

Exploring Alternative Databases

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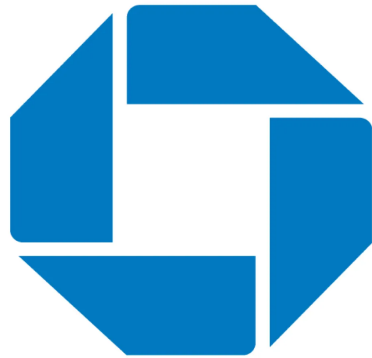
Data Structures

Scalability

Consistent or Available?

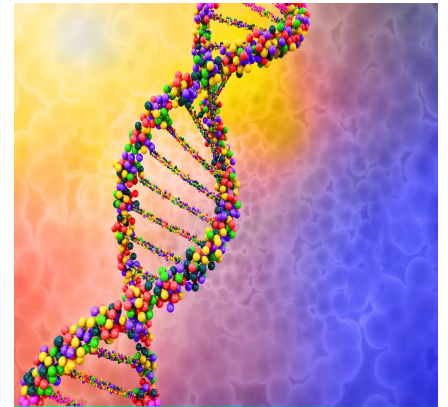
Traditional Databases

- **A**tomic
- **C**onsistent
- **I**solated
- **D**urable

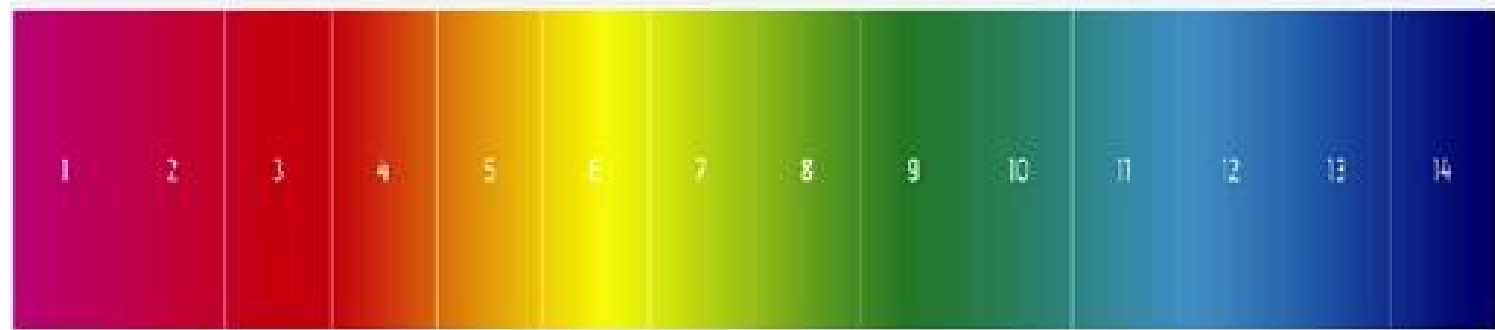


New Generation Databases

- **B**asic
- **A**vailability
- **S**oft-state
- **E**ventual consistency



Technologies



ACID Datastores

BASE Datastores

- <https://www.gavstech.com/the-shifting-ph-of-databases-from-acid-to-base/>

Tables vs Dictionaries

SQL File 1* x

```
1 • use test;
2
3 • CREATE TABLE employee
4 (
5   id int primary key,
6   name varchar(30),
7   dob datetime,
8   email varchar(40)
9 );
10
11 • DESC employee;
```

Filter: File: Autosize: IA

	Field	Type	Null	Key	Default	Extra
▶	id	int(11)	NO	PRI	NULL	
	name	varchar(30)	YES		NULL	
	dob	datetime	YES		NULL	

UserProfile

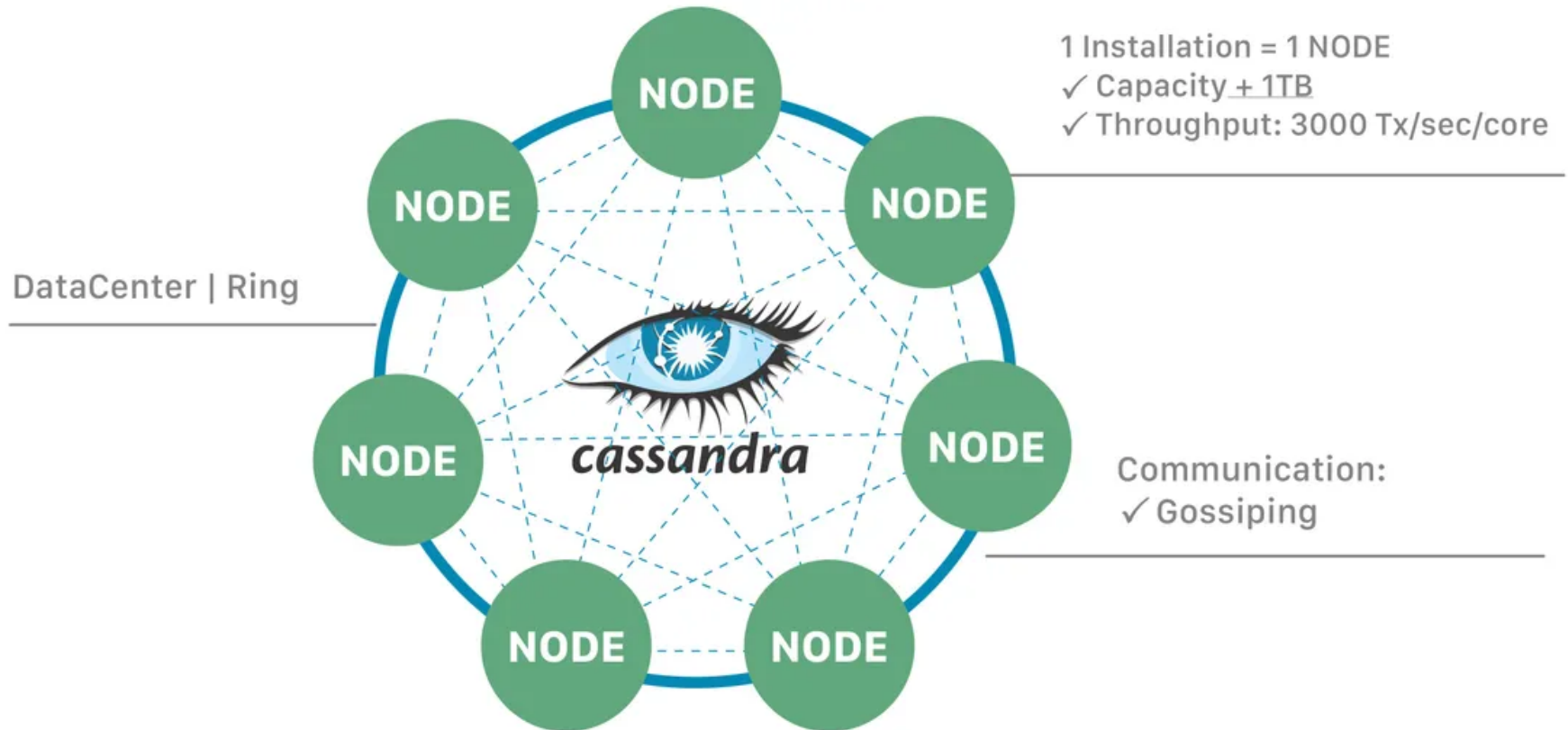
Bob	emailAddress	gender	age
	bob@example.com	male	35
	1465676582	1465676582	1465676582

Britney	emailAddress	gender
	brit@example.com	female
	1465676432	1465676432

Tori	emailAddress	country	hairColor
	tori@example.com	Sweden	Blue
	1435636158	1435636158	1465633654

Highly Scalable, Fault Tolerant

ApacheCassandra™ = NoSQL Distributed Database



- <https://www.baeldung.com/cassandra-keys>

Non-Relational Operations

- **C**reate

- **U**pdate

- **R**ead

- **D**elete

```
db.users.updateMany(
```

```
{ age : { $lt: 18 } },
```

```
{ $set : { status : "reject" } }
```

```
)
```

←

←

←

collection

update filter

update action

```
db.users.find(
```

```
{ age : { $gt: 18 } },
```

```
{ name: 1, address : 1 }
```

```
). Limit(5)
```

←

←

←

←

collection

query criteria

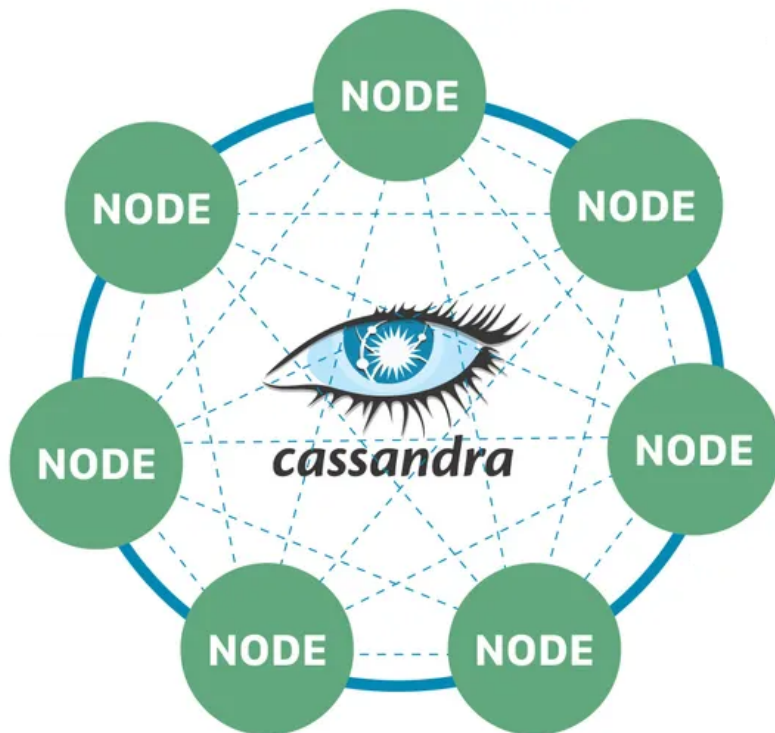
projection

update action



ACID Datastores

BASE Datastores



UserProfile

Bob	emailAddress	gender	age
	bob@example.com	male	35
	1465676582	1465676582	1465676582
Britney	emailAddress	gender	
	brit@example.com	female	
	1465676432	1465676432	
Tori	emailAddress	country	hairColor
	tori@example.com	Sweden	Blue
	1435636158	1435636158	1465633654