Visual Studio
ALM Days 2012

Load Testing mit Visual Studio 2012

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Übersicht

Gründe und Zeitpunkt

Einzeltests erstellen

Einzeltests in Lasttests verwenden

Windows Azure zur Lasterzeugung

Gründe

- (Fast) keine Anwendung skaliert linear
- Hohe Benutzeranzahl schlechtere Antwortzeiten

Architekturanforderungen prüfen

PERFORMANCE

Maximum 3 seconds average page response time	Minimum 25 orders per seconds
Minimum 1200 concurrent users with no timeouts	1 new front end server adds 20% more users

- Zeitpunkt:
- Möglichst früh und regelmäßig
- Einfach beginnen und mitwachsen lassen

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Visual Studio 2012 Lasttest Architektur
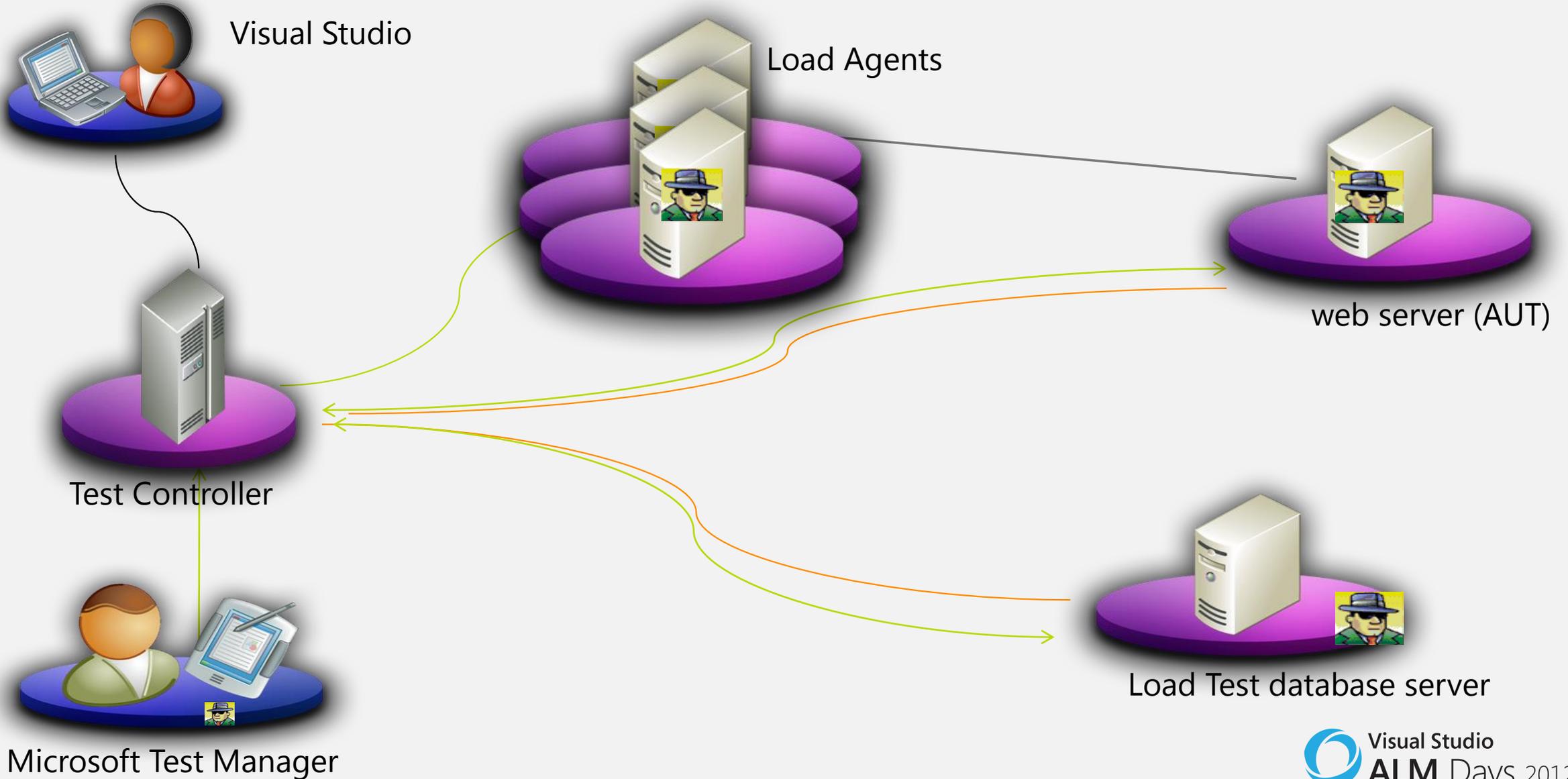
Einzeltests

WebTests

CodedUITests

Unittests

Datenbanktests

WebTest-Erstellung

WebTest-Ausführung

Dauert ein Aufruf besonders lang?

Werden viele Daten übertragen?

Treten Fehler auf?

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Think Time und Response Time Goal

Credentials

Caching

Datengetrieben

Quellcode

WebTest3Coded | ⊕ **Run()**

```vb
Public Overrides Sub Run()
    'Initialize validation rules that apply to all requests in the WebTest
    If (Me.Context.ValidationLevel >= Microsoft.VisualStudio.TestTools.WebTesting.ValidationLevel.Low) Then
        Dim validationRule1 As ValidateResponseUrl = New ValidateResponseUrl()
        AddHandler ValidateResponse, AddressOf validationRule1.Validate
    End If
    If (Me.Context.ValidationLevel >= Microsoft.VisualStudio.TestTools.WebTesting.ValidationLevel.Low) Then
        Dim validationRule2 As ValidationRuleResponseTimeGoal = New ValidationRuleResponseTimeGoal()
        validationRule2.Tolerance = 0.0R
        AddHandler ValidateResponseOnPageComplete, AddressOf validationRule2.Validate
    End If

    Dim request1 As WebTestRequest = New WebTestRequest("http://www.fabrikam.com/")
    MyBase.Send(request1)
    request1 = Nothing

    Dim request2 As WebTestRequest = New WebTestRequest("http://www.fabrikam.com/ServiceTickets/GetServiceTi
    request2.QueryStringParameters.Add("ticketId", "1", False, False)
    MyBase.Send(request2)
    request2 = Nothing

    Dim request3 As WebTestRequest = New WebTestRequest("http://www.fabrikam.com/ServiceTickets/GetServiceTi
    request3.ThinkTime = 4
    request3.QueryStringParameters.Add("ticketId", "2", False, False)
    MyBase.Send(request3)
    request3 = Nothing
```

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WebTest

Demo

Neu, ausführen und datengetrieben

CodedUITest

- Aufzeichnung und Abspielen von Benutzerinteraktionen
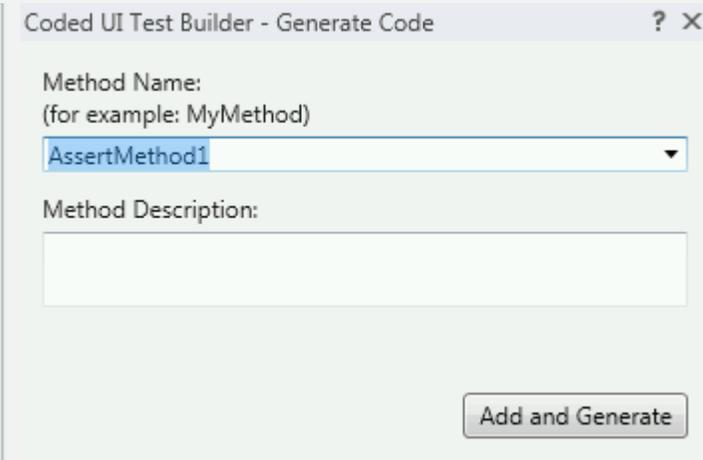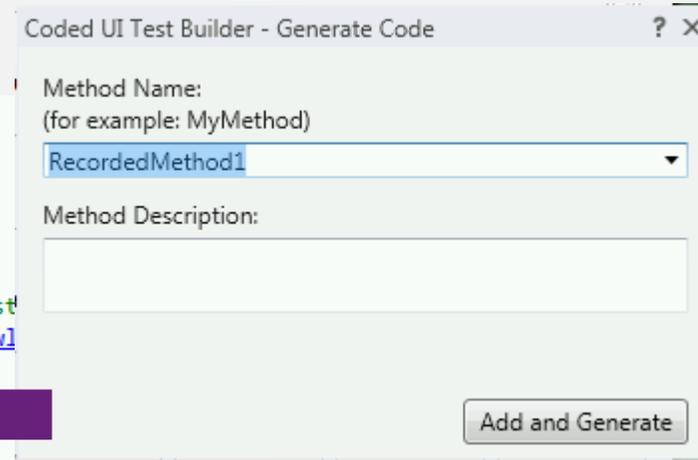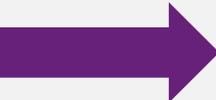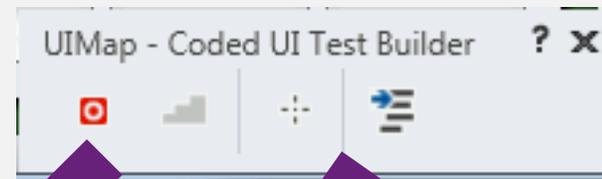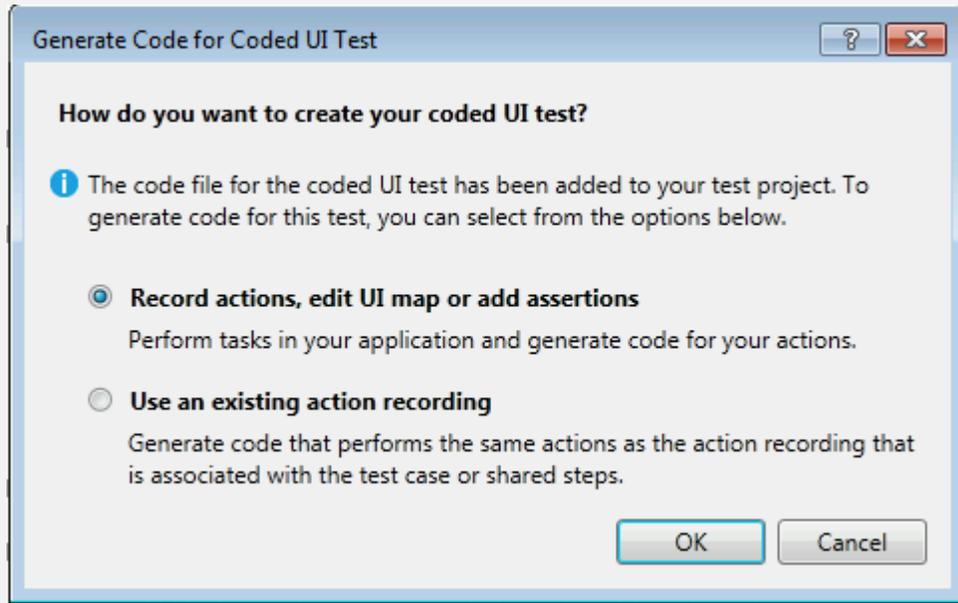
CodedUITest
Demo

Unittests

```csharp
[TestClass()]
public class CustomersControllerTest
{
    MockCustomerRepository mockCustomerRepo;
    CustomersController controller;

    [TestInitialize()]
    public void SetupController()
    {
        mockCustomerRepo = new MockCustomerRepository();
        controller = new CustomersController(mockCustomerRepo);
    }

    [TestMethod()]
    public void CreateInsertsCustomerAndSaves()
    {
        controller.Create(new Customer());

        Assert.IsTrue(mockCustomerRepo.IsInsertOrUpdateCalled);
        Assert.IsTrue(mockCustomerRepo.IsSaveCalled);
    }
}
```

Test Explorer

Search

Run All | Run... ▾

▲ **Failed Tests** (1)
  ❌ ScheduleActionCorre...   28 ms

▲ **Passed Tests** (7)
  ✅ CreateInsertsCustom...   70 ms
  ✅ DeleteConfirmedDel...   < 1 ms
  ✅ DeleteFindAndReturns... 3 ms
  ✅ EditUpdatesCustom...   < 1 ms
  ✅ IndexReturnsNonNull...   3 ms
  ✅ ItShouldThrowExcept...   41 ms
  ✅ ScheduleActionRetu...   130 ms

Unittests

Demo

Datenbanktests

Einzeltests in Lasttest verwenden
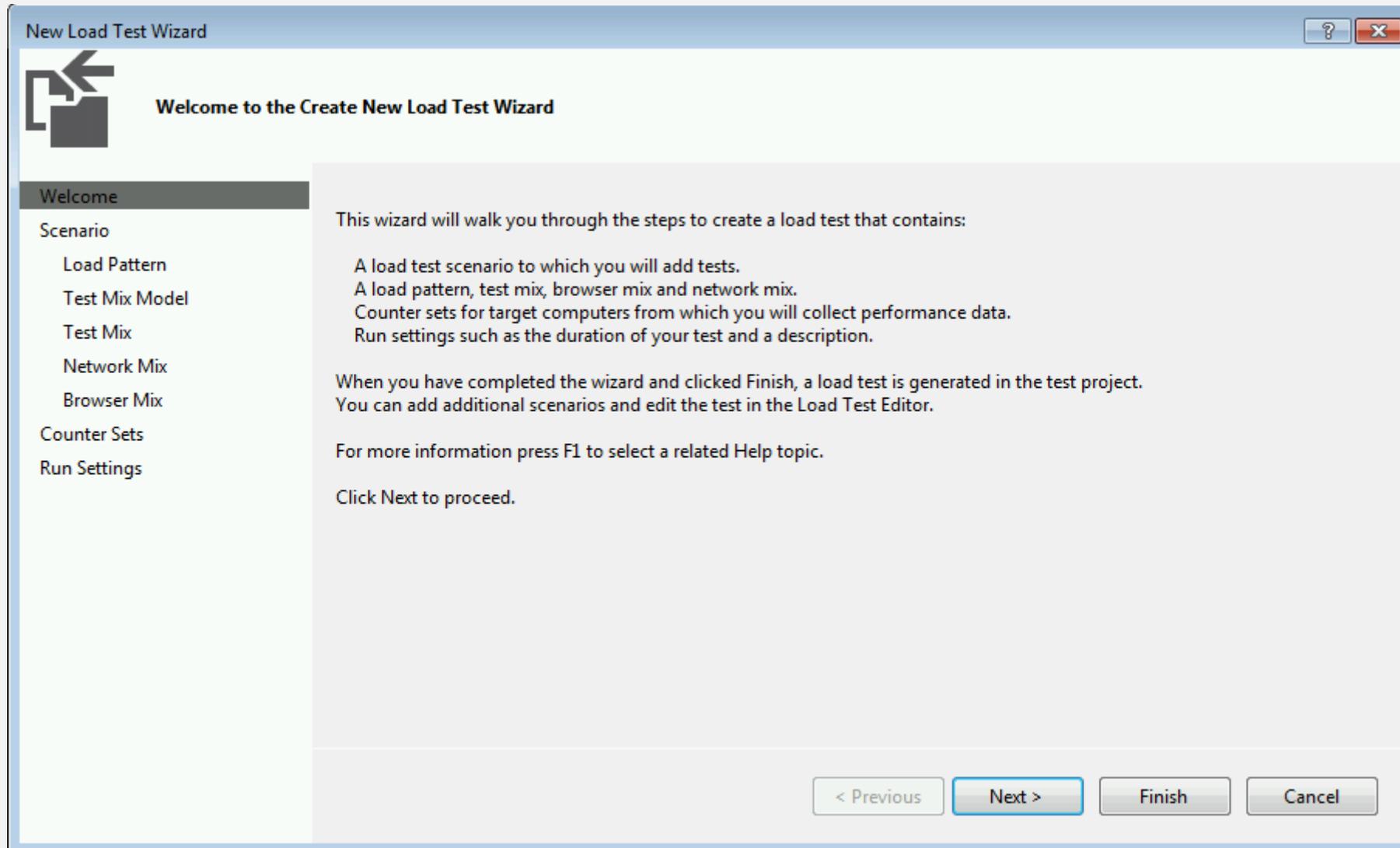
Think Times
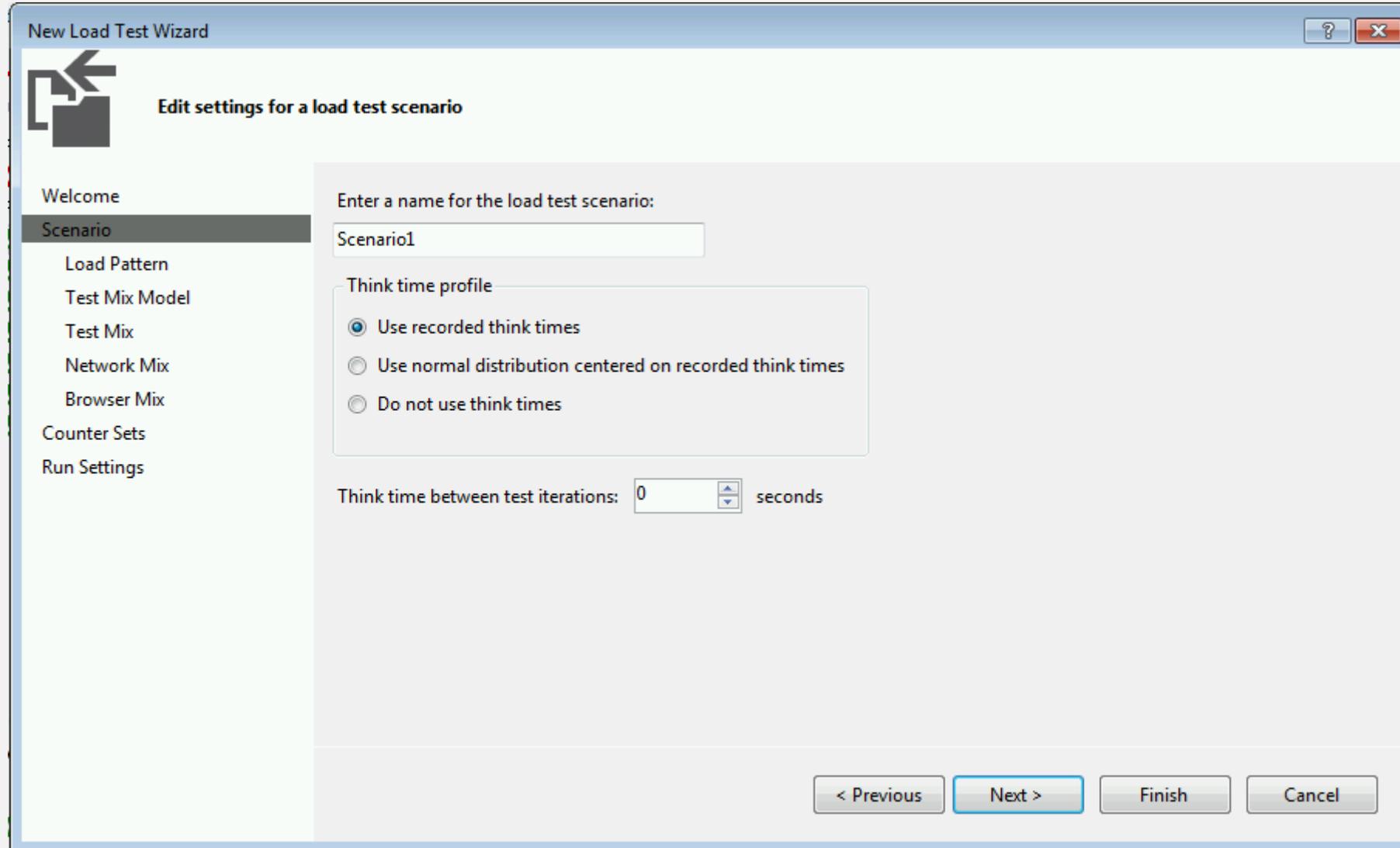
Anzahl der simulierten Benutzer
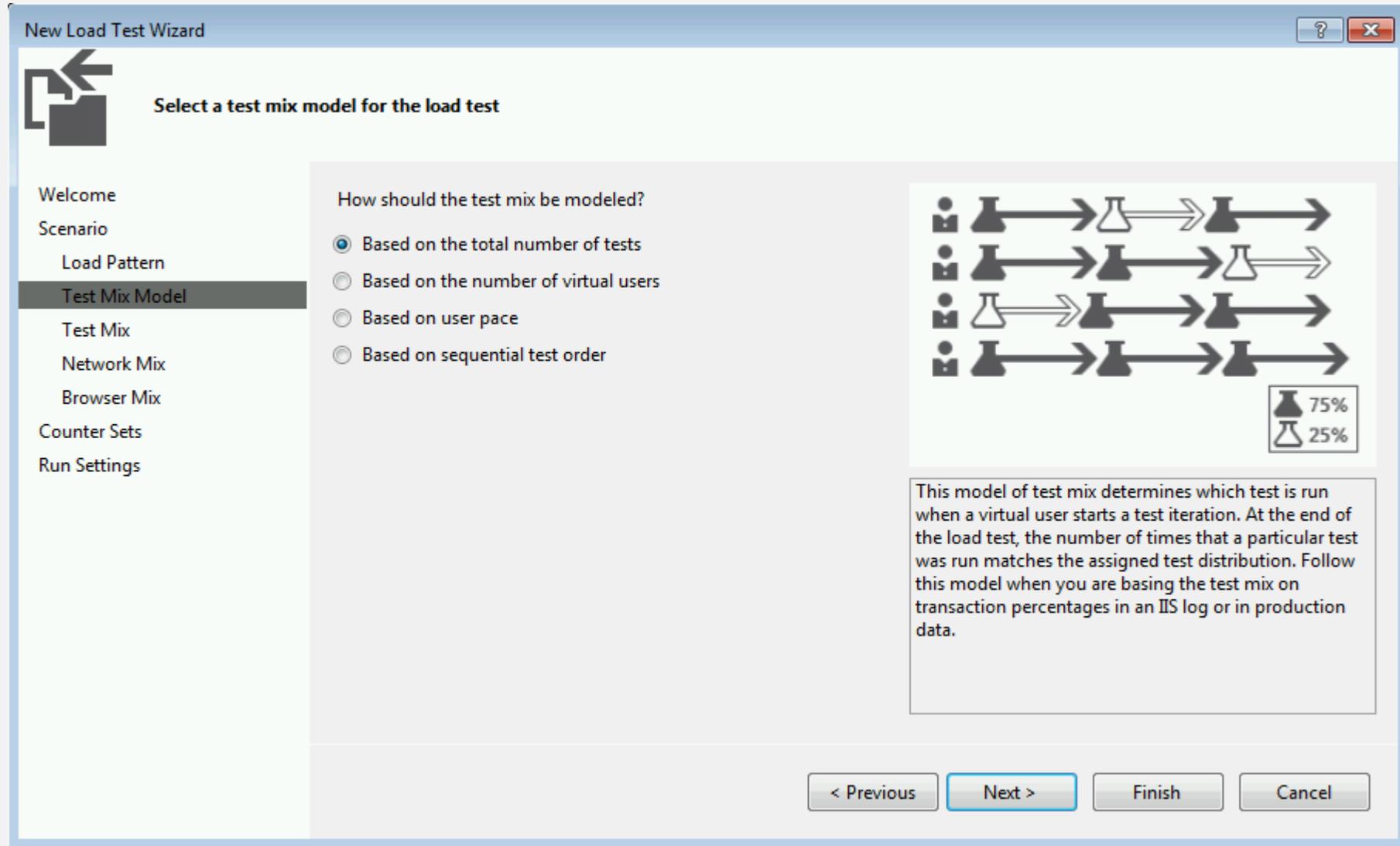
Test mix model

Einzeltests und Verteilung

Netzwerkbandbreite und Verteilung

Browser Mix

Performance Counter

Testdauer

Loadtest

Testergebnis

Loadtest

Demo

Profiler zum Ermitteln der Engpässe

Analyse bis auf Zeilenebene

Function Code View

c:\ws\brian\ff\Dev\FabrikamFiber.CallCenter\FabrikamFiber.DAL\Data\ServiceTicketRepository.cs

```csharp
            get { return this.context.ServiceTickets; }
        }


        public IQueryable<ServiceTicket> AllIncluding(params Expression<Func<ServiceTicket, object>>[]
        {
            IQueryable<ServiceTicket> query = this.context.ServiceTickets;

            foreach (var includeProperty in includeProperties)
            {
                query = query.Include(includeProperty);
            }
```

68.7 %

Profiler

Demo

Beispiel Windows Live Hotmail

- about 8 million customers in 1997 to over 260 million customers worldwide
- Web Testing and Load Testing capabilities of Visual Studio
- support 215,000 concurrent clients

Establishing a Baseline

ATE Ingredients

ATE = Azure Test Environment von Microsoft Consulting Services
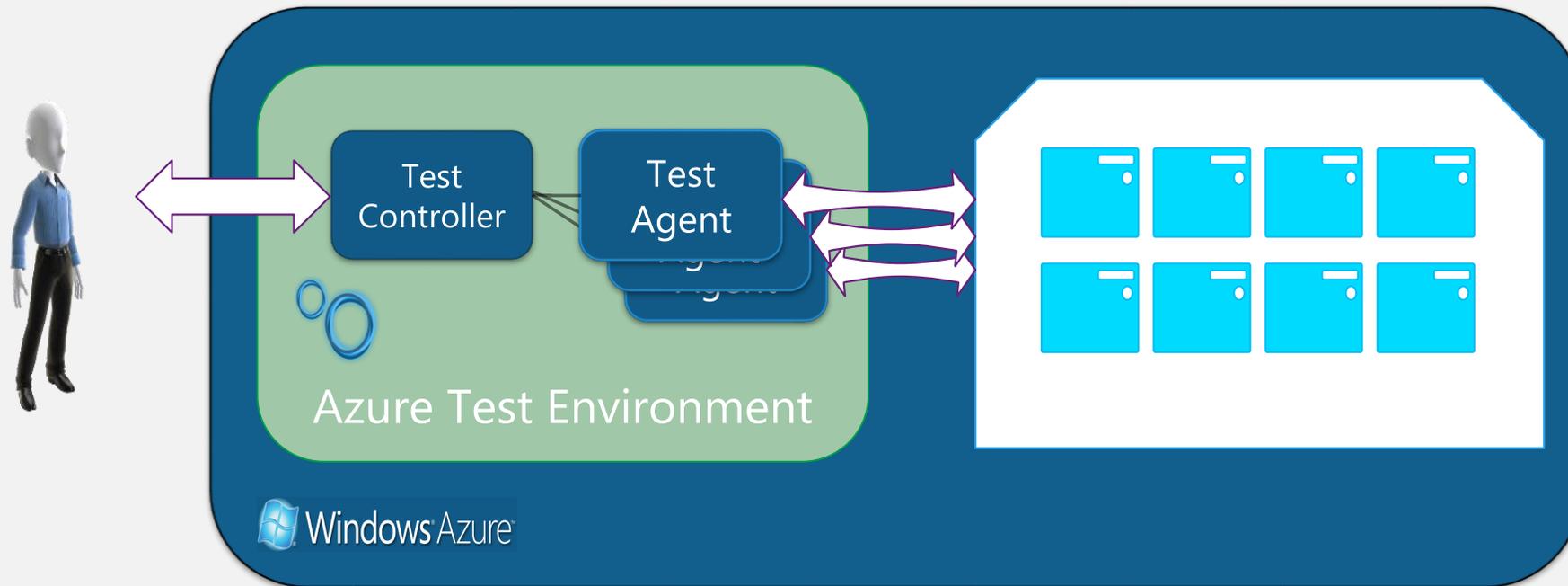
Weitergehende Informationen

Visual Studio Performance Testing (not so) Quick Reference Guide

A quick reference for users of the Team Testing performance features of Visual Studio

Visual Studio Performance Testing Quick Reference Guide

6/20/2011

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Fragen? Danke!

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