LIVE! 360
TECH EVENTS WITH PERSPECTIVE

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Code First - Database First

Where are you on the spectrum and why?

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Level: Intermediate

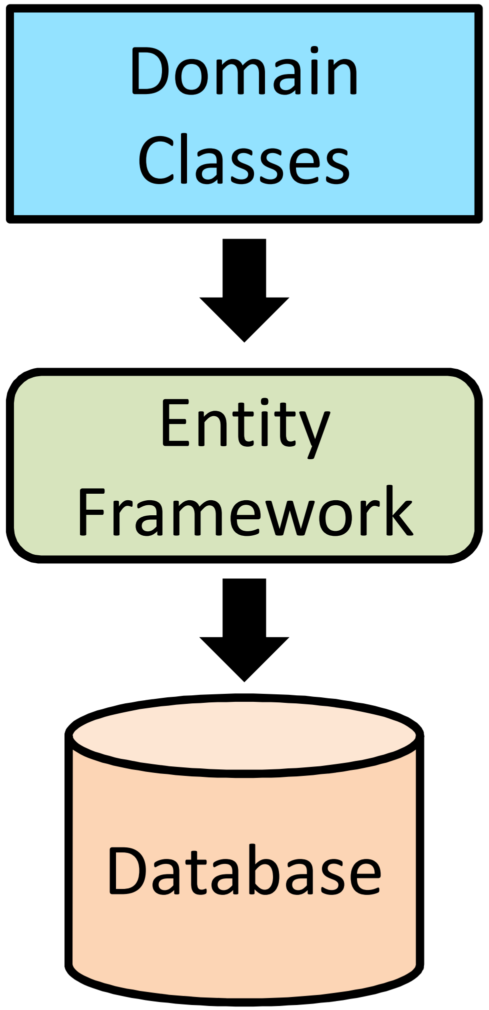
The Ultimate Education Destination
2018 Orlando

Ground Rules

- There are no silver bullets
- SQL Server
- Entity Framework / EF Core

What is Code First?

- Write Data Model Entity Classes
- ORM Generates the Database
- Updates are transferred to the database through Migrations.

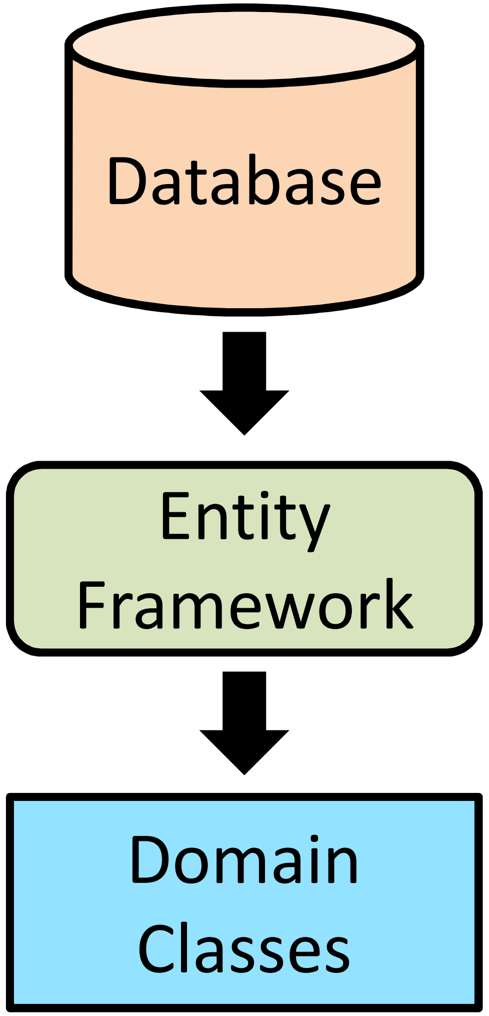


What do you get?

- Initial Development is very straight forward
- Migration Script tracking
- Integrated deployments

What is Database First?

- Existing or New Database
- ORM Generates Domain Classes
- Database code and updates managed in separate project.
  - Visual Studio / Red Gate



What do you get?

- Large number of tooling options
- Highly integrated across object types
- Database and Server level

Five W’s

Why

Who?

- Team(s) involved

When?

- Product Life Cycle

Where?

- The environment

What?

- Characteristic of the Application

Who - Teams

- Development
  - Database Resource
- Support
  - Experience / Technical Level
  - Level of support
  - Processes in place

When – Product Life Cycle

- Proof of Concept
- Greenfield
- Addition/Adjustment to existing application
- New component within existing system
- Change in technology

Where –

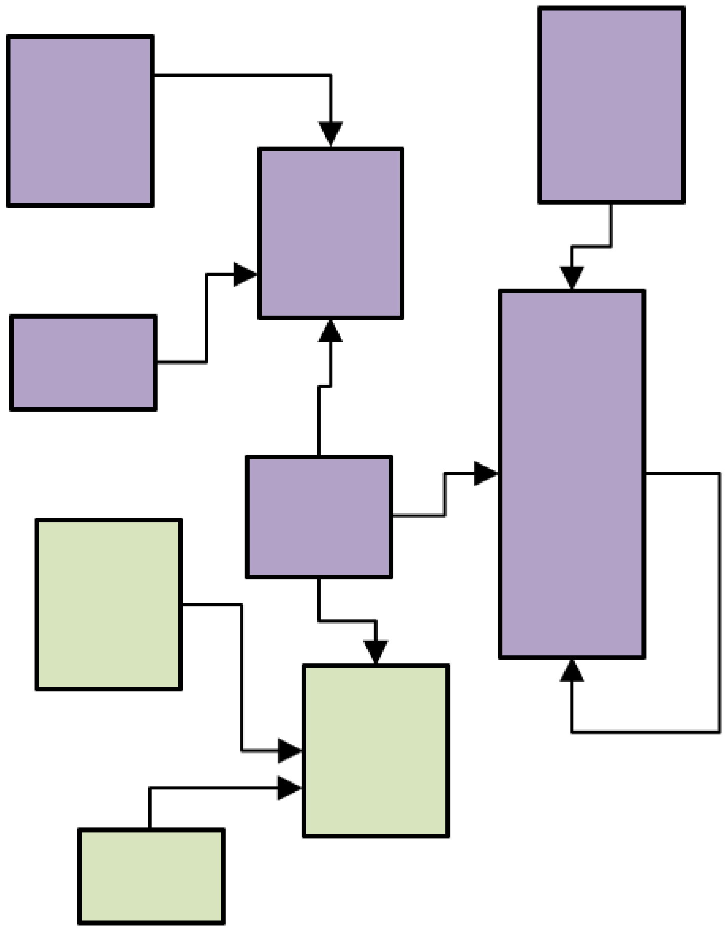
- Cloud / On Prem
- Complexity of the environment
- Stand alone or integrated
- What configurations or options does your application need.

What –

- Domain Space
- Data Profile
- Level of Interaction

Domain Space

- Number of Objects
- Size of Objects
- Complexity
- Using all or part of it .
  - Subset of the domain
  - Subset of objects themselves



Not all data is created equal

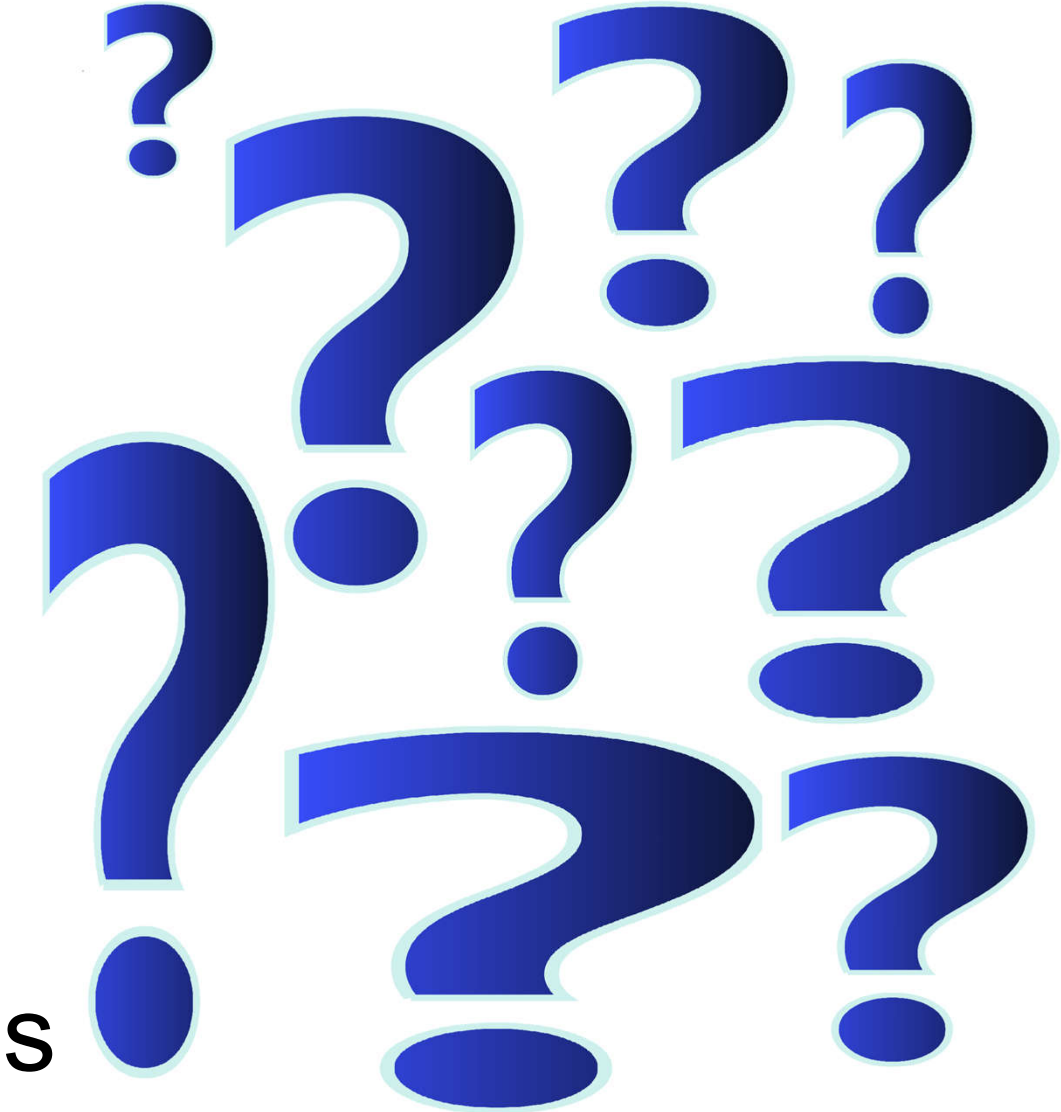
- Owner
- Consumer
- Life expectancy
- Volatility
- Consistency
- Location
- Security
- Volume

Level of Interaction

- Matching up
  - Object-Relational Impedance Mismatch
- Access Footprint
  - Just to see how the copy looks if it goes deep enough to reach the bottom.
    - You never know how much copy will be on a slide

Questions Overlap

- Size
  - The number of objects
- Complexity
  - The types of relationships
- Using all or part of it .
  - Subset of the domain
  - Subset of objects themselves



Use Case Samples

- Microservices
- Document Processing
- Document Review
- Shared Database
  - Direct Map
  - Abstraction Layer

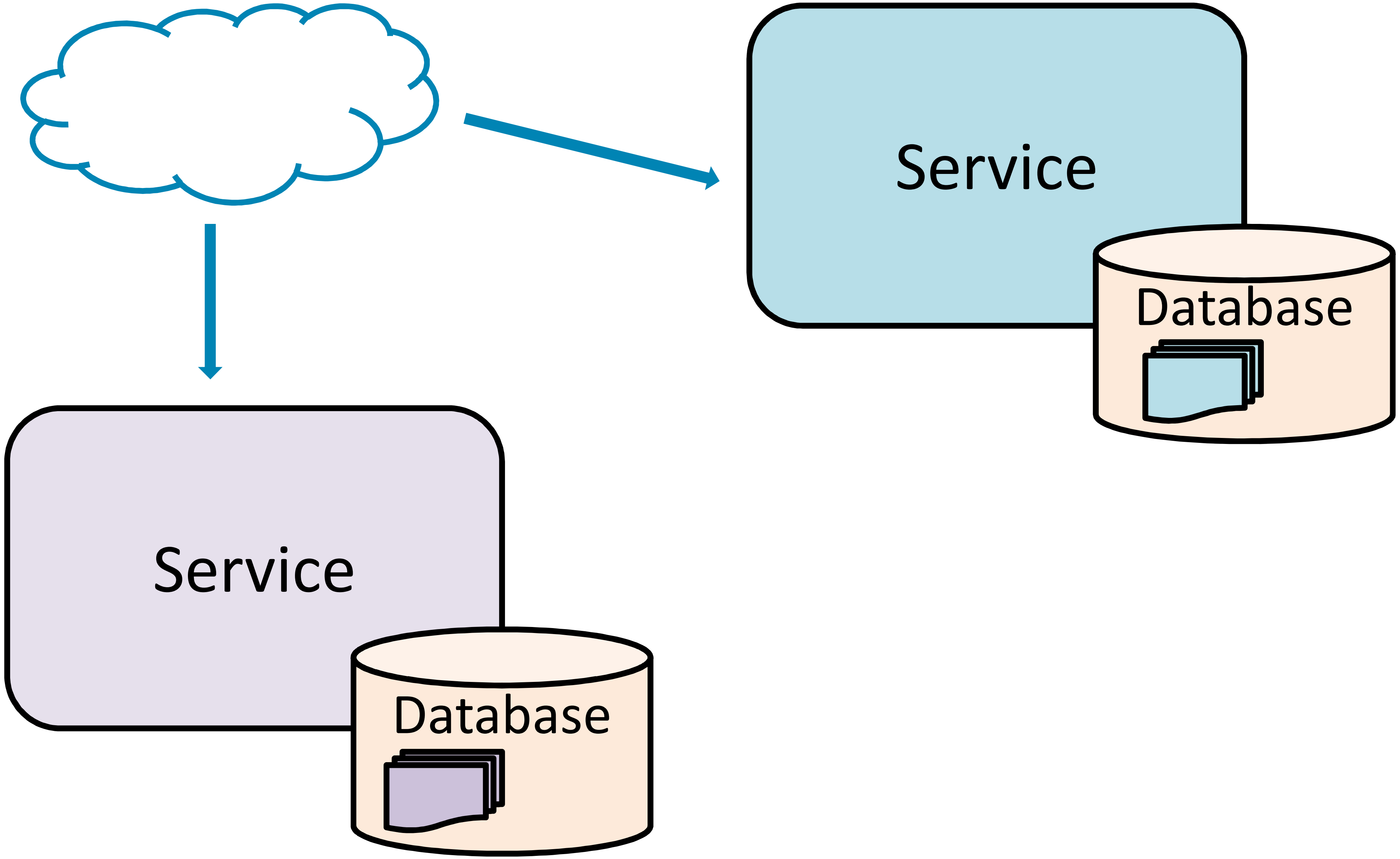
Microservices

- Dedicated Database
  - Isolated Data
- Dedicated Database
  - Shared Data
- Shared Database
  - Direct Map
  - Abstraction Layer

Dedicated w/ Isolated Data

- 1:1 mapping
- Application is sole consumer of data
- Small to Mid size schema
- Lower data volumes
- The classic case for Code First

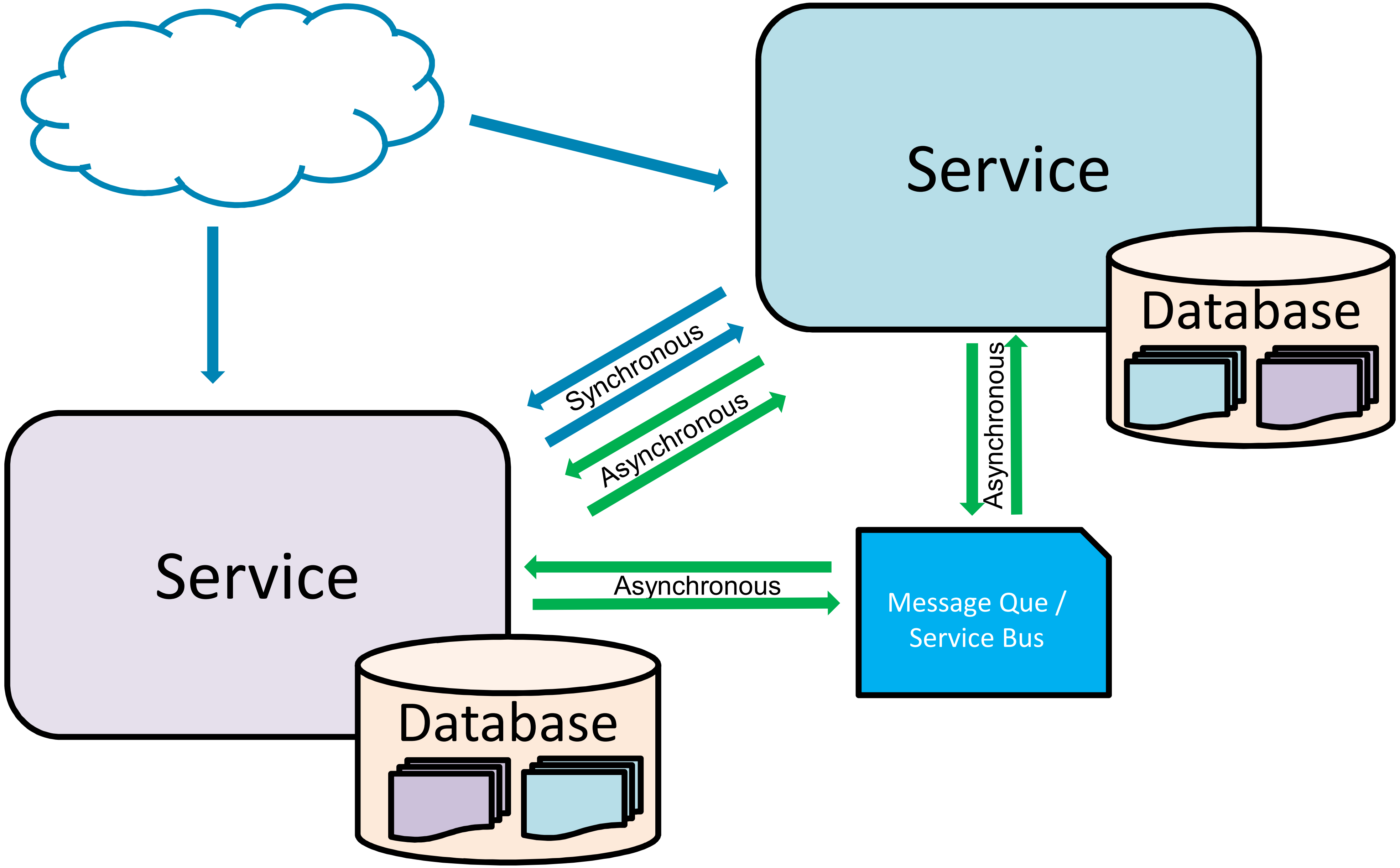
Isolated Data



Dedicated w/ Shared Data

- 1:1 mapping
- Model overlaps with other system
- Small to Mid size schema
- Lower data volumes
- Still a good case for Code First
- Syncing Considerations

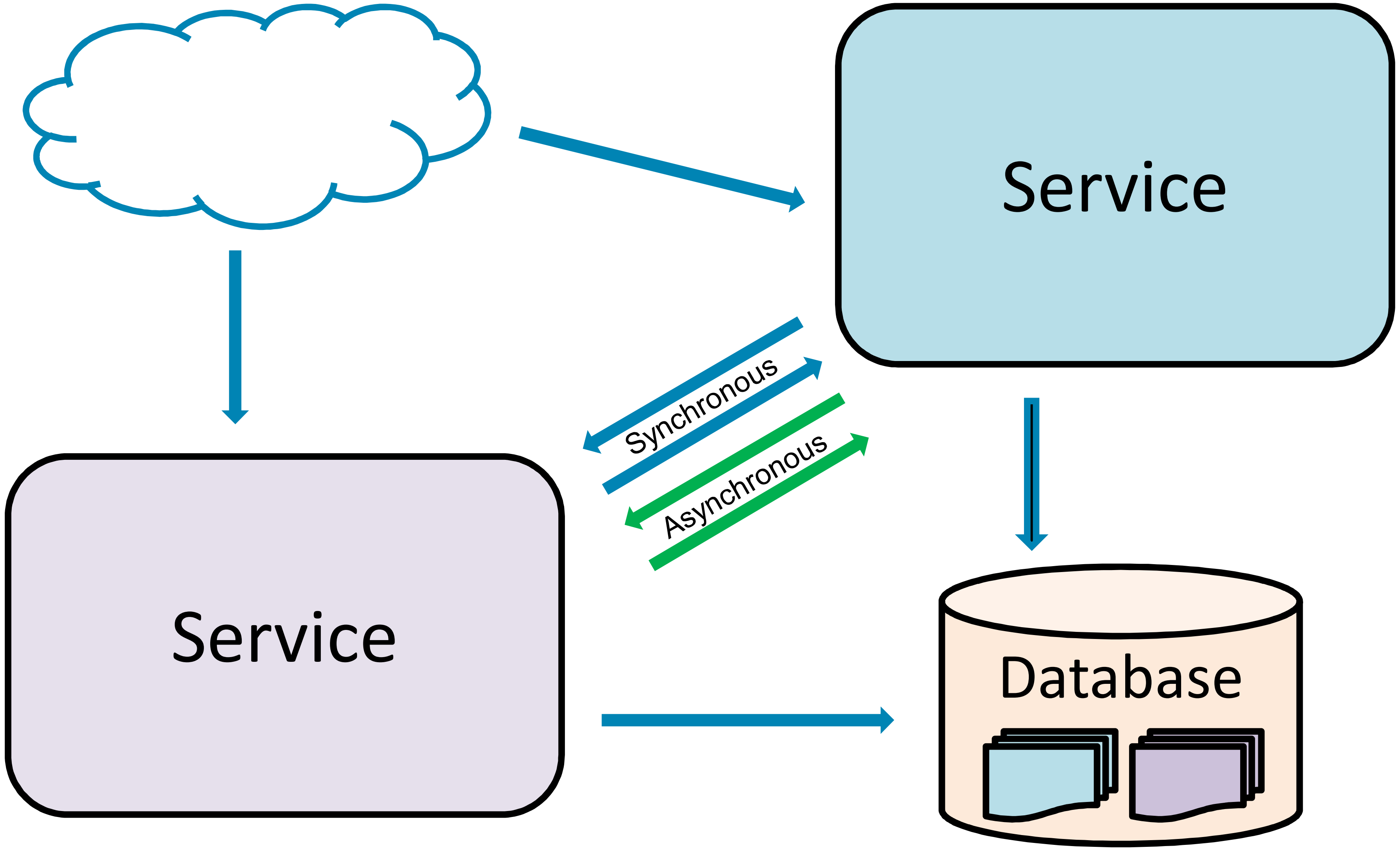
Shared Data


Service
Database
Synchronous
Asynchronous
Asynchronous
Service
Database
Asynchronous
Message Que /
Service Bus

Shared (Direct Map)

- Each application logically maps to subset of tables
- Mid to Large size schema
- Medium data volumes
- Leans towards the Database First side

Direct Map



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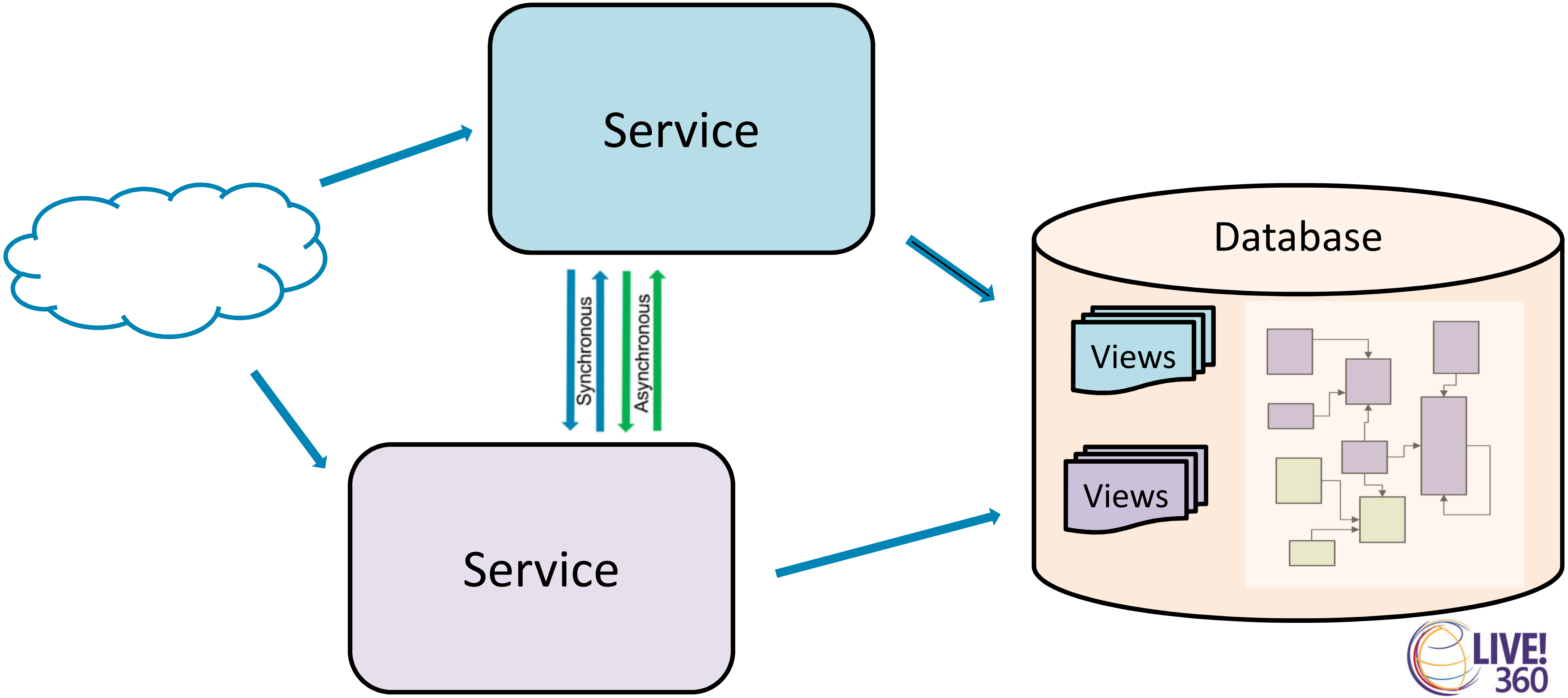
Shared (Abstracted)

- Each application logically maps
  - Subset of tables
  - Portions of tables
  - Composite tables
- Size of the schema not relevant
- About any data volume
- Leans towards the Database First side

Abstracted



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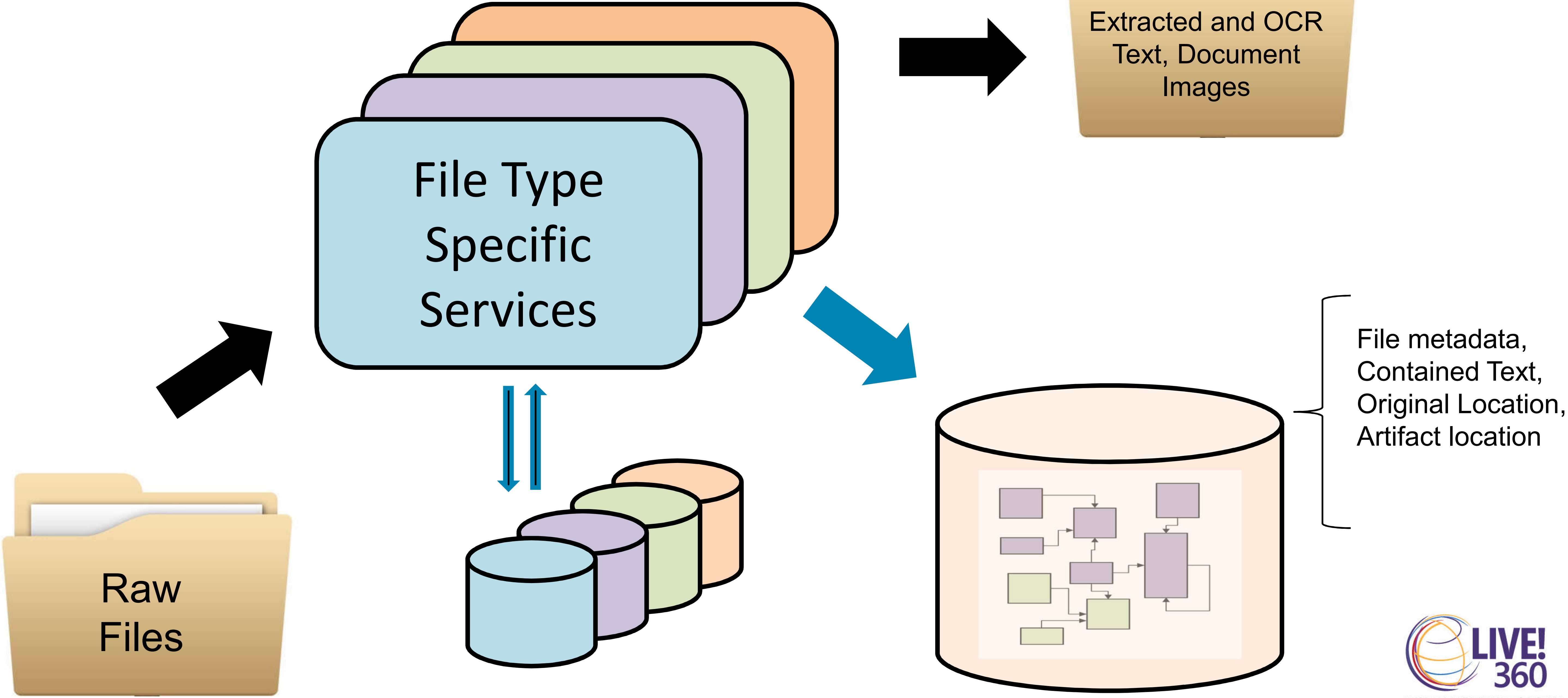
Document Processing



Raw Files

File Type Specific Services

Extracted and OCR Text, Document Images

File metadata,
Contained Text,
Original Location,
Artifact location

What can you run into?

- Complex Queries
- Complex Migrations
- Maintenance
- Need more features

Complex Query

- ORM basically a SQL Code Generator
- Include()
  - Can be chained
  - Can be fastest way to complex code
- Impacted by volume

Mitigation

- Procedures (functions)
  - Parameterization, Temp Objects, etc.
  - Per call or per unit-of-work
- Views
  - Treated like table
- Indexing
  - Treated like table

```
public partial class spMyProcedure : Migration
{
   protected override void Up(MigrationBuilder migrationBuilder)
   {
      var sql = @"CREATE PROCEDURE [dbo].[MyProcedure]
            @Param1 int,
            @Param2 nvarchar(50)
         AS
         BEGIN
         SET NOCOUNT ON;
         SELECT TOP(@Param1)
         *
         FROM dbo.MyTable
         WHERE StringField like @Param2 +'%’
         END";
      migrationBuilder.Sql(sql);
   }

   protected override void Down(MigrationBuilder migrationBuilder)
   {

   }
}
```

Complex Migration

- Existing Data
- Add a Not Null Column
- Changes to Large tables
- Split or Combine tables

Maintenance

- Changes to Database Objects over time
- “Code” is a “String” field
- Overwrite previous migration definition with a new migration definition.

Need More Features

- Replication
- Row Level Security
- Dynamic Data Masking
- Partitioning
- Clustering/High Availability

Change your mind?

- Convert to Database First
  - Large schema growth
  - Volume of non-table object reaches critical mass
- Convert to Code First
  - Split off schema section from the overall
  - Schema never really grew as expected

Patterns

- Convert targeted problem queries to stored procedure calls.
- Convert all read operations to procedure calls.
  - Procedures

    Parameterization, Temp Objects, etc.
  - Views

    Treated like a table

Reporting and Export

- Maintain Relationships
  - May not be used in application logic but may be useful downstream.
- Coordinate Enumerations
  - Dedicated DB may not keep physical table

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