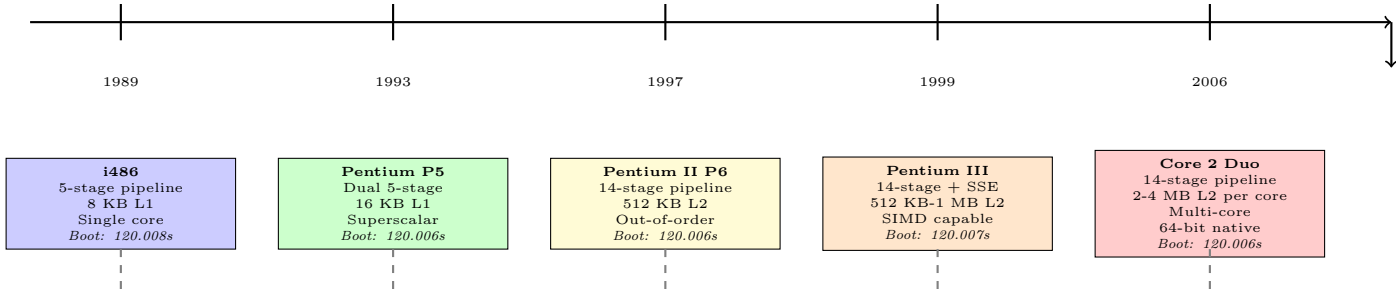


# CPU Architecture Evolution Timeline (1989-2008)

*Why Boot Performance Remains Constant Across 19 Years*



## Key Finding: All Boot Times Cluster at 120,000 ms

Despite 17 years of advancement (486 → Core2Duo):

- Pipeline depth: 5 → 14 stages (2.8× deeper)
  - L1 cache: 8 KB → 32 KB (4× larger)
- L2 cache: None → 2-4 MB per core (massive improvement!)
- Boot time: 120.008 s → 120.006 s (0.002% improvement!)

**Conclusion:** Boot is fundamentally I/O-bound, not CPU-bound

Boot time invariance proves that CPU architecture improvements don't apply to disk I/O intensive workloads