Outline

- Family of NoSQL DBs
- MongoDB profile
- Basic operations
- Company details

The family of NoSQL DBs

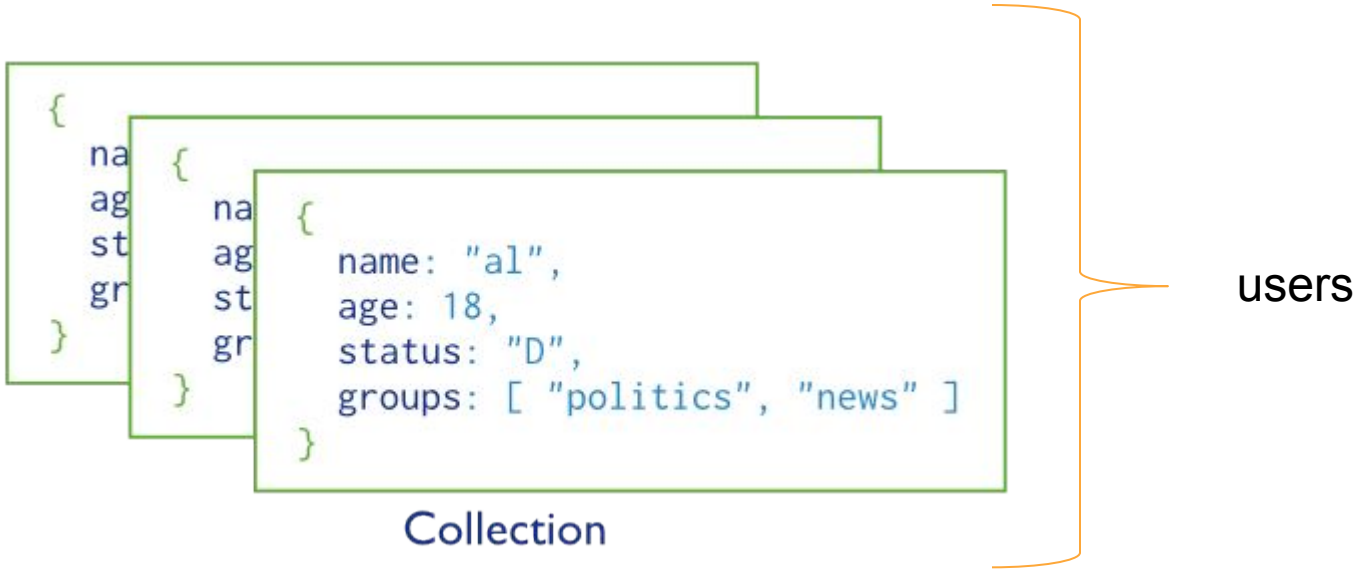
- **Key-values Stores**
  - Hash table where there is a unique key and a pointer to a particular item of data.
  - Focus on scaling to huge amounts of data
  - *E.g. Oracle BDB*
- **Column Family Stores**
  - To store and process very large amounts of data distributed over many machines
  - *E.g. Cassandra, HBase*
- **Document Databases**
  - Collections of Key-Value collections
  - The next level of Key/value, allowing nested values associated with each key.
  - Appropriate for Web apps.
  - *E.g. CouchDB, MongoDb*
- **Graph Databases**
  - Bases on property-graph model
  - Appropriate for Social networking, Recommendations
  - *E.g. Neo4J, Infinite Graph*

MongoDB profile

- Document-oriented NoSQL database.
- Schema-free.
- Based on Binary JSON; BSON[2].
- Organized in Group of Documents Collections
  - Informal namespacing
- Auto-Sharding in order to scale horizontally.
- Simple query language. Rich, document-based queries.
- Map/Reduce support (See more at [7]).
- Open Source (GNU AGPL v3.0.)

Basic operations

```
{
  name: "sue",                          <-- field: value
  age: 26,                              <-- field: value
  status: "A",                          <-- field: value
  groups: [ "news", "sports" ]          <-- field: value
}
```



©MongoDB [3]

CRUD operations - create

Insert a new user.

SQL

```
INSERT INTO users                          <-- table
            ( name, age, status )          <-- columns
VALUES      ( "sue", 26, "A" )             <-- values/row
```

MongoDB

```
db.users.insert (                          <-- collection
   {
     name: "sue",                          <-- field: value
     age: 26,                              <-- field: value
     status: "A"                           <-- field: value
   }                                       } document
)
```

CRUD operations – create (cont'd)

Collection → `db.users.insert(` ← Document

```
{
    name: "sue",
     age: 26,
  status: "A",
  groups: [ "news", "sports" ]
}
)
```

Document

```
{
  name: "sue",
  age: 26,
  status: "A",
  groups: [ "news", "sports" ]
}
```

insert →

Collection

```
{ name: "al", age: 18, ... }
{ name: "lee", age: 28, ... }
{ name: "jan", age: 21, ... }
{ name: "kai", age: 38, ... }
{ name: "sam", age: 18, ... }
{ name: "mel", age: 38, ... }
{ name: "ryan", age: 31, ... }
{ name: "sue", age: 26, ... }
```

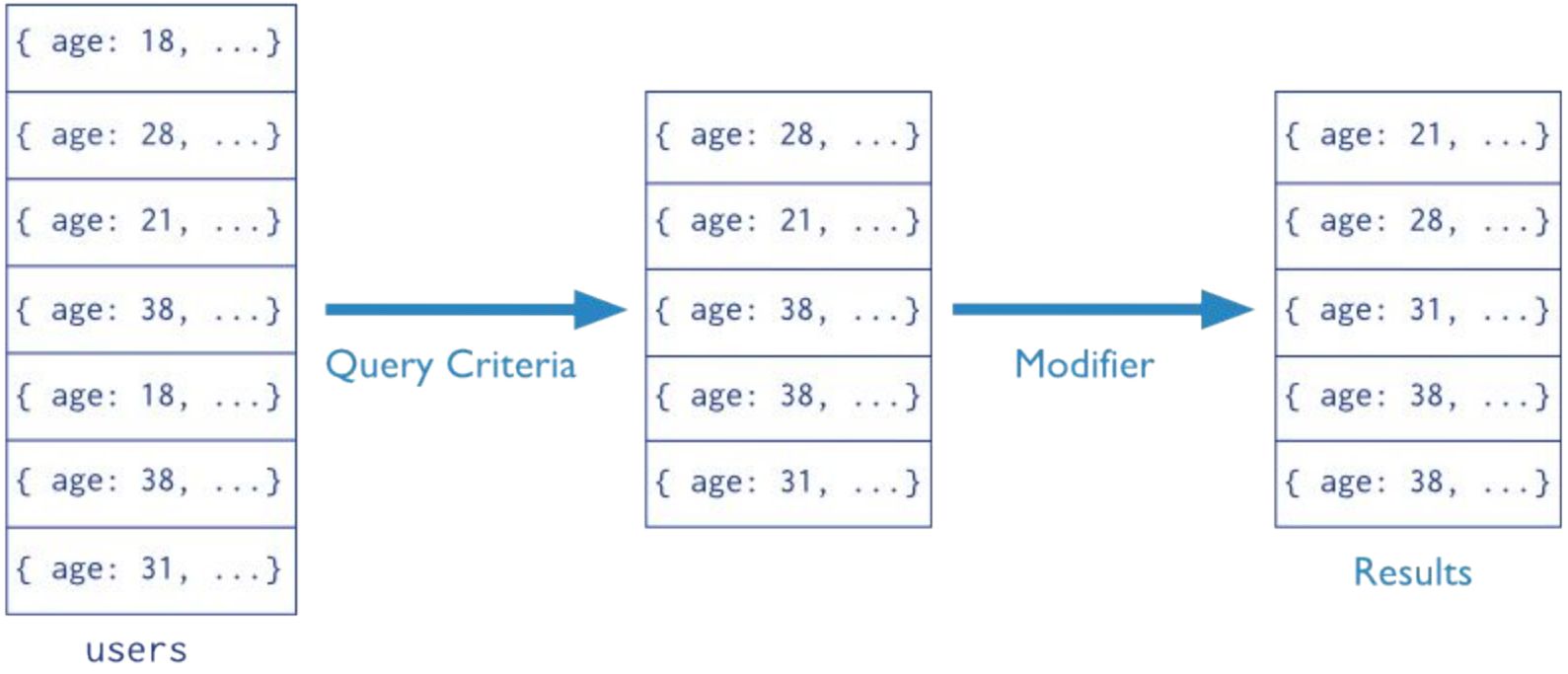
©MongoDB [3]

CRUD operations - read

Find the users of age greater than 18 and sort by age.

Collection | Query Criteria | Modifier

```
db.users.find( { age: { $gt: 18 } } ).sort( {age: 1 } )
```



©MongoDB [3]

CRUD operations - update

Update the users of age greater than 18 by setting the status field to A.

SQL

```
UPDATE users          <-- table
SET    status = 'A'   <-- update action
WHERE  age > 18       <-- update criteria
```

MongoDB

```
db.users.update(                      <-- collection
   { age: { $gt: 18 } },              <-- update criteria
   { $set: { status: "A" } },         <-- update action
   { multi: true }                    <-- update option
)
```

CRUD operations - delete

Delete the users with status equal to D.

SQL

```
DELETE FROM users      <-- table
WHERE  status = 'D'    <-- delete criteria
```

MongoDB

```
db.users.remove(           <-- collection
   { status: "D" }         <-- remove criteria
)
```

Company details

- MongoDB is funded by leading investment firms and technology companies, including Altimeter Capital, Fidelity Investments, Flybridge Capital Partners, In-Q-Tel, Intel Capital, NEA, Red Hat, Salesforce.com, Sequoia Capital, Union Square Ventures and T. Rowe Price. [5]

References

[1] Mikayel Vardanyan, Picking the right NoSQL Database Tool: http://blog.monitis.com/index.php/2011/05/22/picking-the-right-nosql-database-tool/

[2] BSON Specification: http://bsonspec.org/

[3] MongoDB CRUD operations: http://docs.mongodb.org/manual/crud/

[4] MongoDB Write operations: http://docs.mongodb.org/manual/core/write-operations/

[5] MongoDB Investors: http://www.mongodb.com/investors

[6] MongoDB Closes $150 Million in Funding: http://www.mongodb.com/press/mongodb-closes-150-million-funding

[7] MongoDB Aggregation introduction: http://docs.mongodb.org/manual/core/aggregation-introduction/

[8] STI INNSBRUCK www.sti-innsbruck.at