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Code First, Review Later: Making EF Core Work for DBAs

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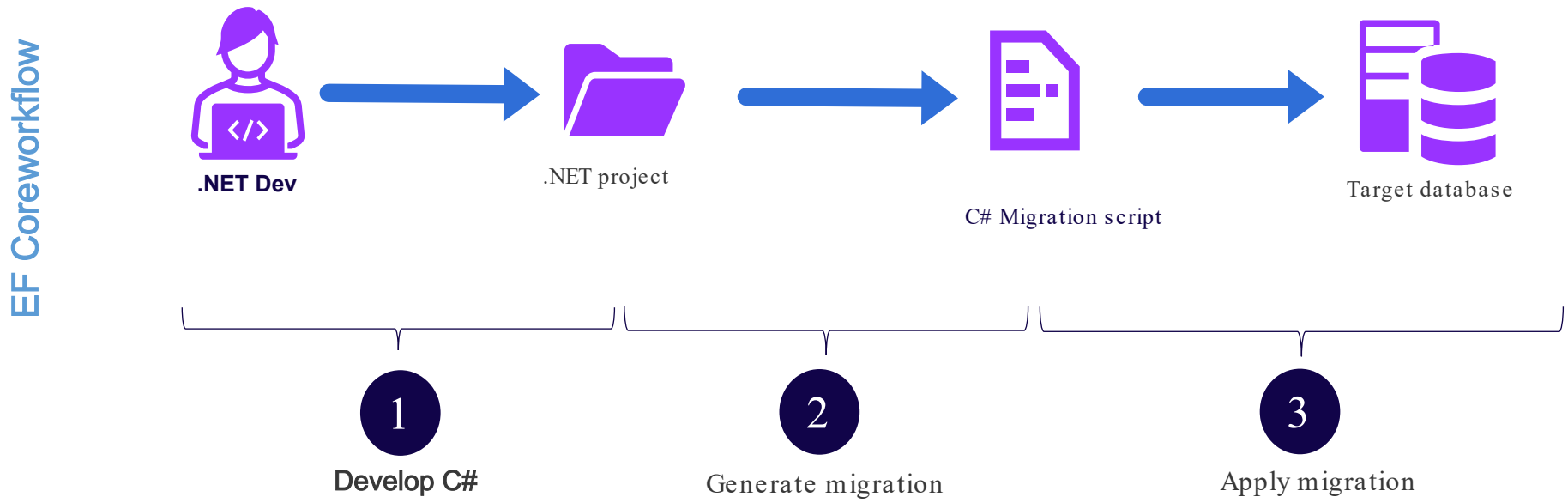
The agenda for today

- The good and the bad of EF Code First
- Three Hybrids workflow for working with EF Core
  - With demos!
- Wrap-up: Take aways + Q&A

The good and the bad of EF Code First

EF Core workflow



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“That's all there is to it – your application is ready to run on your new database, and you didn't need to write a single line of SQL.”

Source: Microsoft documentation

**Note that this way of applying migrations is ideal for local development but...
is less suitable for production environments.**

Migrations Overview - EF Core | Microsoft Learn

https://learn.microsoft.com/en-us/ef/core/...

Create your database and schema

At this point you can have EF create your database and create your schema from the migration. This can be done via the following:

.NET CLI | Visual Studio

.NET CLI Copy

```
dotnet ef database update
```

That's all there is to it - your application is ready to run on your new database, and you didn't need to write a single line of SQL. Note that this way of applying migrations is ideal for local development, but is less suitable for production environments - see the Applying Migrations page for more info.

Note that this way of applying migrations is ideal for local development but... is less suitable for production environments.

“The recommended way to deploy migrations to a production database is by generating SQL scripts.”

Source: Microsoft documentation

Applying Migrations - EF Core | Microsoft Learn

https://learn.microsoft.com/en-us/ef/core/...

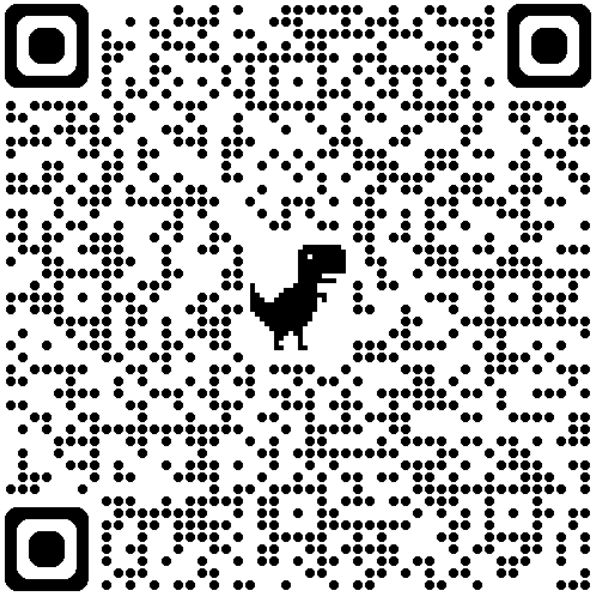
SQL scripts

The recommended way to deploy migrations to a production database is by generating SQL scripts. The advantages of this strategy include the following:

- SQL scripts can be reviewed for accuracy; this is important since applying schema changes to production databases is a potentially dangerous operation that could involve data loss.
- In some cases, the scripts can be tuned to fit the specific needs of a production database.
- SQL scripts can be used in conjunction with a deployment technology, and can even be generated as part of your CI process.
- SQL scripts can be provided to a DBA, and can be managed and archived separately.

Source: Microsoft documentation

"When it's time to move from development and QA to production, letting EF Core update the database for you is generally <u>not</u> the best approach."



Julie Lerman @ The Data Farm

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Data Points - Hybrid Database Migrations with EF Core and Flyway | Microsoft Learn

https://learn.microsoft.com/en-us/archive/msdn-magazine/201...

October 2019

Volume 34 Number 10

[Data Points]

Hybrid Database Migrations with EF Core and Flyway

By Julie Lerman

During development, it's common to use EF Core's migration commands to not only

Entity Framework Core

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The situation with EF

- Developers write C# and let EF handle the SQL
- These migrations aren’t suitable for production deployments.
- DBAs struggle with auto-generated SQL
- Limited visibility into (schema) changes

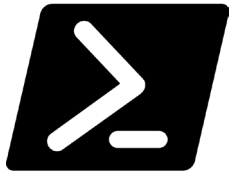
Hybrids workflow For working with EF Core

Flyway Explained

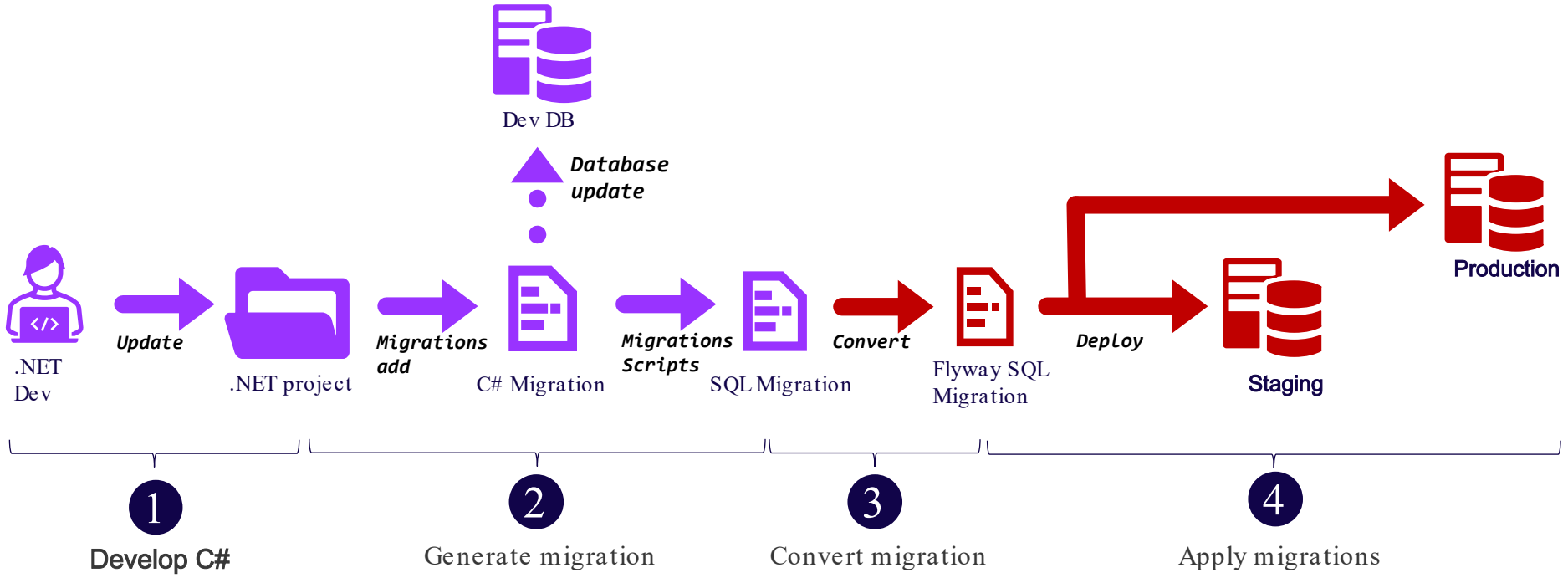
- Flyway “versions” the database
- Flyway applies SQL scripts to the database:
  - Versioned scripts (V) run once
  - Repeatable scripts (R) run on every upgrade
  - Undo scripts (U) allow rollback
- Tracks changes in flyway_schema_history
- Flyway works with multiple RDMSs

```
migrations/
  V1__initial_schema.sql
  V2__add_customer_table.sql
  R__refresh_views.sql
  U2__add_customer_table.sql
```

Simple Hybrid workflow



Simple Hybrid workflow



A

EF-managed Development

B

Flyway-managed Deployments

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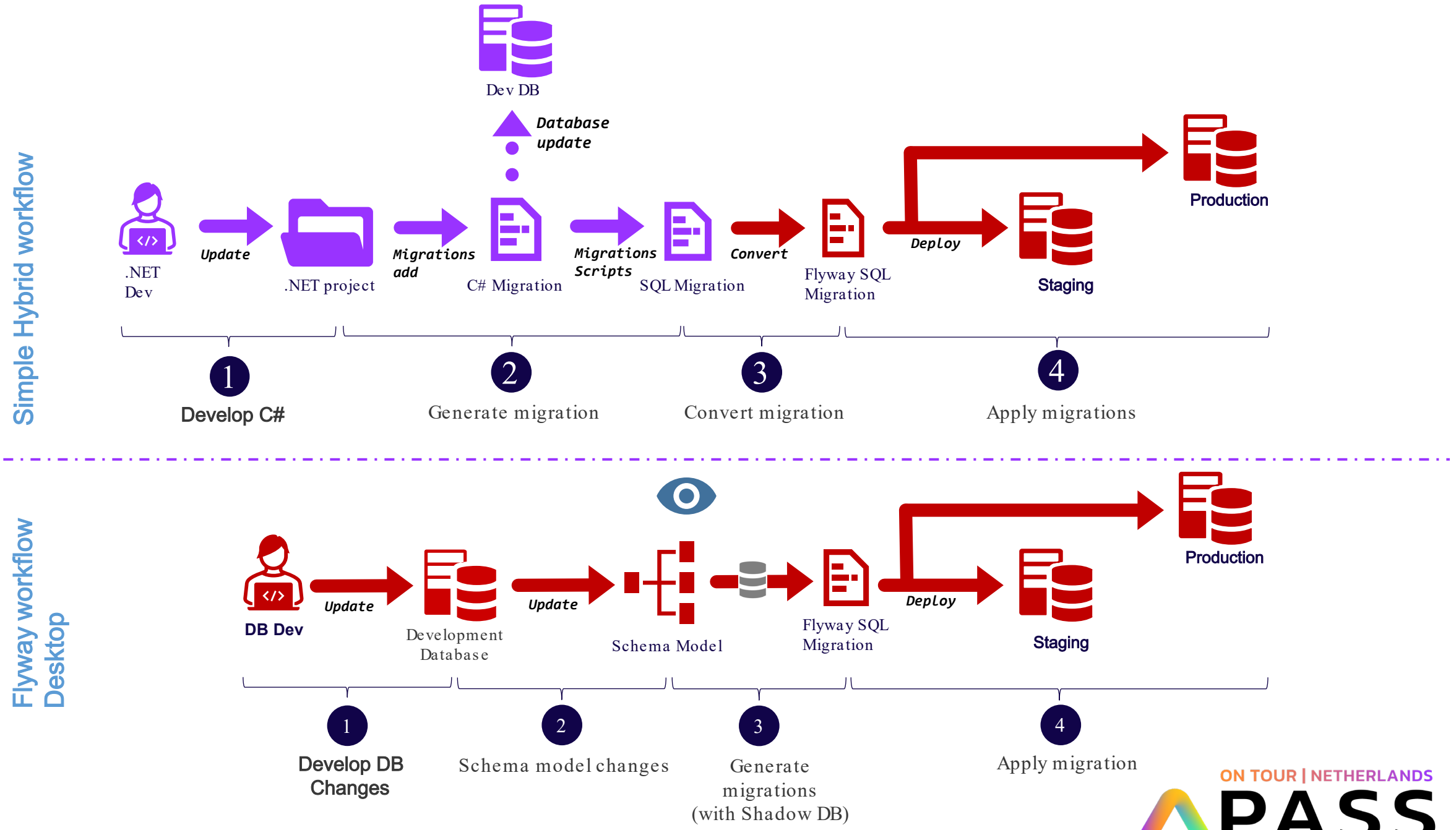
Demo time



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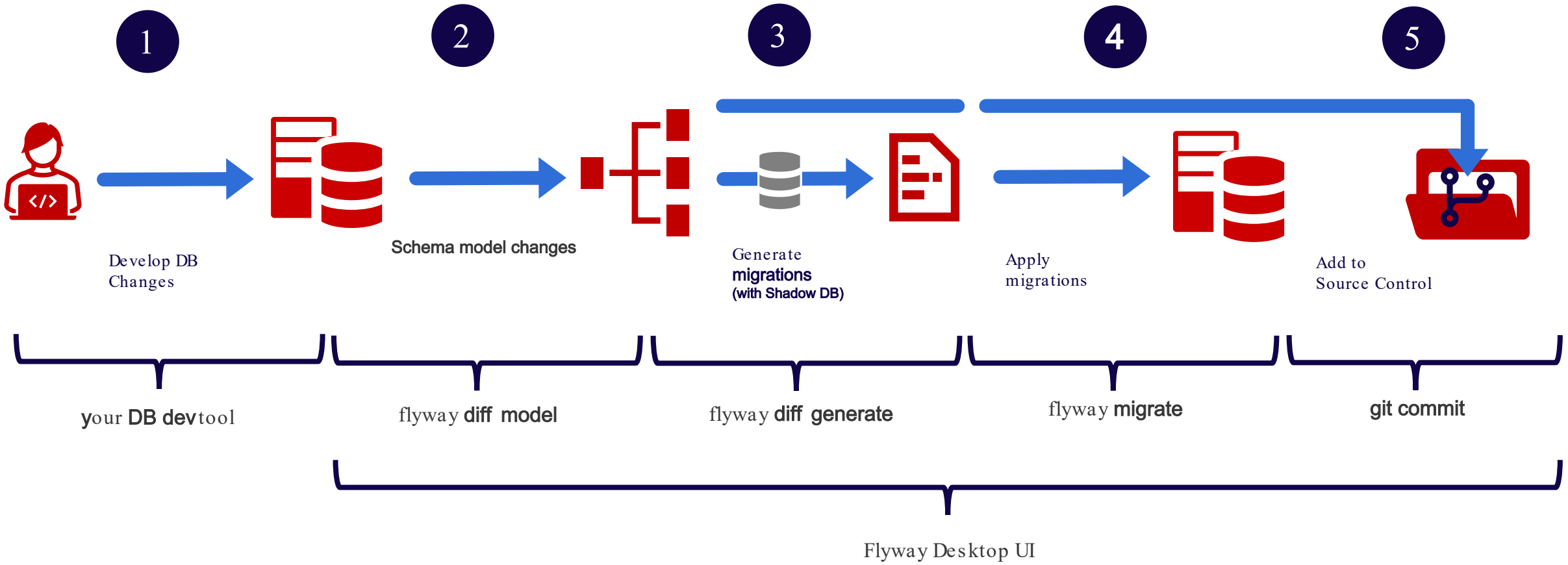
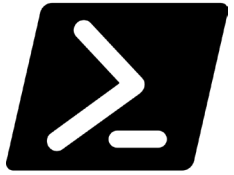
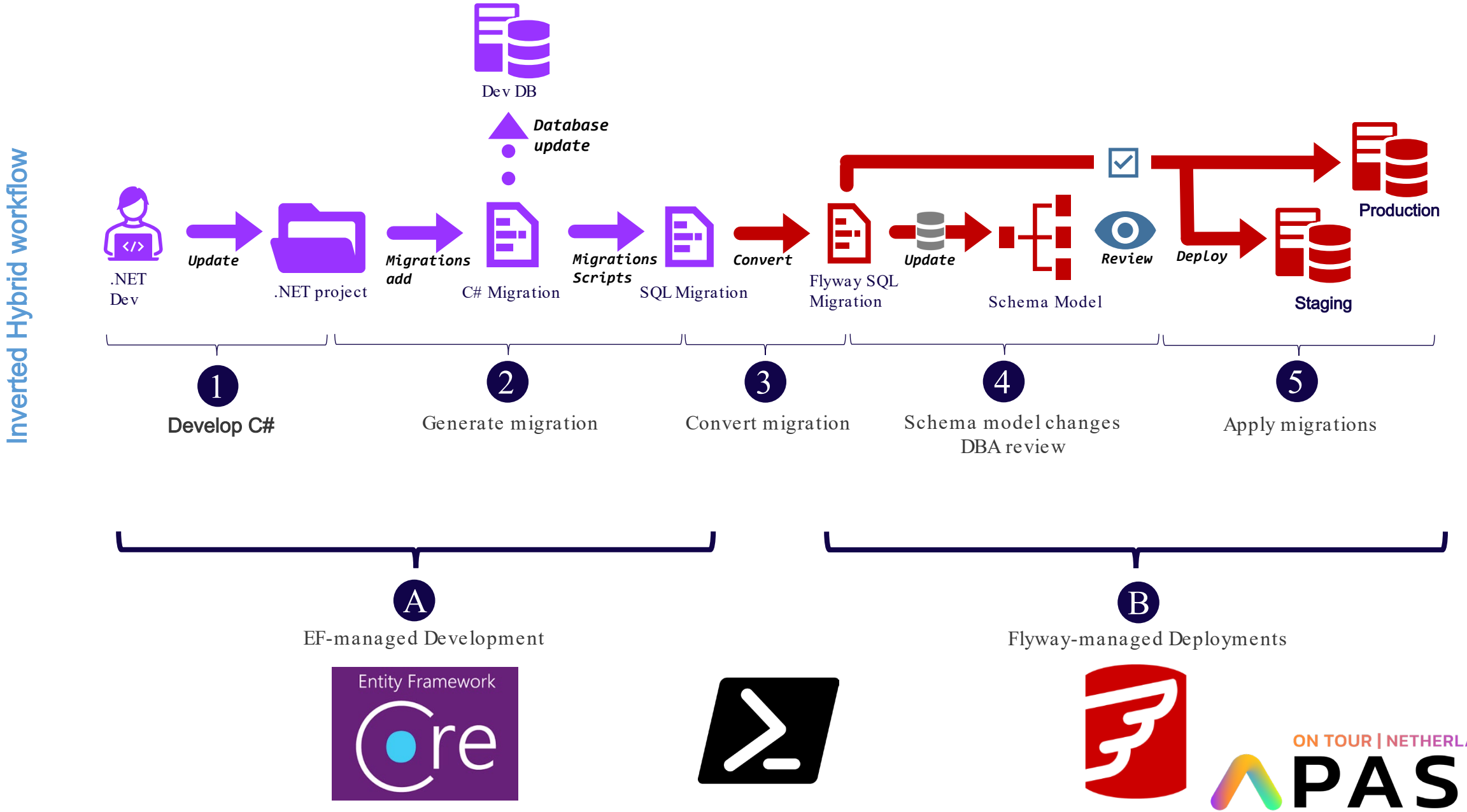
Migration based Flyway Desktop Workflow via CLI



Inverted Hybrid workflow




Inverted Hybrid workflow
Dev DB
Database update
.NET Dev
Update
.NET project
Migrations add
C# Migration
Migrations Scripts
SQL Migration
Convert
Flyway SQL Migration
Update
Schema Model
Review
Deploy
Staging
Production
1
Develop C#
2
Generate migration
3
Convert migration
4
Schema model changes
DBA review
5
Apply migrations
A
EF-managed Development
B
Flyway-managed Deployments
Entity Framework
Core
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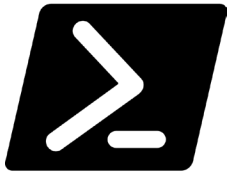
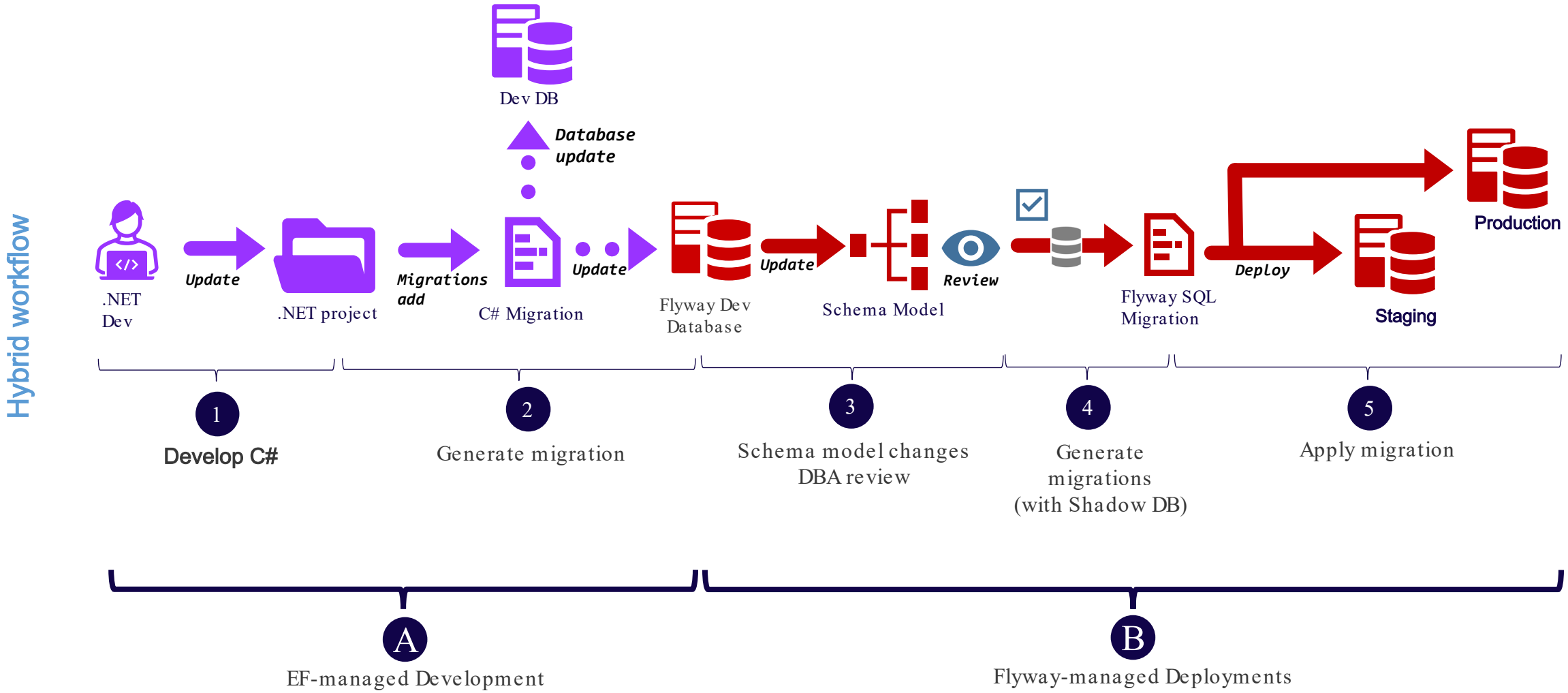
Demo time

Full Hybrid workflow





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Demo time

Comparison

Aspect	EF Core Code First Workflow	Simple Hybrid Workflow	Inverted Hybrid Workflow	Hybrid Workflow
Schema Model Review	❌	❌	✅	✅
Converted & Linked migrations	❌	✅	✅	❌
Generated migrations	❌	❌	❌	✅
Strength	Fastest to deploy; minimal tooling	Faster than DBA-reviewed hybrids	DBA catches issues before production	DBA catches issues before production; Cleanest SQL output
Weakness	No staging/prod separation; no DBA check	No DBA quality check	Two-step tooling adds overhead	Two-step tooling adds overhead

Next steps: Automation

- Choose your workflow
- Create CI trigger on the EF changes
- Use pipelines, but first…
  - Start local to automate
  - Use verbose logging
  - Avoid inline PowerShell

Wrap-up:
Take aways & Q&A

Take aways

- It’s the process not the tool
- Automate the chosen hybrid workflow
- Generate Migrations early to catch issues early
- Always include undo scripts

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Questions?

Thank you

I appreciate the time you spent with me.

Please reach out if you have any questions!

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