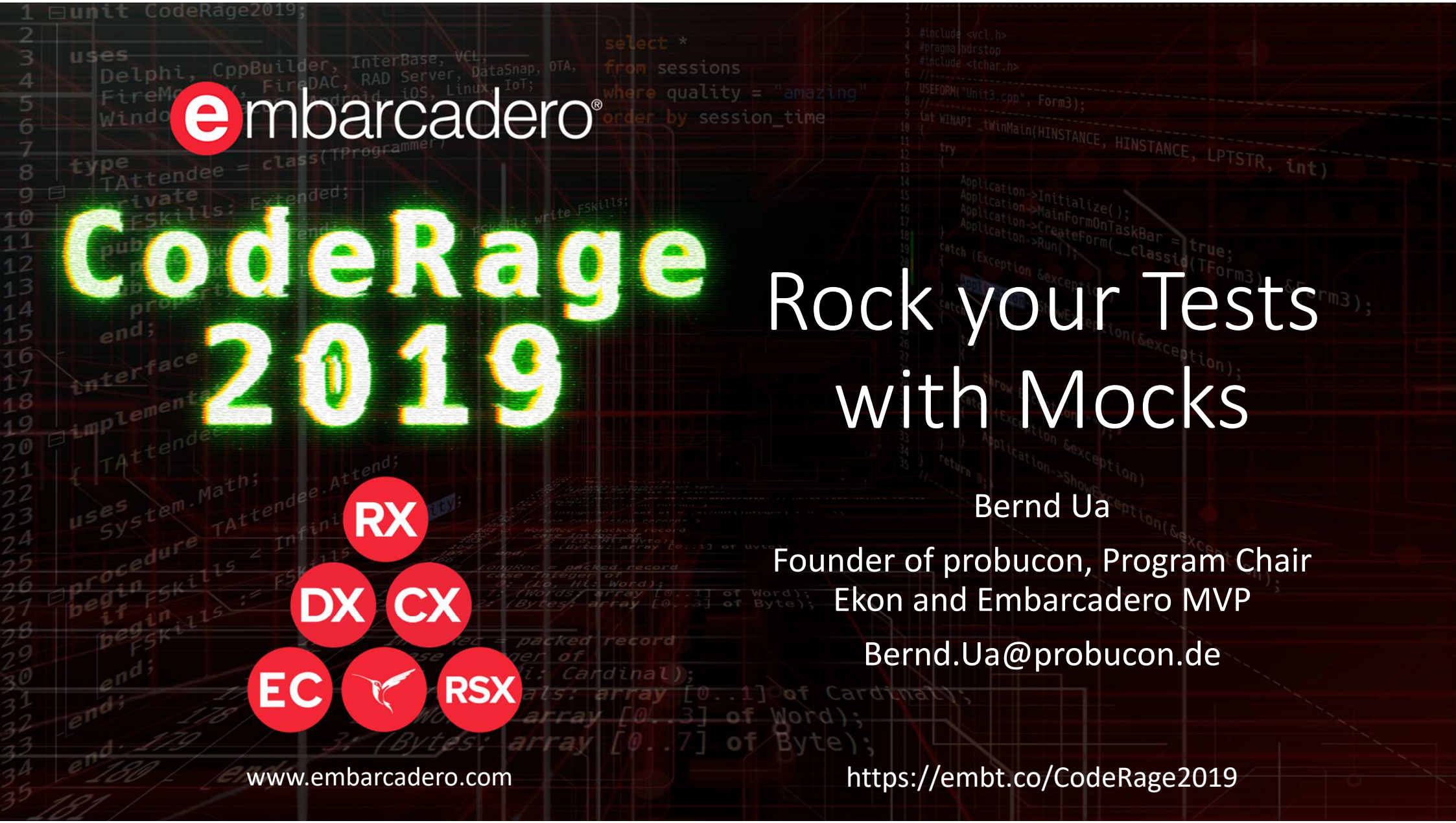

Rock your Tests with Mocks

Bernd Ua

Founder of probucon, Program Chair Ekon and Embarcadero MVP

Bernd.Ua@probucon.de

https://embt.co/CodeRage2019

Overview

- Spring4D is a great open source framework to leverage the power of Delphi. In this session we will take a look a the mocking framework contained in Spring4D. We will see how easy it is, to get started with mocking and mock out interfaces your classes under tests are using.

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What is mocking ?“

- If you are mocking out something you replace a productive implementation with a special implementation for testing, the so called mock
- You can write Mocks manually or use ones that have been automatically created by frameworks
- The difference between mocks and stubs or dummies is some extra code to log and check calls made to the mock

What a Unittest should not do

- a Unit-Test should better not use
  - Databases
  - Network access
  - File Systems
  - External Ressources
  - A configured Environment
- If your unit test uses one of the above it is more likely an integration test

Using Mocks in your Tests

- You can replace concrete access to databases/resources with interfaces and mocks
- The number of classes that need to be tested with resources is minimized, thereby increasing test performance
- Mocks can also be used to test scenarios that are difficult to represent in reality

What characterizes a good unit test?

- It is clearly arranged
  - Probably follows AAA-scheme Arrange-Act-Assert
- It is executed quickly
- It helps to locate a problem quickly

Automatic Mocking

- Advantages
  - Setup of your Test and the definition of expectations can be found directly within the test and not somewhere else
  - Less work and less errors than manual programming
- Disadvantages
  - There might be limitations (IInvokable, Interfaces etc)

Mocking Frameworks for Delphi

- For Delphi before 2009/XE2 there is just PascalMock
  - PascalMock can check Calls and their Order and Parameters using Variant
- For actual Delphi Versions there are
  - DSharp Mocks
  - https://bitbucket.org/sglienke/dsharp/overview
  - DelphiMock
  - https://github.com/VSoftTechnologies/Delphi-Mocks
  - Spring4D Mocks
  - https://bitbucket.org/sglienke/spring4d/src/master/

A short Spring4D history

- Open Source Library für Delphi
- Lizenz Apache License 2.0
- Started in 2010 on Google Code and changed later on to BitBucket
- Actually Stefan Glienke is maintaining the framework and pushing it forward
- Plenty of stuff in it
  - Dependency injection container
  - generic interfaces for lists and collections
  - Multicast events, Nullable types etc
- Since Version 1.2 containing a Mocking Framework

Spring 4D Links

- GIT
- https://bitbucket.org/sglienke/spring4d.git
- WIKI
- https://bitbucket.org/sglienke/spring4d/wiki/Home
- API Documentation at DevJet Software
- http://www.devjetsoftware.com/docs/spring4d/

Simple installation

- Download from BitBucket
- Unzip to destination directory
- Run Build.exe and select Delphi IDEs for install
- If you select Update Registry your Library Path is extended for you

Mocking Framework in Spring 1.2

- Is realized with the help of generic records (Mock<T>) and Interfaces
- The mocks uses fluent interface technique for easy setup
- Simply include unit Spring.Mocking.pas in your uses clause
- Use the generic record Mock<T> for the interface you want to mock out
- Use Mock<T>.Setup to define the behaviour
- You can mock out Interfaces compiled with {$M+} or inheriting IInvokable instead of IInterface
- If you mock out Classes only virtual methods are being mocked out

Setting up a mock in the test

- Use the Setup-Interface to define the behavior
  - .Setup.Returns for functions and results
  - .Setup.Executes for procedures
  - .Setup.Raises to throw exceptions
- Use „When“ after Setup to define the conditions for the behavior
- In Strict-Mode you can only call defined methods
- Use generic Record TArg (or global var Arg) to express special parameter values (like IsAny, IsIn , IsNil etc)

Controlling Mock Behavior

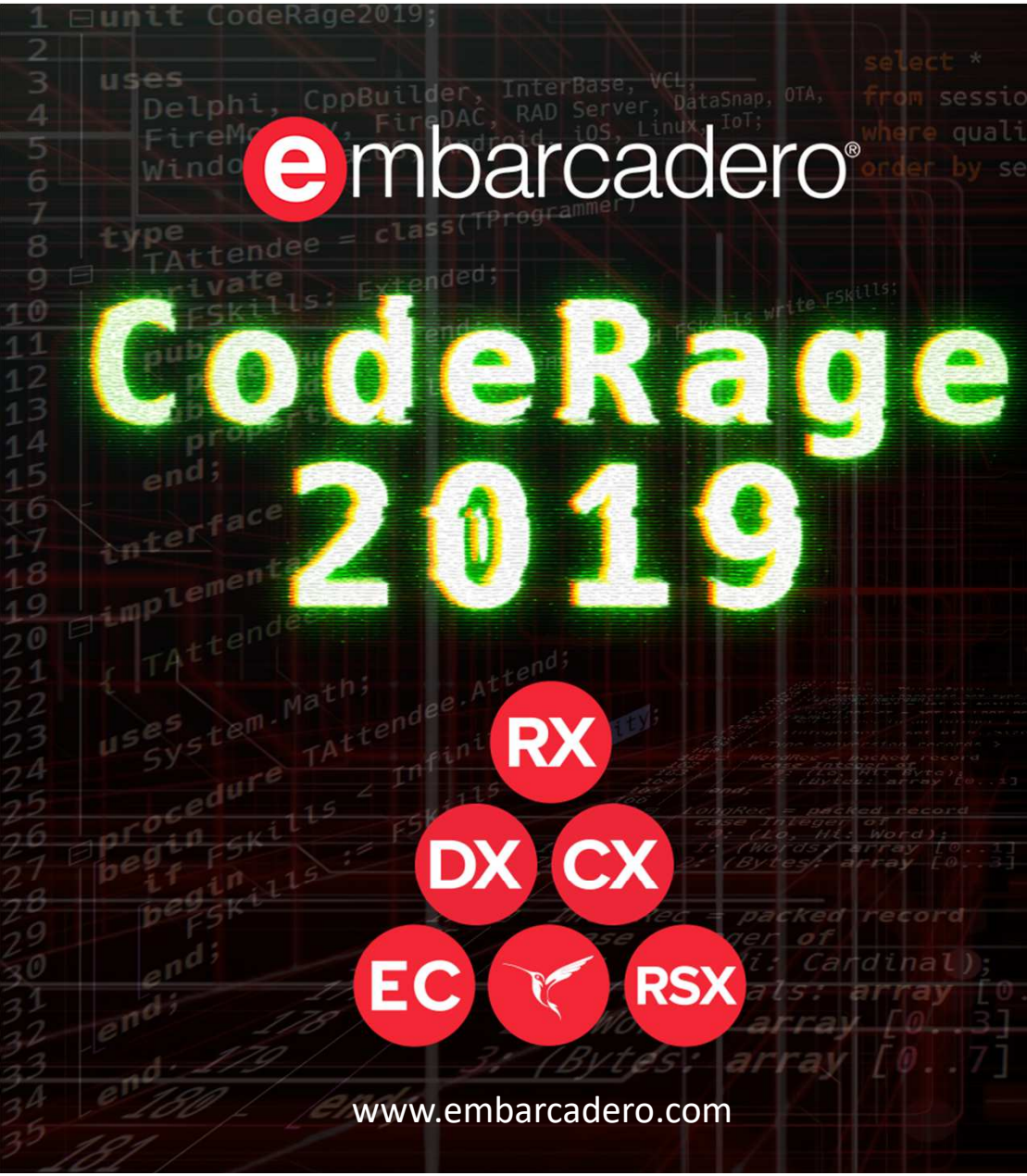
- TMockBehavior.Strict
  - Mock throws an Exception if any Method is called that has not been setup before
- TMockBehavior.Dynamic
  - Mock accepts every call
  - Returns default values for every call

Checking Results

- Most other mocking frameworks use a verify method to compare expectations with issued calls
- Spring4D uses a generic method Received for this purpose
- Received optionally accepts a Times argument to configure the number of expected calls (Once, Never, AtLeastOnce, etc)
- If the calls in Received differ from the actual calls an exception is raised

Checking the Order of Calls

- Spring4D ignores the order if you check or define behavior via Received or Setup
- If you want to check the order of calls, you have to use a MockSequence Record
- Define a local variable of type MockSequence and use it as a parameter for Setup
- If you are done with your test execution check the whole sequence with a call to MockSequence.Completed



More Information

- Landing page with Links to articles, slides and source for this video
- https://probucon.de/blog/2019/12/coderage-2019/
- Bernd Ua
- Bernd.Ua@probucon.de