

# OpenStack Designate

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# What is OpenStack?

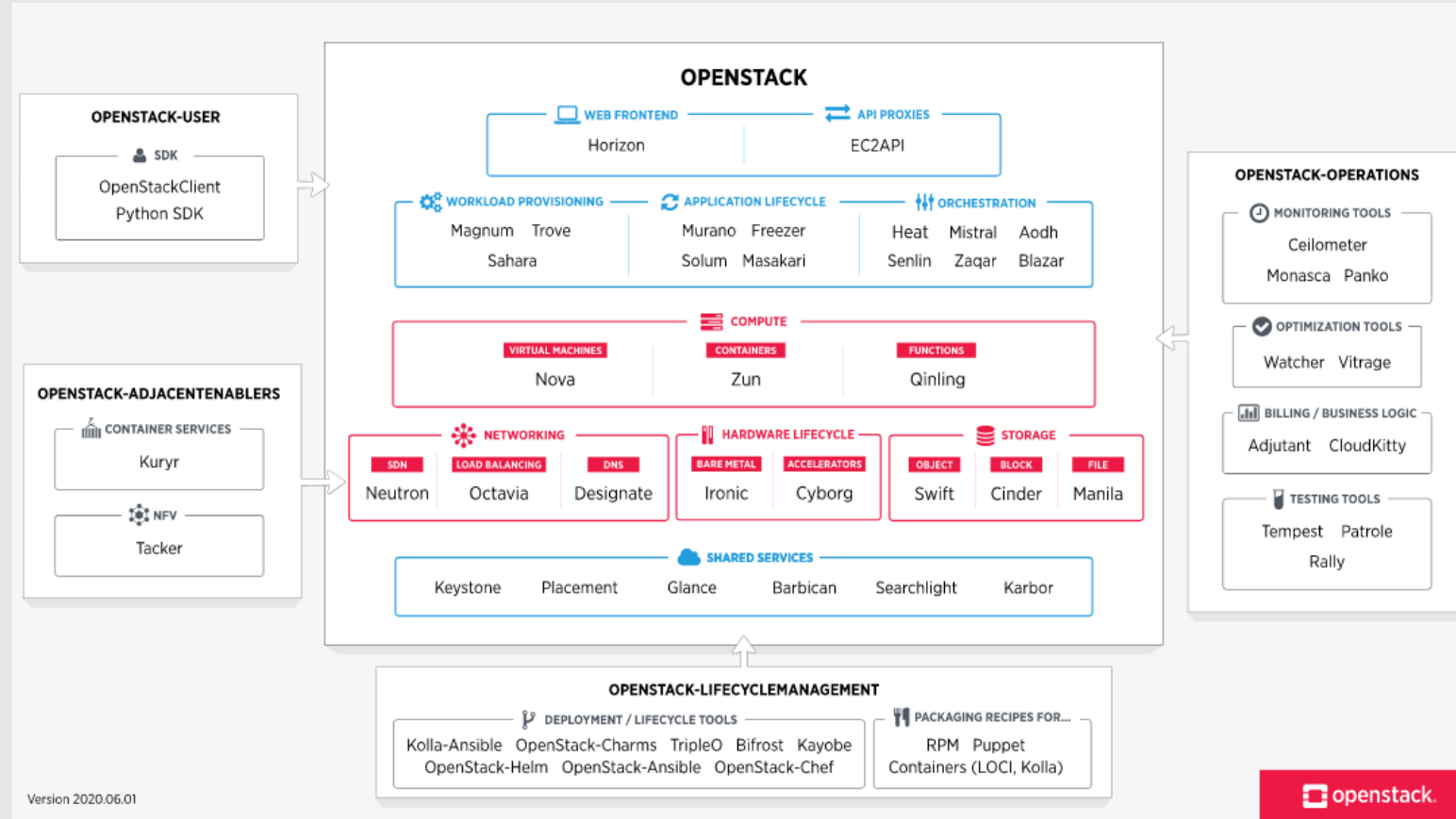
**OpenStack** is a free open standard cloud computing platform, mostly deployed as infrastructure-as-a-service (IaaS) in both public and private clouds where virtual servers and other resources are made available to users.

The software platform consists of interrelated components that control diverse, multi-vendor hardware pools of processing, storage, and networking resources throughout a data center.

Users either manage it through a web-based dashboard, through command-line tools, or through RESTful web services.

OpenStack began in 2010 as a joint project of Rackspace Hosting and NASA. As of 2012, it was managed by the **OpenStack Foundation**

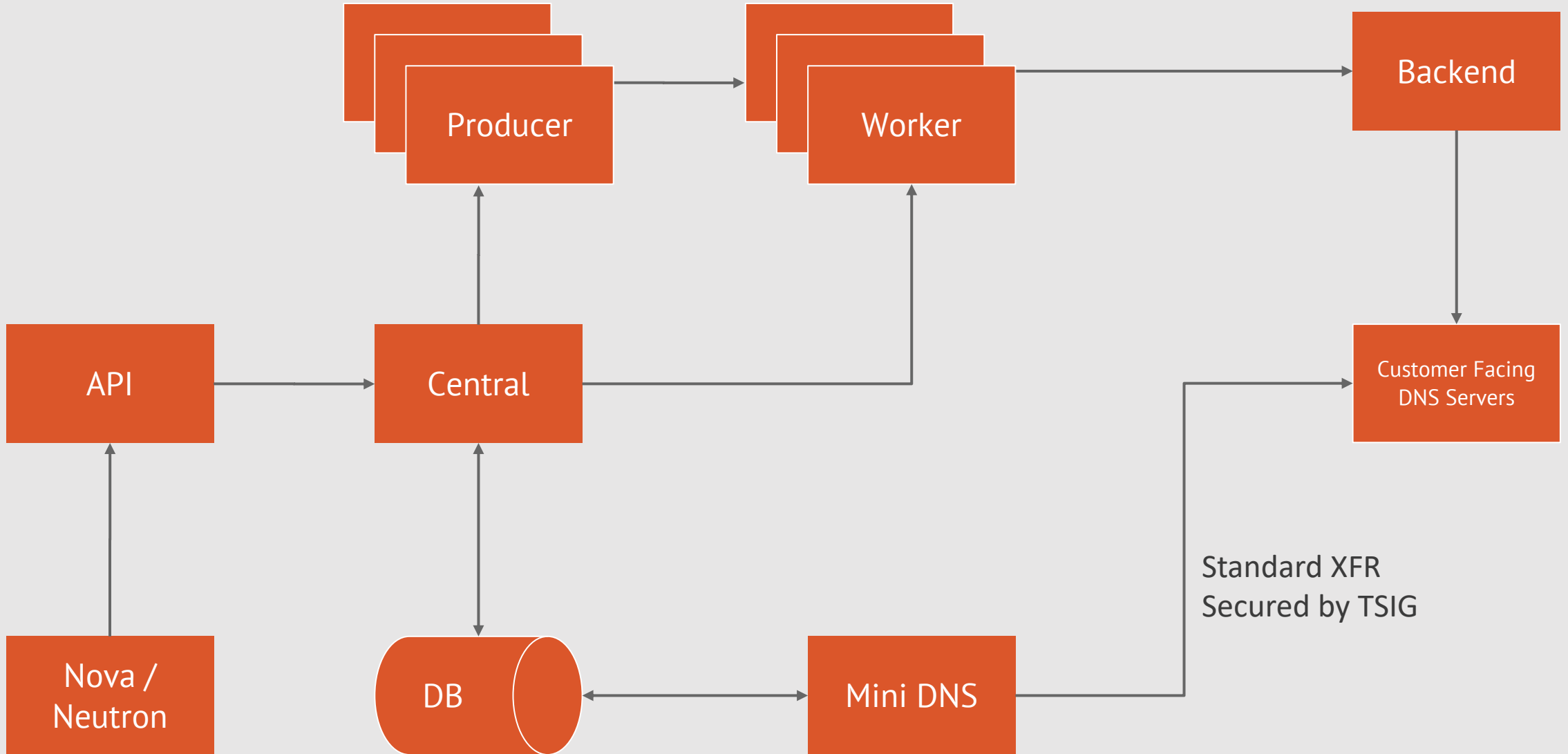
(Source: Wikipedia)



# Designate

- Designate started as a project to maintain DNS infrastructure for OpenStack Users. It was an ecosystem project that was in production at both HP's and Rackspace's clouds. During 2015, Designate was moved into OpenStack Foundation and in 2017 it became a registered trademark.
- Designate is providing API, CLI and a Graphical User interface so that OpenStack Users can setup and make changes to DNS data. The zones are thereafter exposed to secondary DNS servers via Zone Transfers.
- Officially Bind 9.X and PowerDNS 4.X is supported although other DNS servers are known to work too. Most resource Record Types such as A, AAAA, PTR, CNAME, NS, MX, etc are supported





# Need

- We need an open alternative to commercial the cloud services (AWS Route53, Azure DNS, Oracle/DYN, CloudFlare, NS1, Google Cloud Platfrom)
- Keep diversity in the DNS Ecosystem
- Enable end user to make changes via a simple interface and API
- Designate Need/Roadmap:
  - Shared Zones
  - Redesign of Database layer
  - Documentation
  - DNSSEC

# Why DNSaaS?

- SRE / DevOps / Operational Practices
- Removes the Service Desk / Jira ticket
- Automation
- Infrastructure as Code



# How Designate works

- Zone Control is per “project”
  - Async API
  - Zone Data updates are via XFR\*
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- \* Some small exceptions

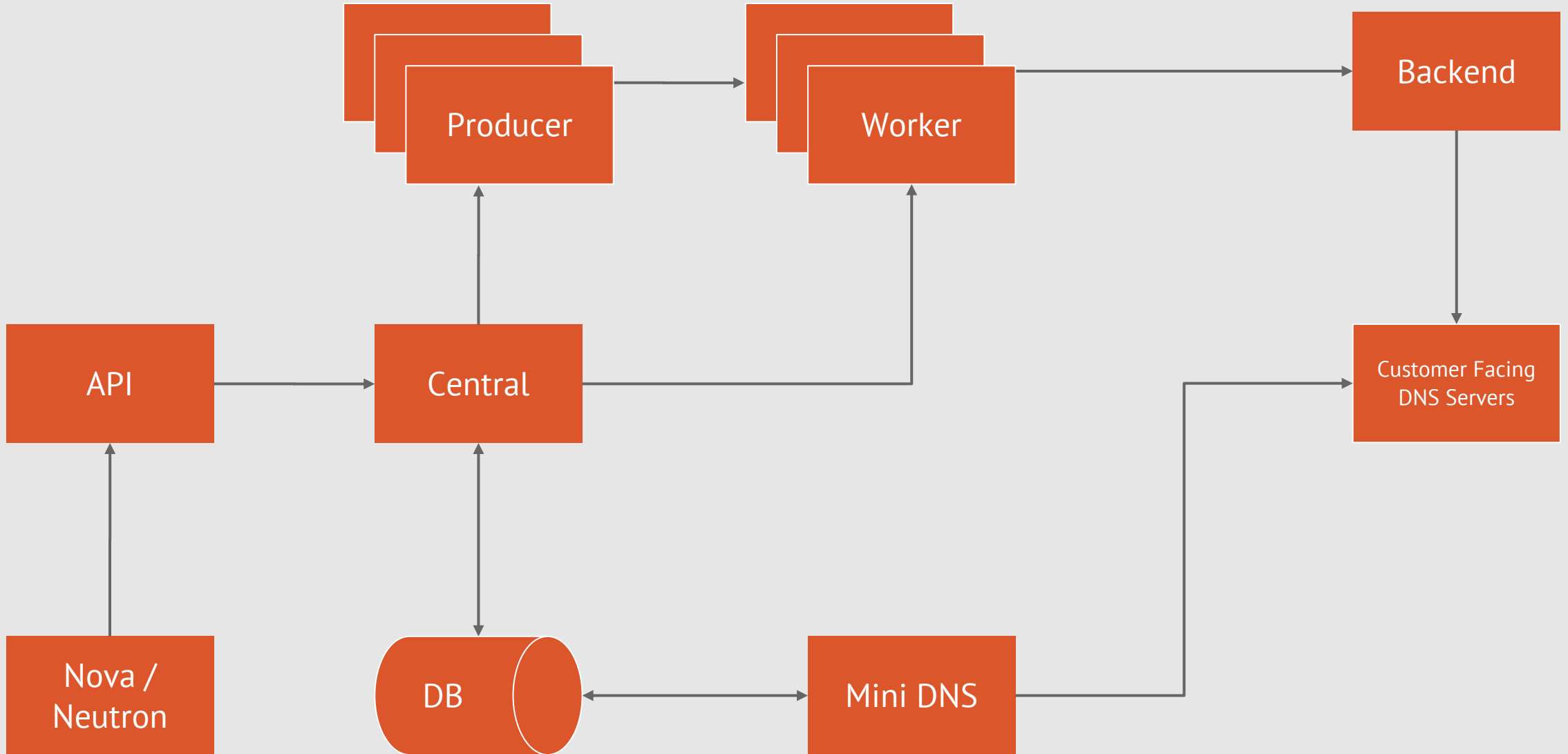


# Example Flow

- API
  - Central
    - Worker
    - MiniDNS
  - Producer
    - Worker







# Pools

- Collection of DNS Servers
- DNS Namespace per pool
- Different tiers
- Different network visibility
- Sharding



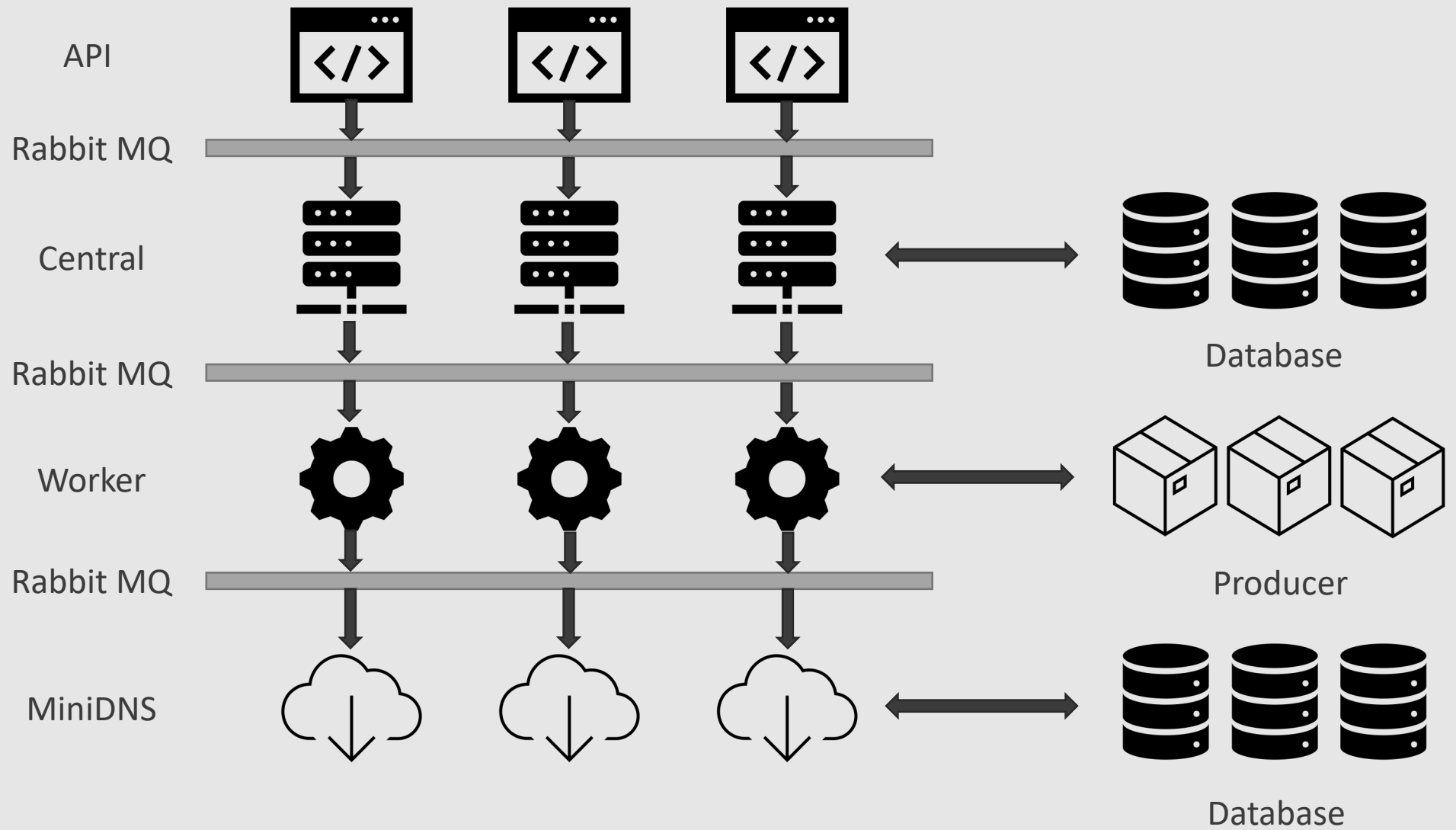
# MiniDNS

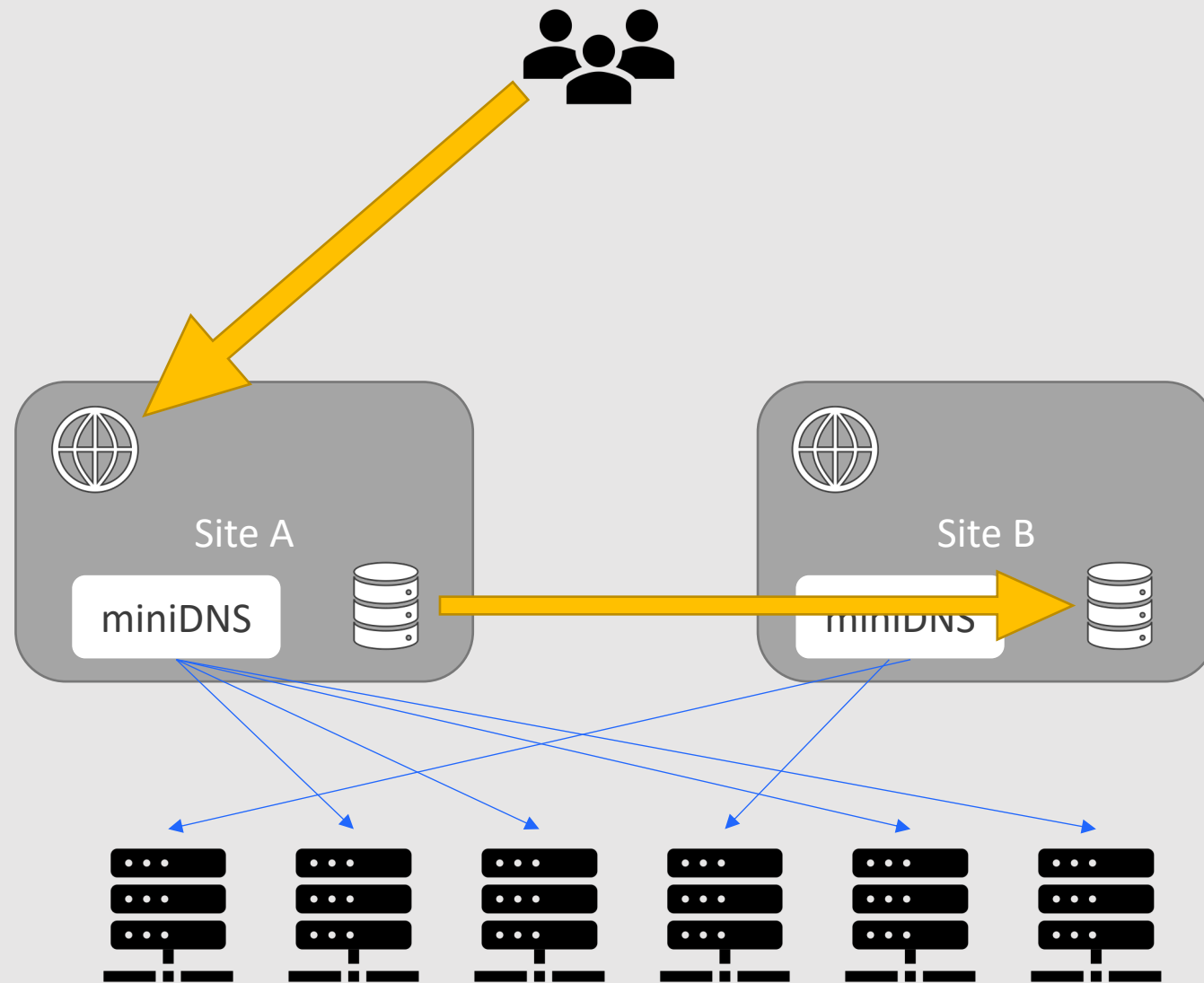
- Direct access to the Designate DB
- Generates XFR response on demand
- Can ingest XFRs to act as a secondary DNS server

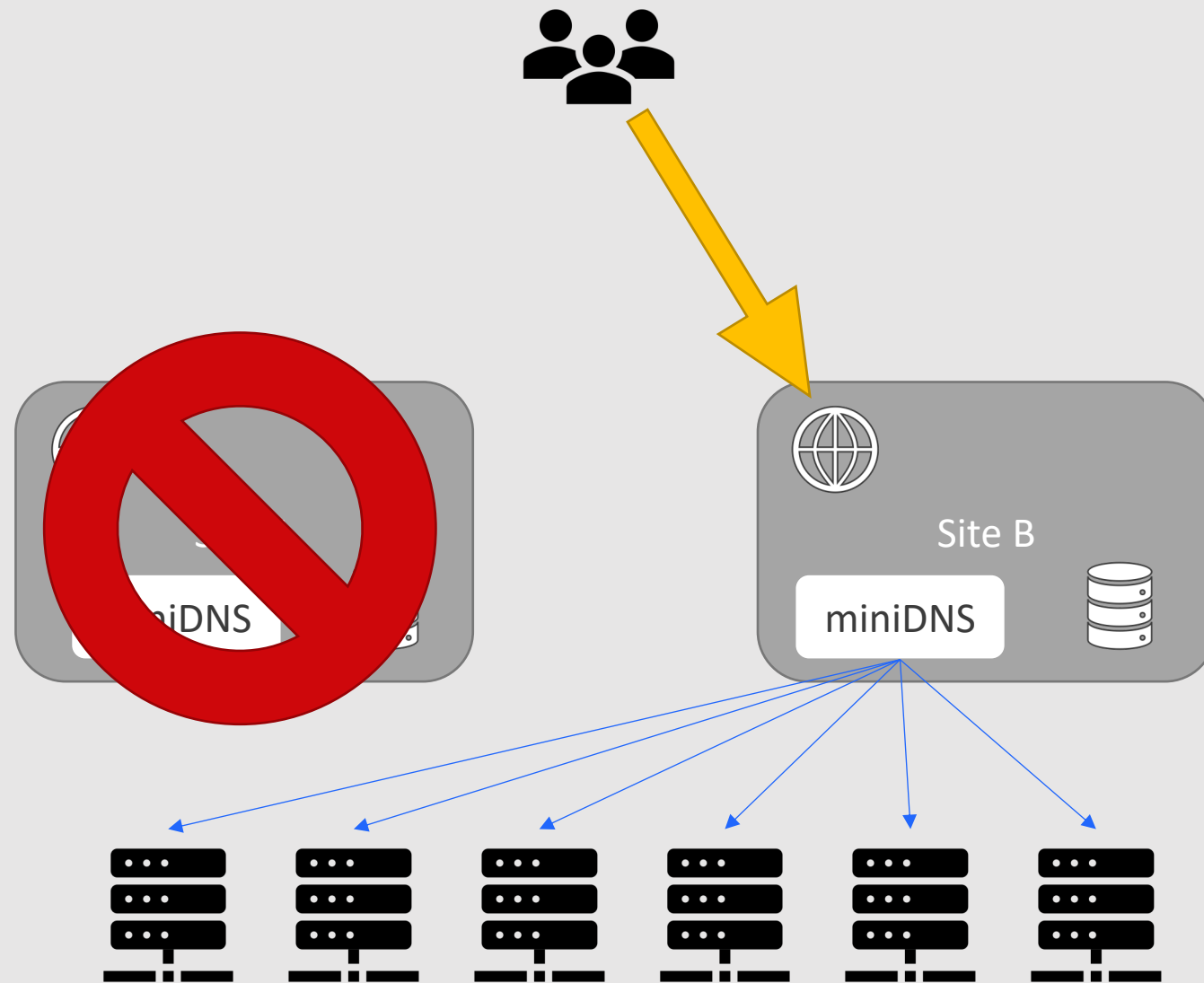


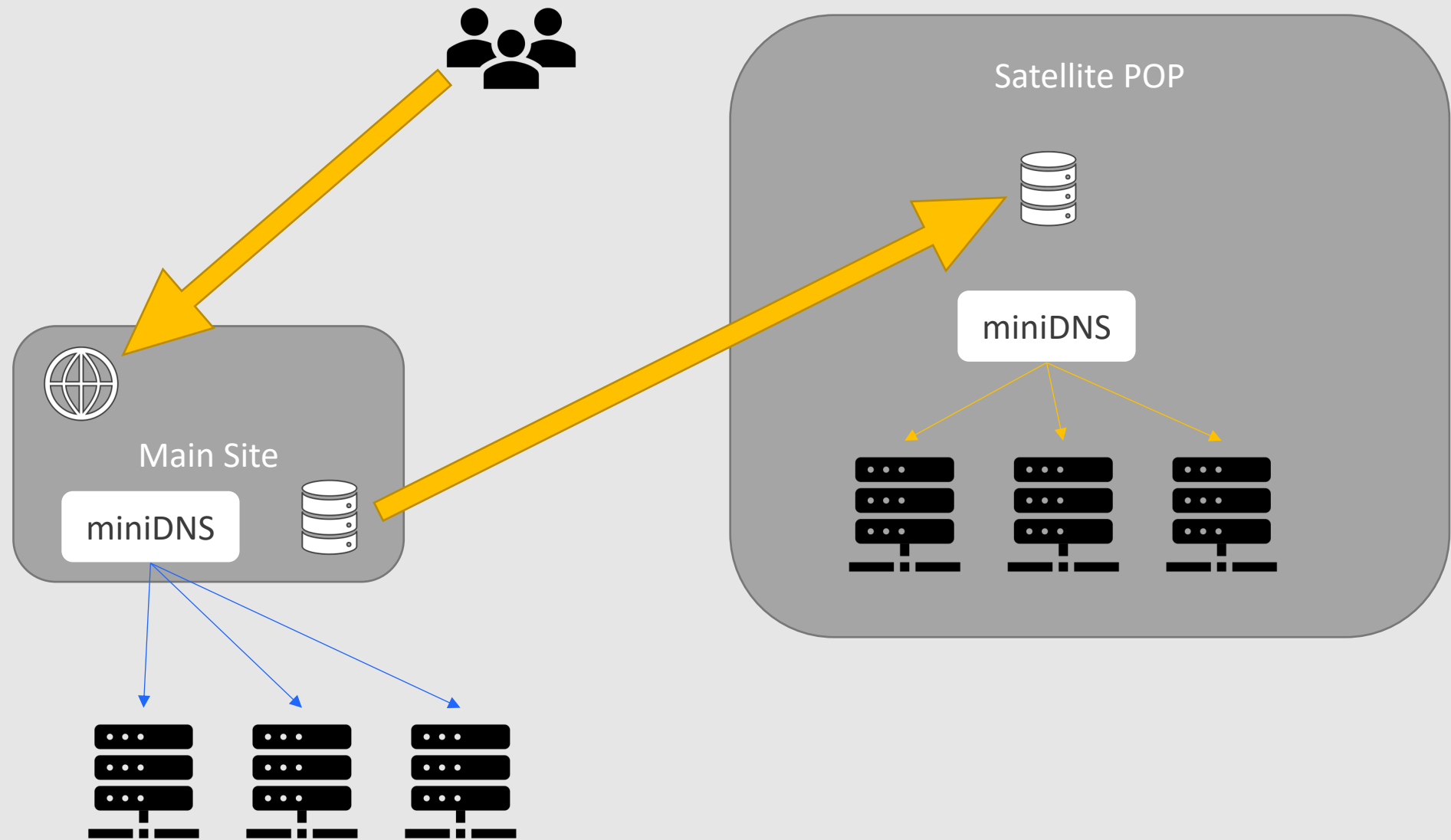
# DB Replication + HA/DR













# Usage



# Integrations – DNS Servers

- Bind9
- PowerDNS 4
  
- Akamai
- Infoblox
- Microsoft DNS Server
  
- Knot, DJBDNS, GDNSSD all “experimental”
- Full list - <https://docs.openstack.org/designate/latest/admin/support-matrix.html>



# Adding DNS Server Support

- Supporting new DNS servers via XFR is easy
- Add 3 methods:
  - Create Zone
  - Delete Zone
  - Update Zone (defaults to sending a notify)

# Designate Agent

- Adds support for edge cases.
- Receives XFR, and the driver can decide what to do
  - Designed for APIs driven providers that do not have a secondary mode

# Integrations – External API

- ACME (certbot)
- Terraform
- Ansible
- Kubernetes (via External-DNS)
- OpenStack Heat (Orchestration Service)
- OpenStack Neutron (Networking Service)



# Example



# Get Involved

- <https://docs.openstack.org/designate/latest/>
- <https://opendev.org/openstack/designate>
- IRC: #openstack-dns on Freenode
- [openstack-discuss@lists.openstack.org](mailto:openstack-discuss@lists.openstack.org)
- [gr@ham.ie](mailto:gr@ham.ie)

