

# Periodic Timers Revisited: the Real-time Embedded System Perspective

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## Research Highlights

- A properly configured periodic timer in combination with a smart designed event queue can match the single-shot approach in terms of performance and interference.
- The overhead of reprogramming the hardware timer in a single-shot interrupt event handler is 5 times higher than a single event handler in the periodic approach.
- A periodic timer can outperform an equivalent single-shot mechanism when the requested period exceeds the maximum hardware period and the single-shot timer falls back to software tick counting.
- In a multi-threaded environment, the periodic interrupt handler presented better execution time (up to 5 threads) in comparison to the single-shot interrupt handler using an 8-bit microcontroller.
- Periodic timer mechanisms proved to be a concrete alternative for real-time embedded systems, which are essentially periodic.