

Testing Your Apps When Entity Framework Is Involved



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Overview



Automated tests, EF and test mocks

Planning what to mock in a test

Converting the first test to use mocking

Making the mocked DbSet reusable

Mocking Entity Framework queries

Mocking the Include method

Mocking asynchronous queries

Avoiding the “mock everything” trap

Refactoring and reorganizing the tests



What Is Mocking and Why Use It in These Tests?



How Mocking Can Help Tests

Method to Test

```
public decimal AddLineItemTotals(int cartId) {  
    var items = _context.CartItems.Where(i => i.CartId == cartId).ToList();  
    return items.Sum(i => i.Quantity*i.CurrentPrice);  
}
```

Test

```
[TestMethod]  
public void MethodReturnsCorrectValue(){  
    Assert.AreEqual(10, data.AddLineItemTotals(1));  
}
```



How Mocking Can Help Tests

Method to Test

```
public decimal AddLineItemTotals(int cartId) {  
    var items = _context.CartItems.Where(i => i.CartId == cartId).ToList();  
    return items.Sum(i => i.Quantity*i.CurrentPrice);  
}
```

Test

```
[TestMethod]  
public void MethodReturnsCorrectValue(){  
    [Mock: replace _context.CartItems with [this list of items]]  
    Assert.AreEqual(10, data.AddLineItemTotals(1));  
}
```



Planning What to Mock in a Test



**Executable
App**

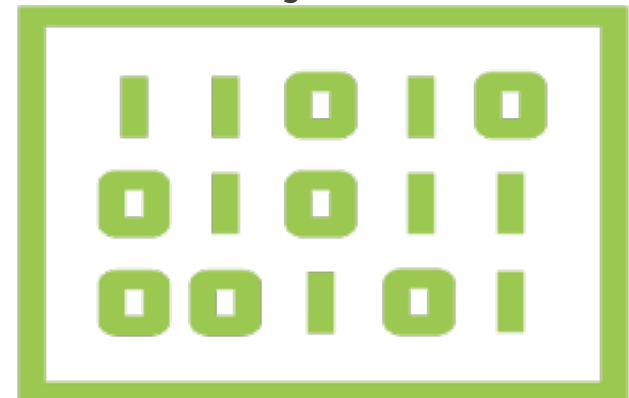
**Automated
Test**



EF Cache



In Memory Data Store



Tasks That Mocking Will Let Me Skip

Interact with
DbContext

Create a
command tree for
the insert

Compose the SQL

Execute the
command on the
database

Retrieve the newly
generated PKs for
Cart & CartItem



What are we mocking anyway?



Converting the First Test to Mock EF





Wait! There's more?

Mocking is not
so hard
if you
understand
how the pieces
fit together





Existing Code Is Too Hard to Test

Time to Refactor That Code



Making the Mocked DbSet Reusable



Mocking Entity Framework Queries



What EF work
does this test involve
that I need to mock?



What

t

What EF work
does this test involve
that I need to mock?

to

mock?



Mocking EF Include



Include Is a “No-op”* When Mocking

**Why does
Include fail?**

**What does it
mean to Eager
Load from
Mocked Data?**

**How to Mock
Include()**

*No Operation



Mocking EF's Asynchronous Methods



Avoiding the “Mock Everything” Trap



Refactoring the Tests Based on Their Database Dependencies



Review



Automated Tests, EF and Test Mocks

Planning What to Mock in a Test

Converting the First Test to Use a Mock

Making the Mocked DbSet Reusable

Mocking Updates & Queries

Mocking Include

Mocking Asynchronous Queries

Avoiding the “Mock Everything” Trap

Refactoring and Reorganizing the Tests



Resources

Helpful Pluralsight Courses

- Automated Testing for Fraidy Cats Like Me bit.ly/PS-Testing
- Patterns for Pragmatic Unit Testing bit.ly/2aJ5XeV
- Refactoring Fundamentals (see Testing Code Smells) bit.ly/PS-Refactor

EF6 Repository on Github: github.com/aspnet/entityframework6

MockableDBSetTests in EF6 Repository:

[github.com/aspnet/EntityFramework6/blob/master/test/
EntityFramework/FunctionalTests/TestDoubles/MockableDbSetTests.cs](https://github.com/aspnet/EntityFramework6/blob/master/test/EntityFramework/FunctionalTests/TestDoubles/MockableDbSetTests.cs)

MSDN Docs: Testing with a mocking framework (EF6 onwards)

msdn.microsoft.com/en-us/library/dn314429.aspx



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