

Synthetic Monitoring

Dynatrace Training Module



Agenda

- Architecture
 - Browser Monitor
 - HTTP Monitor
- Creating a Synthetic Test
- Analysis
- Reports
- Settings
- HTTP Monitors

Synthetic Monitoring

Architecture ◀

Browser Monitor

Analysis

Reports

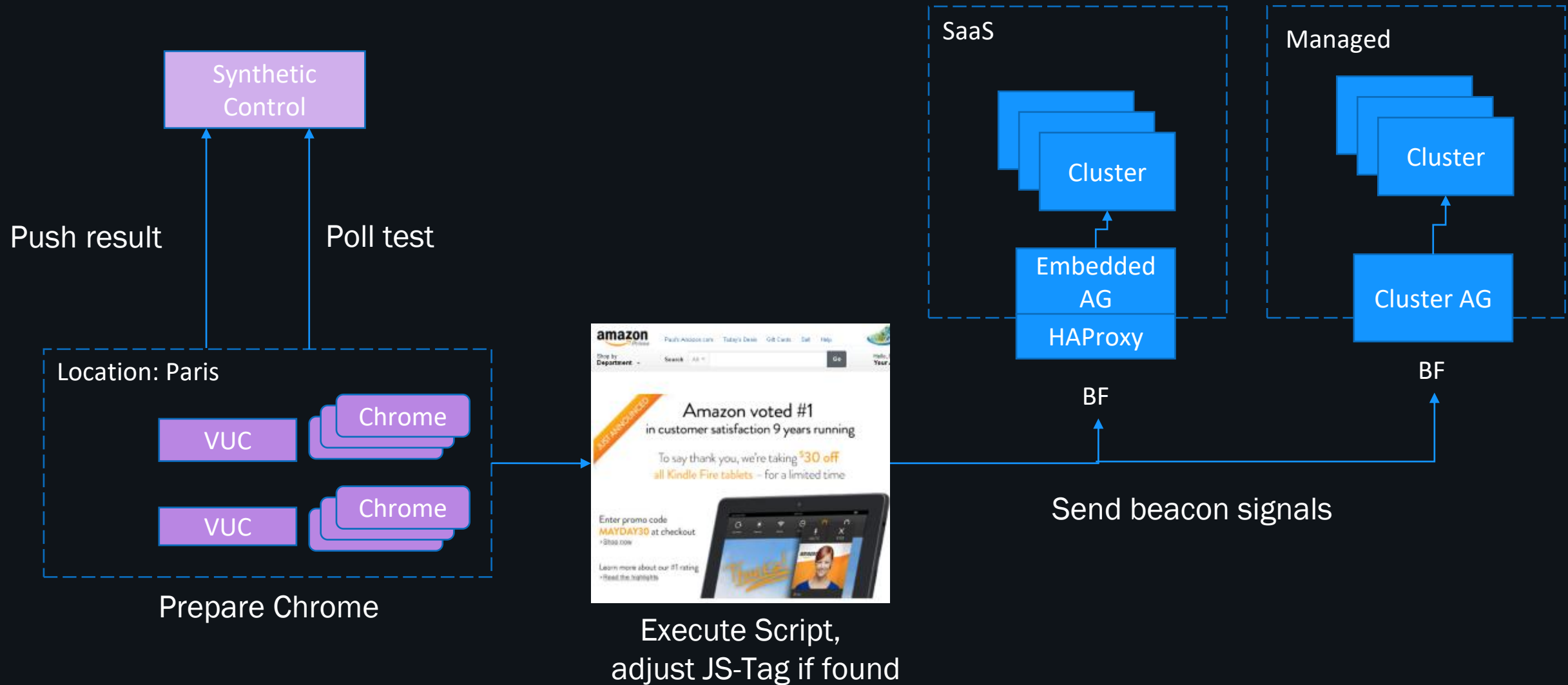
Settings

HTTP Monitor

Architecture

- VU Controller
 - 40+ production locations
 - Script caching
 - Node monitored by Dynatrace
 - KPI - 20 or more concurrent browser executions
- VU Player
 - Chrome based
 - JS agent management – replace RUM tag, inject more in-depth synthetic tag
 - “Login-Sense” like capability to traverse the login by locating form fields and auto-filling
 - Screen Capture

Summary of Test Execution



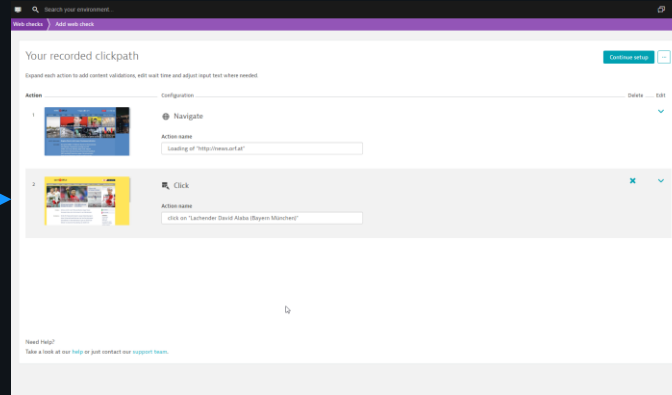
Determine endpoint for Synthetic Beacon-Signal

- SaaS
 - https://*.live.dynatrace.com/bf
- Managed
 - Cluster is using the Domain/IP of the configured Cluster AG
 - <https://myclusterag.gateway.org.com:9999/bf>
- Both approaches end up in the Beacon-Forwarder of an AG
 - Special component simply proxying beacon signals to the cluster

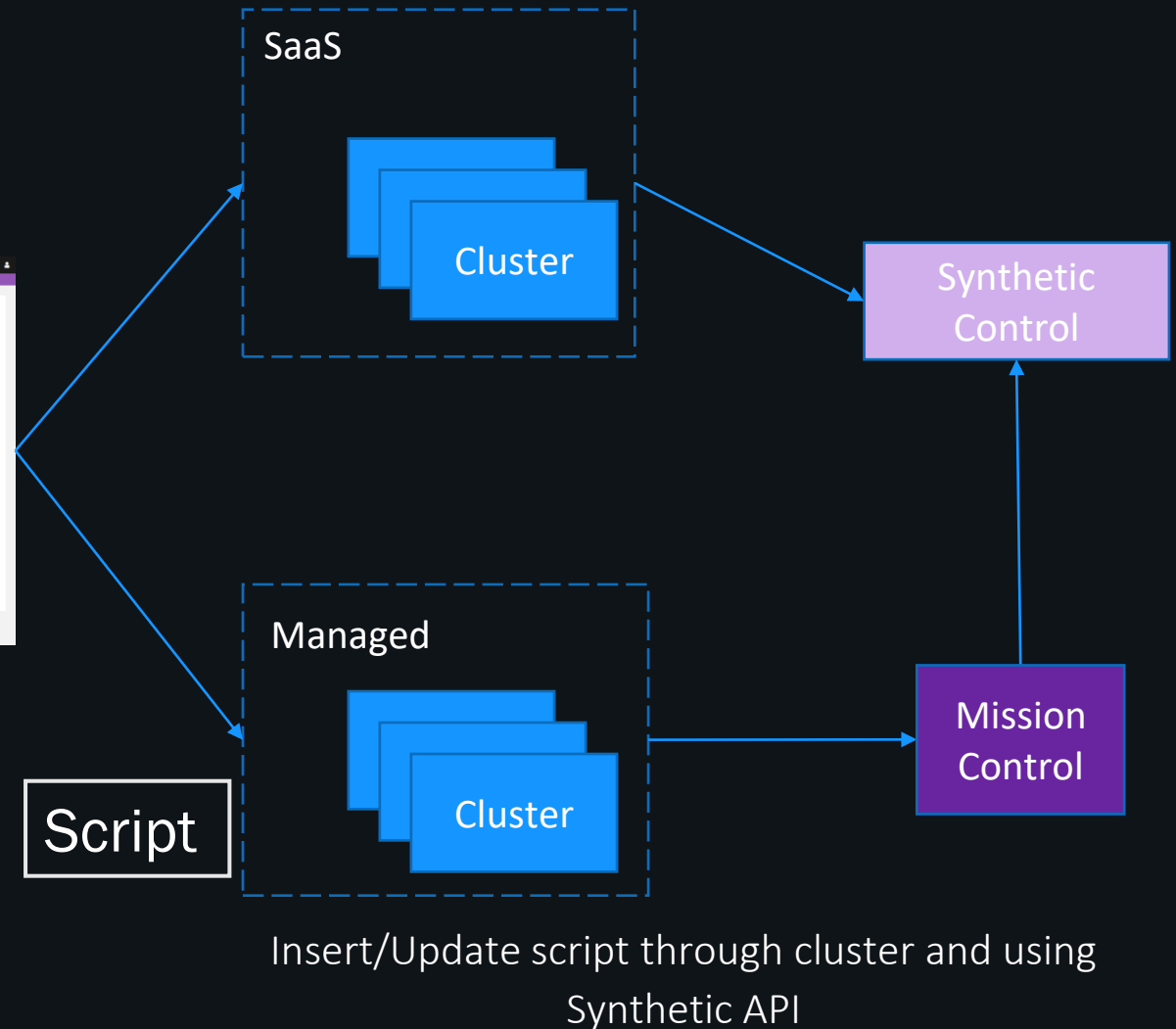
Synthetic Recorder - Plugin



Record clickpath



Update clickpath locally
verify by playback



Synthetic Monitoring

Architecture

Browser Monitor ◀

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HTTP Monitor

Creating a Synthetic Test



Synthetic

Create synthetic monitor

Type

Configuration

What type of synthetic monitor do you want to create?



Simulate user behavior in a real browser

A browser monitor is a simulated user session driven by a modern web browser. You can either monitor a URL or record a sequence of clicks and user input that should be replayed during monitoring.

Create a browser monitor

Create a basic HTTP monitor

An HTTP monitor uses a simple HTTP request to monitor the availability of a URL used by your application.

Create an HTTP monitor

To use HTTP monitors you first need to setup a [private synthetic location](#).

Execution in real browser

- Chrome browser used
 - Constantly updated to current version
- Empty browser caches on execution



Synthetic Monitoring

Architecture

Browser Monitor

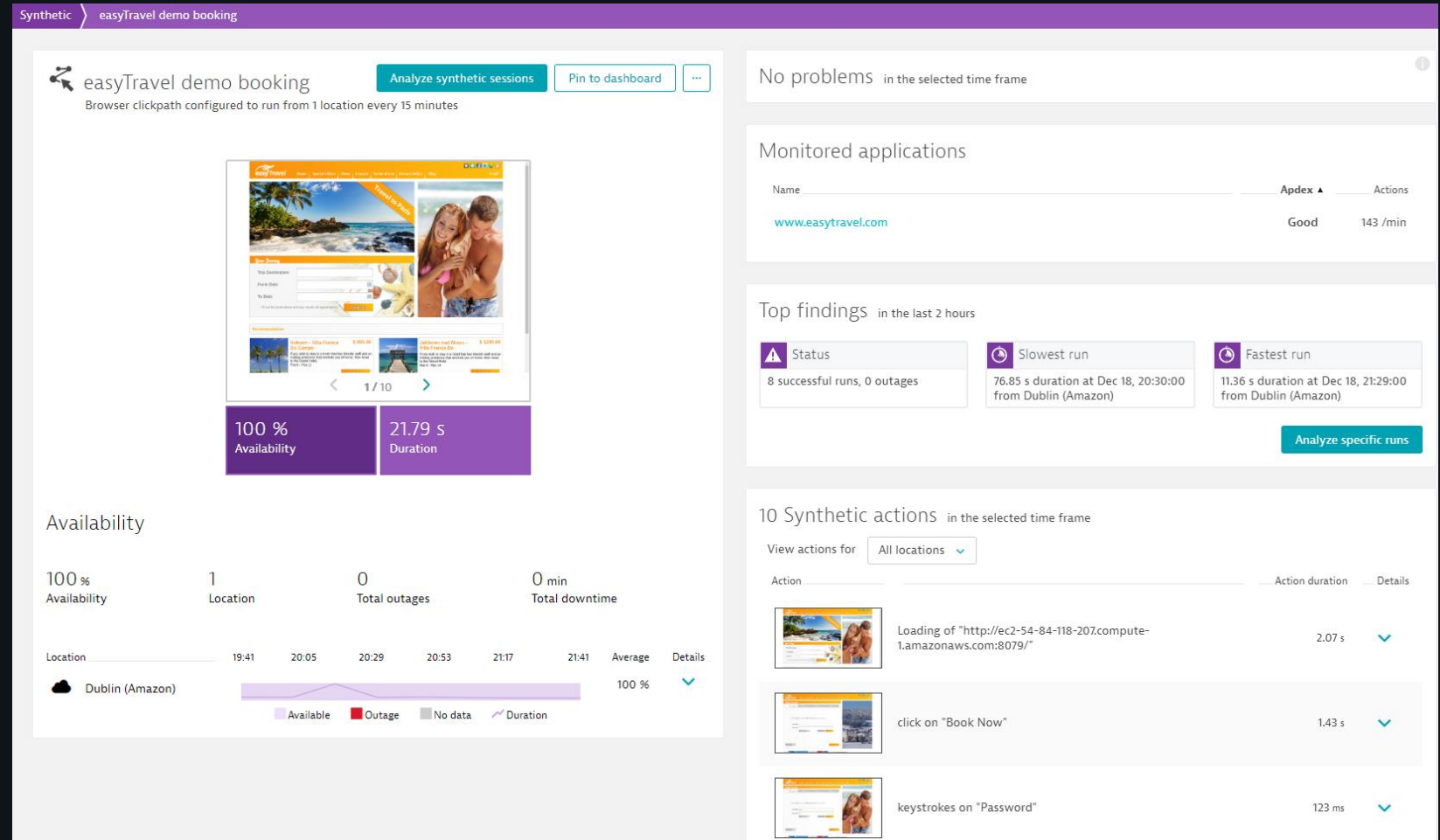
Analysis

Reports

Settings

HTTP Monitor

Analysis



Synthetic Monitoring

Architecture

Browser Monitor

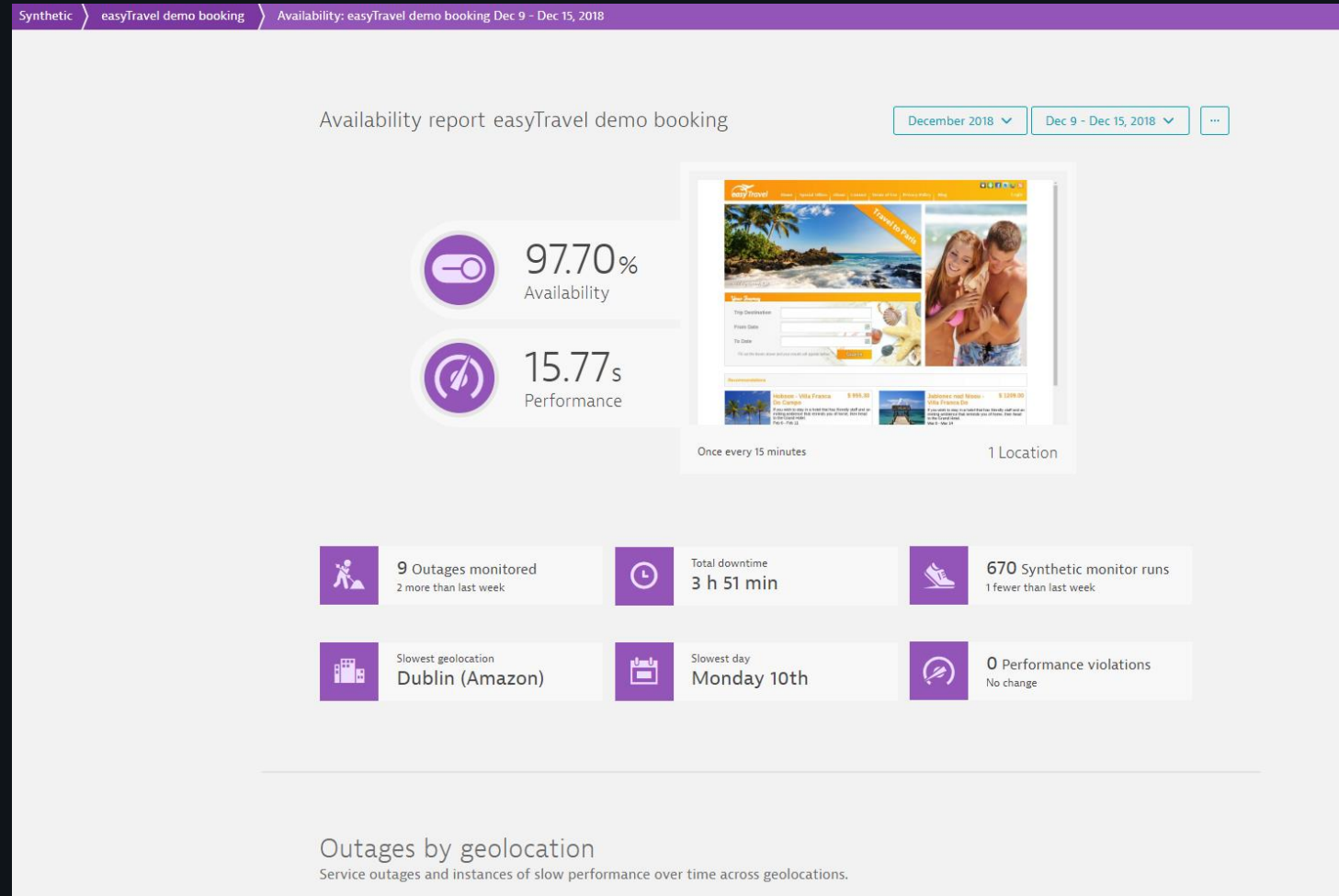
Analysis

Reports

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HTTP Monitor

Reports



Synthetic Monitoring

Architecture

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Reports

Settings ◀

HTTP Monitor

Settings

Synthetic

easyTravel demo booking

Settings

Monitor setup

Monitor settings

easyTravel demo booking

Monitor setup

Name monitor & define device profile

Recorded clickpath

View clickpath & add content validations

Frequency and locations

Define run frequency and locations

Outage handling

Define problem & alert settings

Performance thresholds

Define action duration thresholds

Request headers

Specify request headers for your monitor

Monitor setup

Monitor name

easyTravel demo booking

Define device emulation settings

Define the mobile/desktop device type this browser clickpath is to emulate.

Device

Desktop

Screen size (pixels)

1024 x 768 px

Bandwidth

No throttling

User agent

Default Dynatrace user agent

Assign synthetic monitor to a web application

Connecting your web applications will bring availability information to your web application, and failed tests will result in alerts.

Name

www.easytravel.com (Automatically assigned)

Edit test as clickpath or as JSON script

Syntheticdynatrace.comSettingsRecorded clickpath

Monitor settings

dynatrace.com

Monitor setup

Name monitor & define device profile

Recorded clickpath

View clickpath & add content validations

Frequency and locations

Define run frequency and locations

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Performance thresholds

Define action duration thresholds

Advanced setup

Fine-tune your synthetic monitor

ClickpathScript

Click each event to add content validations, edit wait time and adjust input text wh

Add synthetic event

1

Loading of "http://dynatrace.com"

2

click on "Accept"

3

click on "Free trial"

Syntheticdynatrace.comSettingsRecorded clickpath

Monitor settings

dynatrace.com

Monitor setup

Name monitor & define device profile

Recorded clickpath

View clickpath & add content validations

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Advanced setup

Fine-tune your synthetic monitor

ClickpathScript

This feature is still in beta. Have feedback for the team? Click the **Chat** icon in the menu bar. [Scripting browser monitors](#)

[Download script as .json](#)

```
1 {
2   "configuration": {
3     "device": {
4       "orientation": "landscape",
5       "deviceName": "Desktop"
6     }
7   },
8   "type": "clickpath",
9   "version": "1.0",
10  "events": [{
11    "type": "navigate",
12    "wait": {
13      "waitFor": "page_complete"
14    },
15    "description": "Loading of \"http://dynatrace.com\"",
16    "url": "http://dynatrace.com"
17  }, {
18    "type": "click",
19    "wait": {
20      "waitFor": "network"
21    },
22    "target": {
23      "locators": [{
24        "type": "css",
25        "value": "button:eq(5)"
26      }, {
27        "type": "css",
28        "value": "button:contains(\"Accept\")"
29      }, {
30        "type": "css",
31        "value": ".rxtcookiesdisclaimer__button"
32      }, {
```

Confidential

13

Custom JavaScript events

The screenshot shows the Dynatrace Synthetic Monitor interface. At the top, there's a navigation bar with 'Synthetic' and 'Create synthetic monitor'. Below this, a progress bar indicates the current step is 'Configuration'. The main heading is '10 recorded clickpath events'. Below this, there's a sub-heading 'Click each event to add content validations, edit wait time and adjust input text where needed.' and two buttons: 'Clickpath' and 'Script'. A 'Add synthetic event' button is also present. The 'Synthetic events' list on the left includes:

- 1 Loading of "https://easytravel.perform-2018.dynala..."
Navigate
- 2 get firstname / lastname from API
JavaScript
- 3 click on "loginForm:loginLink"
Click
- 4 click on "loginForm:newAccount"
Click
- 5 click on "First Name"
Click
- 6 set firstname / lastname
JavaScript
- 7 enter email
JavaScript

The detailed view for event 2, 'get firstname / lastname from API', is shown on the right. It includes a 'Close details' button and a code editor with the following JavaScript code:

```
1 api.startAsyncSyntheticEvent();
2 fetch('https://randomuser.me/api/').then((resp) => resp.json()).then(function
  (data) {
3   document.getElementById('firstName').value = data.results[0].name.first;
4   document.getElementById('lastName').value = data.results[0].name.lastname;
5   api.finish();
6 }).catch(function(error) {
7   api.fail('Fetch request to randomuser.me failed');
8 });
```

Below the code editor, there's a 'Target window' field with the value 'optional' and a 'Delete synthetic event' button.

Custom request headers

Deploy Dynatrace

Synthetic > Create synthetic monitor

Device profile

Device: Desktop

Screen size (pixels): 1024 x 768 px

Bandwidth: No throttling

User agent: Default Dynatrace user agent

Additional options

☐ Bypass logins

☒ Enable additional HTTP headers

Header: X-Hello Value: World


Add another header

☒ Only apply headers to requests ☒ matching a pattern

Pattern: */example.com/hello/

Frequency and locations

Monitor my website every 15 minutes



Validate Content

≡

🖨

🔍 Search Dynatrace:

Synthetic

Monitor setup

Frequency and locations

Validate content

Outage handling

Performance thresholds

Monitor script

Advanced setup

Monitor settings

Monitor setup
Name monitor & define device profile

Frequency and locations
Define run frequency and locations

Validate content
Add custom content validation rules

Outage handling
Define problem & alert settings

Performance thresholds
Define action duration thresholds

Monitor script
View & edit raw script of this monitor

Advanced setup
Fine-tune your synthetic monitor

Validate content

By default, browser monitors only validate that a target page loads successfully. To ensure that specific text or images are loaded and correctly displayed on a page, create a content validation rule to target specific text, CSS, or DOM elements.

Add custom content validation

Pass if

website content

contains text

Specify text

Use { } for placeholders
☐ Evaluate as regular expression

Target window

Add

Cancel

Synthetic Monitoring

Architecture

Browser Monitor

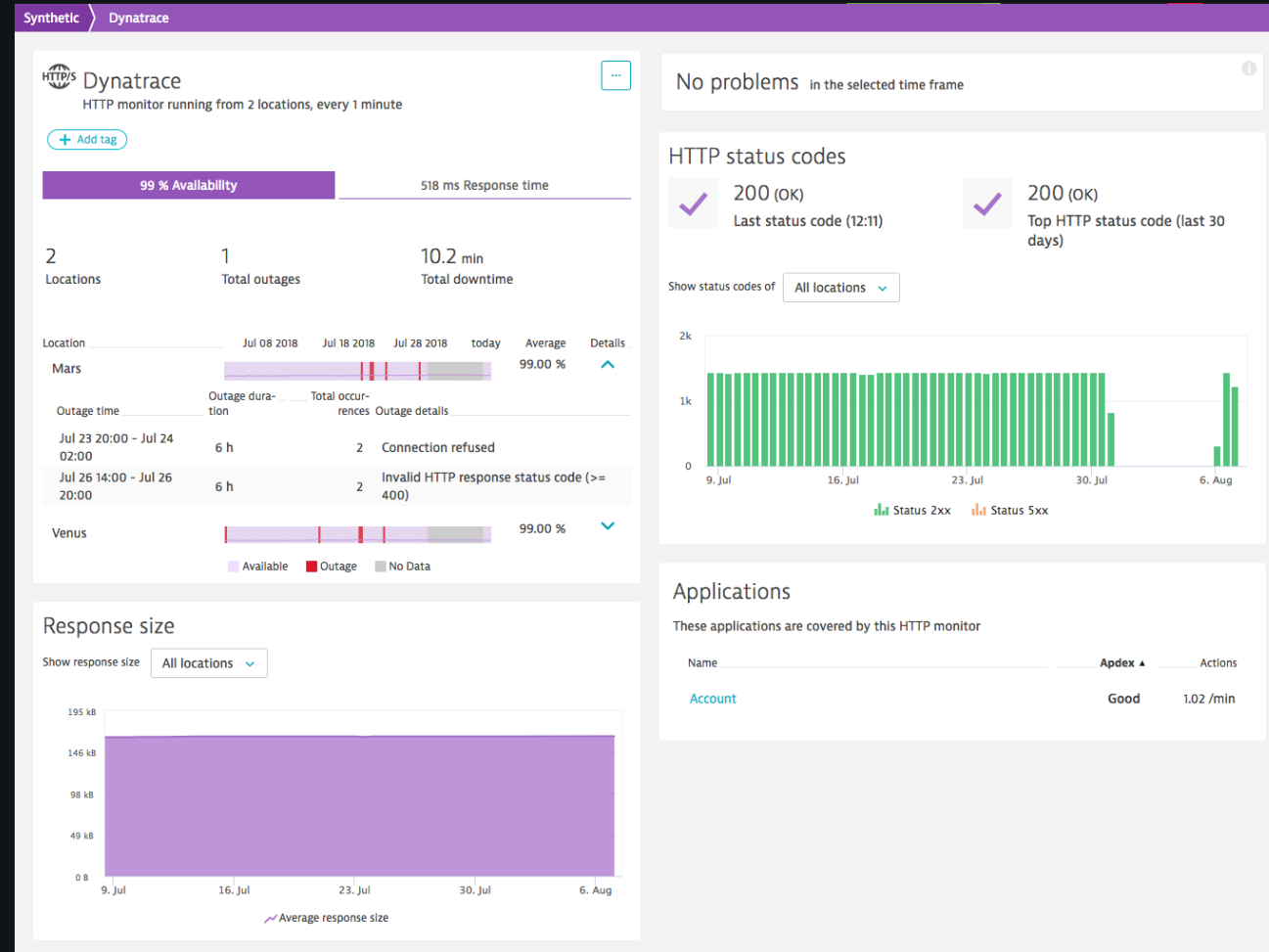
Analysis

Reports

Settings

HTTP Monitor ◀

HTTP Monitors



HTTP Monitors

- An HTTP monitor uses a simple HTTP request to monitor the availability of a given URL or multi-step APIs
- Leverage for automated SLO/SLA monitoring
- Built for API/REST testing
- Can run from Dynatrace cloud locations or private synthetic locations (Environment ActiveGate)

HTTP Monitors vs Browser Monitors

- Both have their optimal use-cases

HTTP Monitors

- Health-check endpoints
- API endpoints
- API transactions (CRUD scenarios, etc.)

Browser Monitors

- Web applications
- Clickpaths (important user-facing workflows)

Create an HTTP Monitor

- The request is executed with a set of parameters:
 - HTTP headers
 - HTTP method
 - User agent
- Also available are:
 - Response validation
 - Basic authentication
 - Different HTTP method types
 - Redirect follows
 - SSL certificate acceptance
 - Assignment to specific applications

Synthetic > Create synthetic monitor

This feature is still in beta. Have feedback for the team? Send us an [email](#)

Type Configuration Summary

Create an HTTP monitor

Type the URL to be monitored (including protocol and port number) Name this HTTP monitor

Select HTTP method User agent (optional) Max response size

MB

Additional options

☐ Enable HTTP basic authentication

☒ Accept any SSL certificate

☒ Follow redirects

☒ Set additional HTTP headers

Header name	Header value	
<input type="text" value="Accept"/>	<input type="text" value="application/json"/>	<input type="button" value="Remove"/>
<input type="text" value="Accept"/>	<input type="text"/>	<input type="button" value="Cancel"/> <input type="button" value="Add another"/>

☐ Response validation

Additional configurations

- Performance threshold that will be displayed along with response time analysis
- Max response size configuration available
- Frequency and internal locations selector
- Multi-request HTTP Monitors
 - Add additional requests to be made within a single monitor.
 - Flexibility to fully exercise an API!

Performance thresholds

☒ Performance thresholds enabled

Notify me if my monitor takes longer than to load

Frequency and locations

Monitor my website every minutes

1 location selected

Filter by location name or by IP address

<input type="checkbox"/>	Location	IP address
<input checked="" type="checkbox"/>	Mars	
<input type="checkbox"/>	Venus	

UI Configuration Script

HTTP requests

create test entry
http: /create
POST

verify creation
http: /find
GET

remove test entry
http: /remove
DELETE

verify removal
http: /find
GET

verify creation

Type the HTTP request URL

HTTP Method
GET

User agent (optional)

Additional options
This feature will be available starting release 1174

☐ Enable pre-execution script

☐ Enable post-execution script

Authentication
No authentication

☒ Set additional HTTP headers

Header name	Header value
name	my-test1
token	

☒ Set rules for response validation

Pass if
text contains

☐ Interpret content match as regular expression



Dynatrace

HTTP monitor running from 2 locations, every 1 minute

[+ Add tag](#)

99 % Availability

518 ms Response time

2

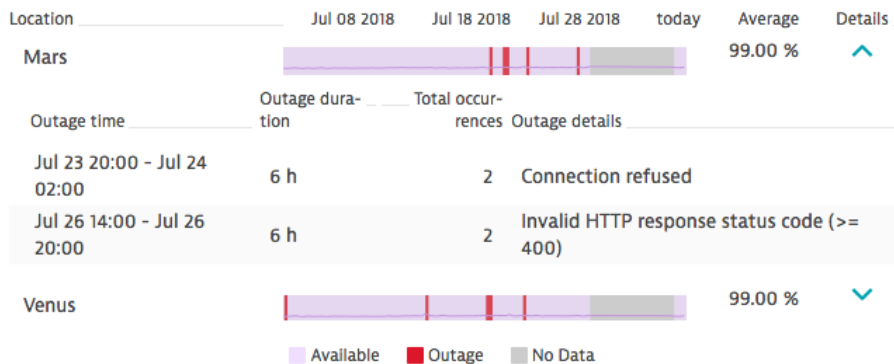
Locations

1

Total outages

10.2 min

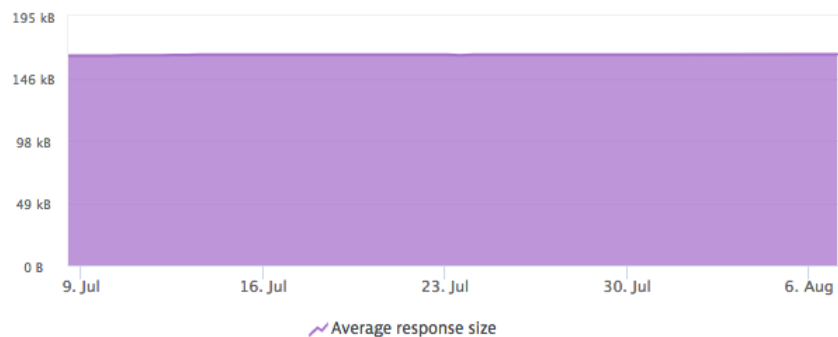
Total downtime



Response size

Show response size

All locations



No problems in the selected time frame

HTTP status codes



200 (OK)

Last status code (12:11)

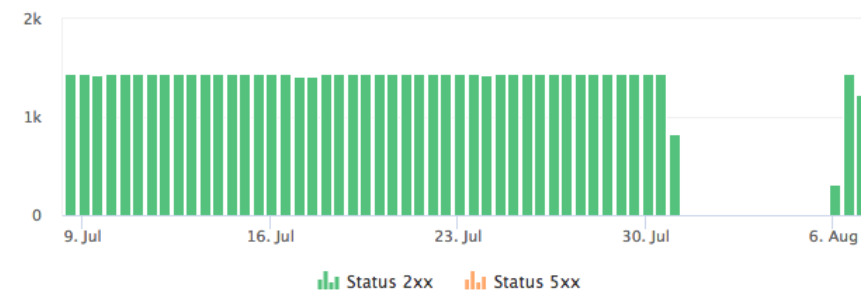


200 (OK)

Top HTTP status code (last 30 days)

Show status codes of

All locations



Applications

These applications are covered by this HTTP monitor

Name

Apdex ▲

Actions

Account

Good

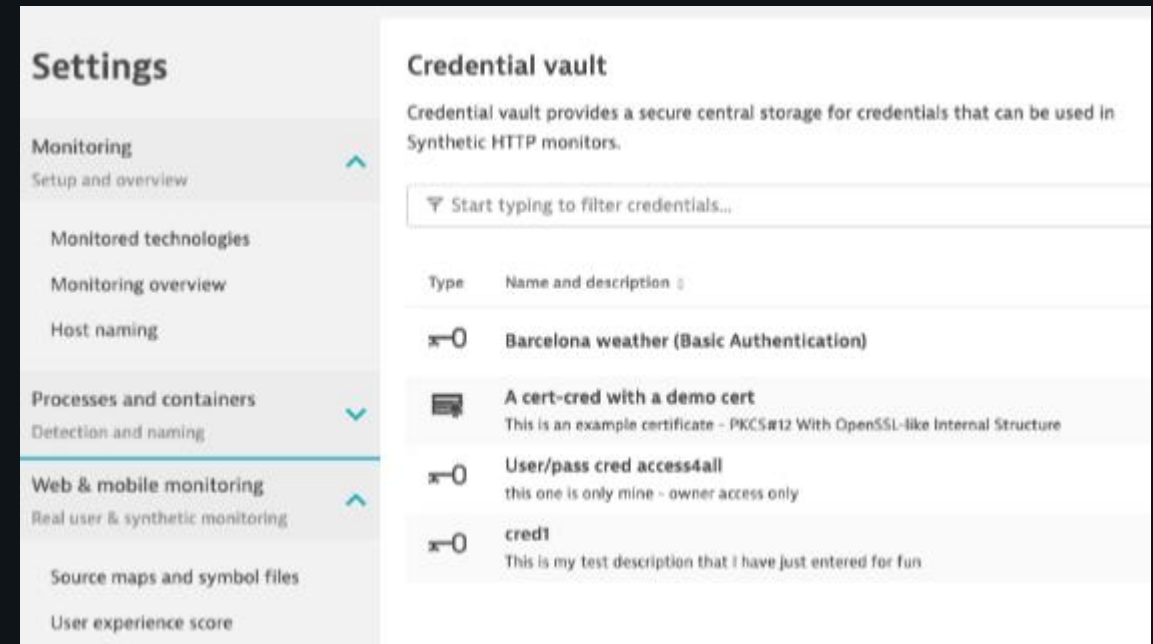
1.02 /min

Synthetic Testing Locations

- For externally available applications Synthetic tests can be executed from the Dynatrace synthetic network. To view all available locations, begin creating a synthetic monitor in the Dynatrace UI.
- Private Synthetic Locations:
 - Both HTTP Monitors and Browser monitors can be executed from customer defined locations
 - Internal synthetic testing requires the use of a Dynatrace ActiveGate.
 - The network location of a Dynatrace ActiveGate becomes the testing location for internal Synthetics
 - Private Synthetic Locations required a dedicated Environment ActiveGate – can't be used for OneAgent traffic

Credential vault

- A secure way to create, control access to, and easily rotate credentials used in synthetic monitors
- Easy to reuse credentials you have access to
- Enter credentials accessible to others or just the owner
 - Non-owners can still manage the monitors to a limited extent (e.g. name, frequency, etc...).
- Certificate based authentication also supported
- Token based authentication supported
- Supported for both HTTP and Browser monitors



Questions?



Simply smarter clouds