



# **Making your application behave using Selenium and Applitools**

# Speaker Info



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# Avast Software, The Czech republic

- antivirus and security company
- portfolio
  - Avast, AVG, CCleaner, HMA!
- Products
  - Antivirus
  - Mobile security
  - VPN
  - CleanUp
  - Passwords
- Platforms
  - Windows
  - Android
  - Mac/iOS
- over 400 millions users
- [www.avast.com](http://www.avast.com)



# Agenda

1. Testing at Avast - Windows Consumer Department
2. UI automation and testing
  - Selenium WebDriver
  - Behave
  - Applitools
  - Debugging
3. Q&A

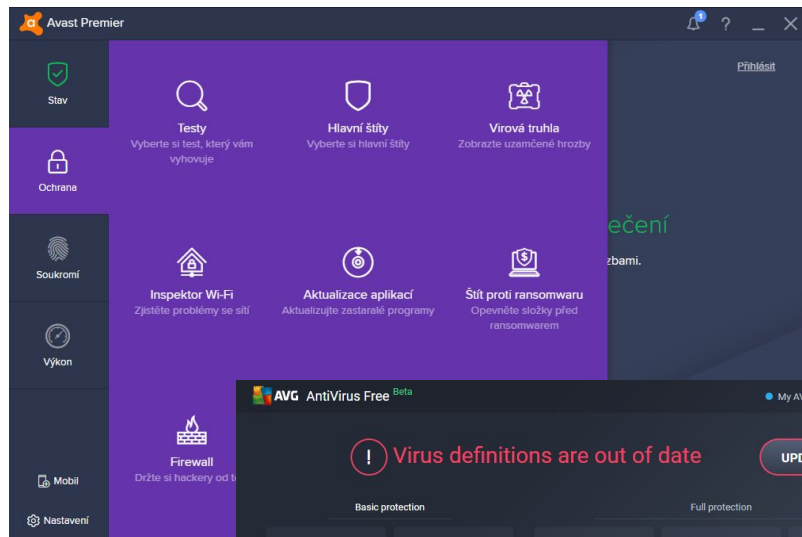


# Testing at Avast - Consumer Windows Division



# What do we test

- Desktop Windows Antivirus
- 1 product, 2 brands
  - Avast, AVG
- AVs architecture
  - Antivirus core layer
    - C++
    - assembler
  - Antivirus UI
    - C++
    - CEF - Chromium Embedded Framework
    - Javascript



# Test Automation Stack

- Mostly open source tools
- HW infrastructure
  - Linux farm
  - VirtualBox as host
    - Support more than 14 OSes
- Core AV functionality
  - Python 3.4
  - Boost framework
- **UI layer**
  - **Python 3.4**
    - **Selenium - webdriver**
    - **Behave**
    - **Applitools Eyes**



# Testing Pipeline

## Short

- Most stable suite
- Verifies basic functionality
- Run for each branch build

## Medium

- Verifies more functionality
- Run for each master and release branch

## Long

- Deep component tests-
- Flaky
- **Selenium and AppliTools tests**
- Run daily

## Exploratory

- Context driven testing approach
- Exploratory check of new functionality
- Exploratory regression

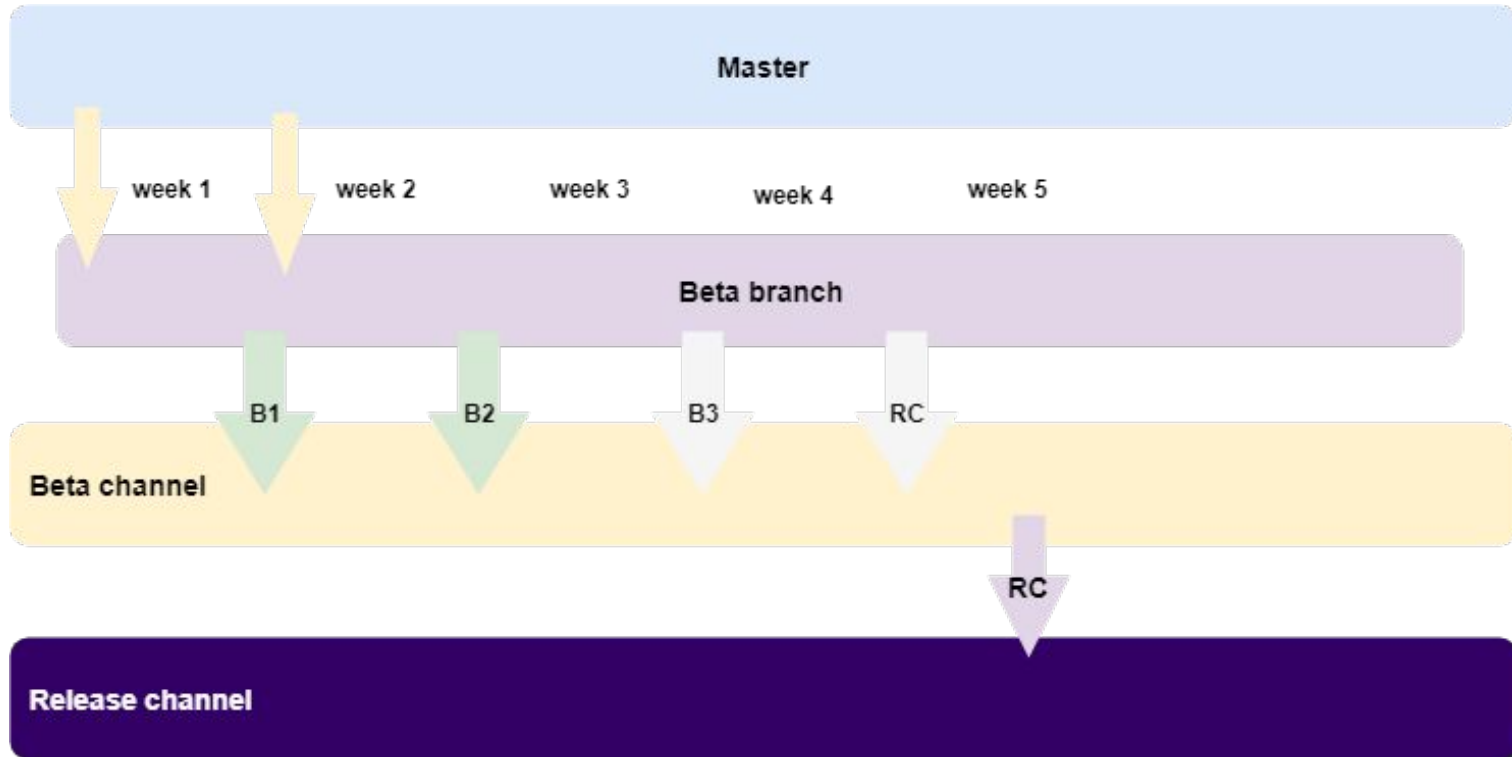
## Beta/Final

- Delivery to 200 mill end users
  - Beta community
  - 250k beta users
  - Evangelists group
- Data tracking
- Crash reporting
  - Virus analytics stats
  - Google analytics
  - Avast internal analytics



“Scrum is dead,  
welcome to punk”

# Consumer Avast + AVG - release cycle

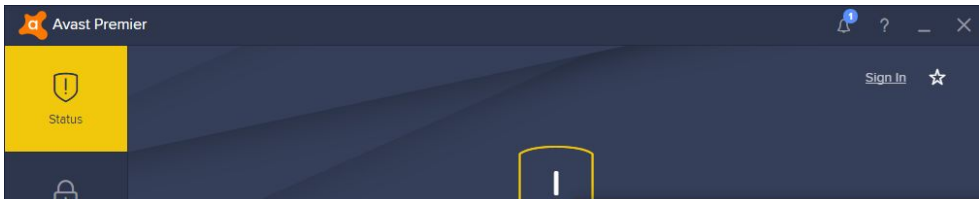




**So where is Behave,  
Selenium, AppliTools and  
promised desktop UI  
testing?**







Automatic updates

You may be missing out on the

TURN ON

IGNORE

a#js-banner.cp-banner.color-dark-banner.-bg | 882 x 128

Attention: Your PC is not operating at maximum performance.  
System junk: 804 MB  
Programs slowing down your PC: 25  
Broken registry items: 386

DevTools

Elements Console Sources Network Timeline Profiles Application Security Audits

```
<html class="platform--win32 nui_html" onselectstart="return false" ondragstart="return false">
<head></head>
<body class="avs nui_no-transitions" style="overflow: hidden" dir="ltr" lang="en" == #0
  <div id="app">
    <div data-ractive-css="{4}" class="avs" data-product="premier">
      <nav data-ractive-css="{3}" id="nui_menu" class="nui_menu"></nav>
      <div id="nui_main" class="nui_main" data-nitro_name="Dashboard" data-nitro_version="1.1.78" data-nitro_created="2018-02-28T10:12:16.060Z">
        <div data-ractive-css="{6}" class="nui_page color-brand -bg slants ipm-visible dsh">
          ::before
          <div class="slants__above">
            <div class="nui_page_scroll nui_-full nui_dashboard"></div>
            <div class="nui_banner">
              <div class="nui_ipm" style="
                <iframe src="https://ipm-provider.ff.avast.com/?data=CAM0Eh0DIOkZkR0ZkXN0MAU4GEAA5I4_UA8CVAN28CY8iicVHTmNTy2NDQ0S4xNDkxNDY4NTk44C4A8action=1&n_src=dashboard" data-nitro-test="ipm-el1-0">
                </iframe>
                <#document
                <IDCTYPE html>
                <html dir="ltr" class="ipm" onselectstart="return false" ondragstart="return false">
                <head></head>
                <body class="en en-eu version-3 program-18 win-sz -banner">
                  <svg class="hp-is-secret"></svg>
                  <a id="js-banner" class="cp-banner color-dark-banner -bg" av_command="show_app_store_window:135:cleanup-detail-1p-cleanup-plus-plus%26p_elm=0%26p_var=x2Fpa%2Fen-w%2Ftest%2Fbanner_paid-segment_cleanup-plus-plus_broken-dark-1R.html" data-tracking="primaryAction"></a>
                  <script type="text/javascript"></script>
                  
                  <img src(unknown) style="margin:0; padding:0; height:0; width:0; visibility: hidden; opacity: 0; position: absolute; top: 0; left: 0; z-index: -1;">
                  </body>
                </html>
                </iframe>
              </div>
            </div>
            <div class="dsh_account__badge"></div>
          </div>
          <div class="nui_titlebar" class="nui_titlebar nui_caption"></div>
        </div>
      </div>
    </div>
  </body>
</html>
```

Styles Computed Event Listeners >>

Filter :hov .cls +

```
element.style {
  overflow: hidden;
}
.nui_html body {
  overflow: hidden;
  margin: 0;
  position: absolute;
  top: 0;
  right: 0;
  bottom: 0;
  left: 0;
  background-color: #20364c;
  color: #fff;
}
.avs, .avs *, .avs *:before, .MainCss.css:162
.avs *:after {
  -moz-box-sizing: border-box;
  -webkit-box-sizing: border-box;
  box-sizing: border-box;
}
.avs {
  background-color: #fff;
  font-family: 'Nitro Font', 'MS UI Gothic';
  font-size: 1.6em;
  font-weight: 400;
  -webkit-font-smoothing: antialiased;
  color: #20364c;
  line-height: 1.4;
  padding: 0;
  margin: 0;
}
body[Attributes Style] {
  direction: ltr;
  unicode-bidi: isolate;
  -webkit-locale: "en";
}
body {
  user agent stylesheet
  display: block;
  margin: 0px;
}
Inherited from html.platform--win32.nui_html
.nui_html {
  -webkit-user-select: none;
  user-select: none;
  -webkit-app-region: no-drag;
  app-region: no-drag;
  -webkit-user-drag: none;
```

# DevTools Console

The screenshot shows the Chrome DevTools Console with the 'Network' tab selected. The console displays a list of network requests and their corresponding responses. The requests are categorized by type (e.g., NAPI HELP, REQUEST, NAPI UI, NAPI MODULE, NAPI MODULE, REQUEST, REQUEST) and include details such as the URL, status, and headers. The responses are shown as JSON objects, with some expanded to show their full content. The console also includes a 'Preserve log' button and a search bar.

Network Requests:

- NAPI HELP** (index.js:621)
- REQUEST app.TrackGA** (index.js:673)
- REQUEST window.Onload** (index.js:673)
- REQUEST app.utils.getModuleList** (index.js:673)
- NAPI UI avast** 1.0.198 Built at: Thu, 22 Mar 2018 10:15:31 GMT (ModuleManager.js:212)
- NAPI MODULE Localization.default - LocalizationAvast** 1.0.639 Built at: 2018-03-21T15:05:25.050Z Loaded in: 10ms (ModuleManager.js:173)
- NAPI MODULE Subscriptions.serviceProxy - Subscriptions** 1.1.71 Built at: 2018-03-02T11:56:30.936Z Loaded in: 270ms (ModuleManager.js:173)
- NAPI MODULE MainUI.default - Core** 1.0.613 Built at: 2018-03-20T15:29:40.302Z Loaded in: 382ms (ModuleManager.js:173)
- REQUEST app.subscriptions.GetStatus** (index.js:673)
- REQUEST app.product.GetStatus** (index.js:673)
- REQUEST app.avService.GetStatus** (index.js:673)
- REQUEST app.product.GetStatus** (index.js:673)

Response for **app.product.GetStatus** (index.js:674):

```
REQUEST app.product.GetStatus: ▶ []
RESPONSE app.product.GetStatus: {"defsVersion":"180319-2","features":{"ais_cmp_bpc":{"enabled":true,"installed":true,"licensed":true,"visible":true},"ais_cmp_cleanup":{"installed":true,"licensed":true,"visible":true},"ais_cmp_datasafe":{"enabled":true,"installed":false,"licensed":true,"visible":true},"ais_cmp_datascan":{"enabled":true,"installed":true,"licensed":true,"visible":true},"ais_cmp_datascan_full":{"enabled":true,"installed":true,"licensed":true,"visible":true},"ais_cmp_fw":{"enabled":true,"installed":true,"licensed":true,"visible":true},"ais_cmp_gamingmode":{"enabled":true,"installed":true,"licensed":true,"visible":true},"ais_cmp_grimefighter":{"enabled":true,"installed":true,"licensed":true,"visible":true},"ais_cmp_hds":{"enabled":true,"installed":true,"licensed":true,"visible":true},"ais_cmp_pap":{"installed":false,"licensed":true,"visible":true},"ais_cmp_pwdman":{"enabled":true,"installed":true,"licensed":true,"visible":true},"ais_cmp_rescuedisk":{"enabled":true,"installed":true,"licensed":true,"visible":true},"ais_cmp_secdns":{"enabled":true,"installed":true,"licensed":true,"visible":true},"ais_cmp_secureline":{"enabled":true,"installed":true,"licensed":true,"visible":true},"ais_cmp_shredder":{"enabled":false,"installed":true,"licensed":true,"visible":true},"ais_cmp_snx":{"enabled":false,"installed":true,"licensed":true,"visible":true},"ais_cmp_swhhealth":{"enabled":true,"installed":true,"licensed":true,"visible":true},"ais_cmp_webcam":{"enabled":true,"installed":true,"licensed":true,"visible":true},"ais_cmp_webrep":{"installed":true,"licensed":true,"visible":true},"ais_shl_bhv":{"enabled":true,"installed":true,"licensed":true,"visible":true},"ais_shl_exch":{"enabled":false,"installed":false,"licensed":true,"visible":true},"ais_shl_fil":{"enabled":true,"installed":true,"licensed":true,"visible":true},"ais_shl_mail":{"enabled":true,"installed":true,"licensed":true,"visible":true},"ais_shl_rsw":{"enabled":true,"installed":true,"licensed":true,"visible":true},"ais_shl_shp":{"installed":false,"licensed":true,"visible":true},"ais_shl_spm":{"enabled":true,"installed":true,"licensed":true,"visible":true},"ais_shl_web":{"enabled":true,"installed":true,"licensed":true,"visible":true},"vps_boot32":{"installed":false,"licensed":true,"visible":true},"isBeta":false,"myAvastUrl":"https://my.avast.com/en-gb/tab","programVersion":"18.3.3305","standalones":{"ais_cmp_cleanup":{"installed":false},"ais_cmp_pap":{"installed":false},"ais_cmp_pwdman":{"installed":false},"ais_cmp_secureline":{"installed":false}},"userConfig":{"debugMode":false,"language":"en-gb"},"uupdateInfo":{"version":"257"}}
```

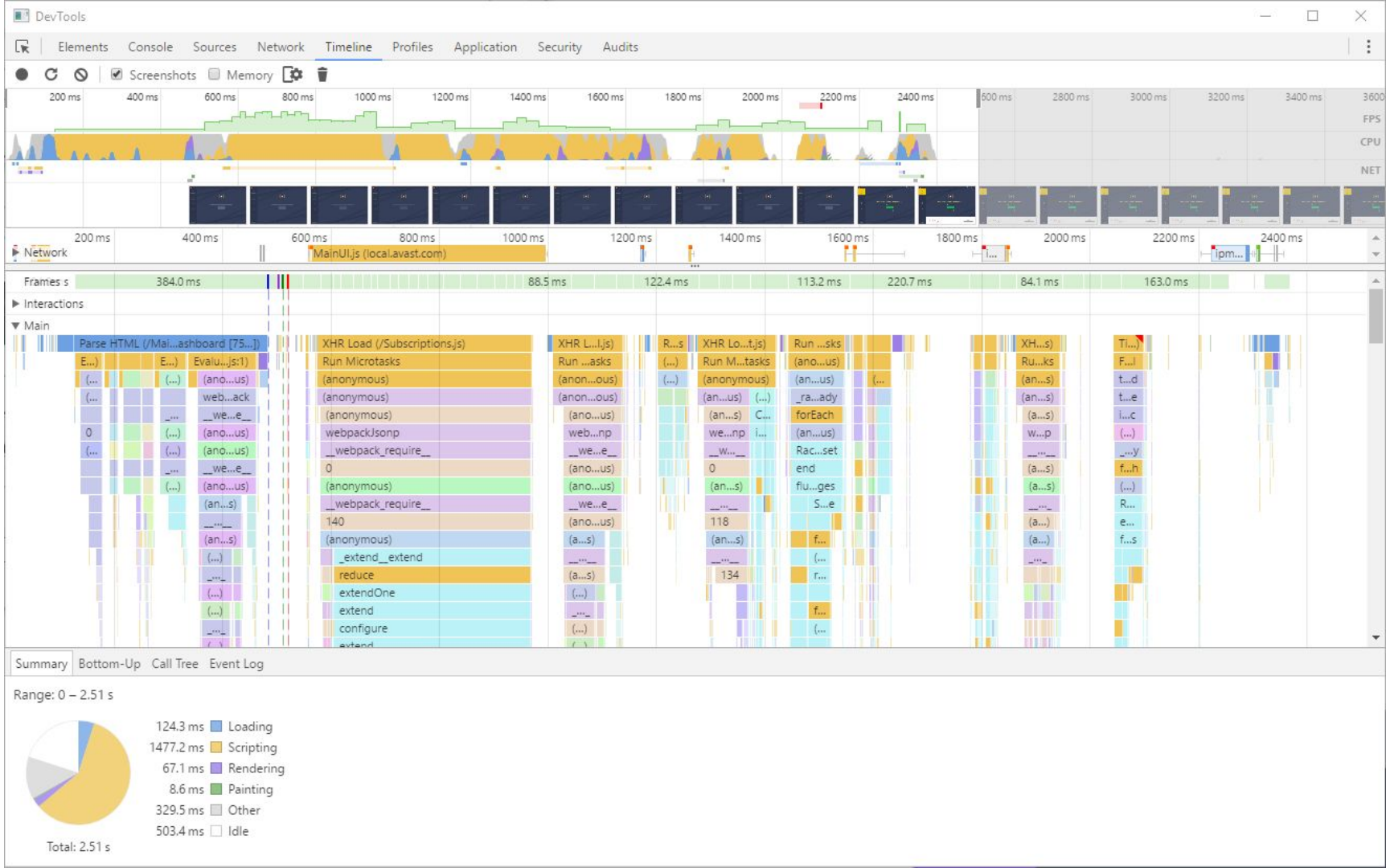
Response for **app.avService.GetStatus** (index.js:675):

```
REQUEST app.avService.GetStatus: ▶ []
RESPONSE app.avService.GetStatus: {"guiLock":false,"issues":{"autoupdate_off":{"ignorable":true,"ignored":false,"priority":6,"severity":2},"lastScanTime":{"lastScanTime":"1520851742","lastUpdateTime":"1521474081","licExpDays":142,"licType":"LicenseSubscription","lic_state":"lic_valid","mainStatus":"yellow","unreadItemsCount":0,"product":"premier","productEx":"","productSeller":"","silentMode":0}}
```

Response for **app.product.GetStatus** (index.js:674):

```
REQUEST app.product.GetStatus: ▶ []
RESPONSE app.product.GetStatus: {"defsVersion":"180319-2","features":{"ais_cmp_bpc":{"enabled":true,"installed":true,"licensed":true,"visible":true},"ais_cmp_cleanup":{"installed":true,"licensed":true,"visible":true},"ais_cmp_datasafe":{"enabled":true,"installed":false,"licensed":true,"visible":true},"ais_cmp_datascan":{"enabled":true,"installed":true,"licensed":true,"visible":true},"ais_cmp_datascan_full":{"enabled":true,"installed":true,"licensed":true,"visible":true},"ais_cmp_fw":{"enabled":true,"installed":true,"licensed":true,"visible":true},"ais_cmp_gamingmode":{"enabled":true,"installed":true,"licensed":true,"visible":true},"ais_cmp_grimefighter":{"enabled":true,"installed":true,"licensed":true,"visible":true},"ais_cmp_hds":{"enabled":true,"installed":true,"licensed":true,"visible":true},"ais_cmp_pap":{"installed":false,"licensed":true,"visible":true},"ais_cmp_pwdman":{"enabled":true,"installed":true,"licensed":true,"visible":true},"ais_cmp_rescuedisk":{"enabled":true,"installed":true,"licensed":true,"visible":true},"ais_cmp_secdns":{"enabled":true,"installed":true,"licensed":true,"visible":true},"ais_cmp_secureline":{"enabled":true,"installed":true,"licensed":true,"visible":true},"ais_cmp_shredder":{"enabled":false,"installed":true,"licensed":true,"visible":true},"ais_cmp_snx":{"enabled":false,"installed":true,"licensed":true,"visible":true},"ais_cmp_swhhealth":{"enabled":true,"installed":true,"licensed":true,"visible":true},"ais_cmp_webcam":{"enabled":true,"installed":true,"licensed":true,"visible":true},"ais_cmp_webrep":{"installed":true,"licensed":true,"visible":true},"ais_shl_bhv":{"enabled":true,"installed":true,"licensed":true,"visible":true},"ais_shl_exch":{"enabled":false,"installed":false,"licensed":true,"visible":true},"ais_shl_fil":{"enabled":true,"installed":true,"licensed":true,"visible":true},"ais_shl_mail":{"enabled":true,"installed":true,"licensed":true,"visible":true},"ais_shl_rsw":{"enabled":true,"installed":true,"licensed":true,"visible":true},"ais_shl_shp":{"installed":false,"licensed":true,"visible":true},"ais_shl_spm":{"enabled":true,"installed":true,"licensed":true,"visible":true},"ais_shl_web":{"enabled":true,"installed":true,"licensed":true,"visible":true},"vps_boot32":{"installed":false,"licensed":true,"visible":true},"isBeta":false,"myAvastUrl":"https://my.avast.com/en-gb/tab","programVersion":"18.3.3305","standalones":{"ais_cmp_cleanup":{"installed":false},"ais_cmp_pap":{"installed":false},"ais_cmp_pwdman":{"installed":false},"ais_cmp_secureline":{"installed":false}},"userConfig":{"debugMode":false,"language":"en-gb"},"uupdateInfo":{"version":"257"}}
```








# DevTools Timeline



# Release process

Create and deploy UI Configuration file for **AVAST**

















Target Application: AVAST Compare to: 1.0.198  Force versions. **PUBLISH**

	<b>Spawn - SvgFlags</b> Last version (1.0.1289) built <b>21 hours ago</b> ( March 26th 2018, 5:30:58 pm ) beb71ad08cb1e68528197a5e97a9dd899c28f5ac	<b>FORCE 1.0.1283</b> 1.0 1289
	<b>MainLayout - MainLayout</b> Last version (11.337) built <b>3 hours ago</b> ( March 27th 2018, 10:46:00 am ) 5edf0c4f9d6826468ce3df06489e6a0028f2224c	<b>FORCE 11.324</b> 1.0 337
	<b>Dashboard - Dashboard</b> Last version (1.178) built <b>1 month ago</b> ( February 28th 2018, 11:12:21 am ) 8de825c47fe9ff7166d424feceaad8d777c62a5f	1.0 78
	<b>SmartScan - SmartScan</b> Last version (11.27) built <b>21 days ago</b> ( March 6th 2018, 2:52:31 pm ) b38be46f36c05bffc3b9cd4f45d313105e1d9337	
	<b>SecurityNetwork - SecurityNetwork</b> Last version (1.0.183) built <b>2 months ago</b> ( February 7th 2018, 1:21:00 am ) fe196f569889010c449aa378d84815805ec344f9	
	<b>SecuritySoftware - SecuritySoftware</b> Last version (11.42) built <b>1 day ago</b> ( March 26th 2018, 2:49:35 pm ) 184f09ba0b399efafbdad2410942fdad5bf66493	
	<b>SecurityFirewall - SecurityFirewall</b> Last version (11.50) built <b>2 months ago</b> ( February 6th 2018, 2:30:00 am ) 28549fa2f15d69c4b63df6b5407d4ad28c0c56a	

```

"metadata": {
  "product": "avast",
  "note": "18.3",
  "version": "1.0.198",
  "created": "Thu, 22 Mar 2018 10:15:31 GMT"
},
"Localization": {
  "version": "1.0.639",
  "url": "http://nuistatic.avcdn.net/nui/avast/1.0.198/Localization.js",
  "hash": "67bbcb2316f8ca1de6d7be569c31600976d1a03e",
  "size": 1952,
  "lzmaurl": "http://nuistatic.avcdn.net/nui/avast/1.0.198/Localization.js.lzma",
  "lzmahash": "c92d47c14d91bdbaea44048612dee2412a644f85"
}

```

Configuration Matrix		free	premier
Win_7_Uit_32b_EN	18.2.3827_A18R2		
	18.1.3800_A18R1		
	beta9x_public		
	freeze		
Win_10_Pro_64b_EN	18.2.3827_A18R2		
	18.1.3800_A18R1		
	beta9x_public		
	freeze		

- Avast 18 r2  
<https://s-nuistatic.avcdn.net/nui/avast/1.0.196/updatefile.json>
- Avast 18 r3  
<https://s-nuistatic.avcdn.net/nui/avast/1.0.198/updatefile.json>
- beta  
<https://s-nuistatic.avcdn.net/nui/avast/1.0.198/updatefile.json>



CEF UI automation  $\approx$  Web automation

# Selenium WebDriver



# Connect to running instance of UI

```
# UI process must be running with --remote-debugging-port=CEF_PORT

options = webdriver.ChromeOptions()
options.debugger_address = "localhost:{}".format(CEF_PORT)
desired_capabilities = DesiredCapabilities.CHROME
desired_capabilities['loggingPrefs'] = {'browser': 'ALL'}
cls.instance = webdriver.Chrome(
    desired_capabilities=desired_capabilities,
    executable_path=CHROMEDRIVER_PATH,
    options=options,
    service_args=["--verbose"],
    service_log_path=log_path,
)
```

# Page objects and Element objects

```
class Shields(Page):  
    web_shield_switch = ElementSwitch(*LShields.SWITCH_WEB_SHIELD)  
    file_shield_switch = ElementSwitch(*LShields.SWITCH_FILE_SHIELD)
```

```
class ElementSwitch(Element):  
    def __init__(self, *locator):  
        super().__init__()   
        self.e = self.driver.instance.find_element(* self.locator)
```

```
    def toggle(self):  
        self.e.click()  
        self.wait_until(lambda x: self.e.is_enabled(), timeout)
```

```
    def is_selected(self):  
        value = self.e.get_attribute("data-checked")  
        return True if value == "true" else False
```

# Work with more windows

```
def switch_to_modal_window (self):  
    handles = driver.instance.window_handles  
    handles.remove (self.ui.window_handle)  
    driver.instance.switch_to.window(handles[ 0])
```

```
def switch_to_main_window (self):  
    if self.ui.window_handle in driver.instance.window_handles:  
        driver.instance.switch_to.window( self.ui.window_handle)
```

# Main window object

```
class AvastUI(UI):
    URL_MAINWINDOW = "https://local.avast.com/MainWindow.html"

    dashboard = Dashboard() # ui.dashboard.run_smart_scan()
    antispam = Antispam() # ui.antispam.stop()
    scans = Scans() # ui.scans.computer_scan.start()
    cleanup = Cleanup() # ui.cleanup.clean()
    shields = Shields() # ui.shields.file_shield_switch.toggle()
    ...

    @staticmethod
    def close():
        e = Driver.instance.find_element(*LocatorsNitro.CLOSE).click()
    ...
```

# behave



# File Structure and running

```
ui_checks/  
  .avast/  
    ..steps/  
      ...switch.py  
      ..features/  
        ...shields.feature  
      ..environment.py  
    .avg/  
      ..steps/  
        ...switch.py  
        ..features/  
          ...shields.feature  
        ..environment.py
```

```
behave.exe --tags=smoke -D edition=premier -D eyes=true --junit avast\features
```



# Feature file #shields.feature

**Feature:** Shields

Checks correct behavior of disabling/enabling core shields

**Background:** Navigate to Shields page

**Given** I am on **Shields** page

@smoke

**Scenario Outline:** Turning off <shield> Shield

**Given** <shield> Shield is **ON** # FileSystem Shield is ON

**When** I turn <shield> Shield OFF **permanently**


**Then** <shield> Shield is **OFF** # FileSystem Shield is OFF

**When** I turn <shield> Shield ON

**Then** <shield> Shield is **ON** # FileSystem Shield is ON

**Examples:**

shield	
FileSystem	
Web	
Email	
Behavior	


  
Status

[Sign In](#) ☆

  
Protection



You're protected

  
Privacy

**RUN SMART SCAN**

  
Performance

A one-click, all-inclusive PC checkup. Scan your PC for all kinds of security, privacy, and performance issues.

 Mobile  
 Settings



**Attention:** Your PC is not operating at maximum performance!

- System junk: 1 GB
- Programs slowing down your PC: 23
- Broken registry items: 295

RESOLVE

# Step implementation #switch.py

```
from ui_selenium_framework.avast.main_window import AvastUI as ui

@step("{shield} Shield is {state}") # (Given/Then) FileSystem Shield is ON
def step_impl(context, shield, state):
    if state == "ON":
        state = True
    elif state == "OFF":
        state = False
    if shield == "FileSystem":
        switch = ui.shields.file_shield_switch
    ...
    actual_state = switch.is_selected() # Selenium Framework
    assert_that(actual_state, equal_to(state), "FAIL_MSG") # PyHamcrest
```

# Environment file (optional) #environment.py

```
def before_all(context):  
    context.edition = context.config.userdata.get( "edition", None)  
    context.edition = context.config.userdata.get( "eyes", False)  
    ... # Getting environment variables
```

```
def before_feature(context, feature):  
    pass # Starting UI
```

```
def before_scenario(context, scenario):  
    pass
```

```
def before_step(context, step):  
    pass
```

```
def before_tag(context, tag):  
    pass
```

```
@smoke  
Scenario Outline: Turning off <shield> Shield  
Given <shield> Shield is ON  
When I turn <shield> Shield OFF permanently  
Then <shield> Shield is OFF  
When I turn <shield> Shield ON  
Then <shield> Shield is ON  
Examples:  
| shield |  
| FileSystem |  
| Web |  
| Email |  
| Behavior |
```

# Applitoools Eyes



# Visual regression

Team: Quality Assurance (Windows) [Admin]

Test results

Test: Web shield detection. Create exception action- ask mode  
Steps: 7

Strict

Baseline | 2/7 Detection dialog is displayed (after step)  
Strict | Microsoft Windows [Version 6.1.7601] | Chrome | 1010x674

Checkpoint | 2/7 Detection dialog is displayed (after step)  
Strict | Microsoft Windows [Version 6.1.7601] | Chrome | 1010x674

The screenshot shows the Avast 'Threat blocked' dialog. The threat is VBA:Dropper-M [Trj] on version 10.2.8.61. The dialog asks 'What would you like to do?' and provides two buttons: 'ABORT CONNECTION' and 'MORE OPTIONS'. The 'ABORT CONNECTION' button is highlighted with a green progress bar. The 'MORE OPTIONS' button has a dropdown arrow. Below the buttons is a 'Hide details' link. The details section shows the following information:

Threat name	VBA:Dropper-M [Trj]
Severity	<div style="width: 100%; height: 10px; background-color: black;"></div>
URL	http://10.2.8.61/malware_new/75D719597CEB0EB51833AEE9790B84302FC20D20C7E51DB0B6C0D2A7F2665031.dat.doc
Process	C:\Python34\python.exe
Detected by	Web Shield
Status	Connection blocked

Orange circles highlight the close button (X) in the top right corner, the 'ABORT CONNECTION' button, the 'MORE OPTIONS' button, and the 'MORE OPTIONS' button's dropdown arrow.

The screenshot shows the Avast 'Threat blocked' dialog. The threat is VBS:Downloader-ATK [Trj] on version 10.2.8.61. The dialog asks 'What would you like to do?' and provides two buttons: 'ABORT CONNECTION' and 'MORE OPTIONS'. The 'ABORT CONNECTION' button is highlighted with a green progress bar. The 'MORE OPTIONS' button has a dropdown arrow. Below the buttons is a 'Hide details' link. The details section shows the following information:

Threat name	VBS:Downloader-ATK [Trj]
Severity	<div style="width: 100%; height: 10px; background-color: black;"></div>
URL	http://10.2.8.61/malware_new/0EFE8B90265DBFF938F847308E9030E5FD44F1CFCD4819CC3251F8E0327EF9A3.dat.txt
Process	C:\Python34\python.exe
Detected by	Web Shield
Status	Connection blocked

Orange circles highlight the close button (X) in the top right corner, the 'ABORT CONNECTION' button, the 'MORE OPTIONS' button, and the 'MORE OPTIONS' button's dropdown arrow.

# Eyes setup

```
def before_scenario (context, scenario):  
    if (context.eyes or "eyes" in scenario.tags):  
        context.eyes = Eyes()  
        context.eyes.api_key = EYES_API_KEY  
        context.host_os = os.popen("ver").read().replace("\n", "")  
        context.batch = BatchInfo("Avast Premier 18.3.1532")  
        context.driver.instance = eyes.open(  
            driver=context.driver.instance,  
            app_name="Avast Premier ({})" .format(scenario.feature.name),  
            test_name=scenario.name  
        )
```

# Visual check

```
def after_step(context, step):
    if context.eyes_opened:
        _screen = context.driver.instance.get_screenshot_as_base64()
        if not (hasattr(context, "prev_screen") and _screen ==
context.prevs):
            context.eyes.check_window(step_id) # Validation is here
            context.prevs = _screen
            context.eyes_opened = True

def eyes_closed(f): # Usage: @eyes_closed before step_impl
    def decorator(context, **kw):
        context.eyes_opened = False
        f(context, **kw)
    return decorator
```



# Summary

- CEF is just Chrome
  - We can use all the same tools for web testing which is powerful
  - Checks are more targeted - using the right tools for each layer
- Behave solved problem with writing documentation what is test doing
  - Readable for everyone from developers to CEO
- Applitools extends our eyes
  - Now we can really say some other have already seen
  - Eyes are faster and see changes we would never could notice

A fool with a tool is still a fool.

Grady Booch



Q&A

Thank you

# Useful links

- <https://github.com/behave/>
- <http://selenium-python.readthedocs.io/>
- <https://applitools.com/>
- <https://www.jetbrains.com/pycharm/>
- <http://opensource.spotify.com/cefbuilds/index.html>
- <https://sites.google.com/a/chromium.org/chromedriver/>