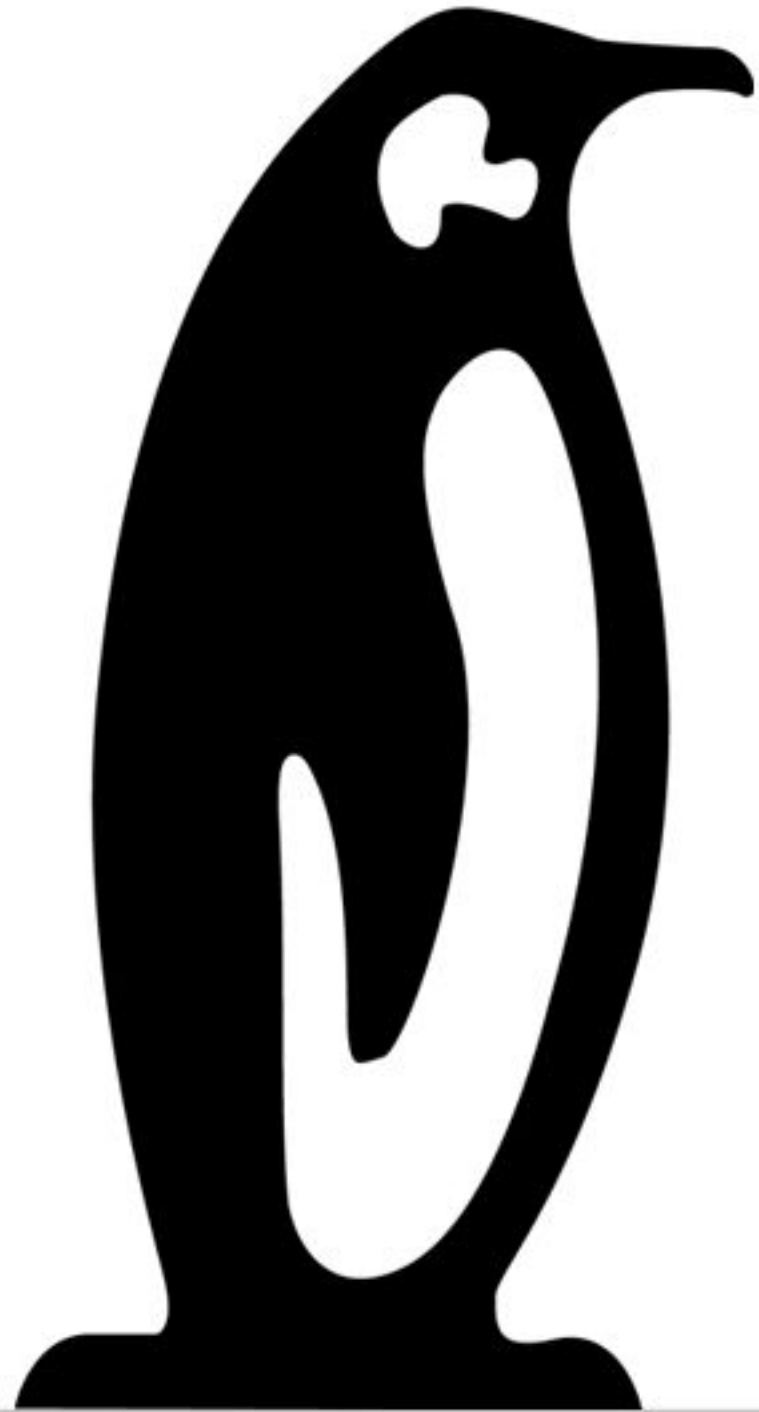




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