

Entity Framework Core 2: Getting Started

INTRODUCING MICROSOFT'S MODERN DATA ACCESS
FRAMEWORK



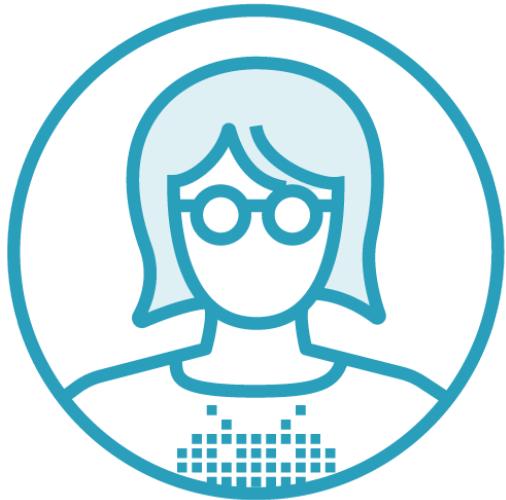
Julie Lerman

MOST TRUSTED AUTHORITY ON ENTITY FRAMEWORK

@julielerman thedatafarm.com



Who Is This Course For?



New to EF Core 2



New to EF/EF Core



Manager/CTO



Course Overview

EF Core 2 Introduction and comparison to earlier versions

Creating a data model and database with EF Core 2

Using EF Core 2 to interact with your data

Using EF Core 2 in client applications

Using EF Core 2 in ASP.NET Core applications

Module Overview



What Is Entity Framework Core?

How does EF Core 2 compare to earlier versions of EF Core and EF?

EF Core, .NET Framework and .NET Core

Highlights of familiar features from EF6 and EF Core

Highlights of new features in EF Core 2

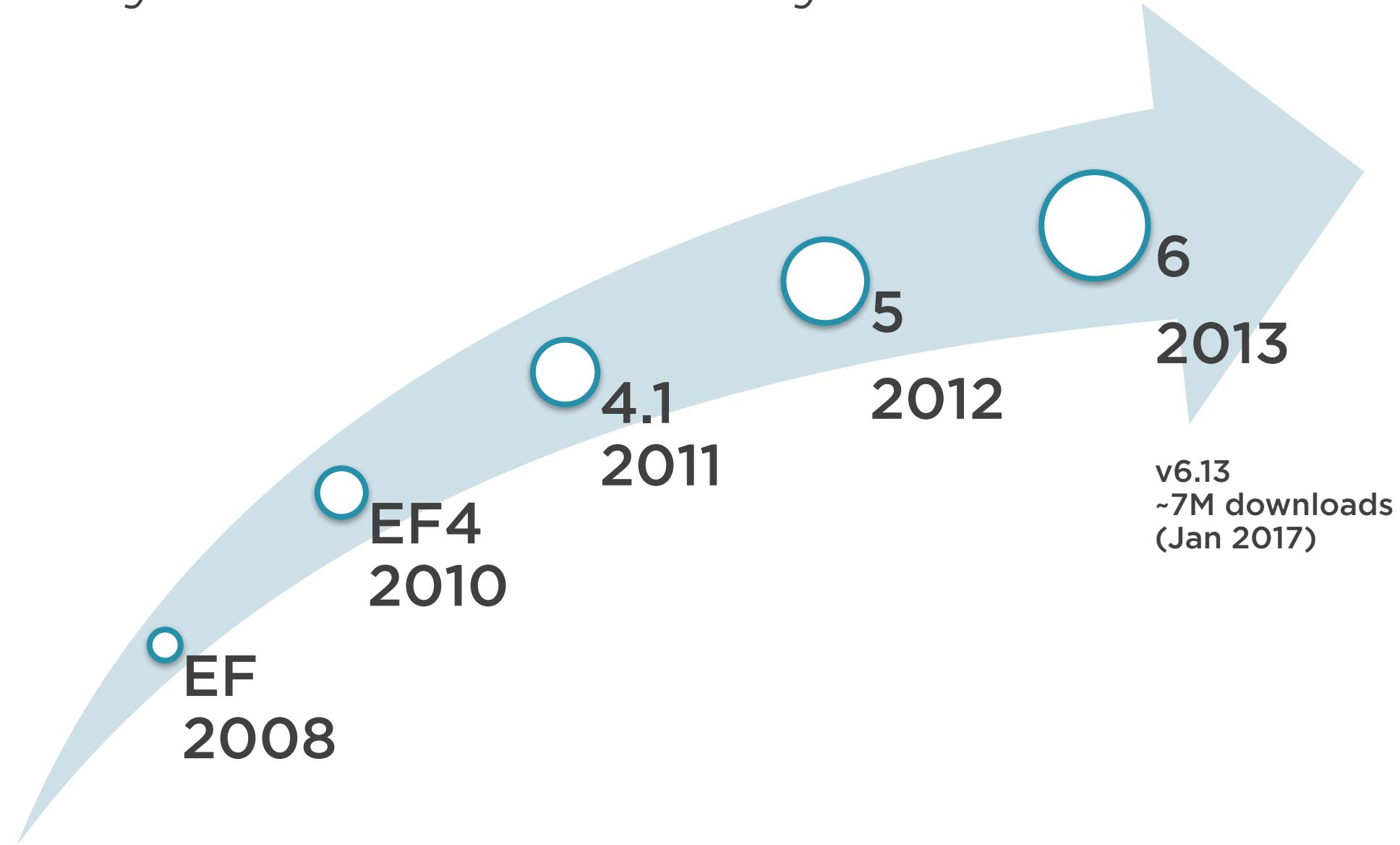


Entity Framework

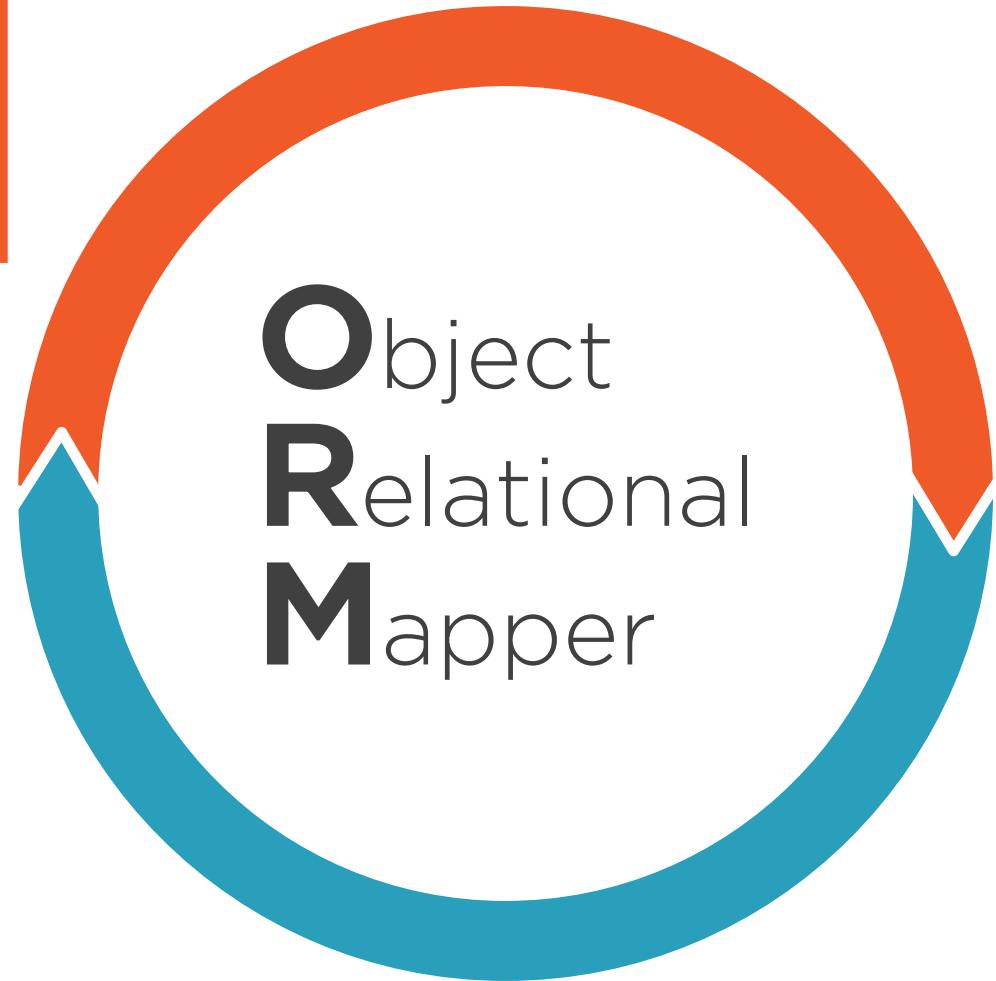
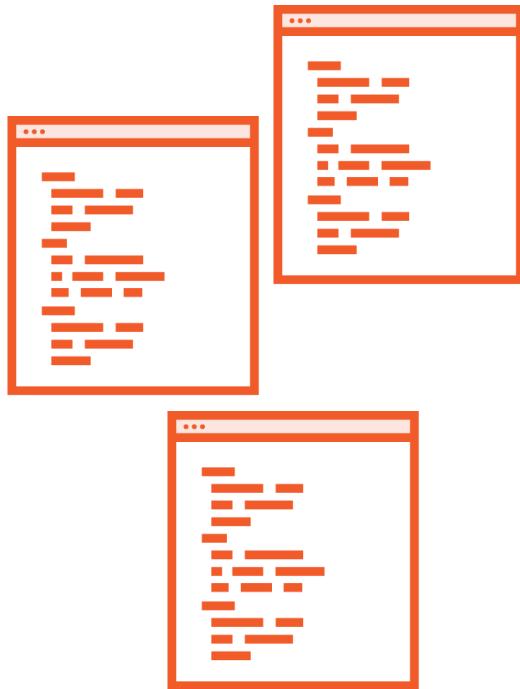
Microsoft's official data access technology
for .NET development



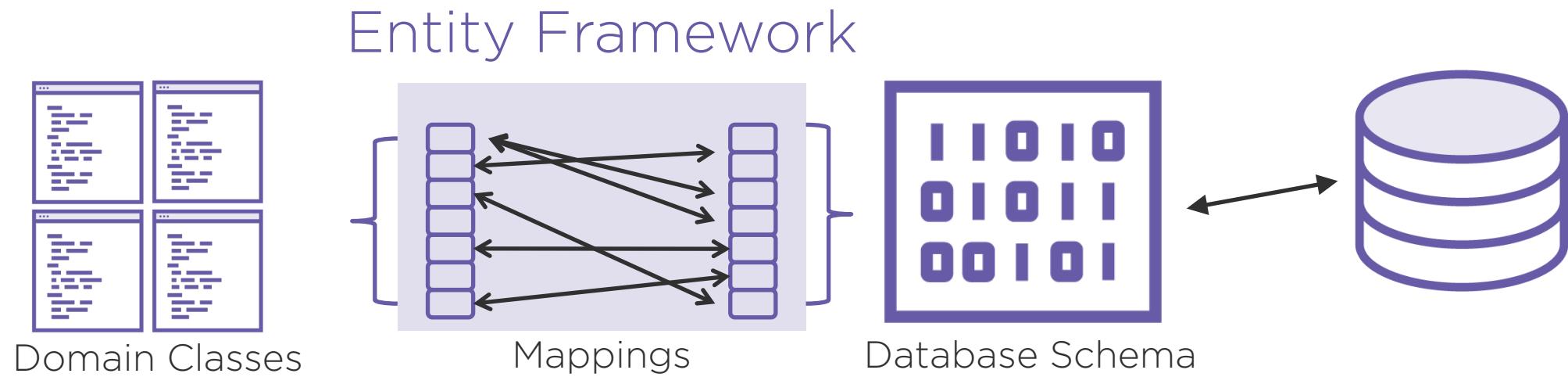
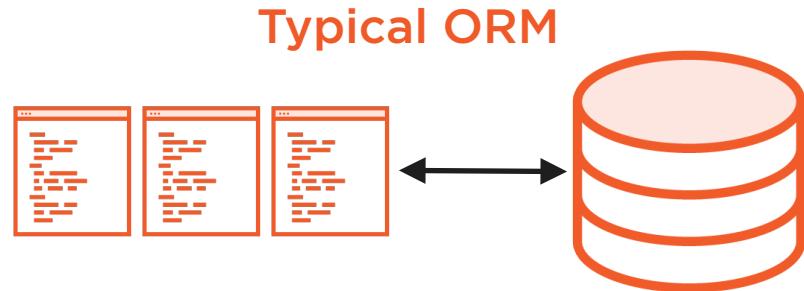
Entity Framework History Before EF Core



EF Is an ORM



EF Maps Differently Than Most ORMs



Why Entity Framework?

Developer productivity

First class member
of
Microsoft .NET stack

Consistent query syntax
with
LINQ to Entities

Focus on domain,
not on DB, connections,
commands, etc.



“Entity Framework (EF) Core is a lightweight and extensible version of the popular Entity Framework data access technology.”

EF Core Documentation

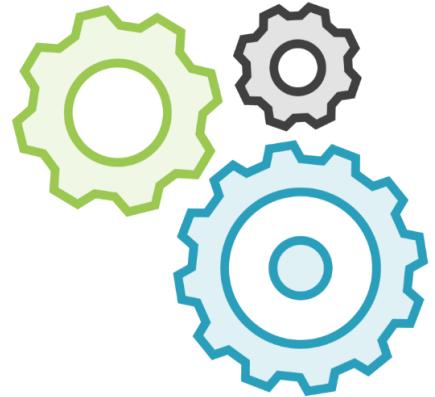


EF Core 1.0
June 2016

EF Core 2.0
Aug. 2017

EF Core 2.1
1st half 2018

.NET Core Themes



Composable APIs



Cross-Platform



Modern
Software Practices



Open Source

GitHub - aspnet/EntityFra...  GitHub, Inc. [US] https://github.com/aspnet/EntityFramework

Personal Open source Business Explore Pricing Blog Support This repository Search Sign in Sign up

aspnet / EntityFramework Watch 749 Star 3,684 Fork 1,112

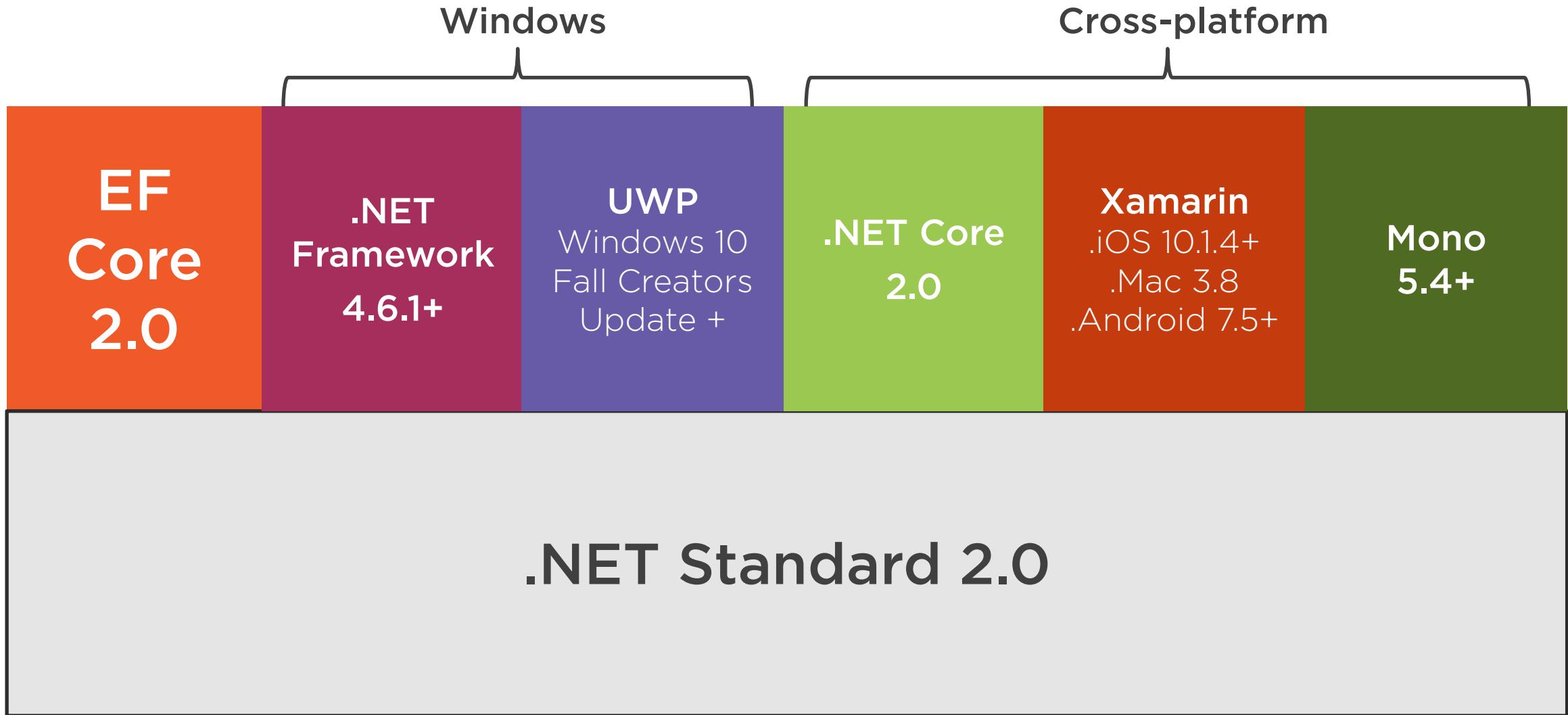
Code Issues 461 Pull requests 5 Wiki Pulse Graphs

Entity Framework Core is a lightweight and extensible version of the popular Entity Framework data access technology
<https://docs.efproject.net>

3,248 commits 18 branches 14 releases 72 contributors

Branch: dev New pull request Find file Clone or download

AndriySvyryd	Avoid changing OnDelete behavior for memory optimized tables	Latest commit bee6c7c 4 days ago
.github	Add issue and PR templates	4 months ago
src	Avoid changing OnDelete behavior for memory optimized tables	4 days ago
test	Avoid changing OnDelete behavior for memory optimized tables	4 days ago
tools	Merge branch 'rel/1.0.1' into dev	6 days ago
.gitattributes	Force LF line-endings in *.sh files	10 months ago
.gitignore	Fix breaking API changes inadvertently introduced into the 1.0.1 branch	7 days ago
.travis.yml	Remove Microbenchmarks projects	2 months ago
CONTRIBUTING.md	Update Home master -> Home dev	a year ago
EntityFramework-xproj.sln	Split tools into VisualStudio and DotNet packages and implement ef.exe	26 days ago
EntityFramework.sln	Split tools into VisualStudio and DotNet packages and implement ef.exe	26 days ago
EntityFramework.sln.DotSettings	Fixes #5333 - More generic solution for severity level of warnings (t...)	3 months ago
LICENSE.txt	Update LICENSE.txt and license header on files.	a year ago
NuGet.config	Switching to dotnet.myget.org feed	28 days ago



Applications Types for EF Core 2.0

	.NET 4.6.1+	.NET Core 2.x	Mono 5.4	UWP
OS	Windows	Windows, macOS, Linux	iOS Android	Windows 10 FCU
App Types	Console WinForms WPF ASP.NET 4 Web Forms etc..	ASP.NET Core Web Apps Web APIs Libraries Services Console Apps Docker	Mobile Tablet	Mobile PC HoloLens Xbox Surface Hub IoT



Environment for Building with EF Core

2.0

Install .NET Core 2.0 SDK

microsoft.com/net/download/core

.NET Framework

on Windows only

VS2015*

VS2017 15.3+

*Install NuGet 3.6.0

Cross Platform

Windows

VS2017 15.3+

macOS

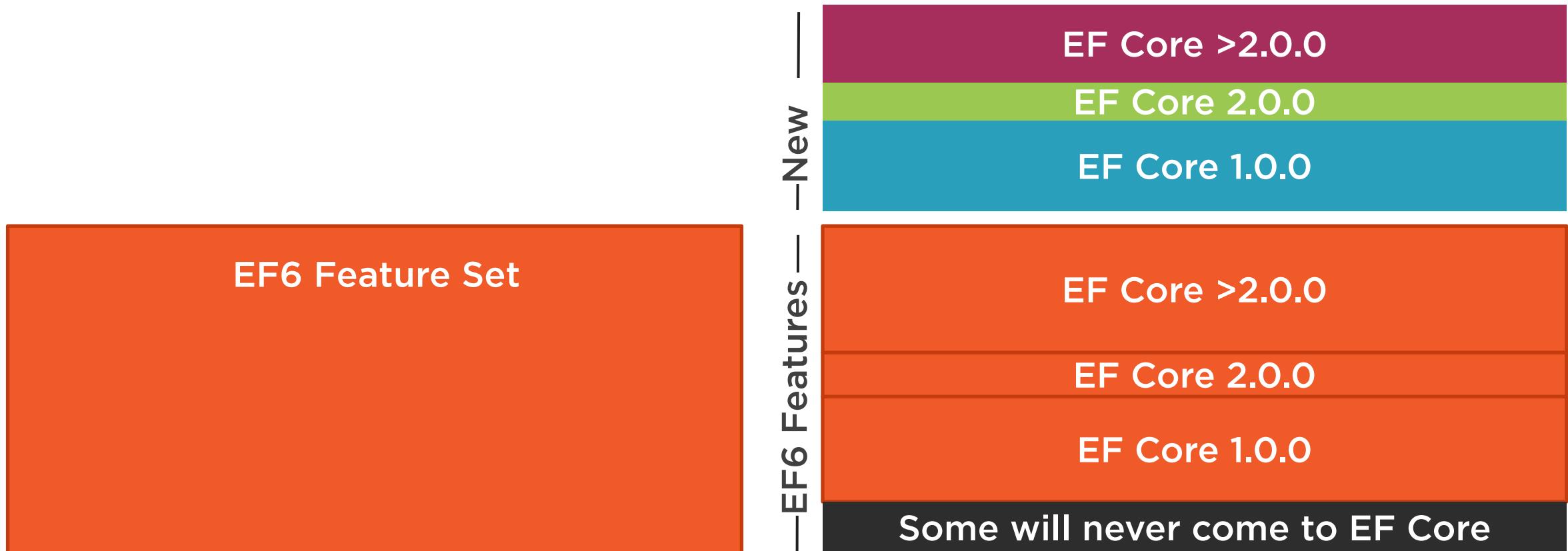
VS for Mac

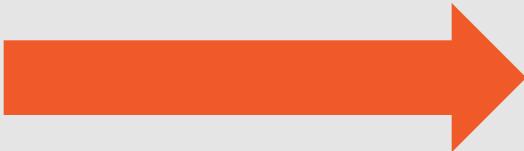
Windows/macOS/Linux
Visual Studio Code

This course will use
Visual Studio 2017
on Windows

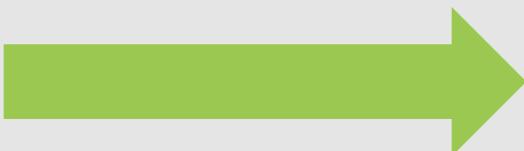
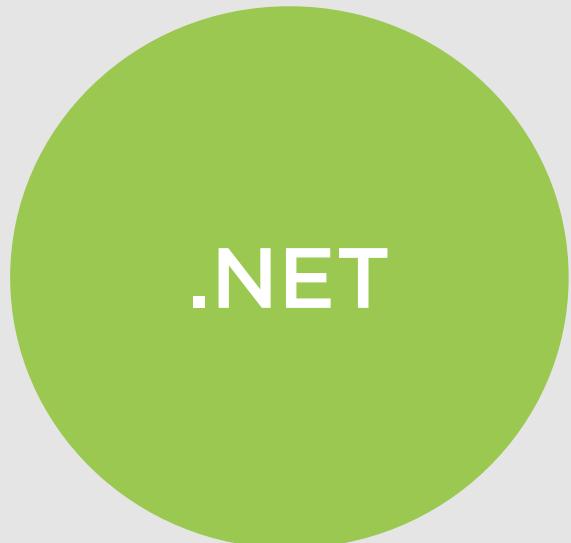


EF6 Features vs EF Core Features





EF Core



**EF Core
or EF6**



For .NET Apps,
use EF Core only if it has all
of the features you need.

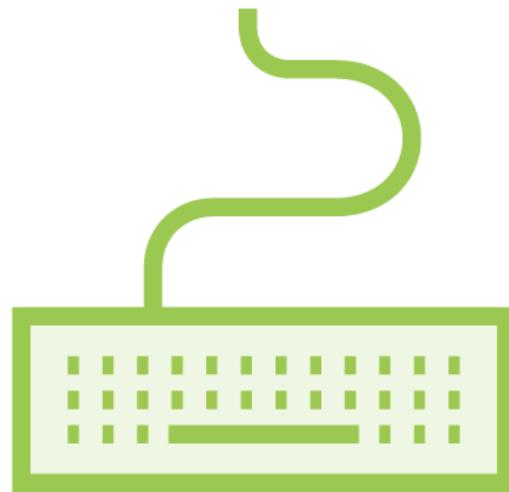
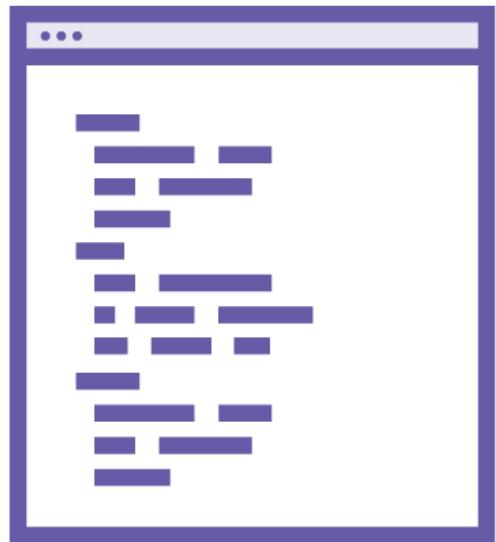
Otherwise, use EF6



How EF Core Works



EF Puzzle Pieces



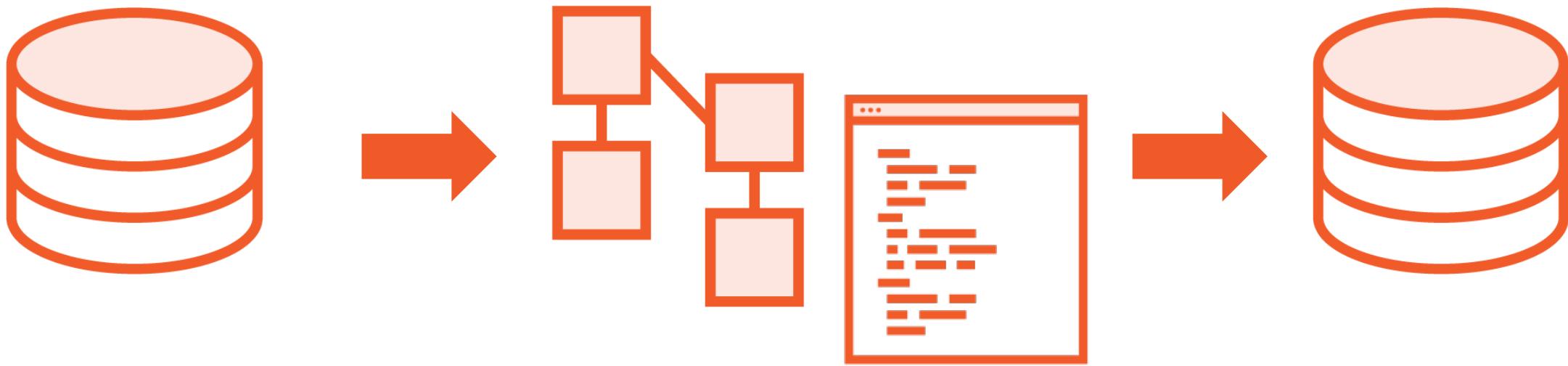
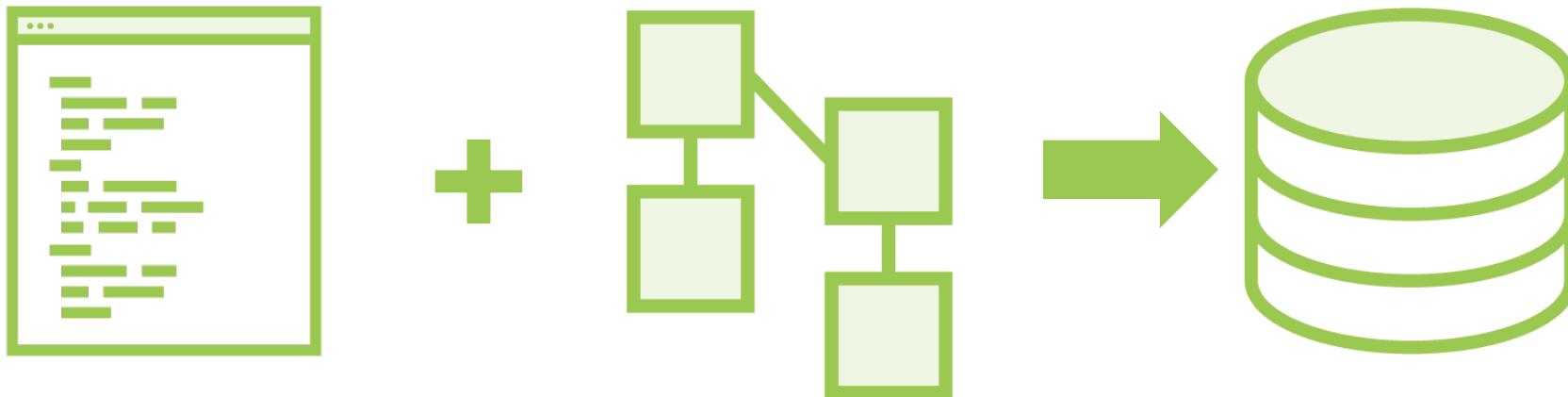
Data model
LINQ queries
Save changes



Track changes
Build SQL
Execute SQL
Create objects



Model Creation Options



Mapping Classes & Properties to Database

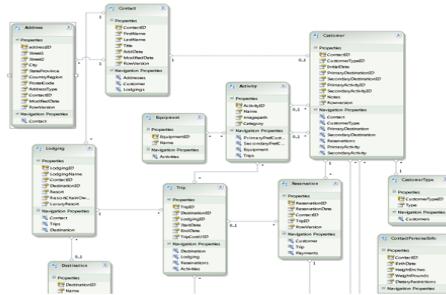


```
public class Customer {  
    ← Relies on Data Model/Custom → Table Name: Customers  
    public int Id {get;set;}           ← Convention → Id (PK, int, not null)  
    public string FirstName {get;set;} ← Custom Mapping → First_Name(nvarchar(30),not null)  
    public DateTime DateOfBirth {get;set;} ← Convention → DateOfBirth(date, not null)  
}
```



Basic Workflow

Define model



Express & execute query

(from p in people select p)
.ToList()

EF determines
& executes SQL

SELECT * from people

User modifies data



EF transforms results
into your types

3	Ms.	Donnie	F.	Carreras
4	Ms.	Janet	M.	Gates
5	Mr.	Lucy	NULL	Harrington
6	Mr.	Joop	X.	Carroll
7	Mr.	Dominic	P.	Gash
10	Ms.	Kathleen	M.	Garza
11	Ms.	Kathleen	NULL	Harding
12	Mr.	Johnny	A.	Caprio
16	Mr.	Christopher	R.	Beck
18	Mr.	David	J.	Liu
19	Mr.	John	A.	Beaver

Code triggers save

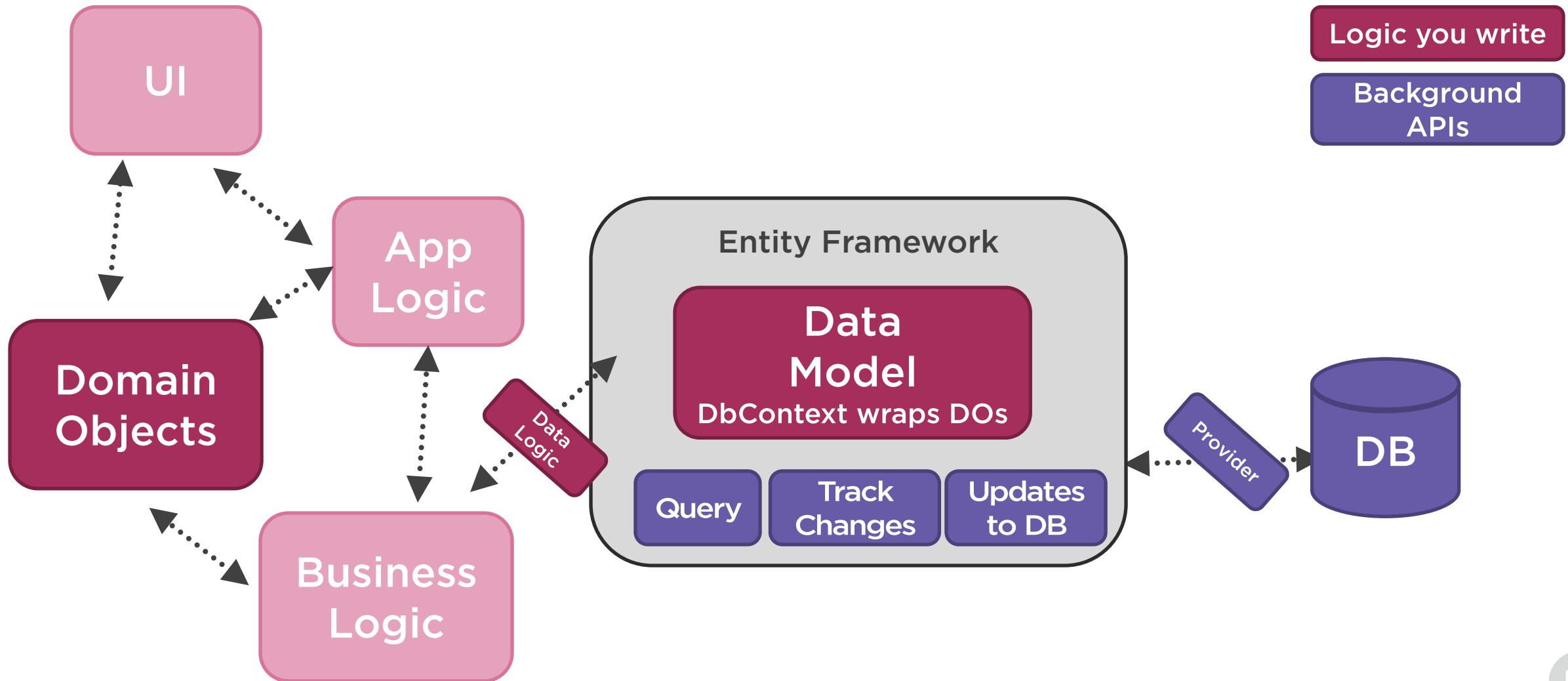
DbContext.SaveChanges

EF determines & executes SQL

UPDATE people
SET Firstname='Julie'
WHERE id=3



EF in Your Software Architecture



EF Core Is Still Entity Framework

Data Model

DbContext API

Migrations

LINQ to Entities

Change Tracking

SaveChanges



EF Core Enables Long-Requested Features

Batch Insert,
Update, Delete

Unique
Constraints

Smarter
Queries

Smarter
Disconnected
Patterns

In-Memory
Provider for
Testing

Extensible & IoC
Friendly

Model-Only
Properties
("Shadow State")

Smarter & Simpler
Mapping

Mapping to
Backing
Fields

Opt out of
DB Transactions
at SaveChanges

Temporary
Properties for
run time, not DB

Simple Service
Replacement



New in EF Core 2.0

Querying

- GroupJoin fixup
- Improved LINQ translation
- EF.Functions.Like()
- Global query filters (per type)
- Manually compiled queries

Mapping

- Type Configuration (ala EF6)
- Complex type/
(value object) support
- Table splitting

Etc.

- Consolidate logging
& diagnostics
- App Insights integration
- Easier service replacement



EF Core 2.1 – Planned Features

- | | |
|-----------------------------|----------------------------|
| ▪ GroupBy | Lazy loading |
| ▪ Seeding | Value conversions |
| ▪ View types | Lifecycle events |
| ▪ Include for derived types | Non-default constructors |
| ▪ System.Transactions | Update model from database |
| ▪ Cosmos DB provider | Column ordering |
| ▪ Sample Oracle provider | Perf investigation |
| ▪ App insights integration | UWP testing |



bit.ly/EFCoreRoadmap



What About EF6 and EF Core 1.0?



EF6 or EF Core?

Starting a
new app

Want to
update an
old app



	EF6	EF Core 2
Production Ready		
Actively Evolving		
Visual Designer		*expect 3 rd party support
Backwards Compatible		
Full .NET Support		*4.6.1 +
.NET Core Support		
Lightweight API(s)		
Better APIs, New Features		
Non-Relational Data		*EF 2.1: Cosmos DB
Open-Source (on GitHub)		



For .NET apps,
use EF Core only if it has all
of the features you need.

Otherwise, use EF6



Updating EF6 to EF Core





EF Core 1.1

bit.ly/PS_EFCoreStart

Entity Framework Core: Getting Started

★★★★★ By Julie Lerman

This course will help those with experience in earlier versions of Entity Framework, and developers completely new to Entity Framework, learn how to build models with EF Core, how to use EF Core to interact with data, and more.

[Start free trial now](#)

[Play course overview](#)

Course Overview

Course Overview

Introducing a New, Lightweight Version

Introduction

Course Overview

Module Overview

What Is Entity Framework?

What Is Entity Framework?

Where Can You Use Core?

EF6 Features Not Co to EF Core

How Entity Framework Works

Review

Entity Framework Core overview

Why a fresh start and a new name?

EF Core vs EF6

Highlights of new features

Highlights of familiar features

EF Core, .NET Framework and .NET Core

Resources

Pluralsight: Domain-Driven Design Fundamentals bit.ly/PS-DDD
Entity Framework in the Enterprise bit.ly/PS-EFEnt

Entity Framework Core on GitHub github.com/aspnet/entityframework
Entity Framework 6 on GitHub github.com/aspnet/entityframework6

EF Core Roadmap bit.ly/efcoreroadmap

Data Points - EF Core Change-Tracking Behavior: Unchanged, Modified and Added, Aug 2016
<http://msdn.microsoft.com/magazine/mt767693>

Data Points - Refactoring an ASP.NET 5/EF6 Project and Dependency Injection,
Feb 2016 <http://msdn.microsoft.com/magazine/mt632269>

ASP.NET 5 is dead - Introducing ASP.NET Core 1.0 and .NET Core 1.0 by Scott Hanselman
hanselman.com/blog/ASPNET5IsDeadIntroducingASPNETCore10AndNETCore10.aspx

Some Insights into Features Being Dropped in the Move From EF6 to EF Core
thedatafarm.com/data-access/droppedfromefcore



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