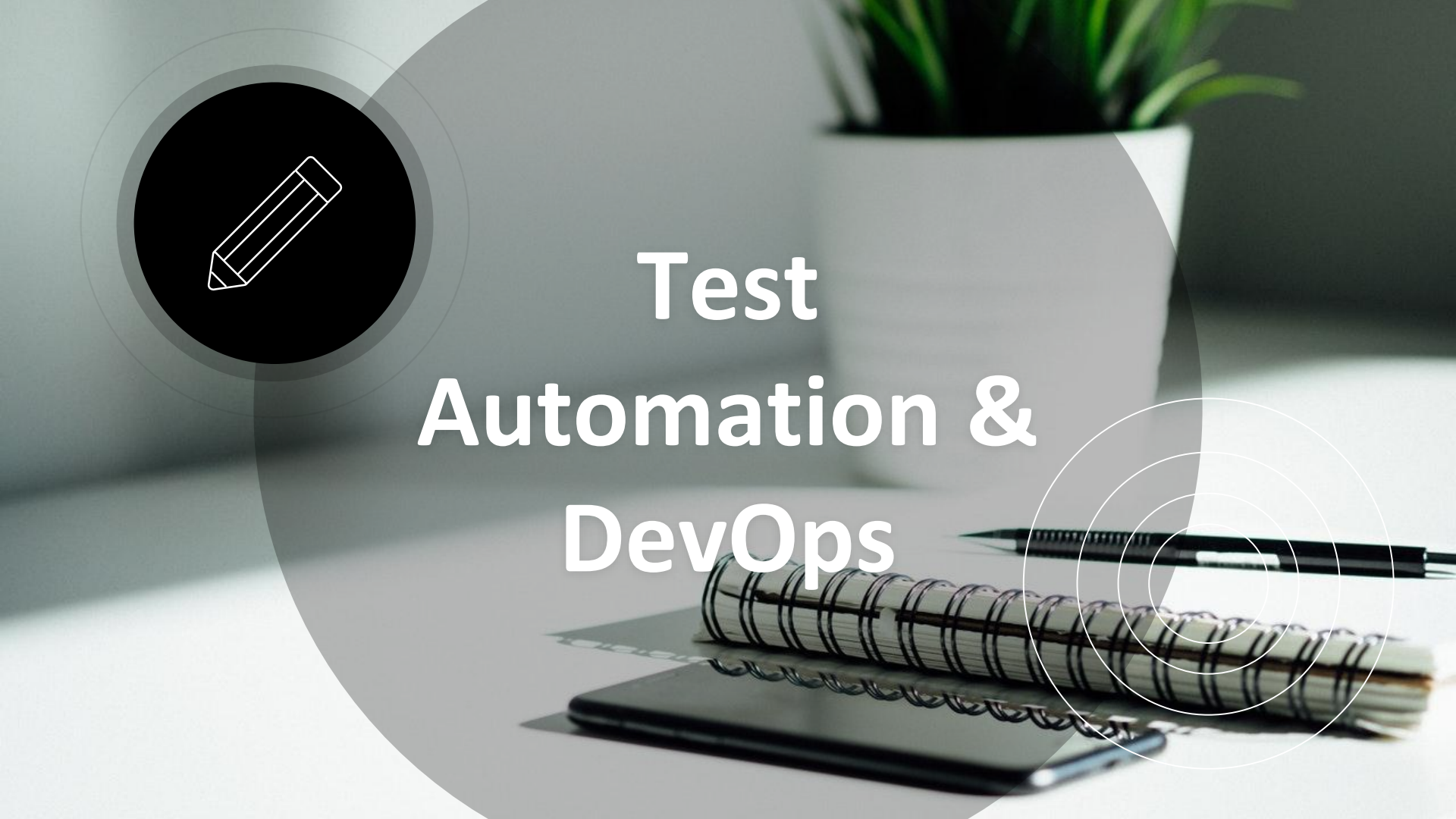
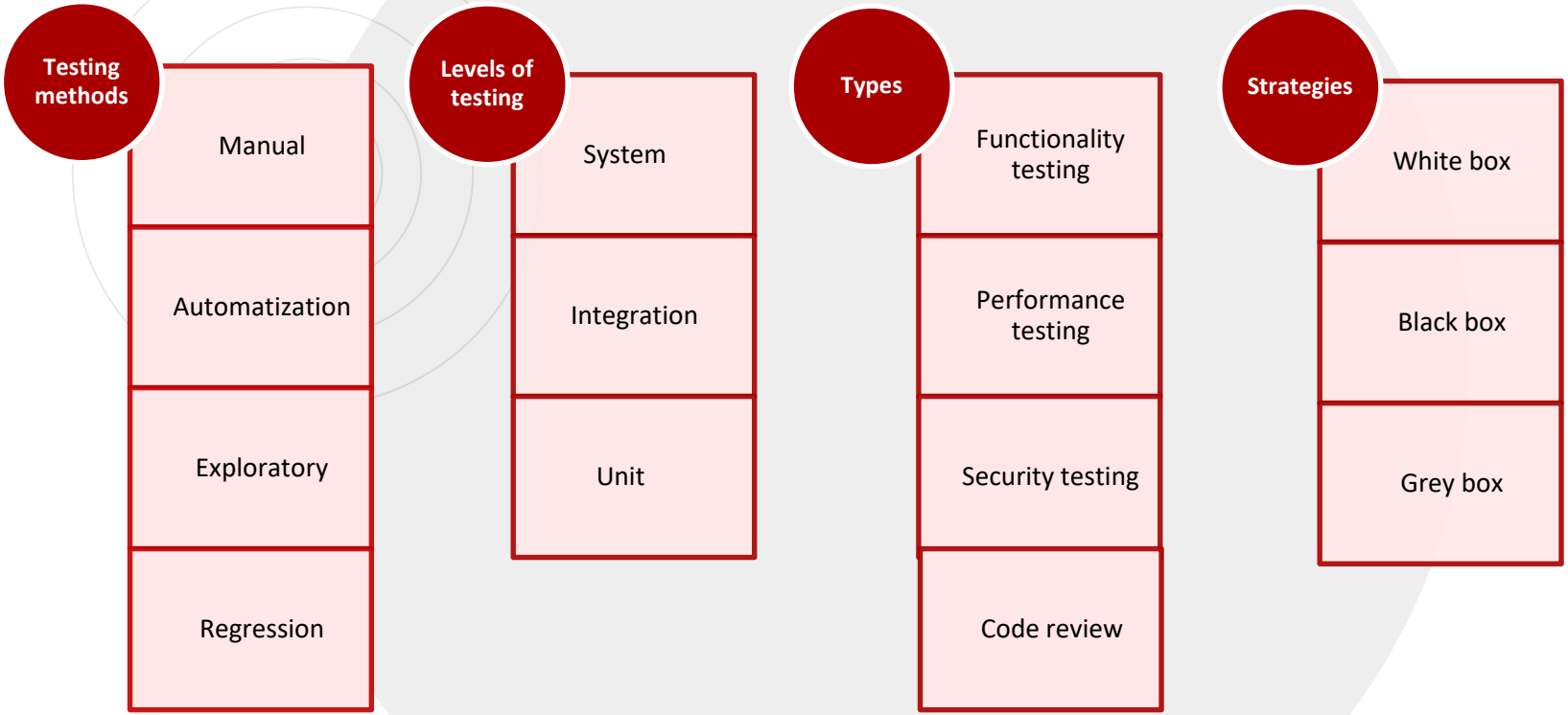

Test
Automation &
DevOps

Hello!

Stefani Majić

Software Test Engineer, Span

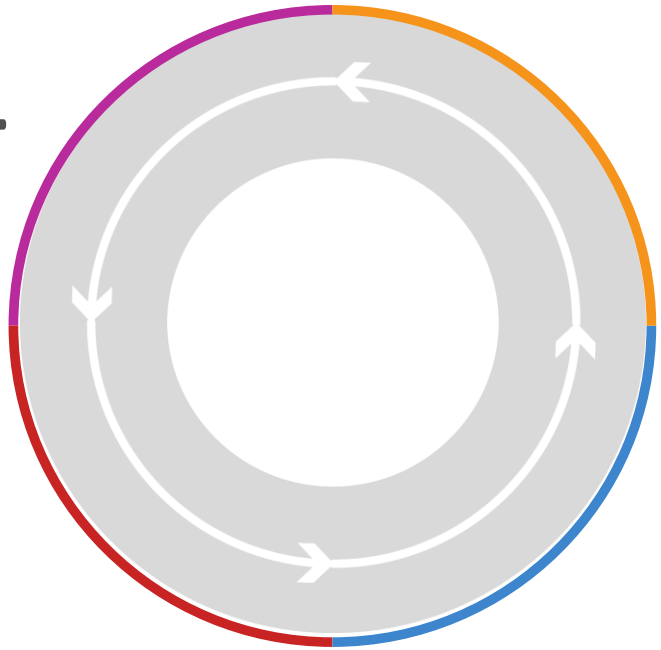
stefani.majic@span.eu


Testing methods
Manual
Automatization
Exploratory
Regression
Levels of testing
System
Integration
Unit
Types
Functionality testing
Performance testing
Security testing
Code review
Strategies
White box
Black box
Grey box

Create a cordon

Documentation

1



5

Record scene

Automation

Regression

At the crime scene

Exploratory testing

2

4

Lead suspects?

Bug managment

3

Create common approach

Types and cases

Software investigation

“Automation does not do what testers used to do, unless one ignores most things a tester really does. Automated testing is useful for extending the reach of the testers work, not to replace it.”

James Bach

1

Automation in Agile

Let’s start

Automation in Agile

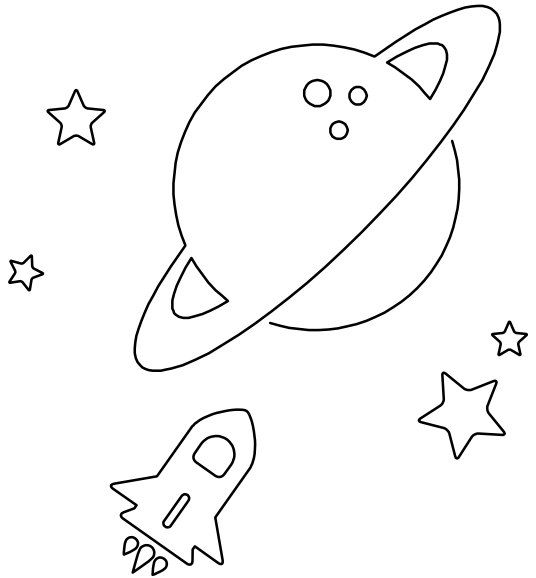
Automation is a critical component of agile testing. The significance of automating test cases lies in the fact that the count of test cases at the system testing level will keep on increasing after each sprint whenever a new functionality is going to get added and then the old code needs to be regressed to authenticate them.

Due to time constraints, it is important to know what should be automated in best possible way to get good returns from automation.

- **Test automation** is the best way to increase the effectiveness, efficiency and coverage of your software testing.
- Mostly used for **regression** testing.

- An automated test is able to playback pre-recorded and predefined actions, compare the results to the expected behavior and report the success or failure of these manual tests to a test engineer.

Test Automation Challenges in Agile



Big concept

What to automate?

	Simple things	Hard things
Done once	**Do it manually**	**Automate it**
Done often	**Automate it**	**Buy or write software**

What to Automate?

- What to Automate ?
  - Automate the primary functions that will be used by the End-users
  - Automate End-to-End Scenarios
- What not to Automate ?
  - Do not try to automate not-so critical portions in the beginning
  - Do not automate status bars, help screens

When to automate?

- When to Automate ?
  - Is the Build Stable ?
  - Are the Test Cases and Test Scenarios ready and Final?
  - Are the Test Data ready ?
  - Is the Test Bed ready ?
  - Is the Test Automation tool installed ?
- When not to Automate ?
  - If the AUT is not Large\Complex
  - If you receive only few builds to test
  - If the feature doesn’t work accurately

How much to automate?

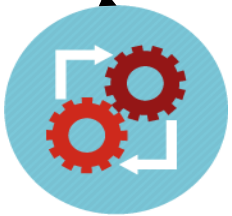
- Ideally 60% Automation is expected for a Regression Suite
- First, automate the primary functions that will be performed by the targeted end-users
- Next, add the not-so-critical portions of the application as time permits.
- Develop a test coverage matrix

Benefits of Test Automation in Agile

ROI

24x7 execution

Unit, integration, regression



Re-usability

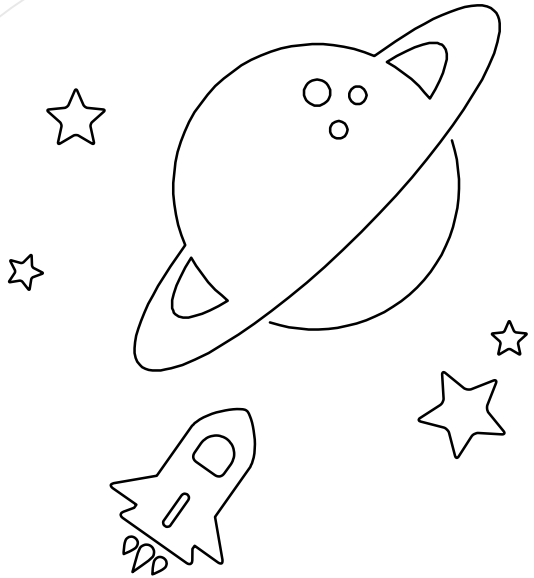
Reliability

Critical Success Factors

- Test automation must be implemented as a full-time effort, not a sideline.
- The test design process and the test automation framework must be developed as separate entities.
- The test framework must be application independent.

Critical Success Factors

- The test framework must be easy to expand, maintain, and enhance.
- The test strategy/design vocabulary must be framework independent.
- The test strategy/design must hide the complexities of the test framework from testers.



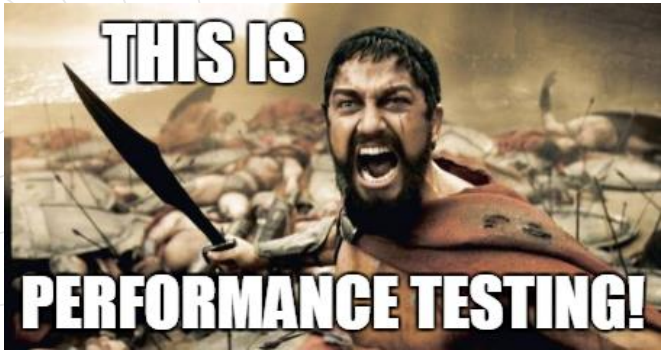
Tools

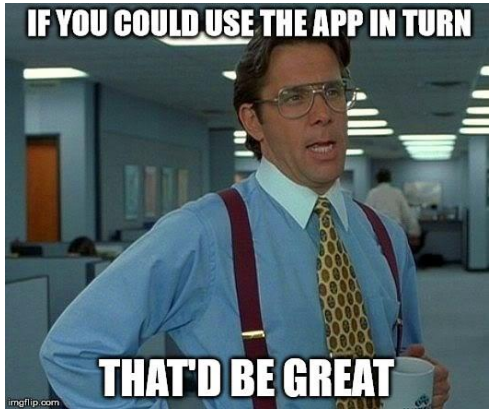
Technology we use

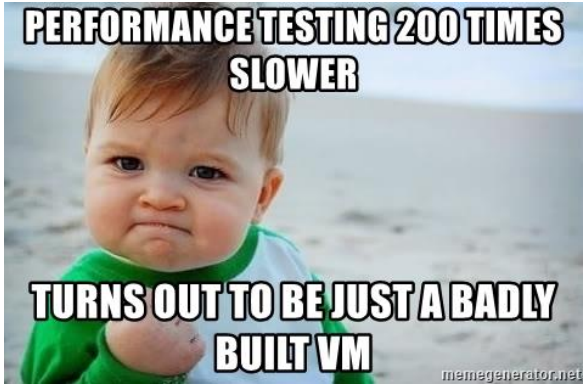
QA tools

- TFS, Azure DevOps
- VS Enterprise, Microsoft Test Manager
- Microsoft SQL Server Management Studio
- GIT
- Katalon Studio, Selenium, NUnit
- Zeplin, InVision, Maze, Figma
- Snagit, Canva (infografika)
- Postman, Newman
- Swagger, Fiddler
- Reponsive Web Design Tester
- BrowserStack
- Jmeter
- OWASP ZAP, Burp Suite
- TeamCity, Jenkins
- Appium, HockeyApp

Load and performance testing

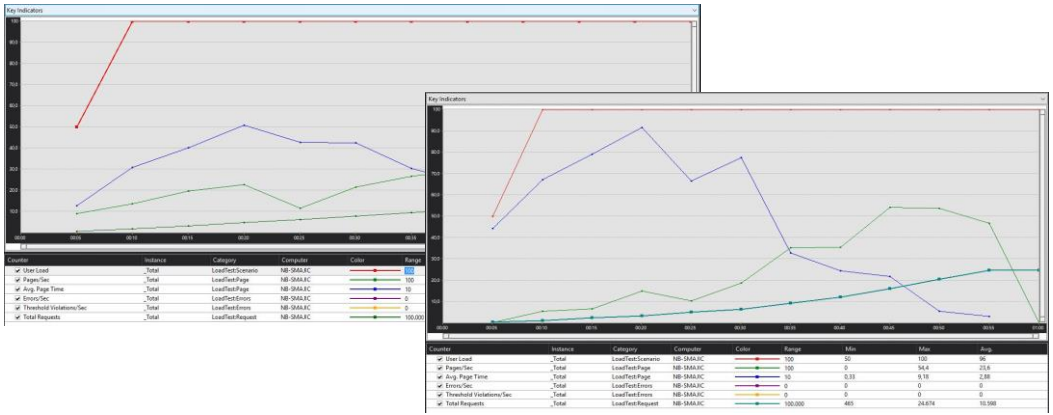


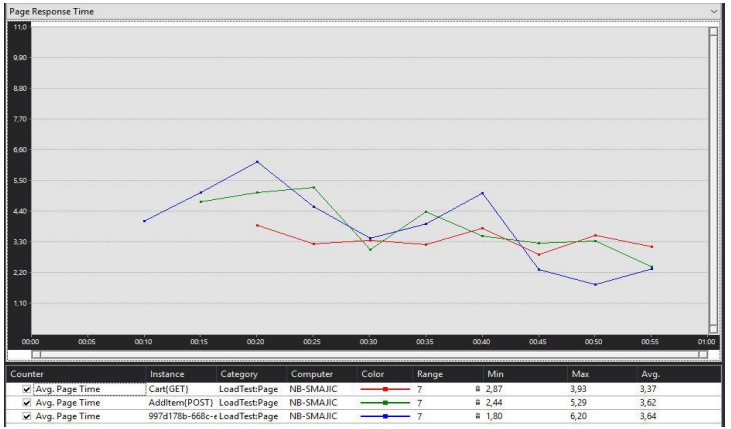


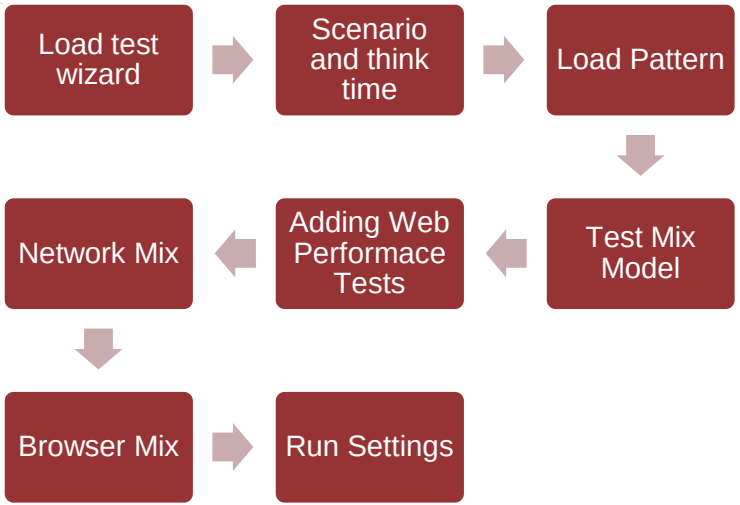


Load and performance testing

- Visual Studio Enterprise
- Jmeter



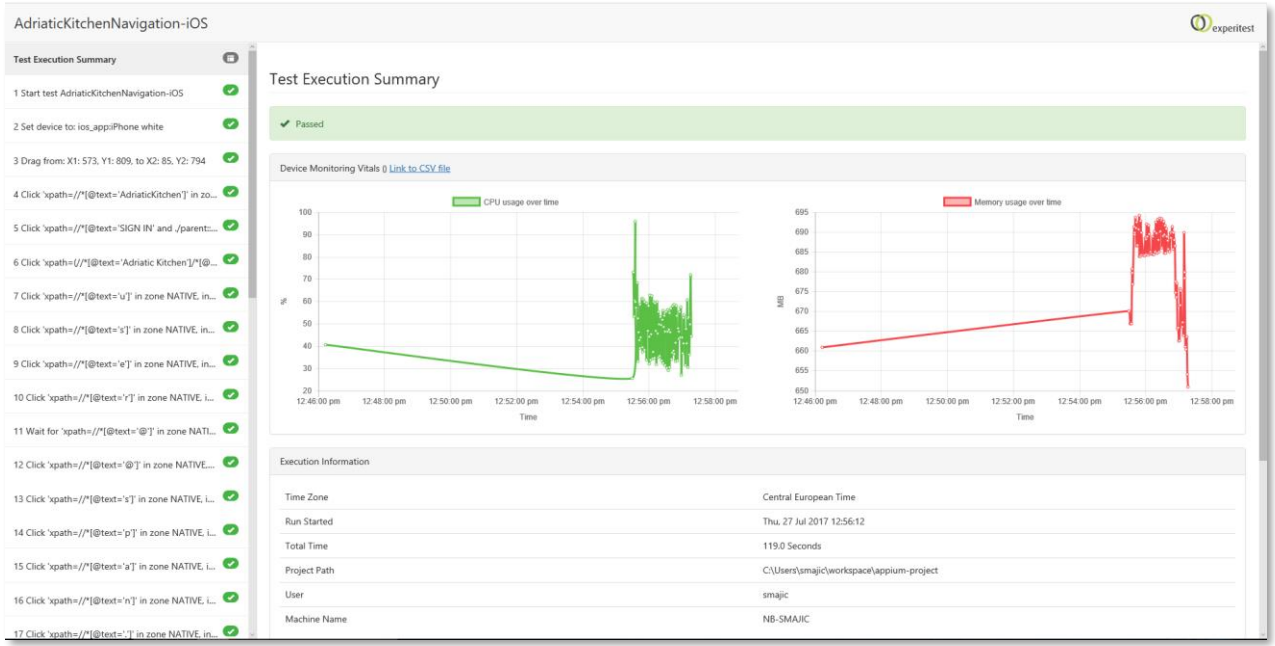




Mobile testing

Appium (za MAC & Windows)

- Android & iOS
- Java
- C#(Nunit)
- Python



Device Information (SM-G900F (Stefani))

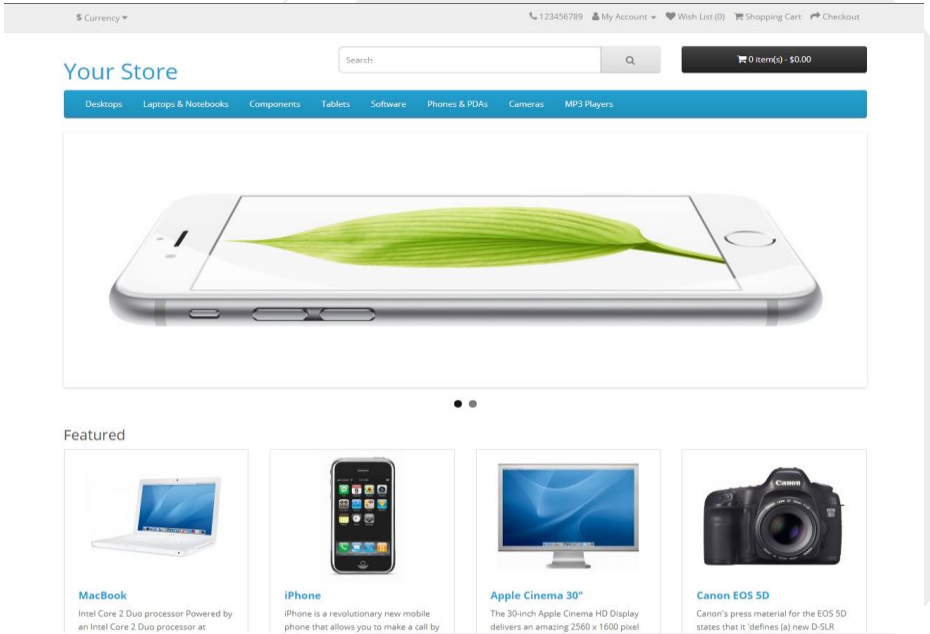
Name	SM-G900F (Stefani)
OS	Android
Model	SM-G900F
Manufacturer	samsung
Version	6.0.1
Screen Size	1080x1920
S/N	13de87a3

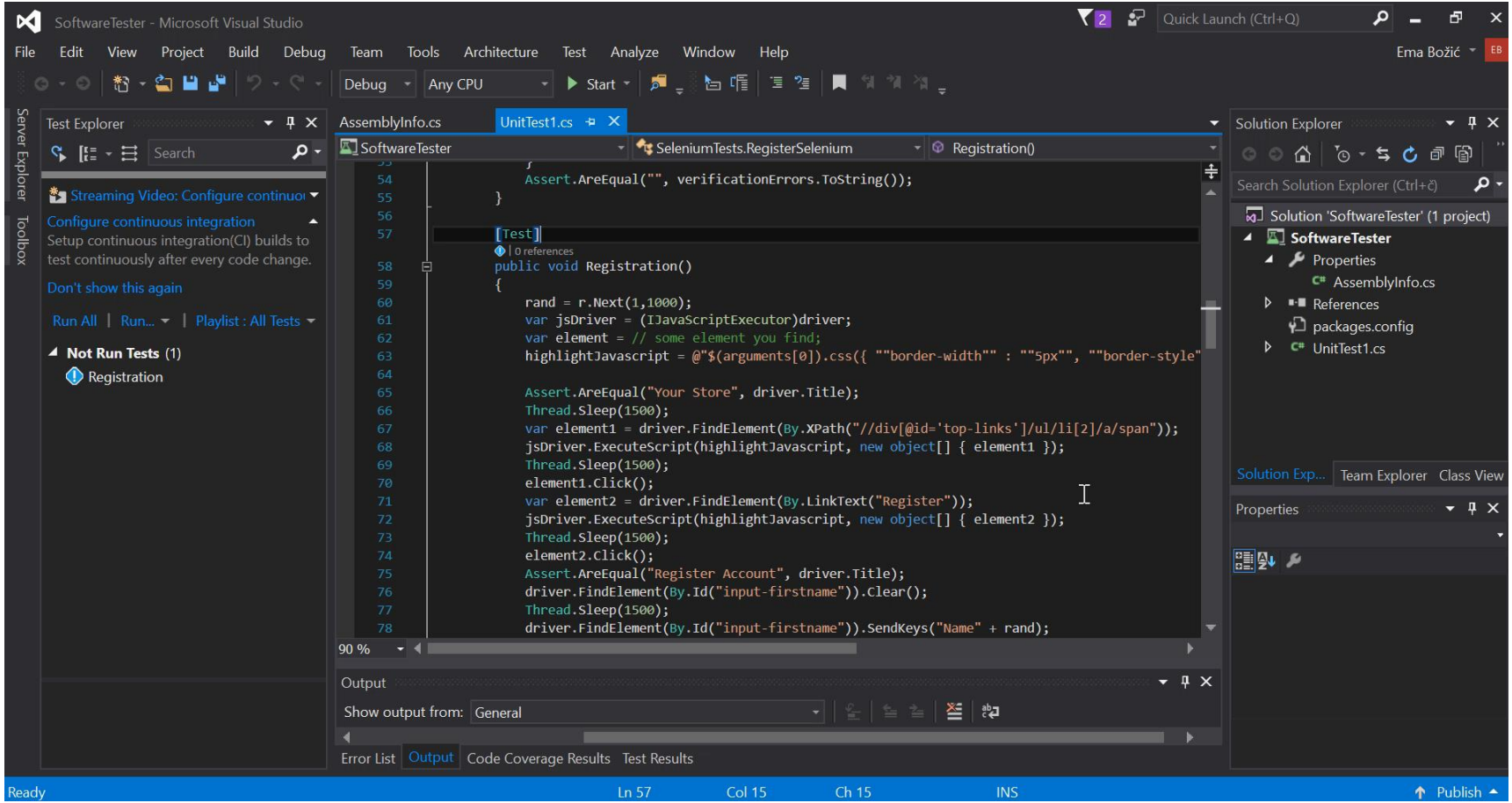
Device Information (iPhone white)

Name	iPhone white
OS	iOS
Model	iPhone 5s
Manufacturer	Apple
Version	10.3.2
Screen Size	640x1136
S/N	a412330c1e6d27fcf0559d99f929538f1a629c17

UI testing

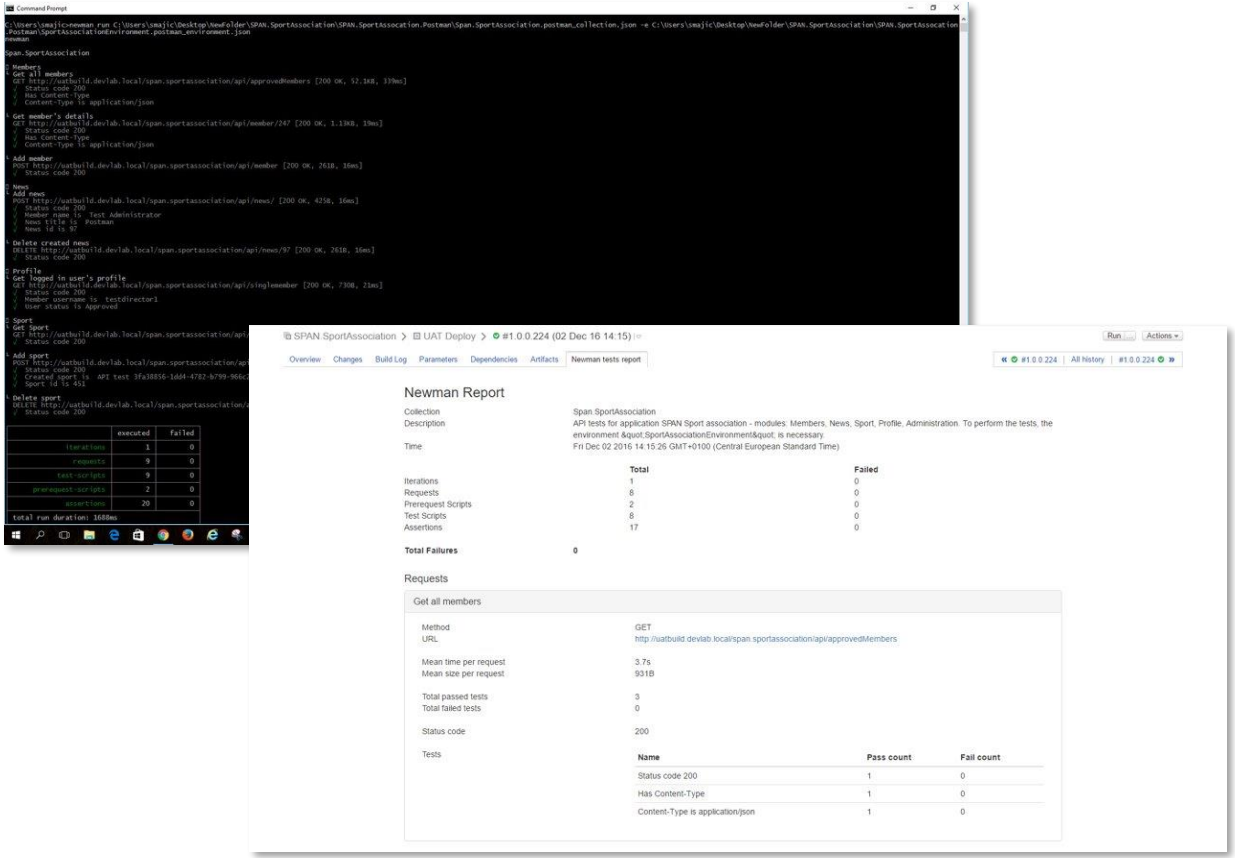
- Selenium, Nunit
- CodedUI (VS enterprise)
- Katalon Studio

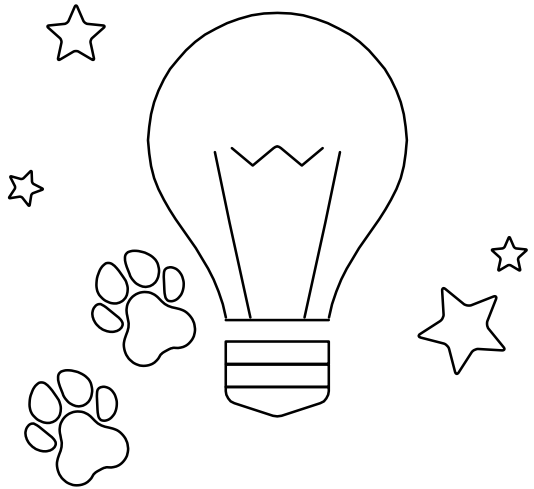



SoftwareTester - Microsoft Visual Studio
Quick Launch (Ctrl+Q)
File Edit View Project Build Debug Team Tools Architecture Test Analyze Window Help
Ema Božić
Debug
Any CPU
Start
Test Explorer
Search
Streaming Video: Configure continuou
Configure continuous integration
Setup continuous integration(CI) builds to test continuously after every code change.
Don't show this again
Run All | Run... | Playlist : All Tests
Not Run Tests (1)
Registration
AssemblyInfo.cs
UnitTest1.cs
SoftwareTester
SeleniumTests.RegisterSelenium
Registration()
Assert.AreEqual("", verificationErrors.ToString());
}
[Test]
0 references
public void Registration()
{
rand = r.Next(1,1000);
var jsDriver = (IJavaScriptExecutor)driver;
var element = // some element you find;
highlightJavascript = @"$(arguments[0]).css({ ""border-width"" : ""5px"", ""border-style"
Assert.AreEqual("Your Store", driver.Title);
Thread.Sleep(1500);
var element1 = driver.FindElement(By.XPath("//div[@id='top-links']/ul/li[2]/a/span"));
jsDriver.ExecuteScript(highlightJavascript, new object[] { element1 });
Thread.Sleep(1500);
element1.Click();
var element2 = driver.FindElement(By.LinkText("Register"));
jsDriver.ExecuteScript(highlightJavascript, new object[] { element2 });
Thread.Sleep(1500);
element2.Click();
Assert.AreEqual("Register Account", driver.Title);
driver.FindElement(By.Id("input-firstname")).Clear();
Thread.Sleep(1500);
driver.FindElement(By.Id("input-firstname")).SendKeys("Name" + rand);
90 %
Output
Show output from: General
Error List Output Code Coverage Results Test Results
Solution Explorer
Search Solution Explorer (Ctrl+ž)
Solution 'SoftwareTester' (1 project)
SoftwareTester
Properties
AssemblyInfo.cs
References
packages.config
UnitTest1.cs
Solution Exp... Team Explorer Class View
Properties
Ready
Ln 57 Col 15 Ch 15 INS
Publish

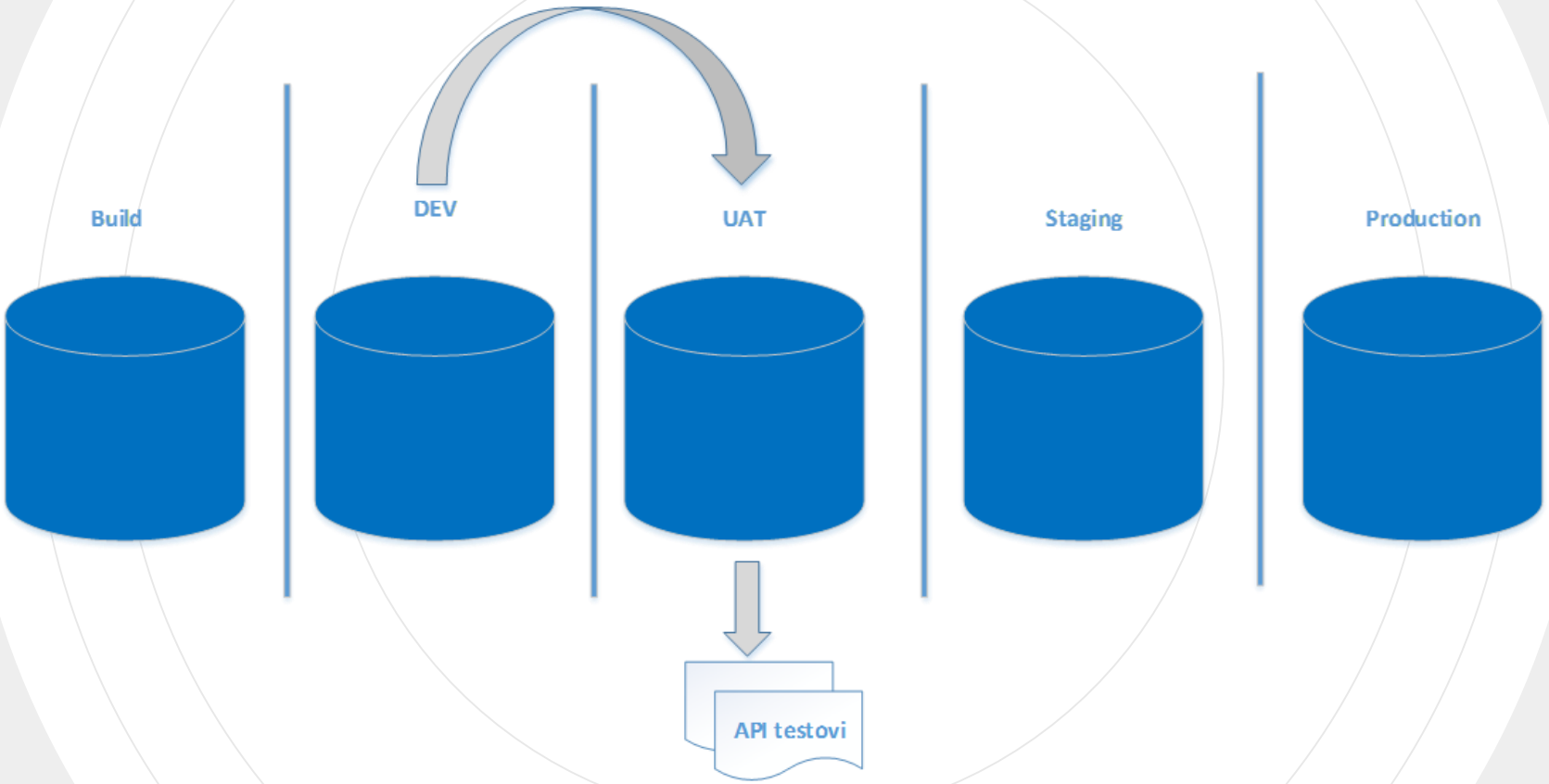
API testing

- API testing automation
- Monitoring
- CI/CD integration
- Postman + Newman
- .NET (RestSharp + NUnit)



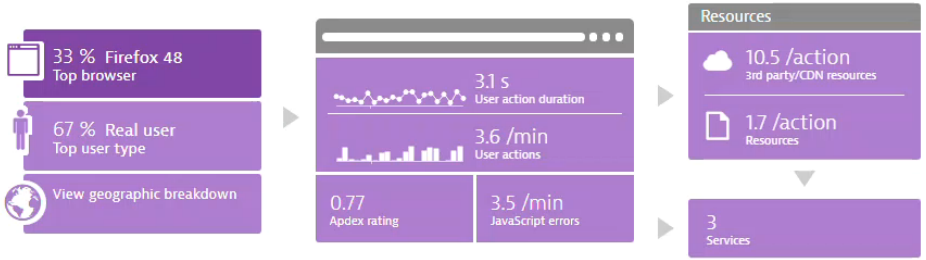


The idea


Build
DEV
UAT
Staging
Production
API testovi

Performance analysis

Actions /min, Action duration, Apdex rating, JavaScript errors, 3rd party providers and Services.

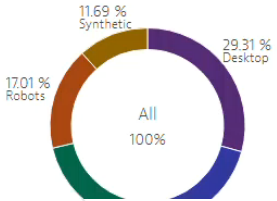


User behavior

Active sessions, Actions per session, Entry/Exit actions, Bounce rate, and Conversion goals.

Browser breakdown

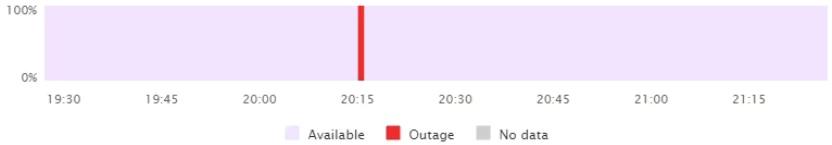
All | Desktop | Mobile | Tablet | Synthetic | Robots

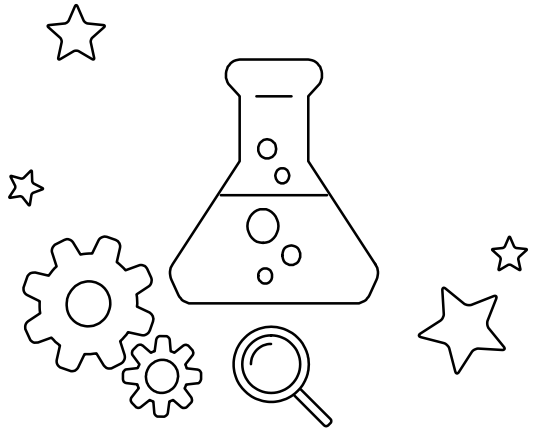


No problems in last 72 hours

95 % Availability

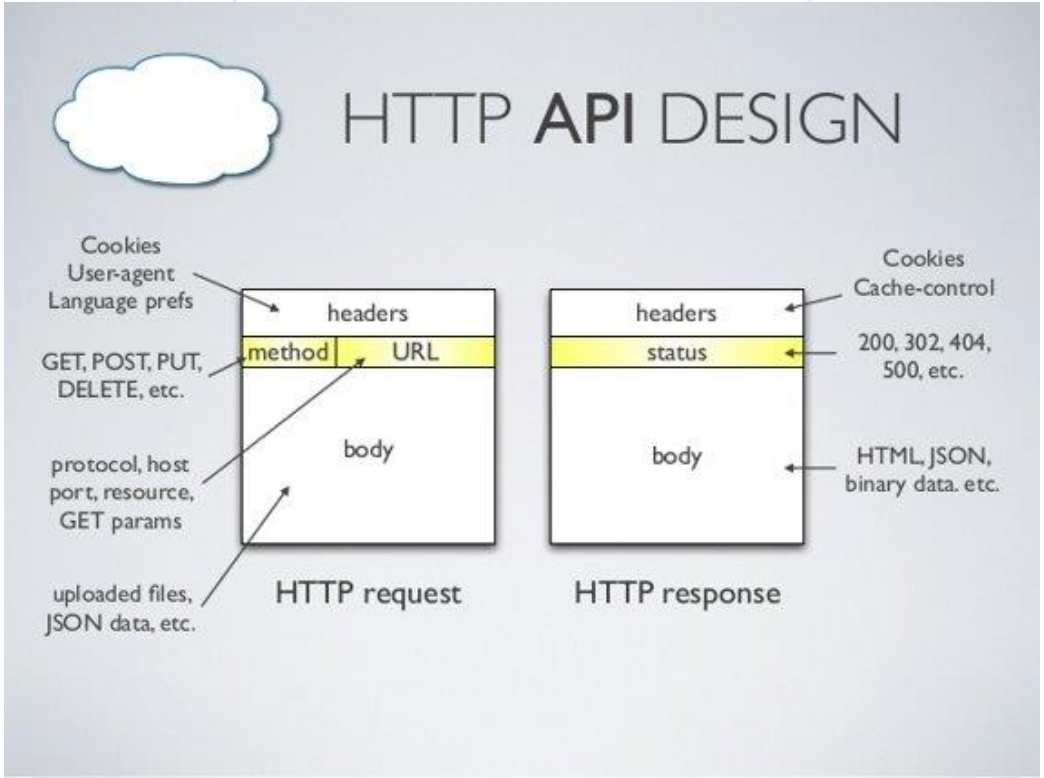
1	2	6 min
Synthetic monitor	Locations	Total downtime





Let’s get our hands dirty

Zašto više uložiti u API testiranje, a ne UI?


HTTP API DESIGN
Cookies
User-agent
Language prefs
GET, POST, PUT,
DELETE, etc.
protocol, host
port, resource,
GET params
uploaded files,
JSON data, etc.
headers
method
URL
body
HTTP request
headers
status
body
HTTP response
Cookies
Cache-control
200, 302, 404,
500, etc.
HTML, JSON,
binary data. etc.

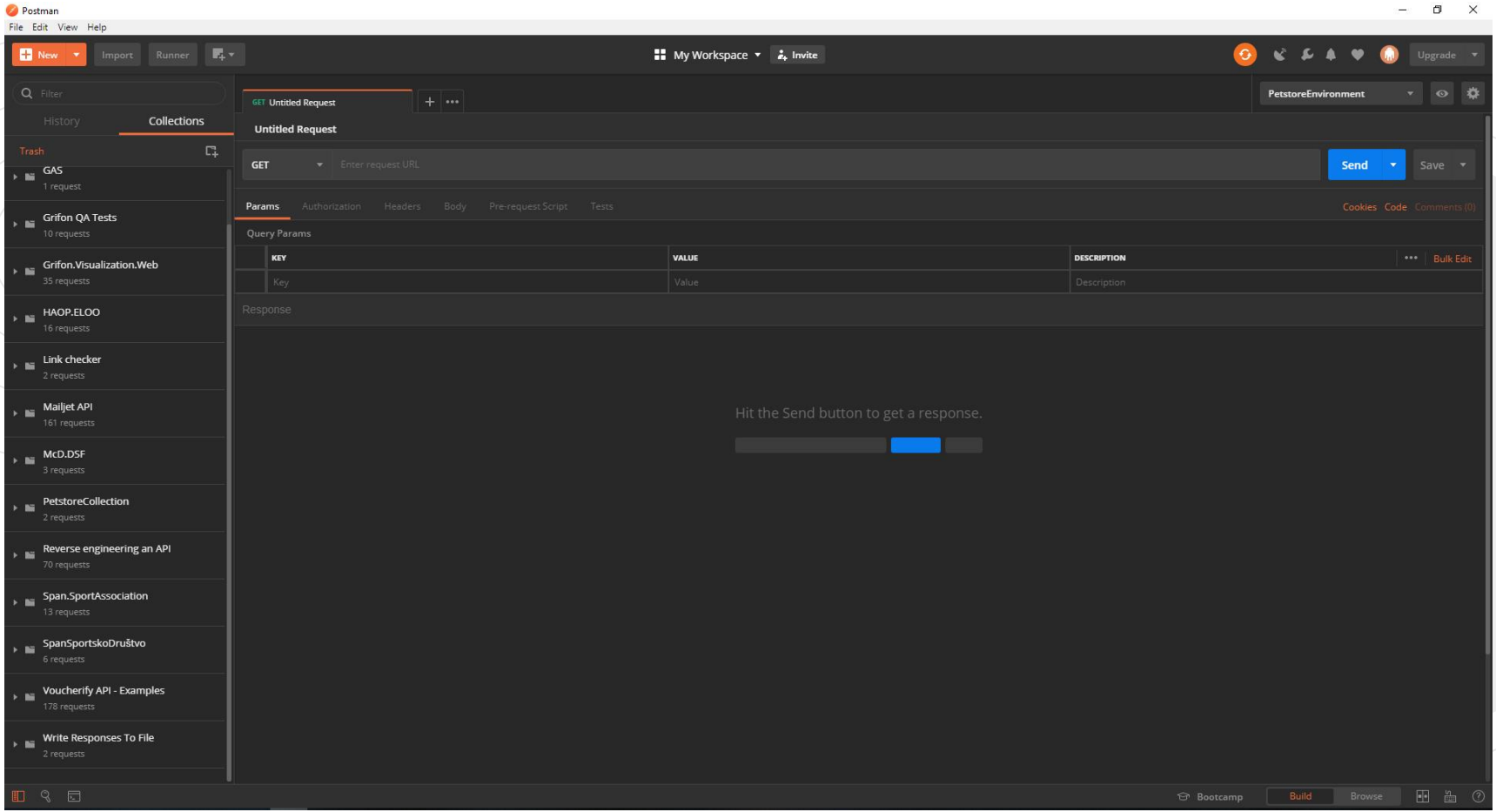
Koncept

- Core functionalities
- Neovisnost o UI 😊
- Input argument values
- Parameter combinations
- Error Validation
- Scenario testing
- Niz API poziva
- E2E scenario testing

API testing

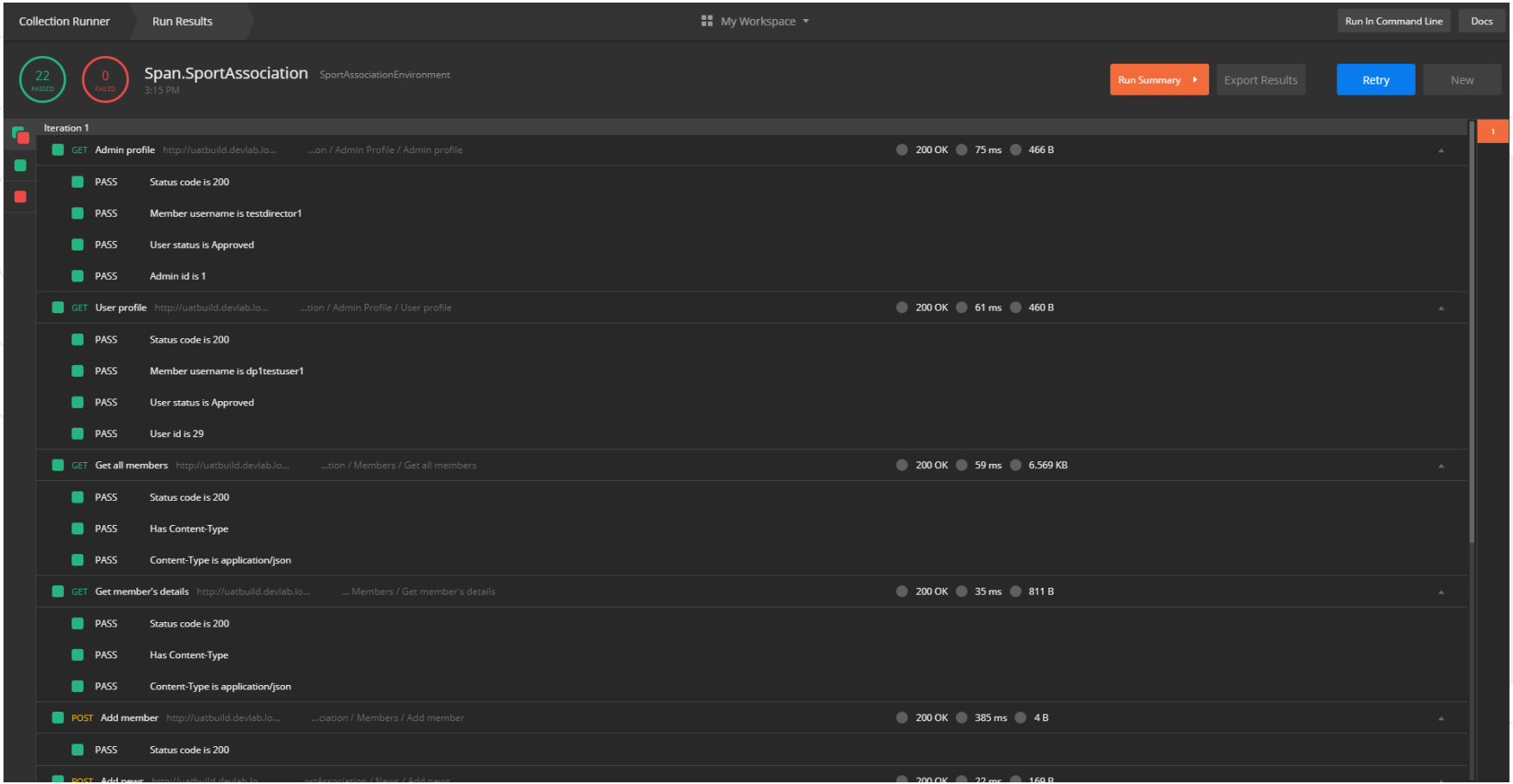
Postman

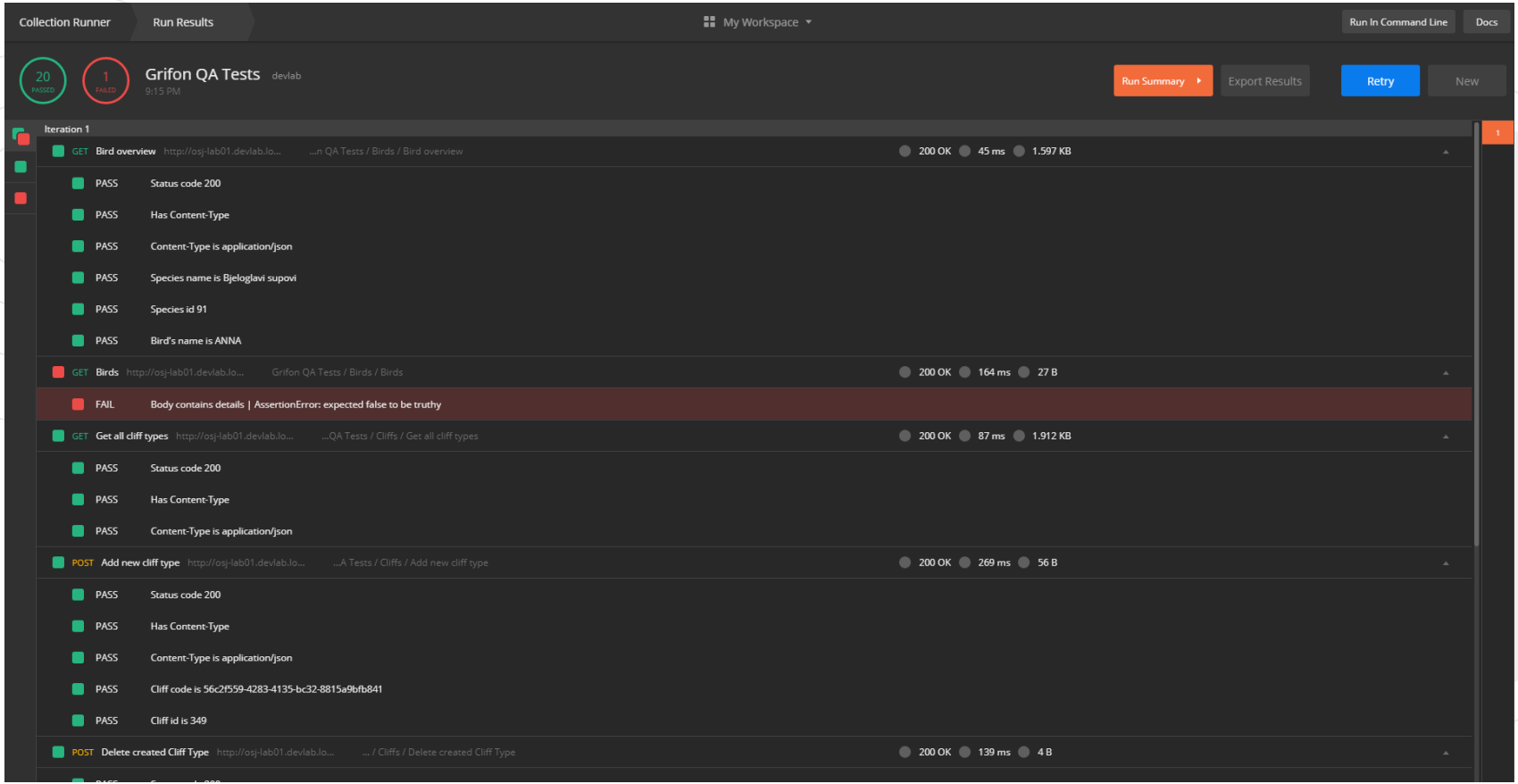
- HTTP client za API testiranje


Postman
File Edit View Help
New
Import
Runner
My Workspace
Invite
Upgrade
Filter
History
Collections
Trash
GAS
1 request
Grifon QA Tests
10 requests
Grifon.Visualization.Web
35 requests
HAOP.ELOO
16 requests
Link checker
2 requests
Mailjet API
161 requests
McD.DSF
3 requests
PetstoreCollection
2 requests
Reverse engineering an API
70 requests
Span.SportAssociation
13 requests
SpanSportskoDruštvo
6 requests
Voucherify API - Examples
178 requests
Write Responses To File
2 requests
GET Untitled Request
Untitled Request
PetstoreEnvironment
GET
Enter request URL
Send
Save
Params
Authorization
Headers
Body
Pre-request Script
Tests
Cookies
Code
Comments (0)
Query Params
KEY
VALUE
DESCRIPTION
Bulk Edit
Key
Value
Description
Response
Hit the Send button to get a response.
Bootcamp
Build
Browse

Postman – API testovi

- 3 osnovna koncepta:
  - Collections
  - Environments
  - Skripte (test objects i pre-request)
- Varijable – global, dinamičke i environment
- Mogućnost importa i exporta
- Handleanje autentikacije:
  - Basic/Win auth
  - Digest
  - OAuth 1.0 i OAuth 2.0
  - Hawk
  - AWS Signature
- Korištenje CSV-a
- Collection runner


Collection Runner
Run Results
My Workspace
Run In Command Line
Docs
22
PASSED
0
FAILED
Span.SportAssociation
SportAssociationEnvironment
3:15 PM
Run Summary
Export Results
Retry
New
Iteration 1
GET Admin profile http://uatbuild.devlab.lo... ...on / Admin Profile / Admin profile
200 OK 75 ms 466 B
PASS Status code is 200
PASS Member username is testdirector1
PASS User status is Approved
PASS Admin id is 1
GET User profile http://uatbuild.devlab.lo... ...tion / Admin Profile / User profile
200 OK 61 ms 460 B
PASS Status code is 200
PASS Member username is dp1testuser1
PASS User status is Approved
PASS User id is 29
GET Get all members http://uatbuild.devlab.lo... ...tion / Members / Get all members
200 OK 59 ms 6.569 KB
PASS Status code is 200
PASS Has Content-Type
PASS Content-Type is application/json
GET Get member's details http://uatbuild.devlab.lo... ... Members / Get member's details
200 OK 35 ms 811 B
PASS Status code is 200
PASS Has Content-Type
PASS Content-Type is application/json
POST Add member http://uatbuild.devlab.lo... ...ciation / Members / Add member
200 OK 385 ms 4 B
PASS Status code is 200

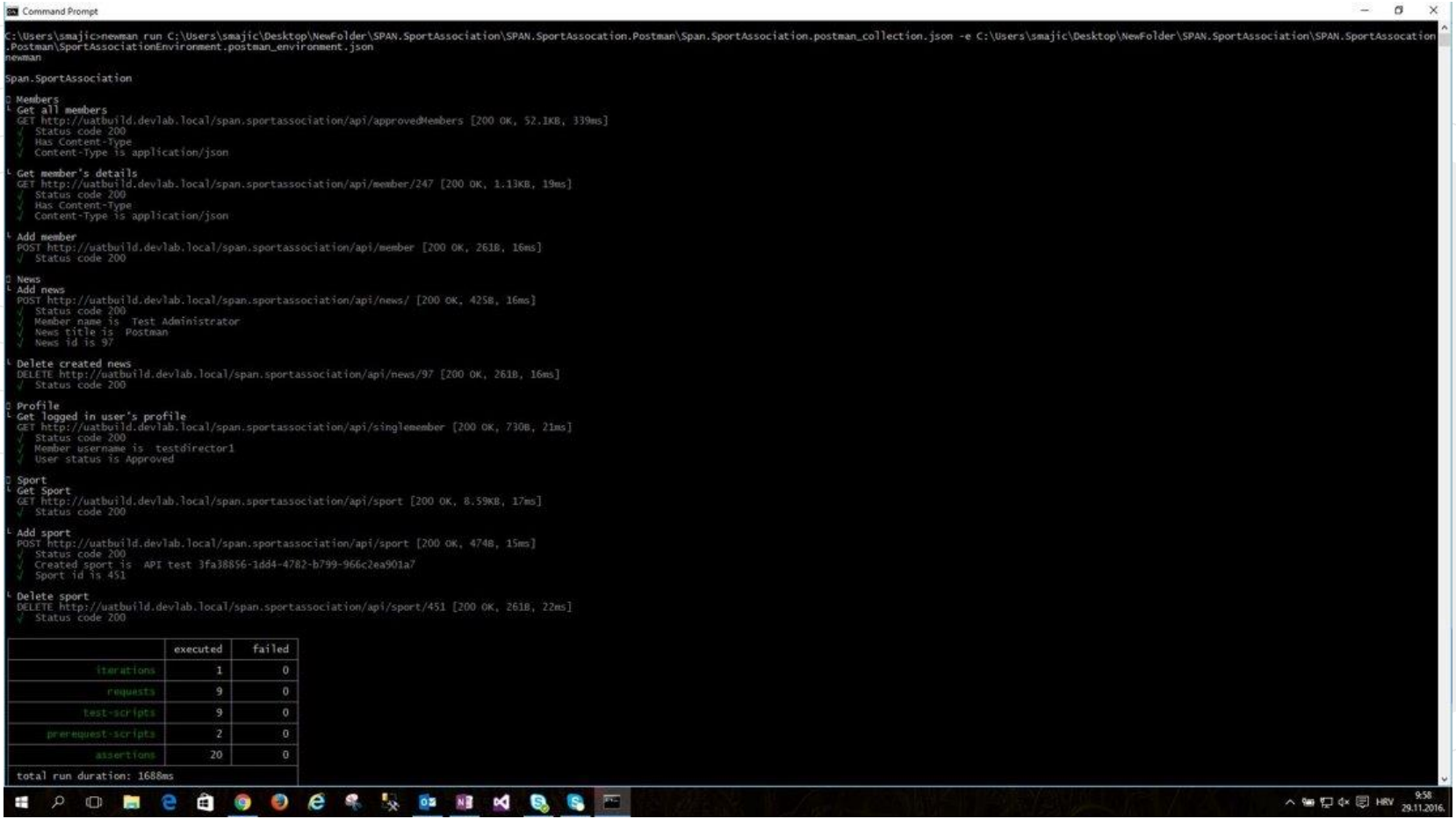

Collection Runner
Run Results
My Workspace
Run In Command Line
Docs
20
PASSED
1
FAILED
Grifon QA Tests
devlab
9:15 PM
Run Summary
Export Results
Retry
New
Iteration 1
GET Bird overview http://osj-lab01.devlab.lo... ...n QA Tests / Birds / Bird overview 200 OK 45 ms 1.597 KB
PASS Status code 200
PASS Has Content-Type
PASS Content-Type is application/json
PASS Species name is Bjeloglavi supovi
PASS Species id 91
PASS Bird's name is ANNA
GET Birds http://osj-lab01.devlab.lo... Grifon QA Tests / Birds / Birds 200 OK 164 ms 27 B
FAIL Body contains details | AssertionError: expected false to be truthy
GET Get all cliff types http://osj-lab01.devlab.lo... ...QA Tests / Cliffs / Get all cliff types 200 OK 87 ms 1.912 KB
PASS Status code 200
PASS Has Content-Type
PASS Content-Type is application/json
POST Add new cliff type http://osj-lab01.devlab.lo... ...A Tests / Cliffs / Add new cliff type 200 OK 269 ms 56 B
PASS Status code 200
PASS Has Content-Type
PASS Content-Type is application/json
PASS Cliff code is 56c2f559-4283-4135-bc32-8815a9bfb841
PASS Cliff id is 349
POST Delete created Cliff Type http://osj-lab01.devlab.lo... ... / Cliffs / Delete created Cliff Type 200 OK 139 ms 4 B

1. API URL (endpoint)
2. Odabrati API metodu
Autorizacija i Header
4. Body (POST, PUT)
5. Pre-request skripte
6. Testovi

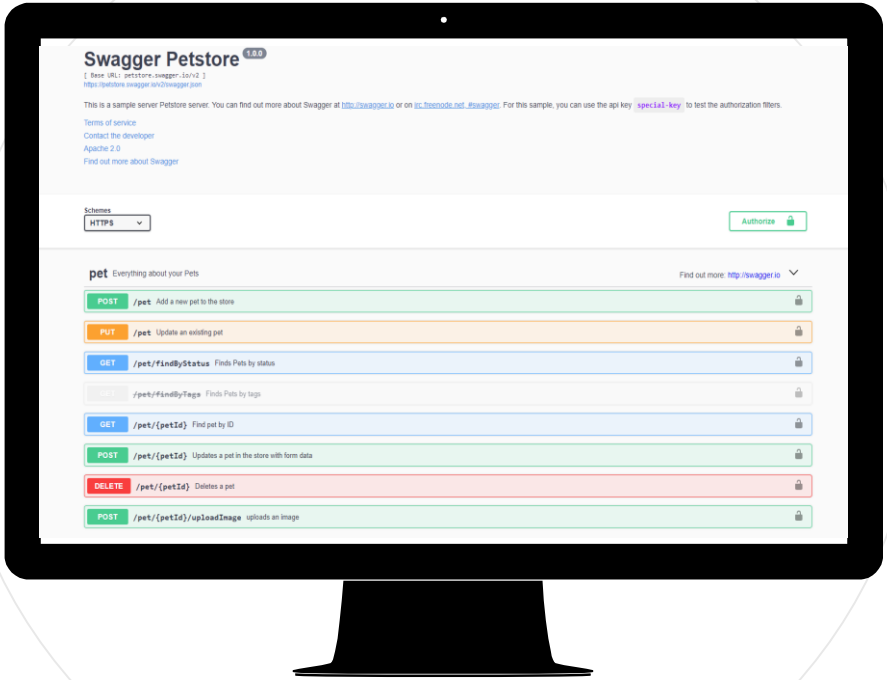
Newman

- Command-line collection runner
- Node.js
- Export rezultata u JSON, HTML ili XML formatu
- Primjer naredbe za pokretanje testova:
- newman run <collection path> -e <environment path>

- newman run C:\Users\smajic\Desktop\Span.SportAssociation.postman_collection.json -e C:\Users\smajic\Desktop\SportAssociationEnvironment.postman_environment.json


Command Prompt
C:\Users\smajic>newman run C:\Users\smajic\Desktop\NewFolder\SPAN.SportAssociation\SPAN.SportAssocation.Postman\Span.SportAssociation.postman_collection.json -e C:\Users\smajic\Desktop\NewFolder\SPAN.SportAssociation\SPAN.SportAssocation.Postman\SportAssociationEnvironment.postman_environment.json
newman
Span.SportAssociation
Members
Get all members
GET http://uatbuild.devlab.local/span.sportassociation/api/approvedMembers [200 OK, 52.1KB, 339ms]
Status code 200
Has Content-Type
Content-Type is application/json
Get member's details
GET http://uatbuild.devlab.local/span.sportassociation/api/member/247 [200 OK, 1.13KB, 19ms]
Status code 200
Has Content-Type
Content-Type is application/json
Add member
POST http://uatbuild.devlab.local/span.sportassociation/api/member [200 OK, 261B, 16ms]
Status code 200
News
Add news
POST http://uatbuild.devlab.local/span.sportassociation/api/news/ [200 OK, 425B, 16ms]
Status code 200
Member name is Test Administrator
News title is Postman
News id is 97
Delete created news
DELETE http://uatbuild.devlab.local/span.sportassociation/api/news/97 [200 OK, 261B, 16ms]
Status code 200
Profile
Get logged in user's profile
GET http://uatbuild.devlab.local/span.sportassociation/api/singlemember [200 OK, 730B, 21ms]
Status code 200
Member username is testdirector1
User status is Approved
Sport
Get Sport
GET http://uatbuild.devlab.local/span.sportassociation/api/sport [200 OK, 8.59KB, 17ms]
Status code 200
Add sport
POST http://uatbuild.devlab.local/span.sportassociation/api/sport [200 OK, 474B, 15ms]
Status code 200
Created sport is API test 3fa38856-1dd4-4782-b799-966c2ea901a7
Sport id is 451
Delete sport
DELETE http://uatbuild.devlab.local/span.sportassociation/api/sport/451 [200 OK, 261B, 22ms]
Status code 200
executed
failed
iterations 1 0
requests 9 0
test-scripts 9 0
prerequest-scripts 2 0
assertions 20 0
total run duration: 1688ms
HRV
9:58
29.11.2016.

Hands on project



http://petstore.swagger.io/

Thanks!

Any questions?