

# Xenomai User Meeting 2009

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# Where Do We Come From?

- RTOS emulation project, July 2001
  - Help migrating applications to Linux
  - Depending on other real-time cores
- Adeos, June 2002
  - Xenomai-originated dual kernel technology
- The RTAI episode, January 2003
  - Do, listen and learn
- Xenomai reloaded, October 2005



# Where Are We Now? (1/3)

- Our strengths
  - Dual kernel technology is mastered
  - Decent release quality
  - Decent high-level documentation
  - Stable API and ABI within a stable series
  - Same level of support across CPU architectures
  - Latest stable series maintained 12+ months



# Where Are We Now? (2/3)

- Our weaknesses
  - Dual kernel technology is mastered, but...
    - Beware of sleep induction
    - I-pipe maintenance is overconsuming
    - We live in isolation
  - Pace of major releases is slowing down too much
    - Goal is ~12 months
  - Too few contributors / maintainers
  - No dedicated release engineer



# Where Are We Now? (3/3)

- What did not work out so far?
  - "Xenomai ..., who?"
  - xenomai.org is not lively enough
  - Not enough traffic on xenomai-core
  - No significant extension of the real-time device driver set
  - No significant extension of the RTOS emulator set



# The Landscape Is Changing

- Full PREEMPT\_RT technology close to mainline
  - Vs dual kernel, really?
- More legacy RTOS applications to migrate to Linux
  - The emulation coverage issue
  - The virtualization challenge
- More legacy Linux applications to go *native*
  - Is there a life beyond POSIX?
  - Where is the real-time device driver factory?



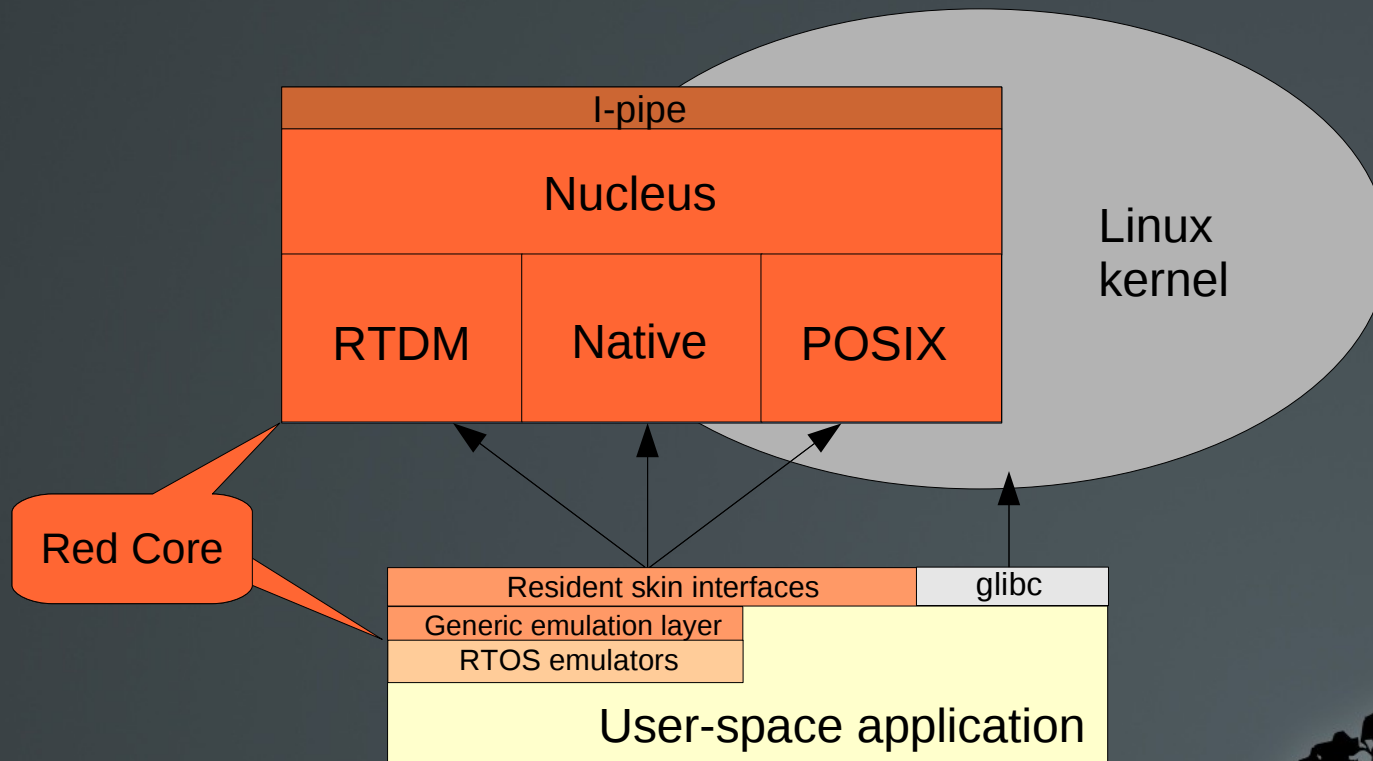
# Where Do We Want To Go?

- Xenomai 3
  - Keep on providing real-time APIs
  - Rely on native real-time whenever possible
  - Provide dual kernel option when necessary
    - More embedded CPU architecture ports
  - Increase coverage of API emulation
- Beyond Xenomai 3
  - Help preserving legacy application design



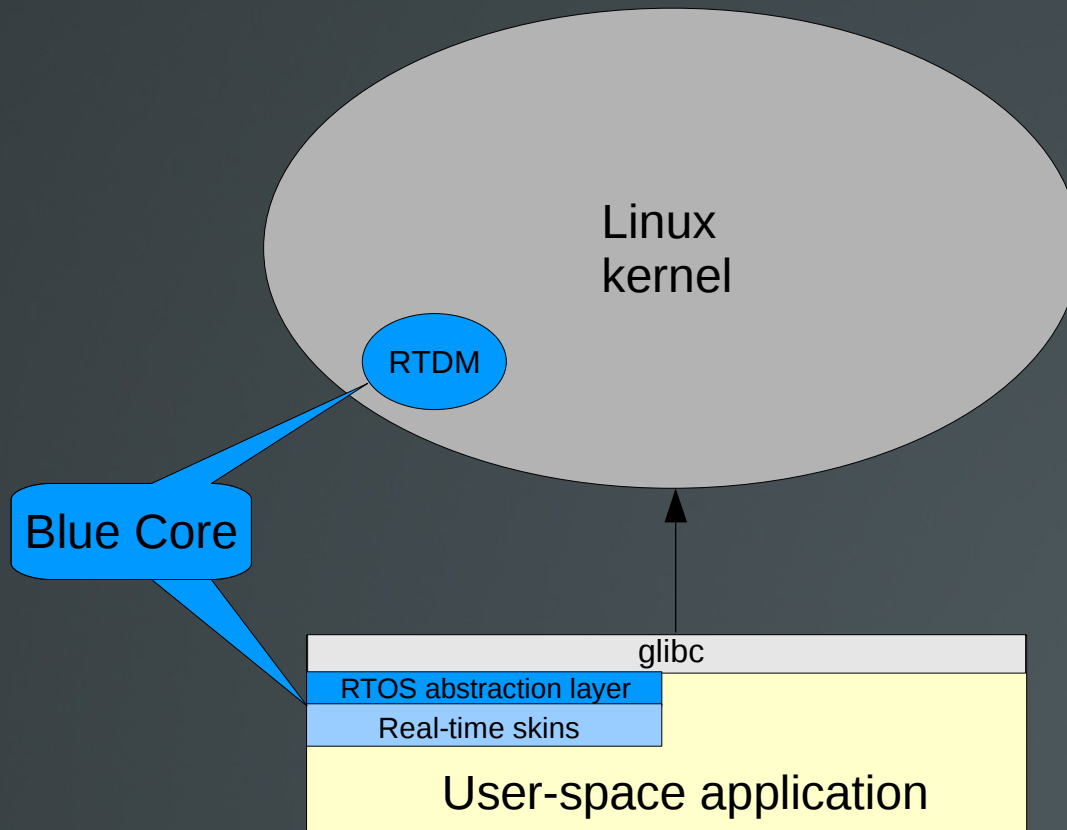
# How Do We Do This? (1/3)

- Our dual kernel architecture will evolve



# How Do We Do This? (2/3)

- A native architecture will emerge



# How Do We Do This (3/3)

- Major development milestones for Xenomai 3.x
  - Evolve the xenomai-solo core:
    - Rebase over the resident POSIX skin for the *red core*
    - Introduce inter-process objects in the *blue core*
  - Enable the native API over the *blue core*
  - Enable the emulators over both *red* and *blue* cores



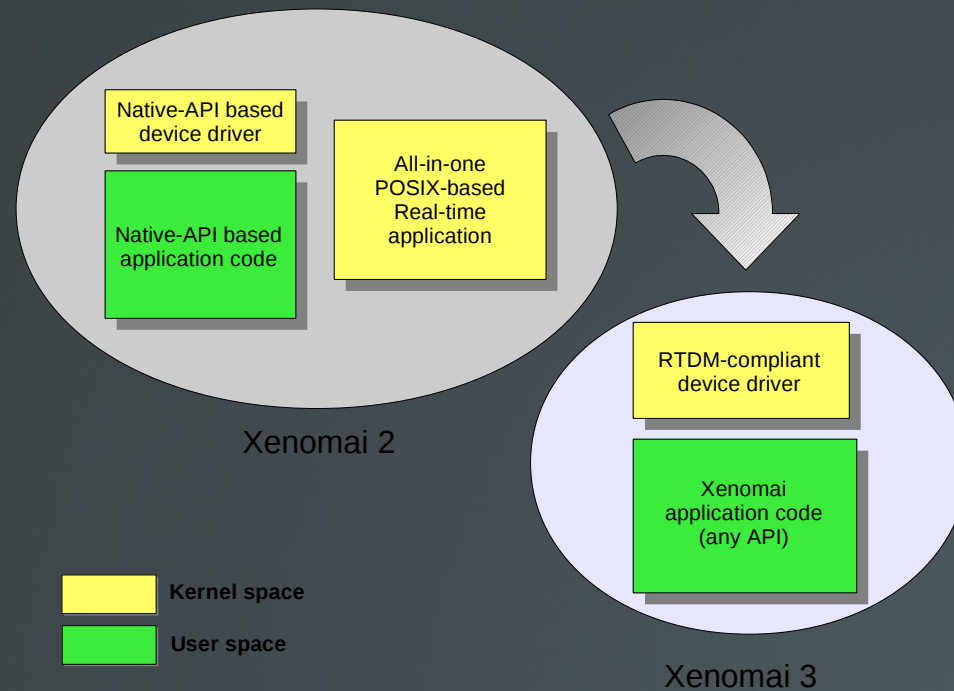
# A Shift In Paradigm

- Native real-time supported when available
  - When the native API is enabled over the *blue core*
  - When PREEMPT\_RT is fully merged in mainline
  - When performances allow
  - On a case-by-case basis for CPU architectures
- Dual kernel available when necessary
  - *Red core* infrastructure maintained
- Application / device driver split enforced



# What Will Change? (1/2)

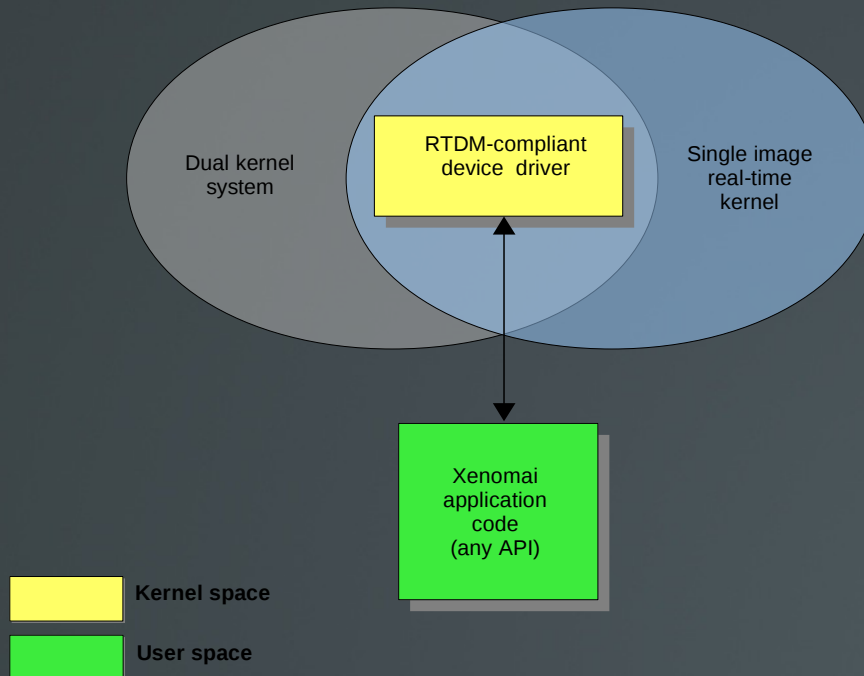
- A common application design to emerge



Transition from v2.x designs to Xenomai 3

# What Will Change? (2/2)

- RTDM as a core-agnostic device model



# Conclusion

- Xenomai is about *embedded systems*
- Dual kernel option is still relevant
- PREEMPT\_RT option is an opportunity
  - To focus on the real-time *skins* again
  - To be even more relevant as a technology bridge



# The End

Thank you for attending

