

Evolving Systems with Erlang

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Scaling Challenges



Memory Footprint



**How much RAM does an
idle merb app require?**



~300MB



**How much memory does
a heavily loaded merb
app require?**



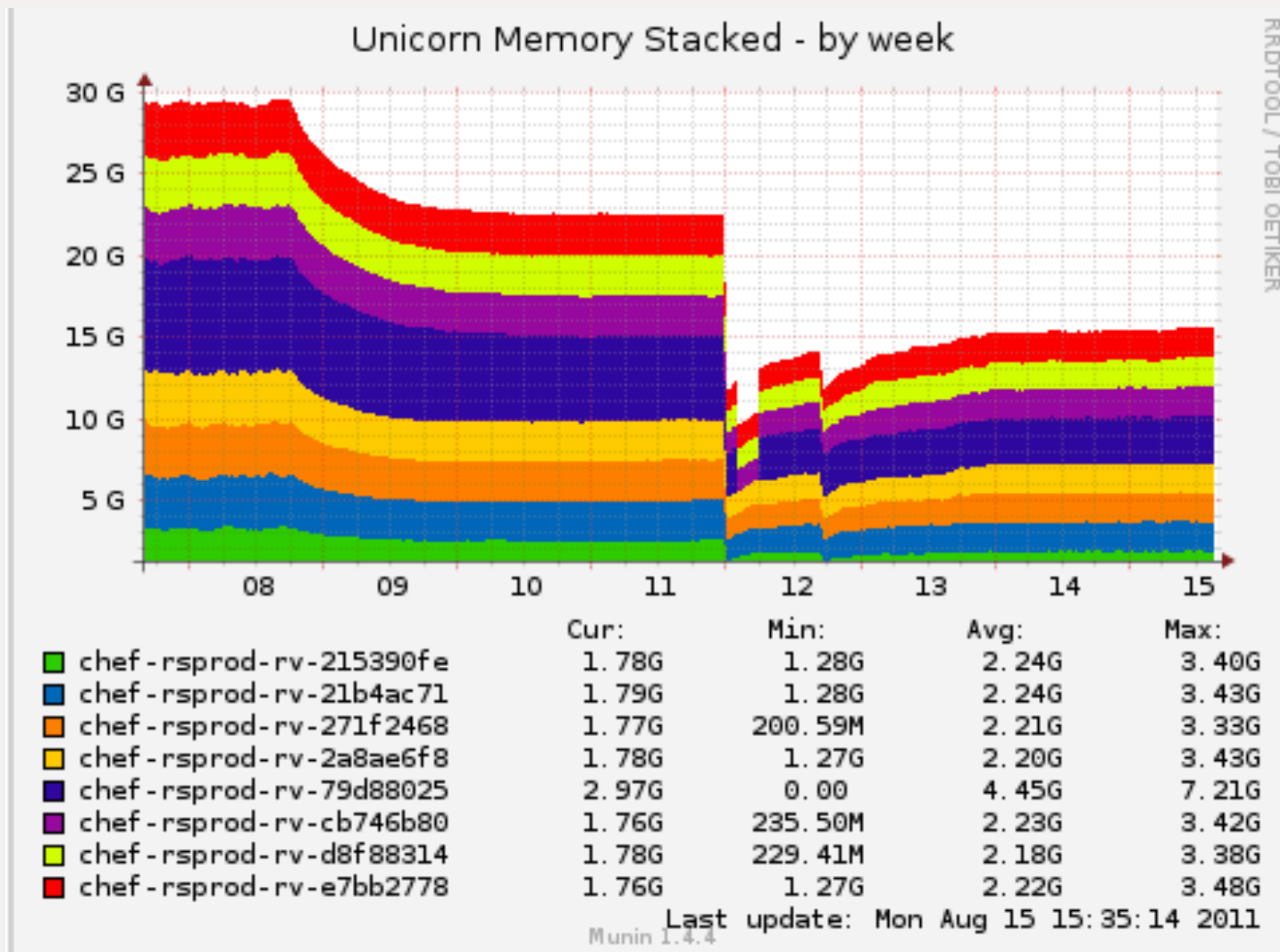
OPSCODE



Developer
(not to scale)
←

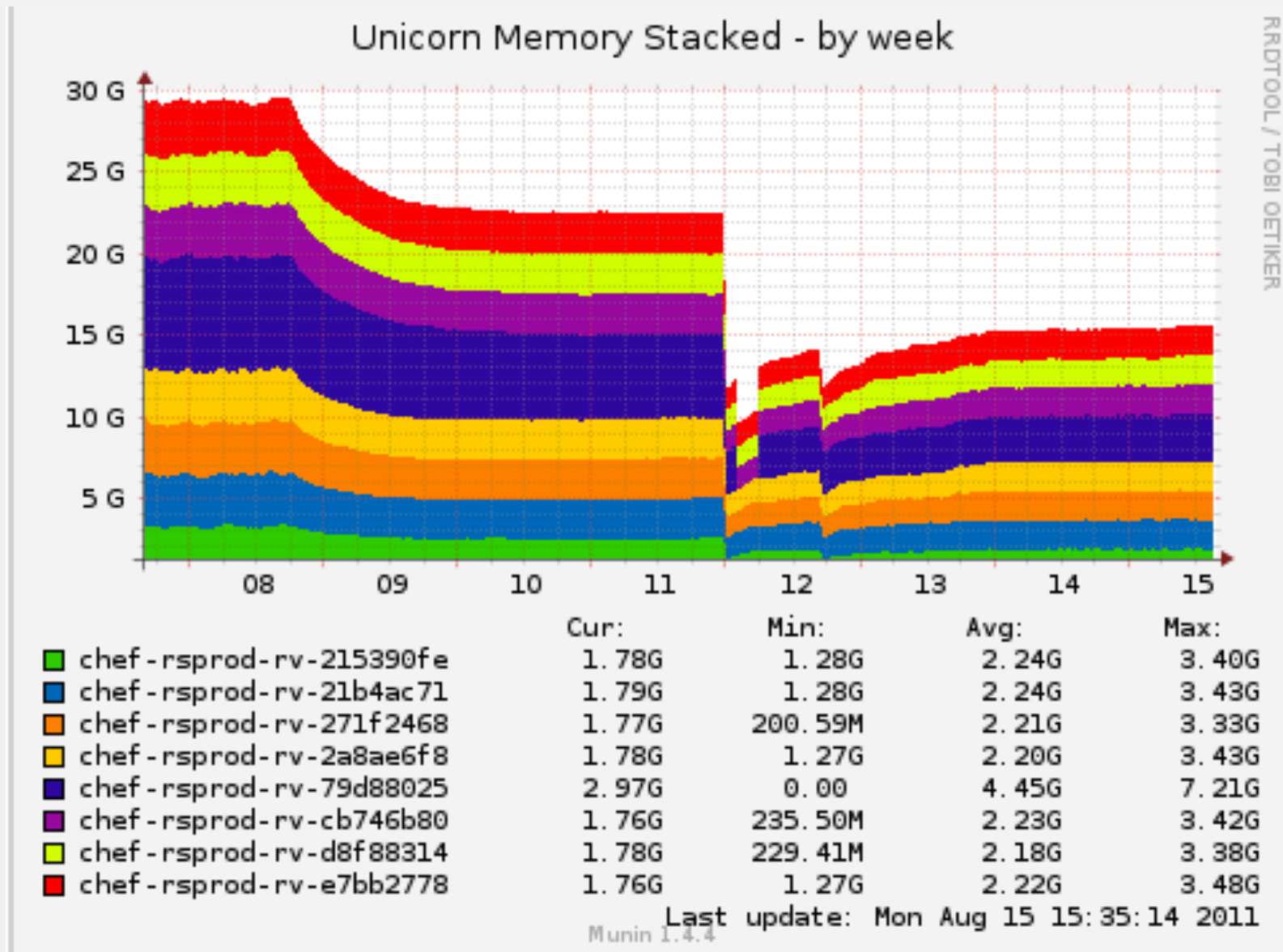


3.5GB

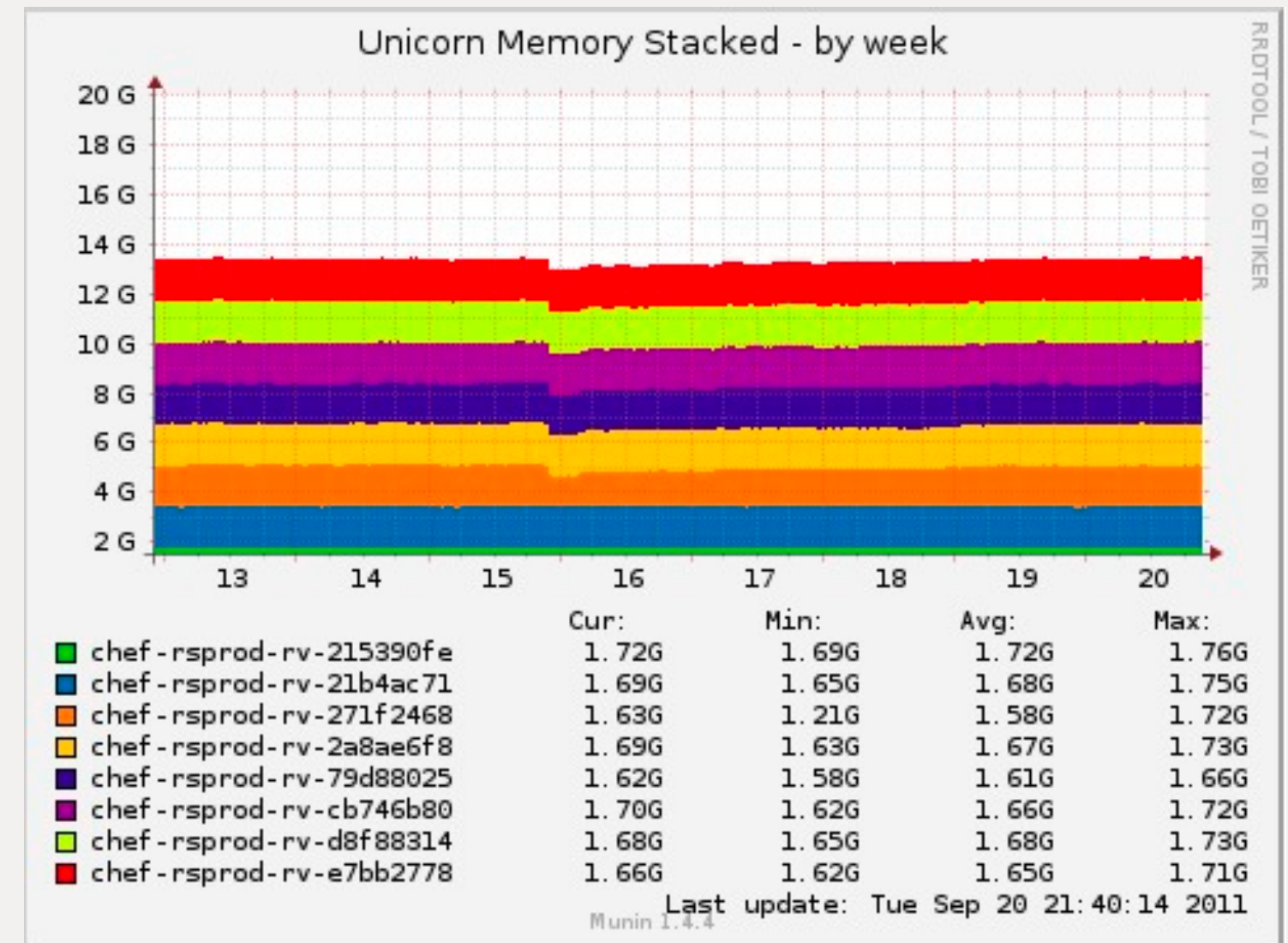


- OO apps are great garbage generators
- Shared heaps/shared GC can be slooow
- Loading application code twice? Y U HATE?!

Before



After



- Erlang's per-process GC is more efficient
- Erlang gives memory back to OS
- Creating less garbage



CPU Usage



**Where are we spending
our time?**



Database calls?



JSON parsing or rendering?



Expensive crypto calls?



Garbage Collection?

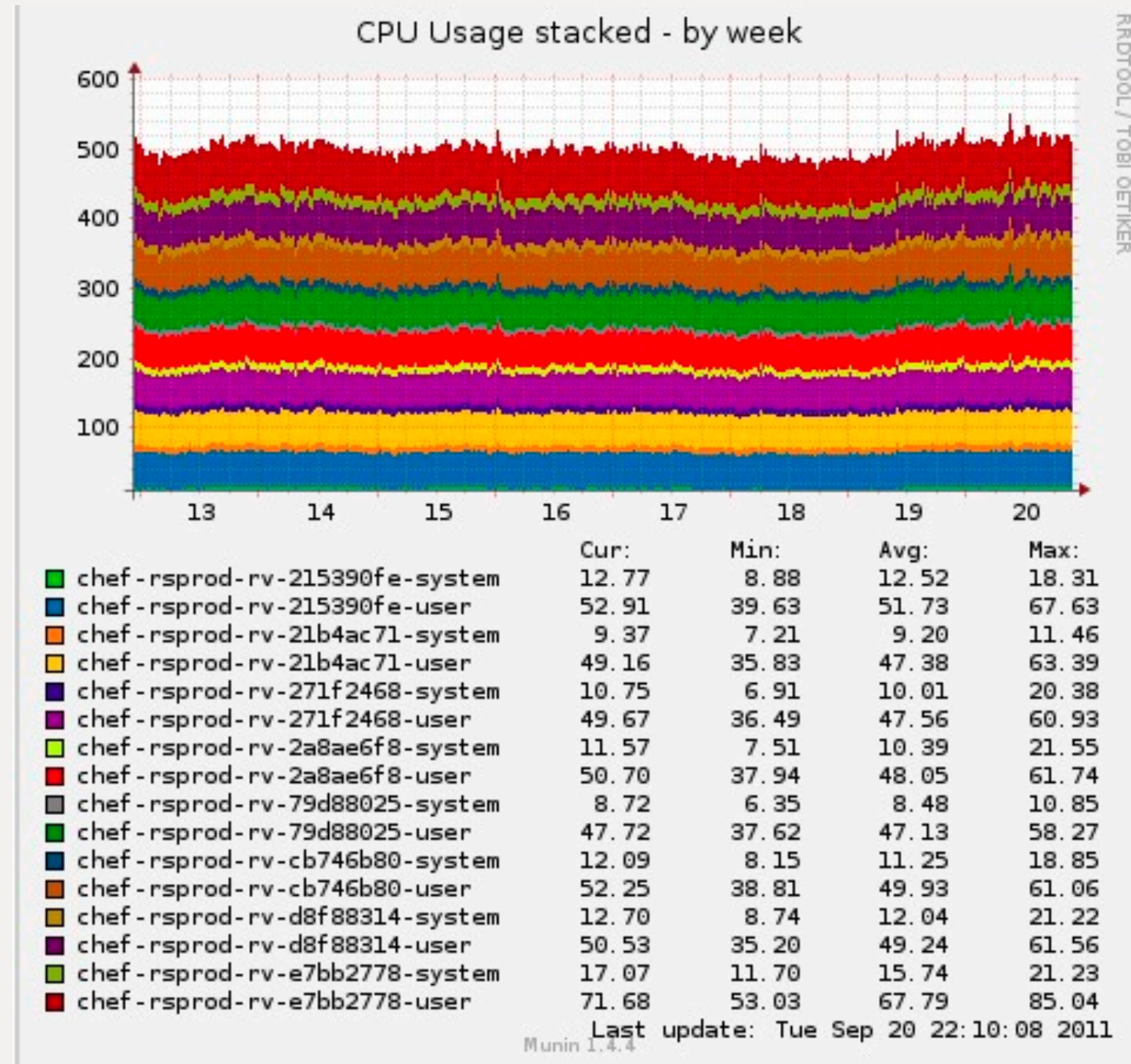


Garbage Collection!



**> 40% CPU spent
in GC**





- Refactored code is much simpler
- Erlang's VM is efficient under load
- Soft-realtime performance
- Per-process GC is a win



Database Performance

Would you use a database if it...?

- Could only do one thing at a time?
- Didn't use disk efficiently?
- Didn't have a query planner?
- Wasn't able to reliably replicate to backup instances?



CouchDB

*(and lots of other NoSQL
“databases” too)*

- Single reader **OR** writer per database
- On-disk btree format is wasteful
- Compaction frequently fails
- Replication has unpredictable delays

- Write intensive?
- Ad-hoc queries?
- HA server-side requirements?
- Operational ease?
- Are you **really** web scale?

- Study code and formulate theories
- Create tests to prove or **disprove** theories
- Measure, measure, measure

- Sophisticated querying is important
- Replication works
- Easy to find knowledgeable devs & admins
- Vibrant ecosystem: Percona, DrizzleDB, MariaDB
- Lots of storage engines: Inno, XtraDB, Tokutek, PBXT

- Pick the right tool for the job
- Predicting scaling pain is hard
- Measure your system to understand problems
- Test prototypes before implementing them
- Ongoing monitoring and measurement is critical



OPSCODE

We're Hiring!

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