

Lawn - an Unbound Low Latency Timer Data Structure for Large Scale Systems

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Abstract

As demand for Real-Time applications rise among the general public, the importance of enabling large scale, unbound algorithms to solve conventional problems with low to no latency is critical for product viability. Timers algorithms are prevalent in the core mechanisms behind of operating systems, network protocol implementation, stream processing and several data base capabilities. This paper presents an algorithm for a low latency, unbound range timer structure, based upon the well accepted Timing Wheel[1] Algorithm. Using a set of queues hashed by TTL, the algorithm allows for simpler implementation, minimal overhead and no degradation in performance in comparison to current state of the algorithms under typical use cases.

Index Terms - Stream Processing, Timer Wheel, Dehydrator, Callout facilities, protocol implementations, Timers, Timer Facilities.

1 Introduction

2 Model

3 Existing Timer Schemes

4 An Algorithmic View

5 Conclusion

References

- [1] George Varghese and Anthony Lauck. Hashed and hierarchical timing wheels: efficient data structures for implementing a timer facility. *IEEE/ACM transactions on networking*, 5(6):824–834, December 1997.