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War Story: How Big Is Too Big For a Schema

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How Big is Too Big?

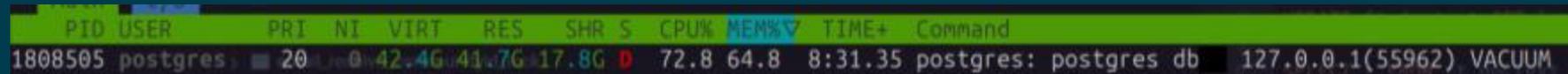
This is probably too big:

```
postgres=# SELECT count(*) FROM pg_class;  
count  
-----  
      10000000  
(1 row)
```



What Actually Breaks?

- VACUUM and ANALYZE meet OOM-Killer
 - Postgres' relcache takes 4kb memory per relation visited by VACUUM or ANALYZE. (regardless of maintenance_work_mem)
 - Band aid: Use vacuumdb



A terminal screenshot showing a PostgreSQL process running VACUUM. The process is identified by PID 1808505, user postgres, and is running the command postgres: postgres db 127.0.0.1(55962) VACUUM. The process is using 72.8% CPU and 64.8% memory. The memory usage is shown as 42.4G / 41.7G / 17.8G.

PID	USER	PRI	NI	VIRT	RES	SHR	S	CPU%	MEM%	TIME+	Command
1808505	postgres	20	0	42.4G	41.7G	17.8G	D	72.8	64.8	8:31.35	postgres: postgres db 127.0.0.1(55962) VACUUM

- pg_dump --schema-only takes hours.
 - Putting dumped objects in the right order requires identifying and fixing dependency cycles, this algorithm is non-linear.
- "out of shared memory" when accessing all tables in a transaction (e.g. pg_dump)
 - Band aid: increase max_locks_per_transaction.

How to Avoid This

- For dynamic schemas, consider using jsonb instead.
- When partitioning, avoid large numbers of small partitions.
- Anticipate some changes in usage patterns
- Avoid unused indexes even on empty tables

Thank you!