Cloudy With A Chance Of Java

Building Multitenant Java EE Cloud Applications

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Agenda

1. Introduction
2. Overview of Strategies
3. Implementations
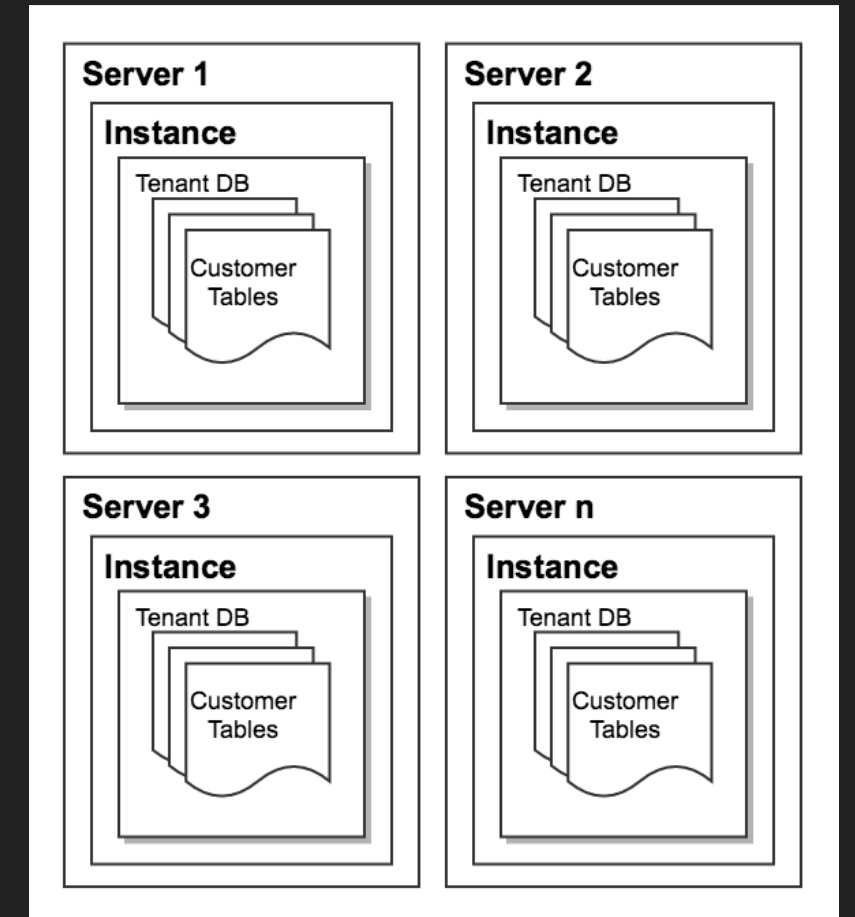4. Q&A

Overview Of Strategies

- Separate Databases
- Shared Database, Separate Schemas
- Shared Database, Shared Schema
- Several others possible, not worth mentioning
  - Shared Database, shared schema, separate tables

Separate Databases

Each tenant has its own copy of the entire database
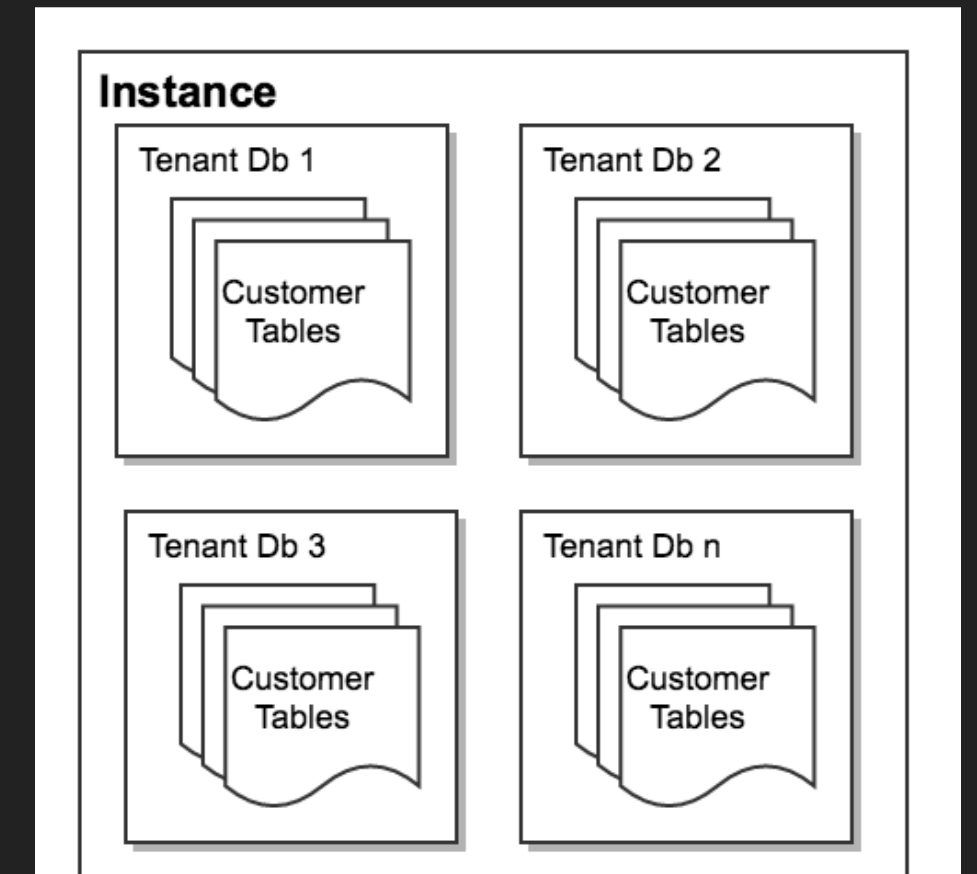
Each database can be in its own instance, or the databases can share an instance

Advantages

- Customer data is 100% isolated
- Backup/Recovery is simplified

Disadvantages

- Licensing costs may increase
- Infrastructure costs will almost certainly increase
- Application updates are more difficult

Shared Database, Separate Schema

Each tenant is stored in the same database, but each gets its own schema
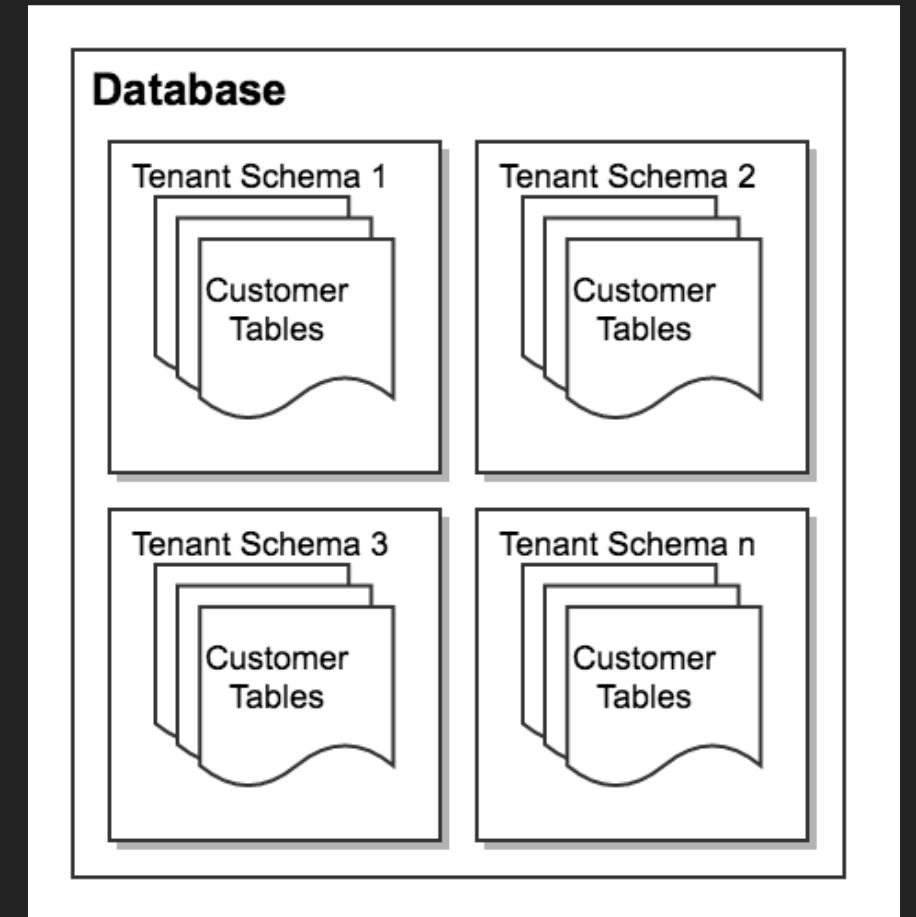
Advantages

- Customer data is mostly isolated
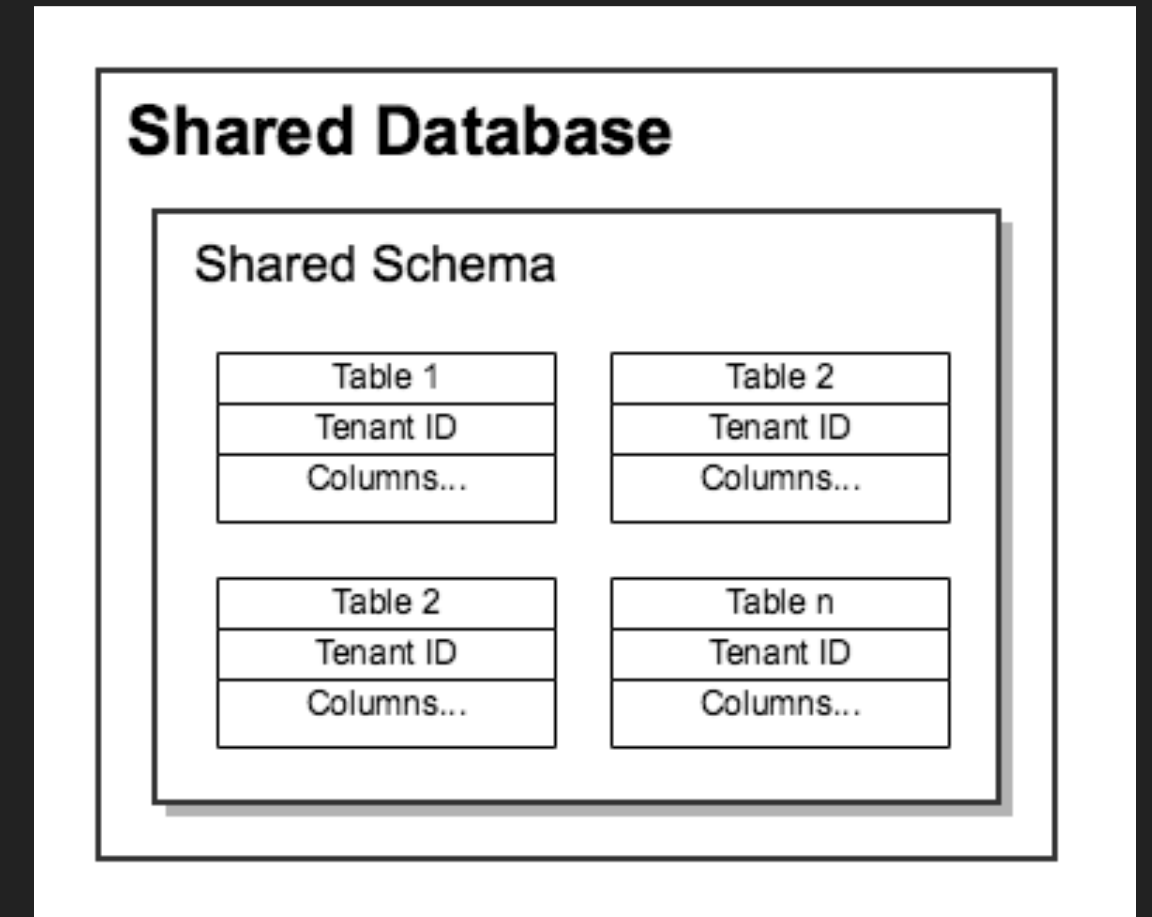- Backup/Recovery is simplified
- Licensing costs likely unaffected

Disadvantages

- Database and application configuration is more complex
- Application updates are more difficult
- Storage space grows more quickly

Shared Database, Shared Schema

- Every tenant is in the same database and in the same schema.
- A discriminator field (e.g., tenant_id, comp_id) is used to logically separate customer data.
- All customer data is in the same set of tables, so care must be taken not to expose the wrong data to a customer.

Shared Database

Shared Schema

Table 1	Table 2
Tenant ID	Tenant ID
Columns...	Columns...

Table 2	Table n
Tenant ID	Tenant ID
Columns...	Columns...

Advantages

- Database configuration is very simple
- Licensing costs likely unaffected
- Application updates are simplified
- Infrastructure costs increase more slowly

Disadvantages

- Customer data is not physically isolated
- Backup/restore is much more difficult
- Database and application configuration can be more complex
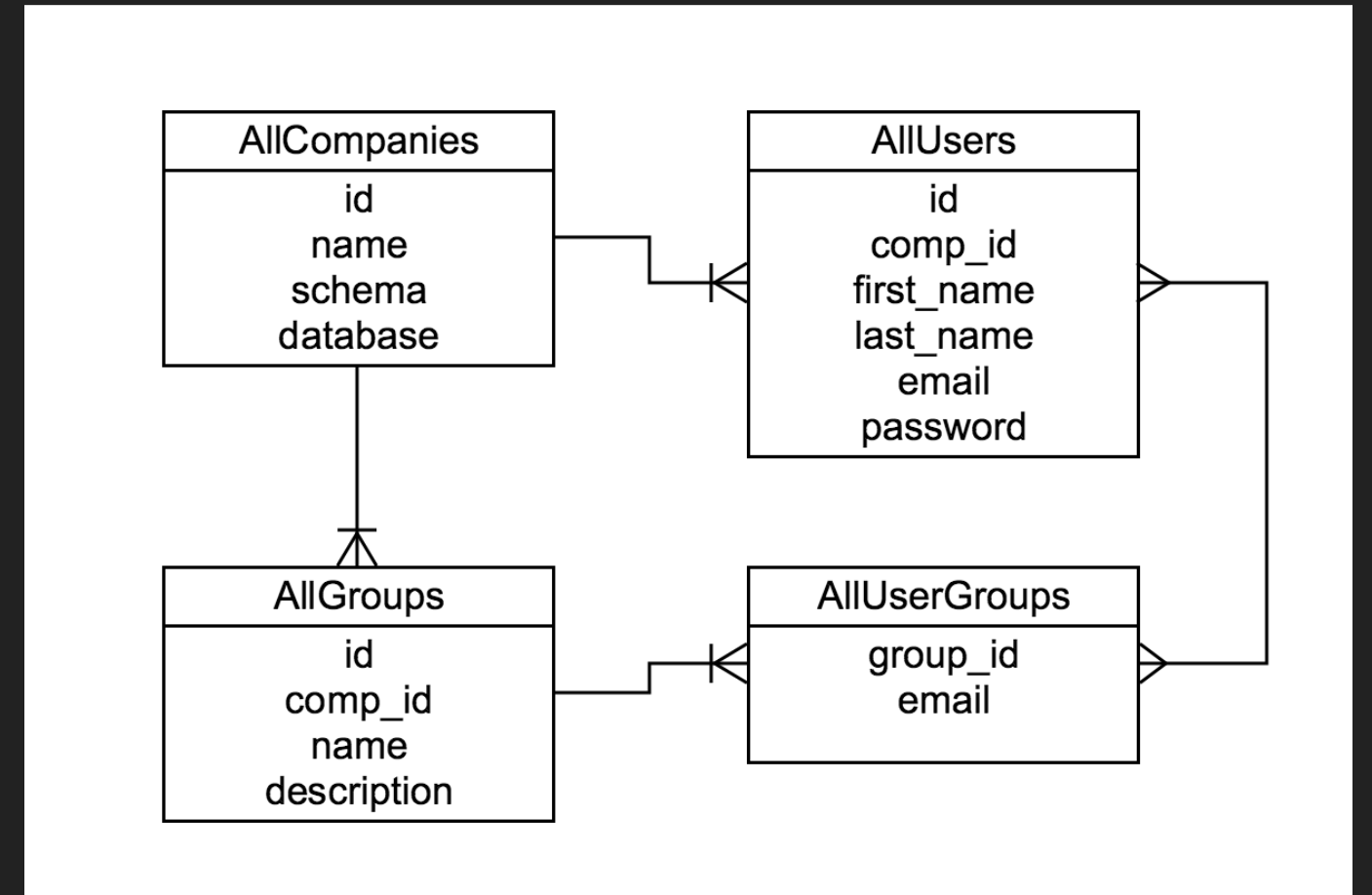
Application Approaches

- Every time the database is queried, the application must specify the discriminator val
- The application works with specially-constructed views that return data for only the

Demo

Security Tables

Basic, but useable example

Q&A

Resources

- Source Code:
  - https://bitbucket.org/jdlee/multitenant-java-ee-demo
- Recommended Reading
  - https://msdn.microsoft.com/en-us/library/aa479086.aspx
  - http://www.ibm.com/developerworks/data/library/techarticle/dm-1201dbdesigncloud/
- My Info
  - Blog - http://blogs.steeplesoft.com
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Thank You