



# Günümüzde Postgres

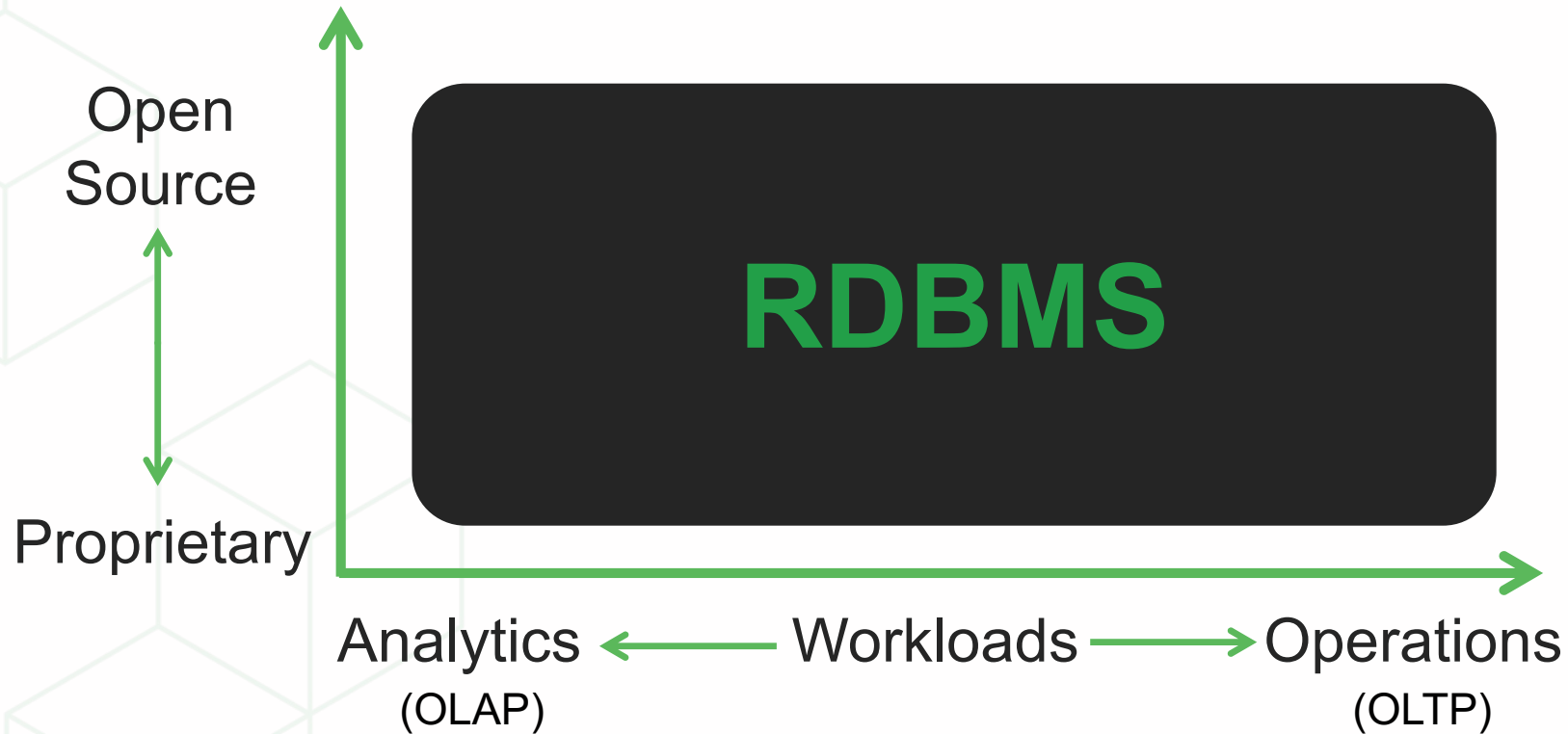
Modern, Ölçeklenebilir Uygulamalar

Utku Azman | Citus Data | PGDay Istanbul

| @citusdata | citusdata.com

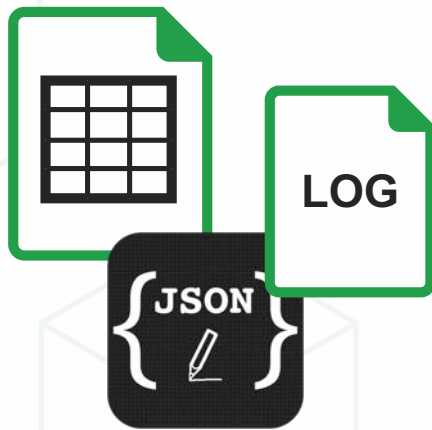


# Veritabanlarının basit olduğu zamanlar (2000'lere kadar)

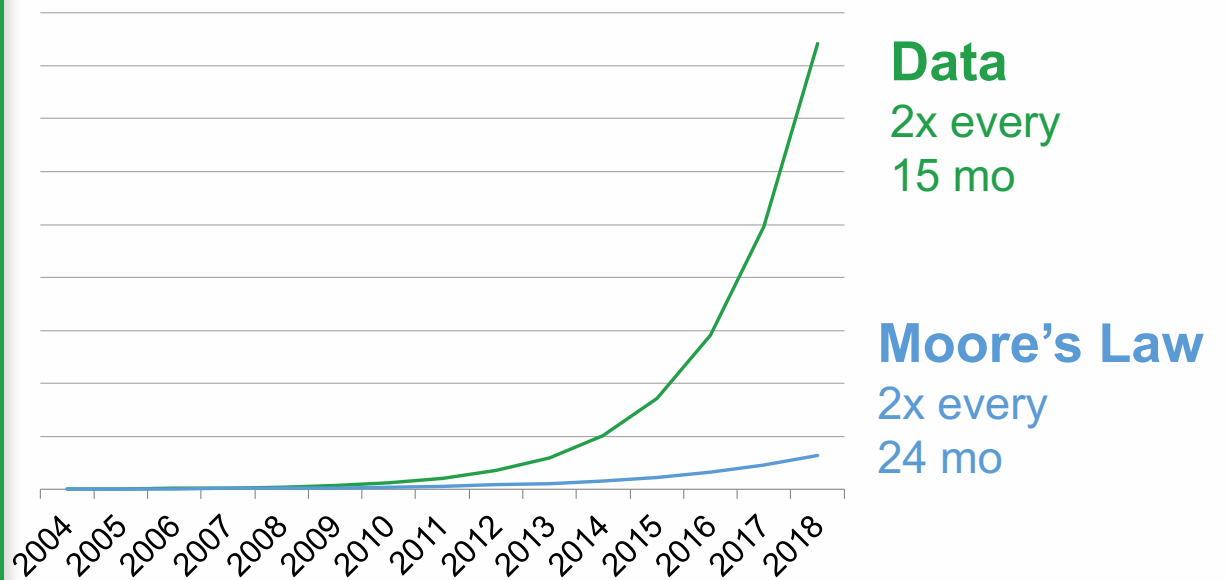


# Bugün yapısal veritabanlarını zorlayan iki gelişme...

## 1 Data with less structure



## 2 Data Growth >> Silicon Growth...



# Postgres'in geçmişinden...

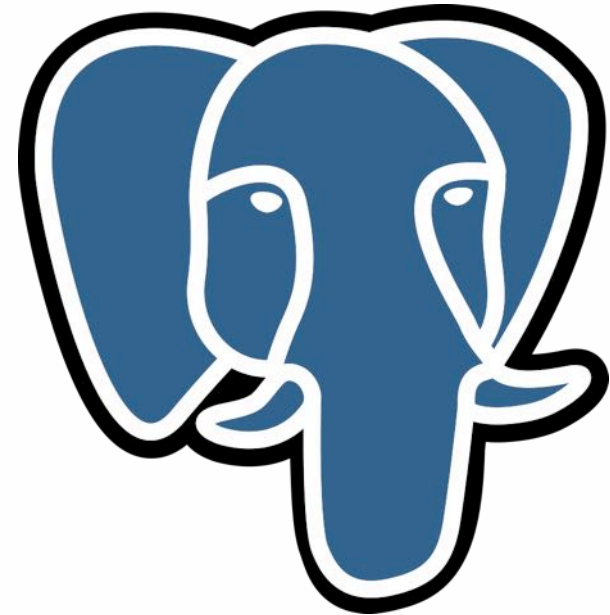
## Bu zorluklar yeni değil

### 1 SQL or not? (1995)

- Post-Ingres
- Started life as object store
- Added SQL API in 1995

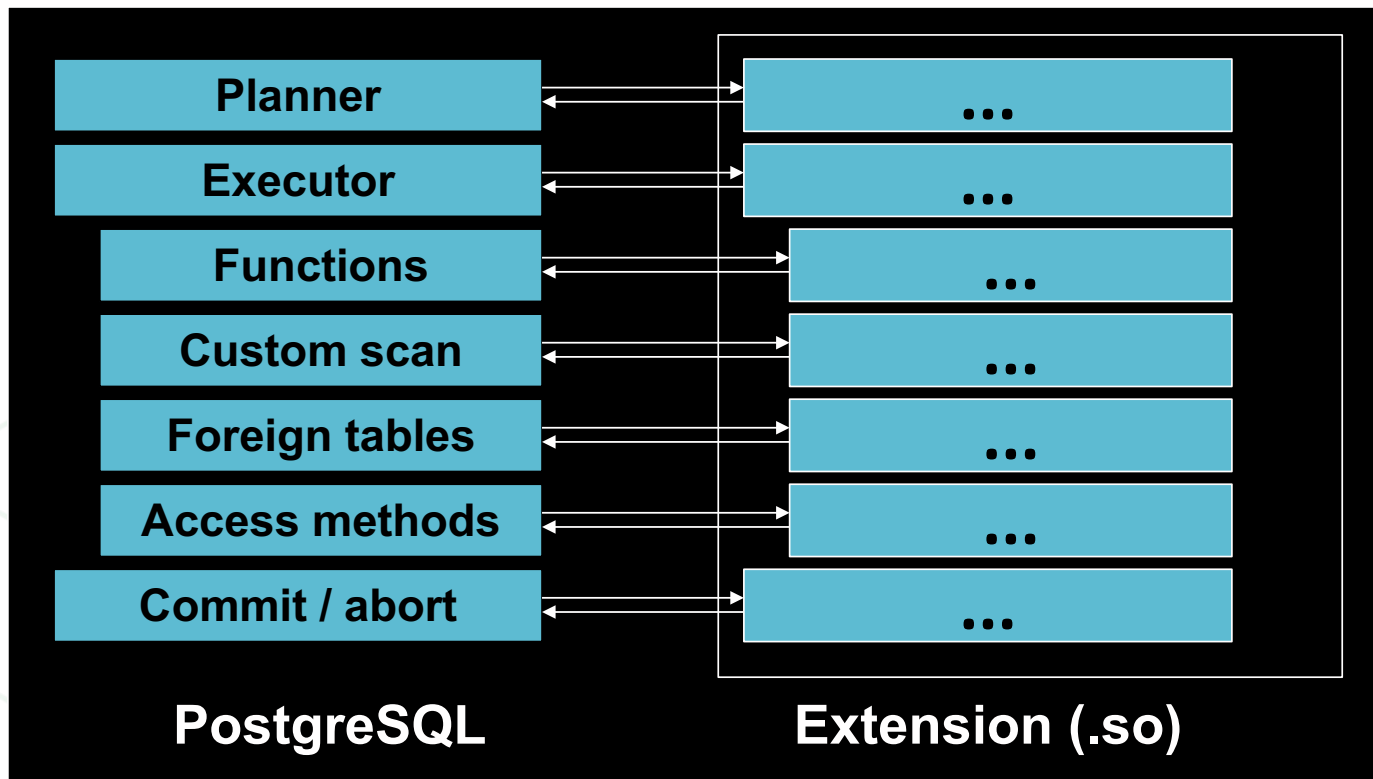
### 2 Scaling out to handle data growth (2005)

- For analytics only: MPPs
- So many forks! AsterData, Netezza, ParAccel (Redshift), Greenplum



# Bugün ise Postgres bu zorluklara karşı çok daha güçlü - SQL Extension APIS (2011)

CREATE EXTENSION ...



# RDBMS ile günümüz ihtiyaçlarına cevap verme

- 1 Yapısal ve yapısal olmayan veri
- 2 Ölçeklenme—işleme & performans



# Dosya sisteminden başlama

---

- (+) Any data, any structure
  - (+) 'Infinately' scalable storage
  - (+) Write fast
- 
- (-) Pay cost at query time
  - (-) Batch vs. real-time
  - (-) Indexes (Append only FS)





# Tek bir erişim şeklini destekleme

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Semi-structured (JSON)

(+) Simple: Put & Get

(+) Scalable

---

(-) No expressiveness for analytics

(-) No JOINS, data duplication

(-) Enforce structure at app layer





1

Yapısal ve Yapısal olmayan veri

# Veritabanını JSON data tipiyle genişletme

Table "public.events"

Column	Type	Sample Data
user_id	<i>bigint</i>	09288
created_at	<i>timestamp</i>	2018-03-08 00:57:12.6936+00
payload	<i>jsonb</i>	<pre>{   "person":{     "name":"Emma",     "emails":{"west":"emma@sf.com", "east":"emma@nyc.com"},     "address":{"       "street_number":12,       "street_name":"15th Street",       "city":"San Francisco",       "state":"CA",       "zip":94107     },     "phone_numbers":["6501234567","6500123456"]   },   "country":"USA",   "event_type":"push_notification",   "device_type":"mobile" }</pre>



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Ölçeklenme – İşleme ve performans

## Index ve diğer temel performans araçları

B-tree indexes

GIN & GiST indexes

Secondary indexes

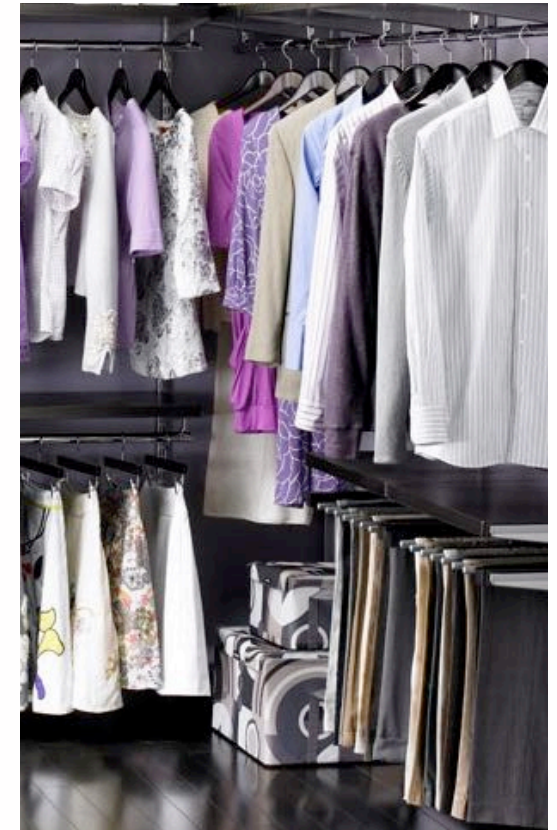
Full text search

Index-only scans

Fitting indexes into memory

+

Not to forget: Parallel queries, MVCC, and many more.

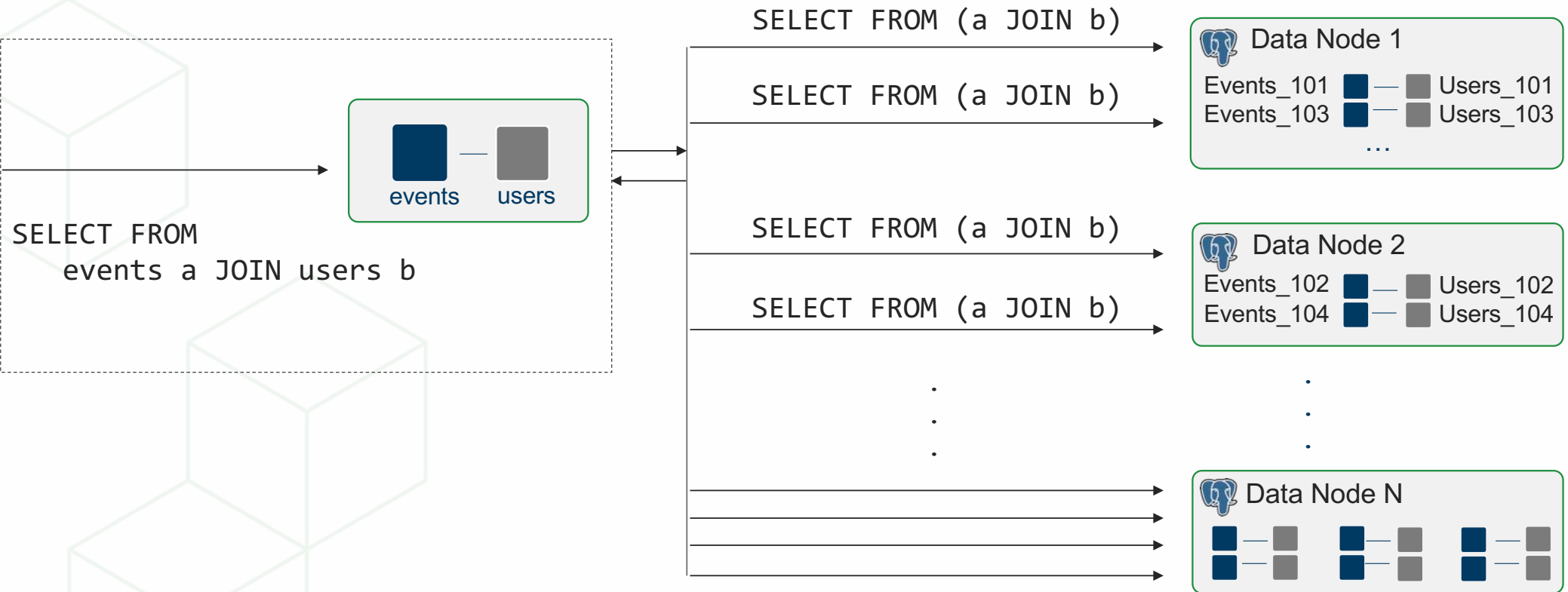




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## Ölçeklenme – İşleme ve performans

# İşlem (ve join)leri birden fazla PostgreSQL instances'a gönderme





# Postgres'e yatay ölçeklenme için eklenti: Citus



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Scalable PostgreSQL for multi-tenant and real-time workloads <https://www.citusdata.com>

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1,734 commits

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36 releases

29 contributors

AGPL-3.0

Branch: master

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onderkalaci Merge pull request #2031 from citusdata/fix\_immediate\_shut\_down\_issue

Latest commit e7b28dd 3 days ago

config

Add citus\_version(), analogous to PG's version()

5 months ago

src

Handle failures during I/O

3 days ago

.codecov.yml

Remove obsolete lines

5 months ago

.editorconfig

Set tab size for GitHub display

a year ago

.gitattributes

Add ruleutils file for PostgreSQL 11

5 months ago

# PostgreSQL: Dinamik ve global ekosistem

## Sample PostgreSQL Extensions

citus  
pgcrypto  
pg\_cron  
pg\_partman  
postgresql-HLL  
cstore\_fdw  
unaccent  
cube  
jdbc\_fdw  
pg\_trgm  
PostGIS  
...

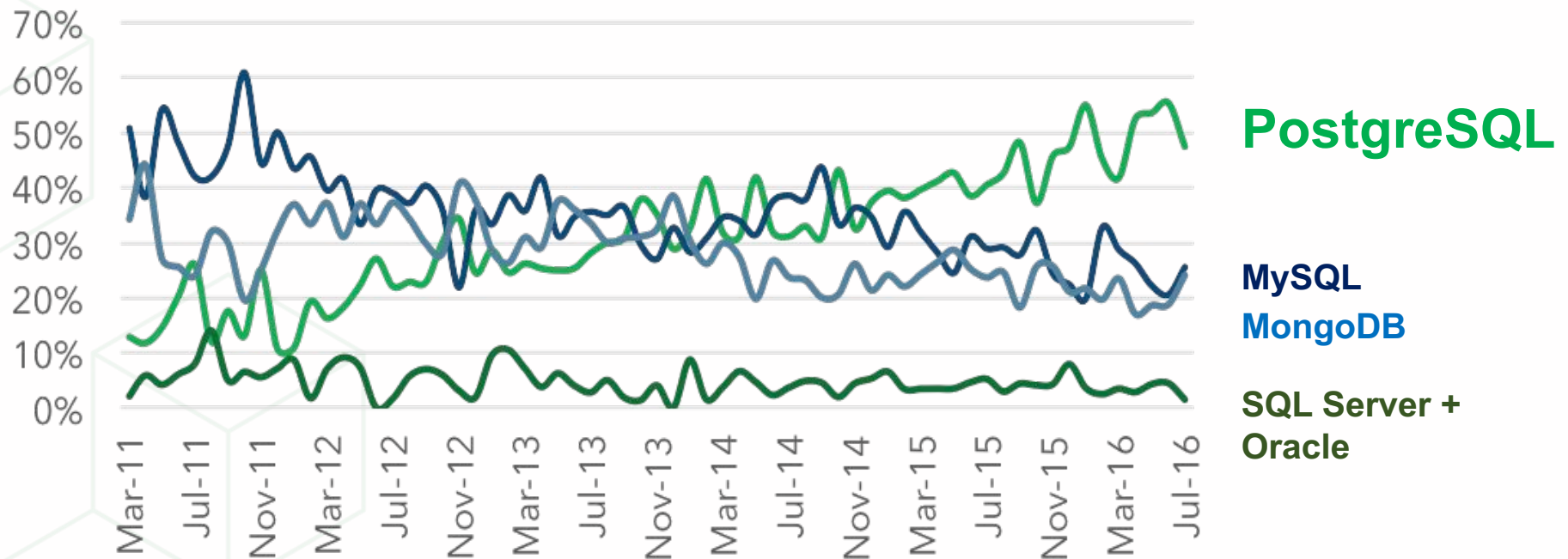
pg\_buffercache  
pg\_prewarm  
btree\_gin  
btree\_gist  
postgis\_topology  
pg\_stat\_statements  
postgresql-unit  
plpgsql  
plv8  
pg\_telemetry  
foreign data wrappers  
...

## Integrations



# PostgreSQL'in artan momentumu

Database adoption among developers<sup>1</sup>

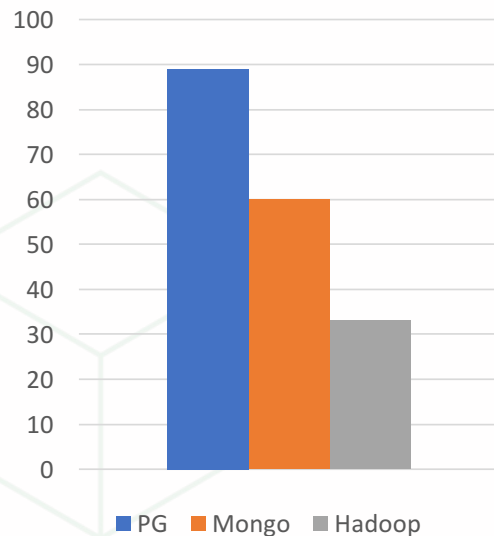


Source: % database job postings that mention each specific technology, across 20K+ job posts on Hacker News, <https://news.ycombinator.com>



# ...ve büyüyen kullanıcı kitlesi

PostgreSQL popularity =  
Hadoop + Mongo combined



Source: Google Trends for the past 2 years

Winning Startups &  
Enterprises

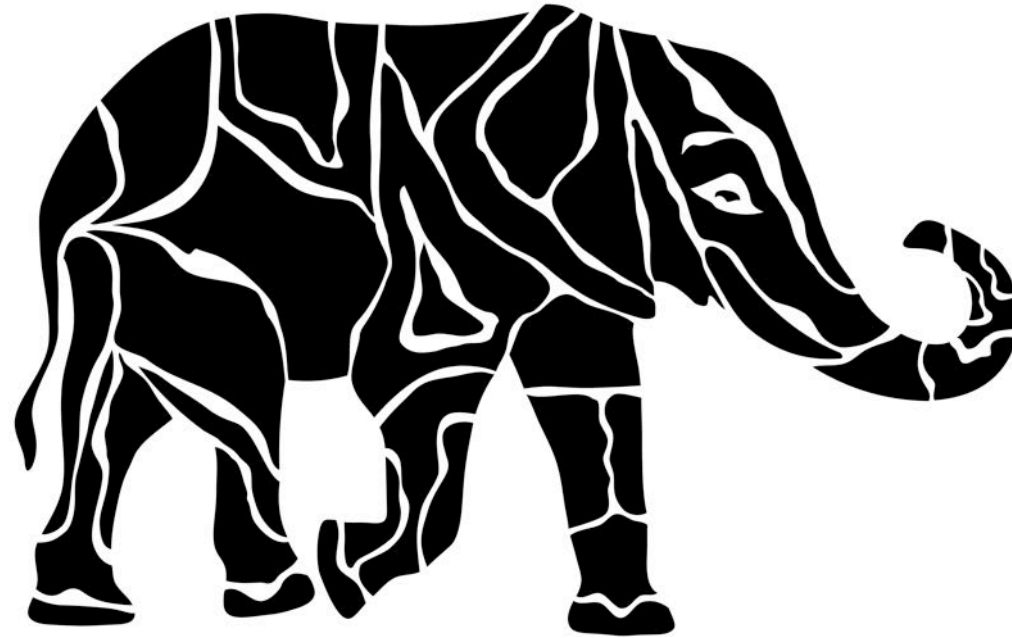


vmware®



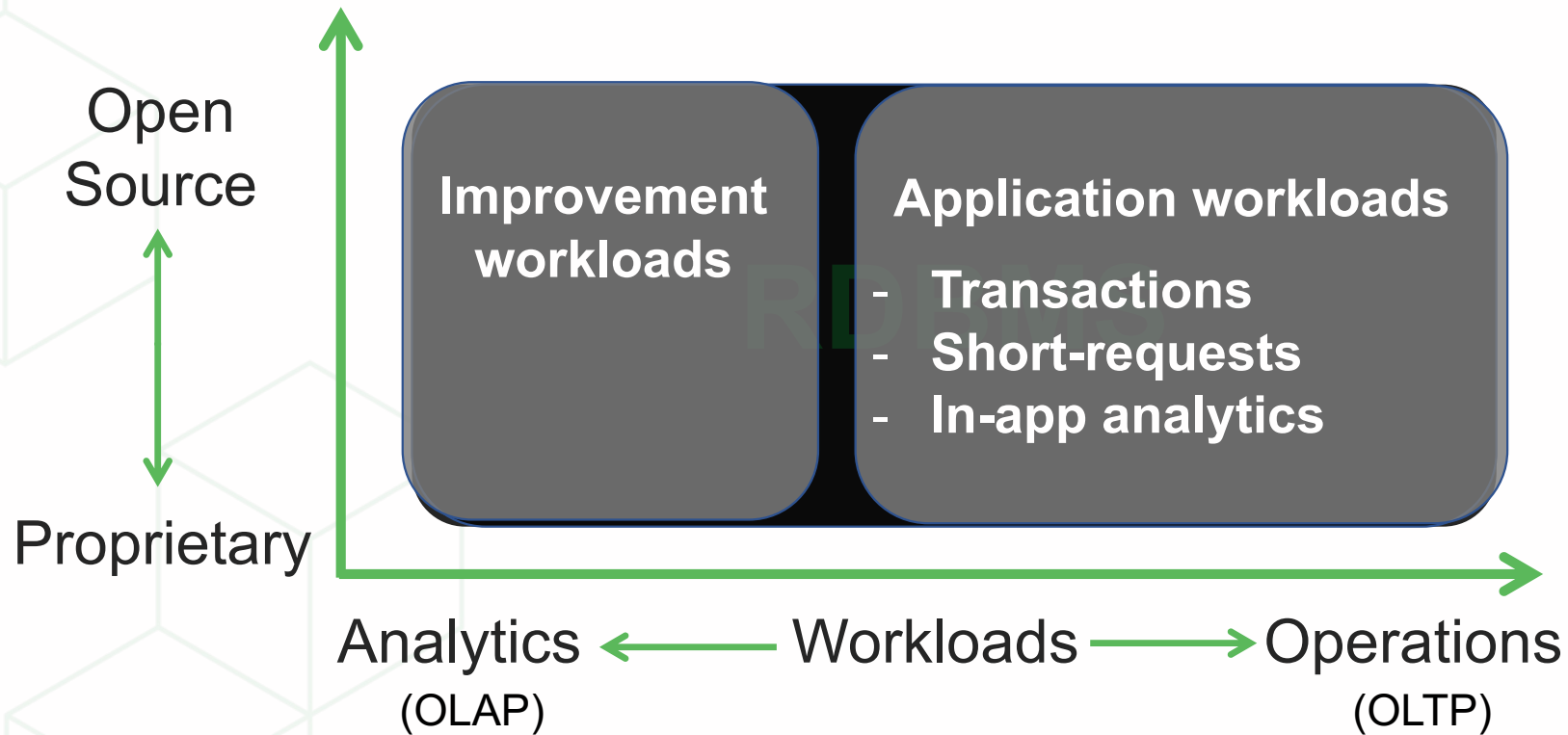


# Postgres'in uzun soluklu yürüyüşü

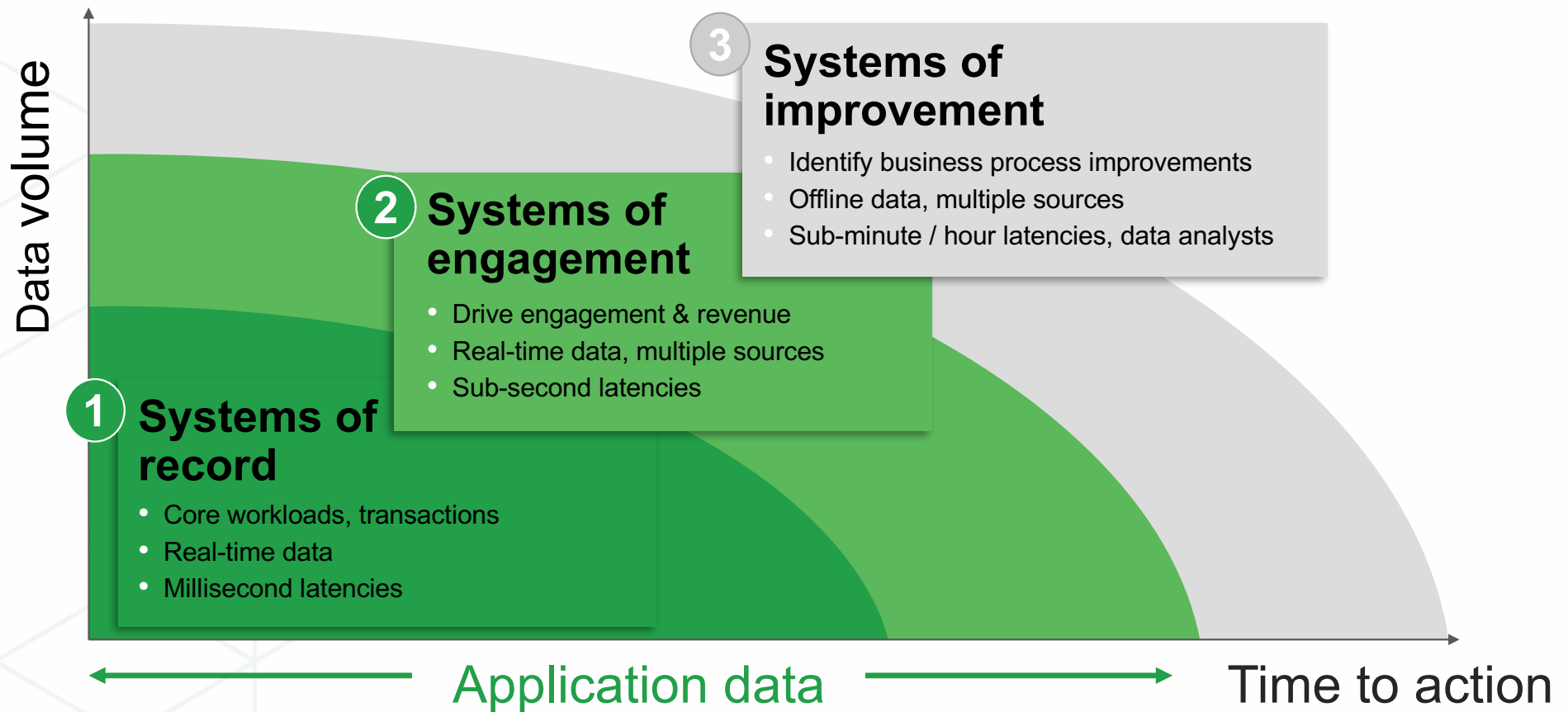


Günümüz uygulamalarında Postgres stack'in neresinde?

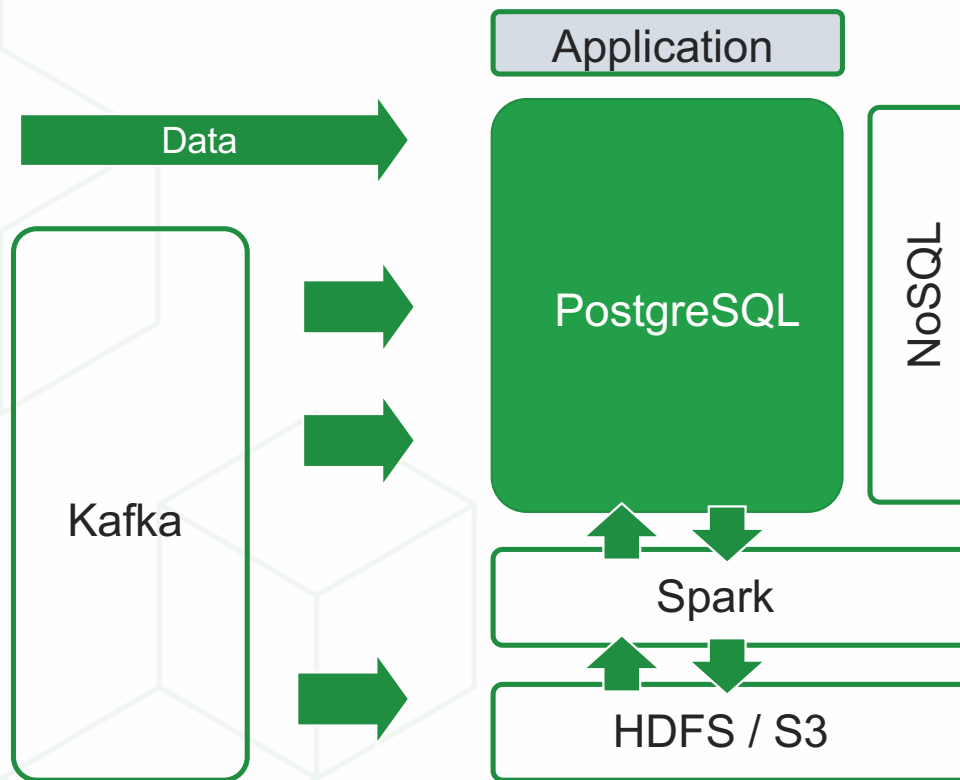
# Modern iş yükleri de evrim geçiriyor...



# Modern veritabanlarının desteklediği 3 tip uygulama



# Altyapınızda PostgreSQL'in yeri



- Standalone database
  - Storage
  - Compute
- Persistence layer for Kafka
- Persistence layer for Spark
- Adjacent to NoSQL

Note: Standard PostgreSQL connectors for all tools (e.g. ODBC / JDBC, PostgreSQL language bindings) available for integrations.

# Özetle: PostgreSQL



Eklentiler

Esneklik

Ekosistem



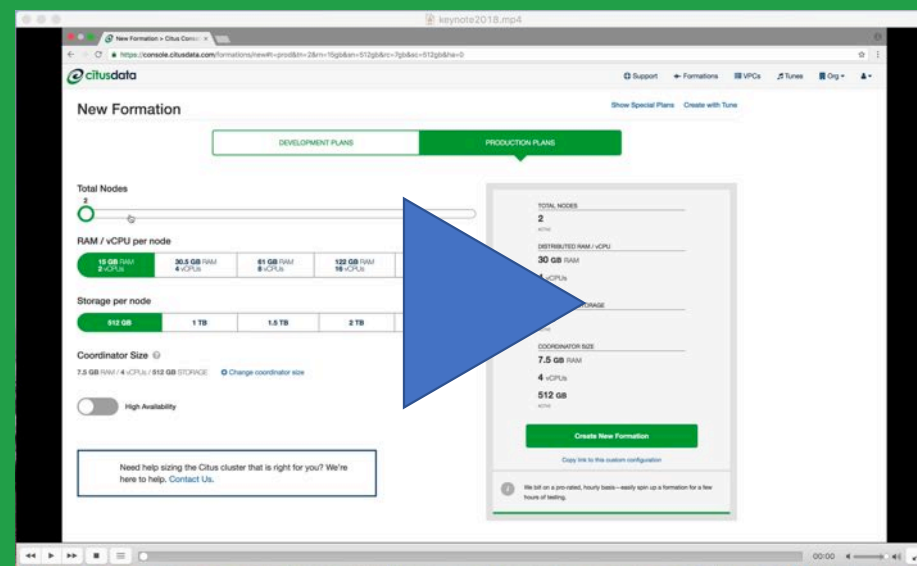
Rasty Turek @synopsi

Dec 21, 2016

Today one of our PostgreSQL tables surpassed half of trillion rows [over 54TB of data].

And still most of our queries run under 600ms

# Ölçeklenme – Video demo







# Teşekkürler



**@citusdata**

**[github.com/citusdata/citus](https://github.com/citusdata/citus)**

**[citusdata.com/jobs](https://citusdata.com/jobs)**