# From DBA to DB Agents

Gülçin Yıldırım Jelínek

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# My journey with Postgres

- Started as a DBA in 2012
- Manual performance tuning, upgrades, backups
- Supported dev teams with query design and troubleshooting
- A lot has changed, but core instincts remain valuable

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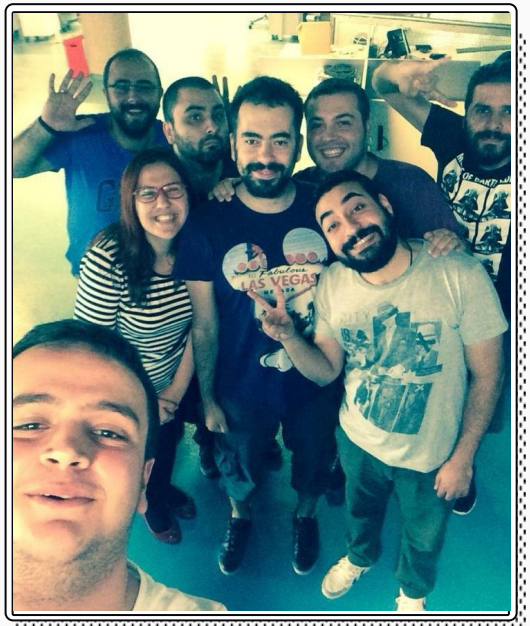
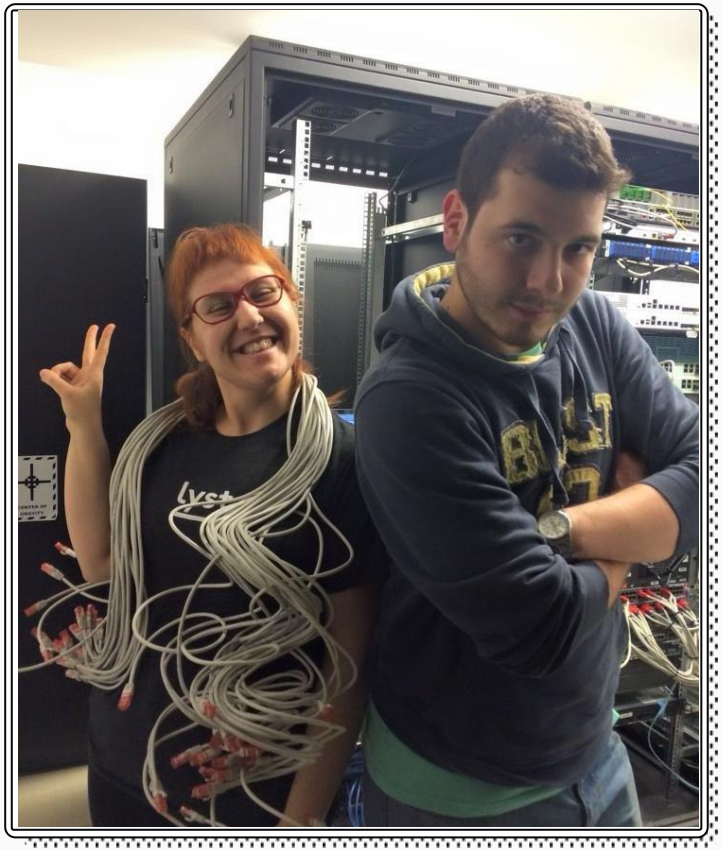
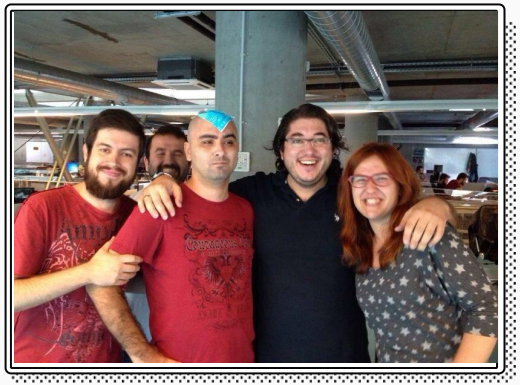
# DBA responsibilities

- Installation & Configuration
- Maintenance & Optimization
- Monitoring & Observability
- Upgrades & Migrations
- Backup & Recovery
- Lock management & Schema migrations
- Performance & Query tuning
- Automation & Tooling

What does a PostgreSQL DBA do? (Turkish, 2015)







# A lost trade: DBA

What does a PostgreSQL DBA do? (Turkish, 2015)

# DevOps, Site Reliability & Platform Engineering

IT automation & orchestration tools emerged (e.g Ansible, Chef, Puppet, Saltstack)

Provisioning & Configuration management

Application deployment & Continuous delivery

Security & Compliance

Ansible Loves PostgreSQL (English, 2016)

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# Ansible's Playbook concept

New patterns: Configuration as Data (YAML files), Infrastructure as Code, Infrastructure as Data

A Playbook contains Plays. Plays contain Tasks. Tasks call Modules.

In Ansible, Playbooks organize Tasks. Roles organize Playbooks.

Suddenly you could manage lots of resources

Ansible Loves PostgreSQL (English, 2016)

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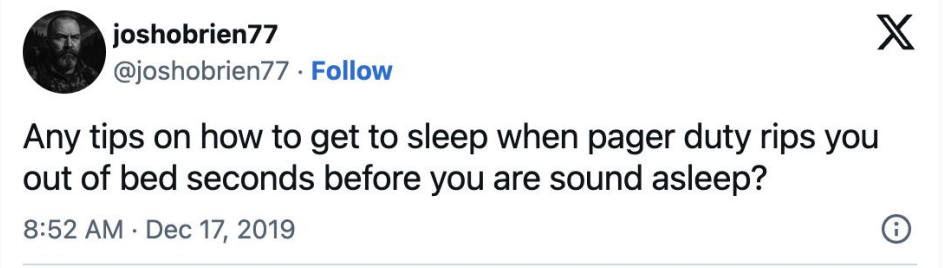
# Ansible's Playbook concept

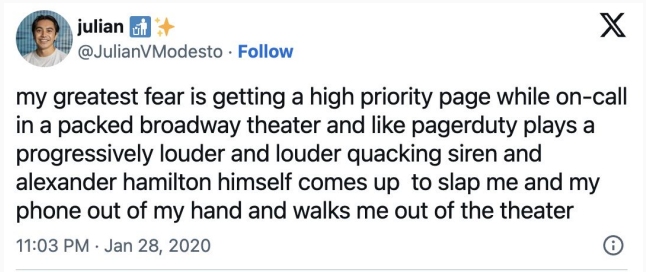
```
- block:
  - name: Install pg_hba.conf
    template:
      src: "{{ hba }}"
      dest: "{{ postgres_conf_dir }}/pg_hba.conf"
      owner: "{{ postgres_user }}"
      group: "{{ postgres_group }}"
      mode: "0644"
    when: _postgres_create_hba_file
    notify:
      - Note Postgres reload required

  - name: Set a fact for contents of pg_hba.conf
    set_fact:
      postgres_pg_hba_config: "{{
          lookup('ansible.builtin.template', hba)
          |split('\n')
          |reject('match', '#')
          |list
        }}"
  when:
    hba != ''
  vars:
    tmpl: pg_hba.conf.j2
    hba: "{{ postgres_hba_template|default(tmpl) }}"
```

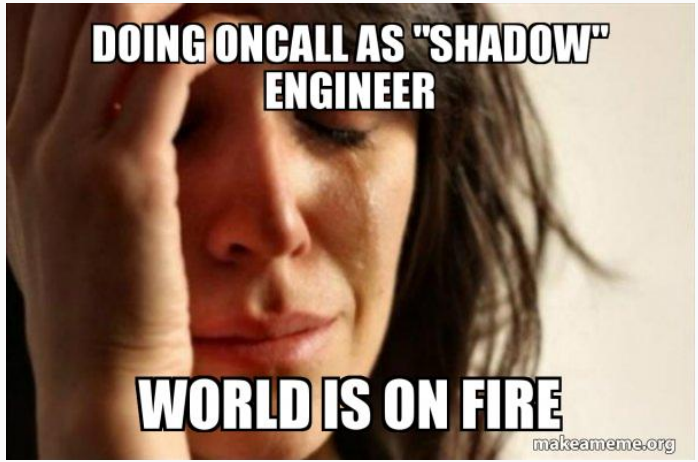
Example from open source TPA project (past contributor)

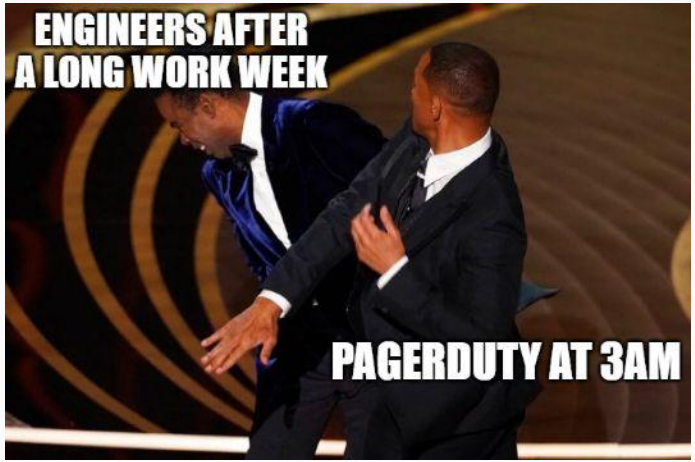
# Let’s talk about on-call


# How an AI agent can help




**Picture this:**

An agent that's **always on-call**. No sleep. No burnout.
No missed alerts. It watches your systems 24/7, reacts instantly and only wakes a human when it really matters.

The big idea

# What if we could turn years of DBA/SRE instincts into a smart, LLM-powered Postgres agent?

# From DBA to DB Agent


Monitor, tune and maintain databases

Scale DBA expertise across large fleets

# Designing the Xata Agent

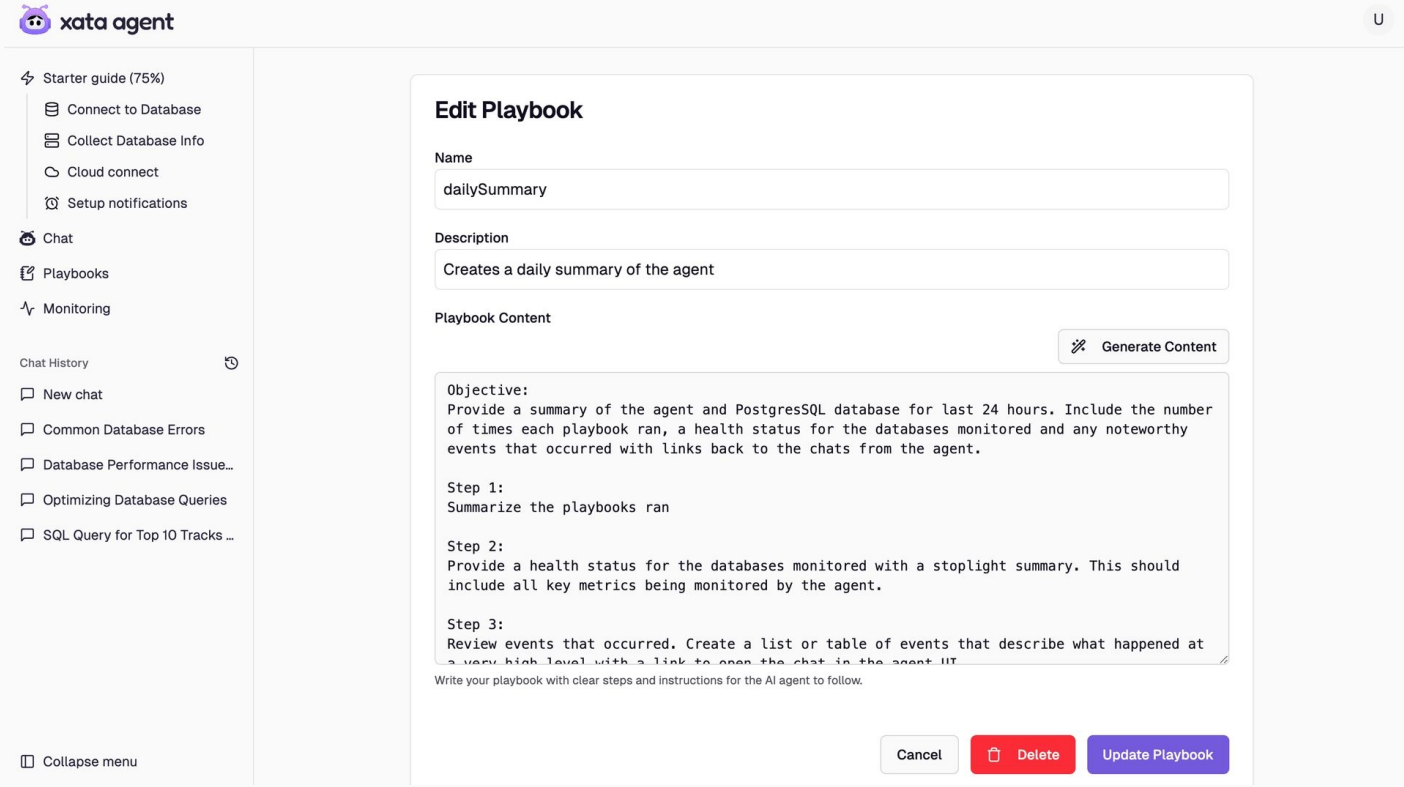
- Internal tool for managing many Postgres clusters
- Built on lessons from classic DBA work
- Combines:
  - SQL analysis
  - Logs and metrics
  - Prompted reasoning from LLMs

# Agent concepts: Playbooks

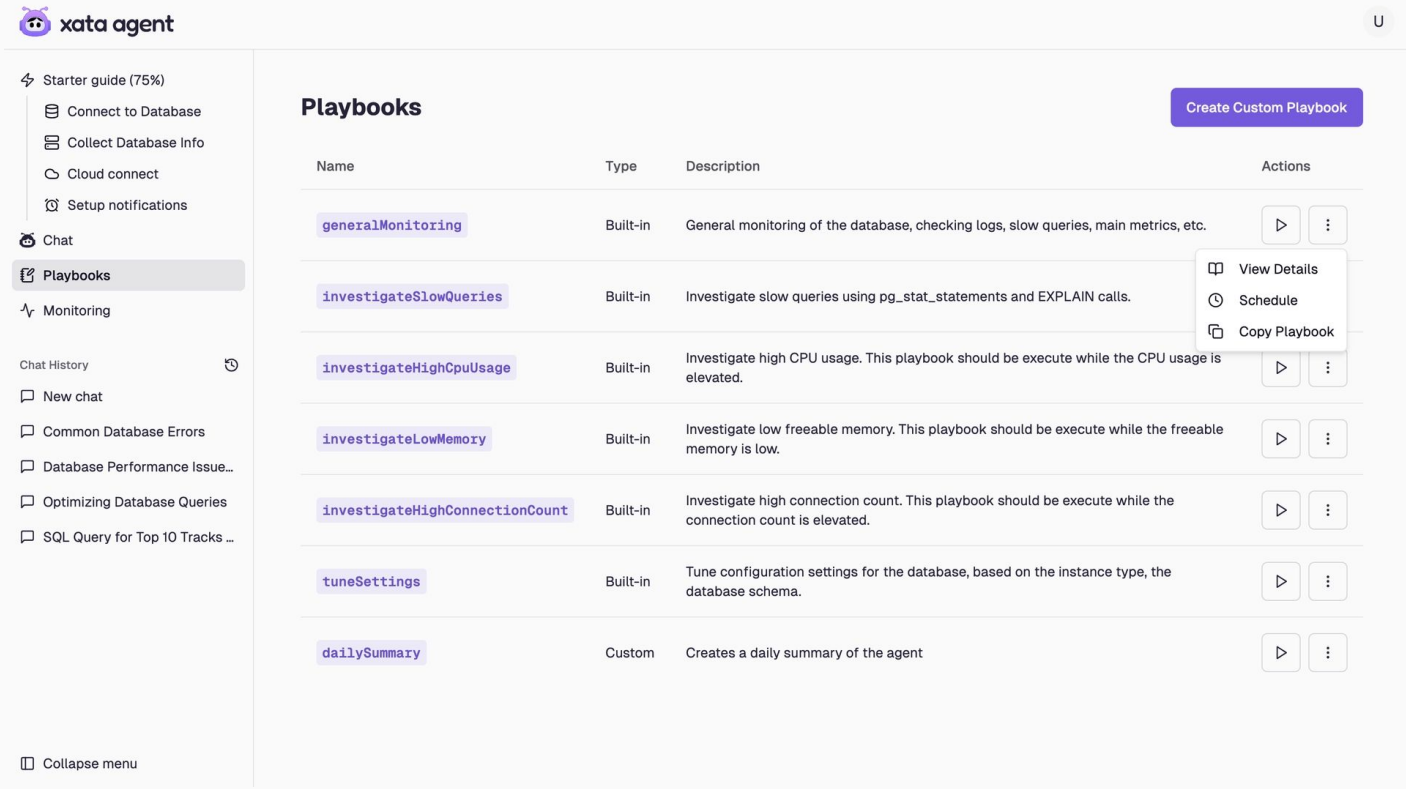
Imagine a DBA/SRE's playbook, then remember the Ansible playbooks. We inherited the same logic.

**Playbooks** are a sequence of steps that the Agent can follow to detect, diagnose, and fix issues in the Postgres database. Playbooks are written in English and you can easily create your own, or modify the pre-built ones.

# Agent concepts: Playbooks



# Agent concepts: Playbooks



# Agent concepts: Schedules

Traditional DBA/SysAdmin/Platform roles relied on cron expressions to schedule maintenance and administration jobs and agent has the same ability.

**Schedules** are used to run playbooks at specified intervals. This way the Agent can detect issues 24/7, find the root cause, and fix them before they impact the users. Schedules are defined as cron expressions, or you can let the Agent decide the best time to run the playbook.

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# Agent concepts: Tools

Traditional DBA/SysAdmin/Platform engineers relied on certain tools to monitor, backup, configure, upgrade the systems they managed. Agent provides a large library of pre-built tools for Postgres.

**Tools** are functions that can be called by the Agent to get information about the Postgres database, the instance/clusters on which it is running, and metrics and logs. Custom tools can be provided by integrations and by MCP servers.

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# What the Agent does

- **Finds root causes:** Pinpoint slow queries, deadlocks and performance bottlenecks and regressions
- **Gets actionable fixes:** AI-powered suggestions from query optimization to suggesting indexes to infrastructure upgrades
- **Ensures uptime:** Proactive monitoring to keep your database healthy. It monitors backups, upgrades, disk and more metrics.

# Future of Xata Agent

- Building workflows for a **self-optimizing** database.
- Approval workflows through Github to review changes recommended by the Agent
- More extensible and customizable observability workflows inside the Xata Agent via MCP servers

# Challenges & Next steps

**Privacy:** Agent may include metadata (e.g., table names, logs) in LLM prompts sent to external APIs. Self-hosted LLMs are a path forward for sensitive environments.

**Cost:** AI models aren't free—but so far but cheaper than traditional observability tools, even with premium LLMs.

**Safety:** Risk of hallucinations or destructive actions.

- Agent is sandboxed: no arbitrary SQL execution without human approval.
- Future support for riskier actions will require gated workflows.

**Testing:** Testing an AI agent is not like testing normal code.

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# The shift to autonomous agents

Can you trust an agent with your most critical infrastructure?

Just 2 years ago: “No way!”

Now? More and more teams are saying yes.

“ Anything that is in the world when you’re born is normal and ordinary and is just a natural part of the way the world works. Anything invented after you’re thirty-five is against the natural order of things ”

Douglas Adams

The Salmon of Doubt: Hitchhiking the Galaxy One Last Time, 2002

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Postgres at scale

# Thank you!

gulcin@xata.io

xata.io