

OBSERVABILIDAD CLOUD Y MEJORES PRÁCTICAS

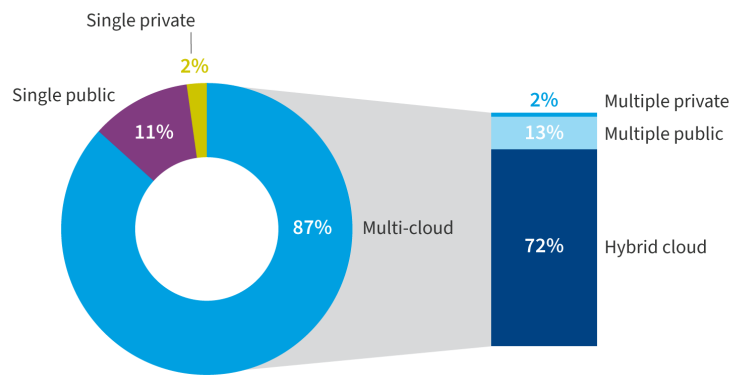


F r a n G a r c í a
H u m p h r i e s

LEAD SE
DYNATRACE

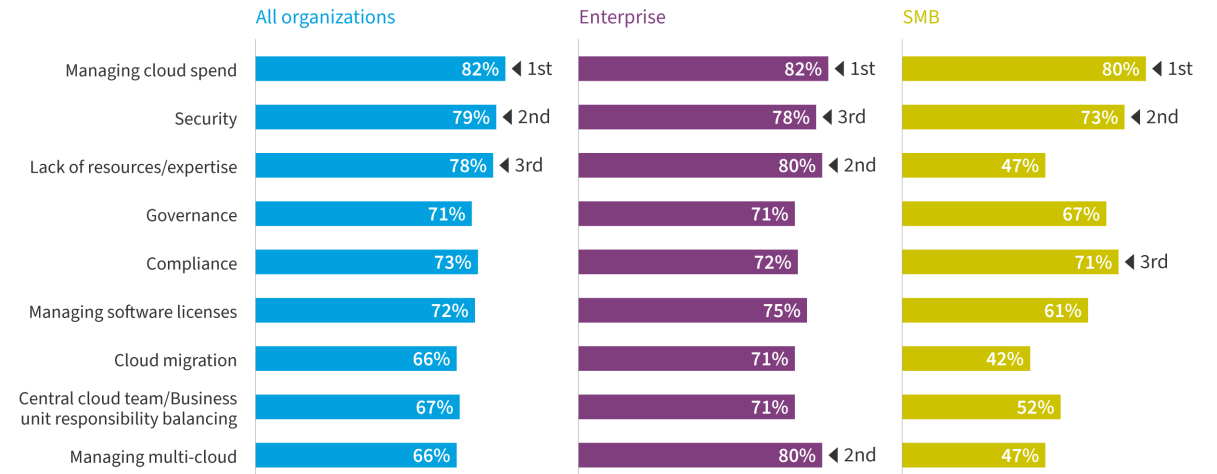
STATE OF THE CLOUD 2023

Organizations embrace multi-cloud



N=750
Source: Flexera 2023 State of the Cloud Report
flexera.

Top cloud challenges



All organizations: N=750, Enterprise: N=627, SMB: N=123
Source: Flexera 2023 State of the Cloud Report
flexera.

MENSAJES

- Ejecutar cargas de trabajo en cloud nos da **flexibilidad, velocidad**, etc....también **complejidad**.
- En entornos multi-cloud, es fundamental contar con **observabilidad integrada**. Imprescindible para integrar con pipelines, FinOps, automatismo...
- En soluciones basadas en **Kubernetes**, la IA reduce drásticamente el **MTTR** y permite **automatizar** de forma mucho más sencilla.
- El paso a la nube de cargas de trabajo es una gran oportunidad para comenzar a adoptar metodologías, soluciones y procedimientos modernos, pero requiere **diseño y planificación**.

LA DIFERENCIA DE DYNATRACE



OneAgent®

Instant deployment & continuous auto-discovery of cloud environment and applications, no manual instrumentation required



Smartscape®

Continuous real-time visualization of cloud hybrid and SaaS environments to reflect service dependency mapping or to help customer see and prioritize which workloads to move to the cloud



Grail™

Massive parallel-processing data lakehouse for enterprise scale metrics, traces, logs and business events from services across clouds, easily queried to automate answers and actions to accelerate adoption and results



Davis® AI

Causal AI engine with hypermodal functionality for automated root cause analysis in full context, predictive forecasting, and generative capabilities

CASO 1

Observabilidad RDS



EKS



id	entity.name	status
KUBE...	eks	●

AKS



id	entity.name	status
KUBE...	alfa	●
KUBE...	beta	●

RDS



id	entity.name	status
SE...	DB1	●

Dbs



id	entity.name	status
SE...	easytravelazure-sql-db	●

Load Balancers



id	entity.name	status
AWS_A...	easytravel-angular-demo1	●
AWS_A...	unguard-lb-live	●
AWS_A...	easytravel-angular-large-staging	●
AWS_A...	unguard-lb-staging	●

Load Balancers



id	entity.name	status
CUSTO...	easytravelazure-lb	●

Lambda



id	entity.name	status
AWS_...	inno-days-update-assistant	●
AWS_...	httpIngress-aws-python-live	●
AWS_...	user-info-service-staging	●
AWS_...	demo1ServiceScalingAutoRemediation	●
AWS_...	demo2-weather-backend-lambda	●
AWS_...	dynatrace-aws-logs-staging-Lambda-yy3BU5057...	●
AWS_...	GotC-IamPasswordPolicyLambda	●

Functions



id	entity.name	status
AZUR...	demolive-function	●
AZUR...	processor-dotnet-live	●
AZUR...	outbound-dotnet-live	●
AZUR...	httpIngress-dotnet-live	●
AZUR...	easytravelazurefunctionapp	●
AZUR...	demostaging-function	●

Show problems ▾

Applications

Services

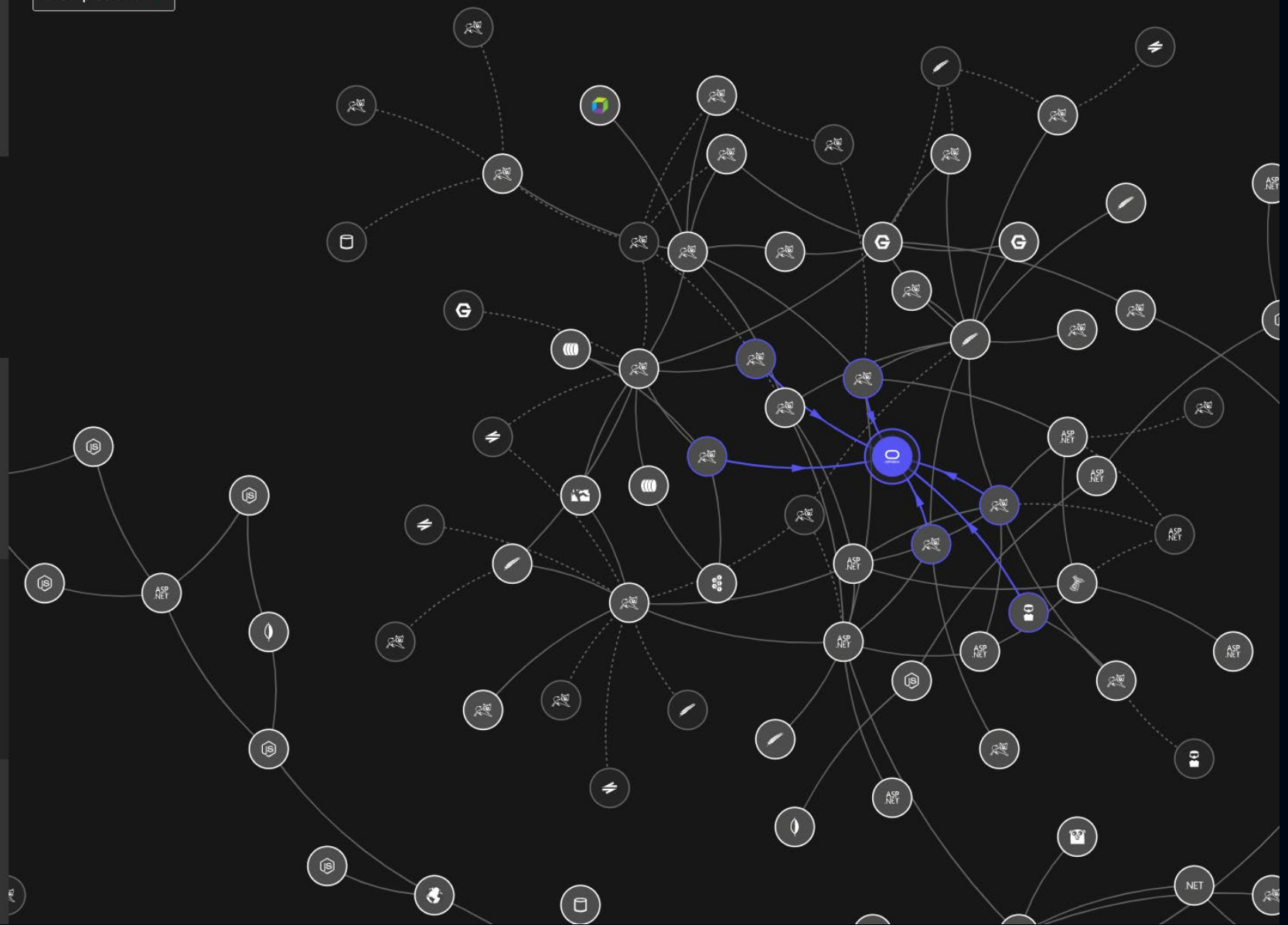
317

DB1
Database

Processes

Hosts

Data centers

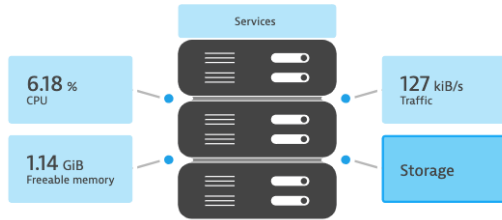


apl-et-demo-1-db-1

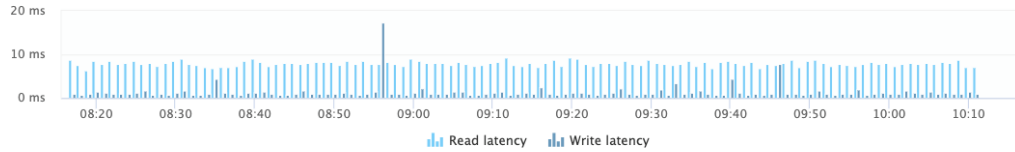
Smartscape view

Properties and tags

[AWS]ACE:CREATED-BY: rafal.psciuk@dy... [AWS]ACE:UPDATED-BY: rafal.psciuk@dy... [AWS]APL:Deployment:_OB_DQ_type_D...



Throughput 252 kiB/s IOPS 26.6 /s Latency 796 ms Free space 65 %



No problems Today, 08:16 - 10:16

No events Today, 08:16 - 10:16



Activate Log monitoring for AWS and get your services logs in context.

Activate



DB1

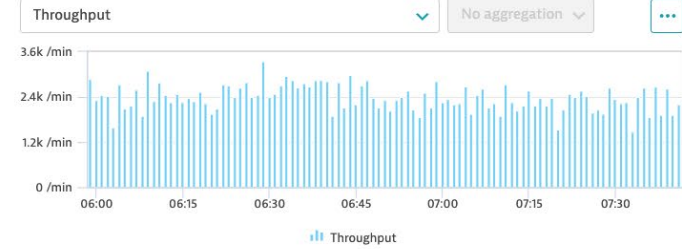
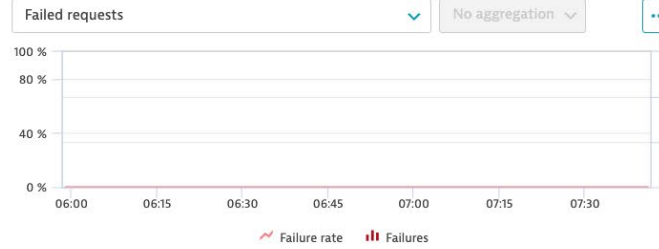
Overview of the Database service

Top requests Multidimensional analysis

Properties and tags Database availability

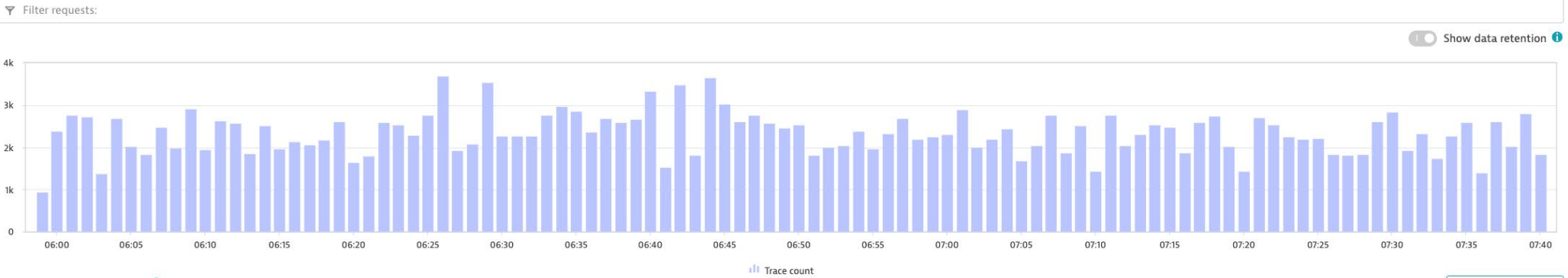
Database service overview

Use the dropdown to select further metrics.



Distributed traces

Contains the most recent 2838 traces. 0 failed.



Analysis range: Today, 07:38 - 07:40

Search for queries...

Details	Start time	Query	Response time	Fetches	Rows affected
	Nov 20 07:40:01.167	<code>select location0_name as name1_2_from Location location0_ where (lower(location0_name) like '%[?!]%') and (exists (select journey1_i...</code>	325 ms	1	4
	Nov 20 07:38:22.164	<code>select * from (select booking0_id as id1_0_ booking0_bookingDate as bookingDate2_0_ booking0_journey_id as journey_id3_0_ booking...</code>	287 ms	1	3
	Nov 20 07:38:22.082	<code>select * from (select booking0_id as id1_0_ booking0_bookingDate as bookingDate2_0_ booking0_journey_id as journey_id3_0_ booking...</code>	258 ms	1	3

- Scroll to Database service overview
- Topology
- Statement types
- Distributed traces
- Events
- Related logs

- Scroll to Database service overview
- Topology
- Statement types
- Distributed traces
- Events
- Related logs

'/easytravel/rest/locations' Trace

Start time: 2023 November 20 07:40:01

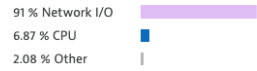
[What's new?](#)

[Find in remote environments](#)

[View logs for this trace](#)

359ms Response time
359ms Processing time

Execution breakdown

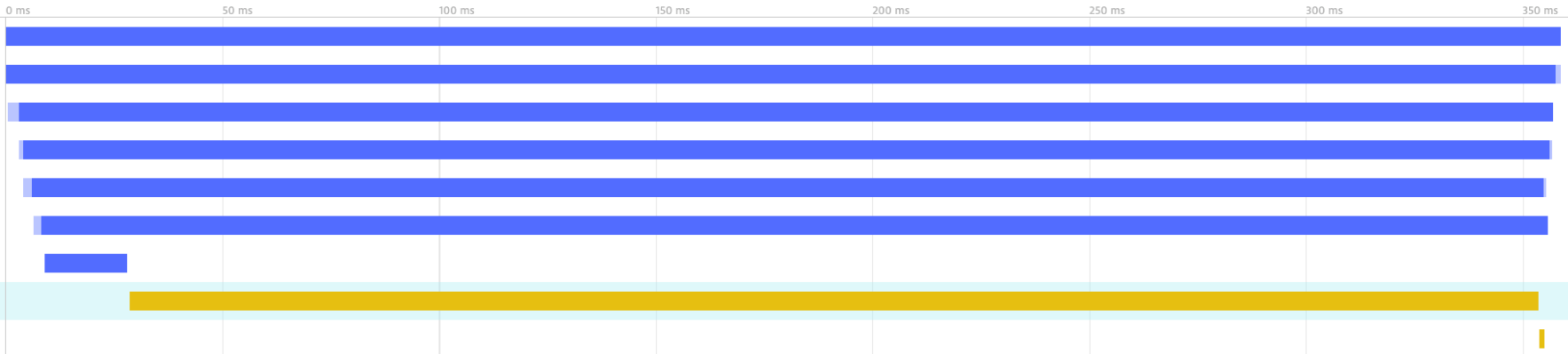


Request attributes

- ClientIP: 40.127.105.141
- sessionid: easytravel-...
- SourceIP: 40.127.105.141
- URL: easytravel-angu...
- ValidUsers: applicatio...

Search name, URL, SQL, attribute...

- ✓ /easytravel/rest/locations
EasyTravelWebserver:9079
- ✓ searchLocations
EasytravelService
- ✓ /services/JourneyService
nginxForCustomerFrontend
- ✓ /services/JourneyService
nginxForMicroservices
- ✓ /services/JourneyService
EasyTravelBackendWebserver:8091
- ✓ findLocations
JourneyService
- JourneyService.checkDestination
 CheckDestination
- select ... from Location location0_ where (lower(location0_name) like '
 DB1
- SQL Commit
 DB1



CASO 2

Kubernetes



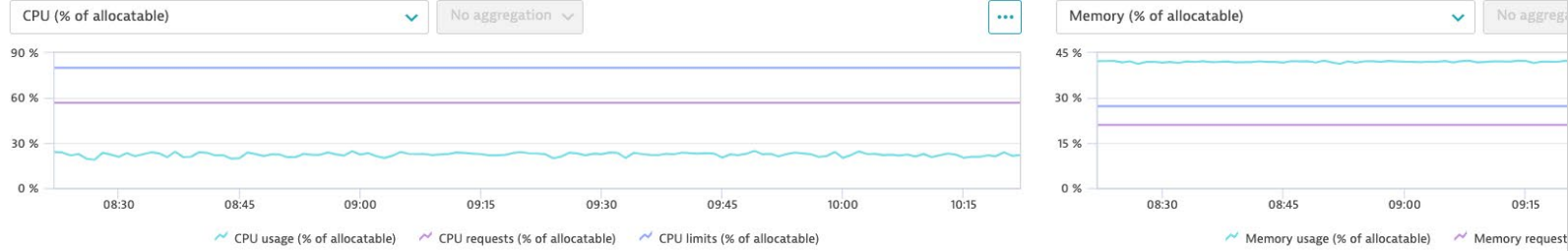
eks

Overview of the Kubernetes Cluster

Properties and tags ✔ No problems 🔴 272 Vulnerabilities

Node analysis

Contains 4 Nodes.

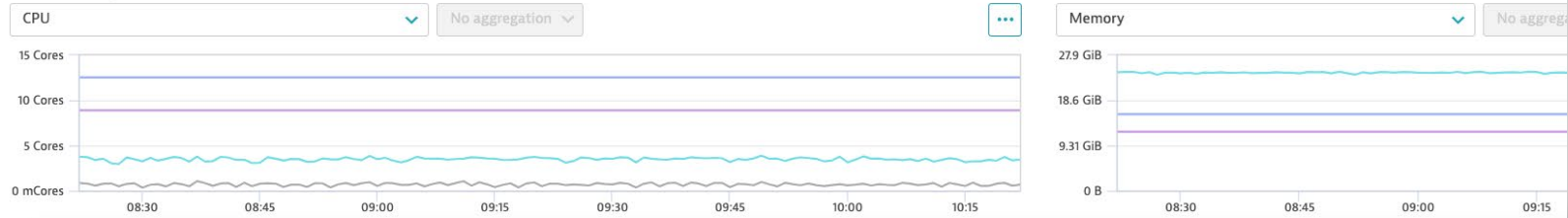


Filter by

Name	CPU usage (% of allocatable)	CPU requests (% of allocatable)	CPU limits (% of allocatable)	Memory usage (% of allocatable)
i-040585ffc09e5c519	3.66 %	52.04 %	49.11 %	33.95 %
i-099de769ee2fe20f7	53.58 %	57.78 %	38.27 %	36.94 %
i-0ac7daa0930d5910e	20.53 %	50.77 %	150.51 %	56.27 %
i-0b046099511f2b0d4	10.17 %	66.58 %	82.27 %	41.01 %

Namespace analysis

Contains 13 Namespaces.



272 vulnerabilities

267 third-party vulnerabilities

5 code-level vulnerabilities

Most severe code-level vulnerabilities

- S-1264: Command injection at BioController.markdownToHtml():80**
Process group: SpringBoot org.dynatrace.profileservice.ProfileServiceApplication unguard-profile-service-* | 8 attacks
- S-1262: Command injection at ProxyController.proxyUrlWithCurl():163**
Process group: SpringBoot org.dynatrace.ssrfservice.Application unguard-proxy-service-* | 2888 attacks
- S-1261: SQL injection at DatabaseManager.insertBio():81**
Process group: SpringBoot org.dynatrace.profileservice.ProfileServiceApplication unguard-profile-service-* | 6495 attacks
- S-1259: Improper input validation at JndiManager.lookup():128**
Process group: SpringBoot org.dynatrace.ssrfservice.Application unguard-proxy-service-* | 4782 attacks
- S-1263: SQL injection at DatabaseManager.updateBio():98**
Process group: SpringBoot org.dynatrace.profileservice.ProfileServiceApplication unguard-profile-service-* | 2884 attacks

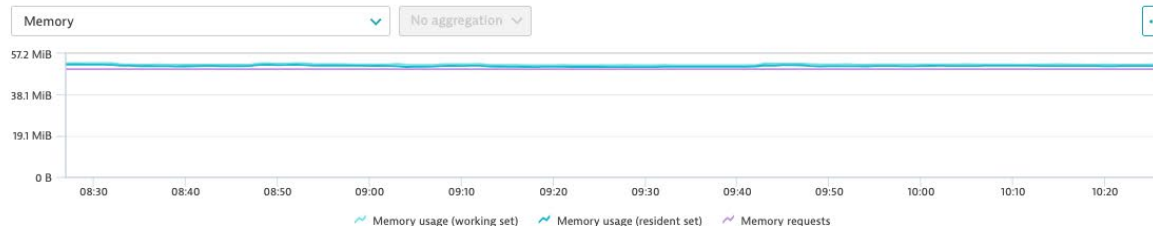
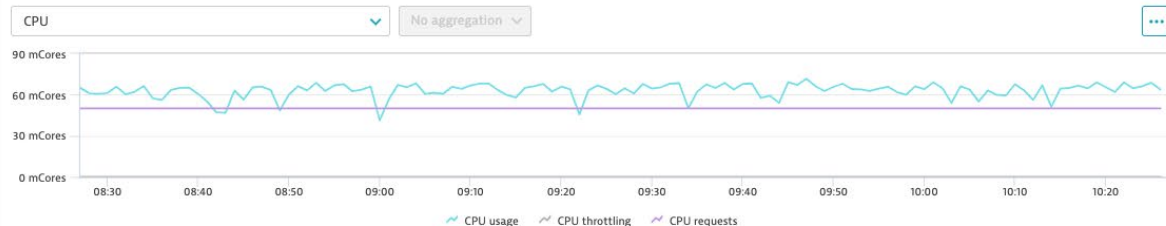
[View all code-level vulnerabilities](#)

frontendreverseproxy

Overview of the Workload
Type Deployment

Properties and tags ✔ No problems ✔ No vulnerabilities ⚙️ 0 SLOs ⚙️ 2 Conditions 👤 Owners

Resources analysis



Pods

Contains 1 Pod.

Name	Host	Status	Age	IP addresses	Containers	Total container restarts
frontendreverseproxy-7548b79988-v4kxd	i-0ac7daa0930d5910e	Running	10 d 21 h	172.31.91.37	1/1	0

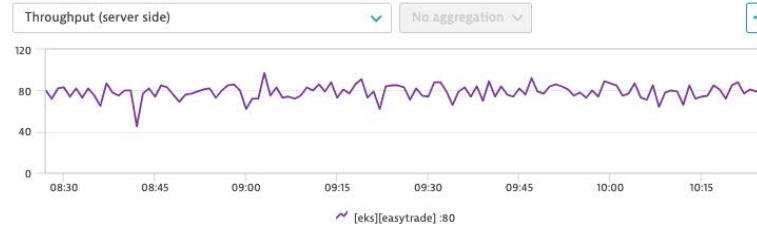
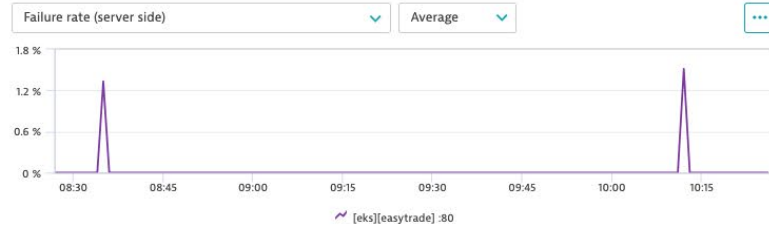
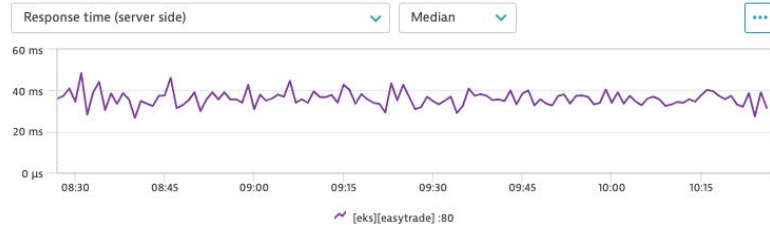
Kubernetes services

Contains 1 Kubernetes service.

Name	Age	Type	Cluster IP	External IP	Ports
frontendreverseproxy-easytrade	233 d 21 h	LoadBalancer	10.100.66.146	-	443:32415/TCP, 80:30090/TCP

Services

Contains 1 Service.



Name	Response time (server side) [Median]	Failure rate (server side) [Average]	Throughput (server side)
[eks][easytrade] :80	31.5 ms	0 %	48

'/broker-service/v1/instrument' Trace

Start time: 2023 November 20 08:34:27

[What's new?](#)

[Find in remote environments](#)

[View logs for this trace](#) ...

88.4ms Response time
88.4ms Processing time
2 Failures









Execution breakdown

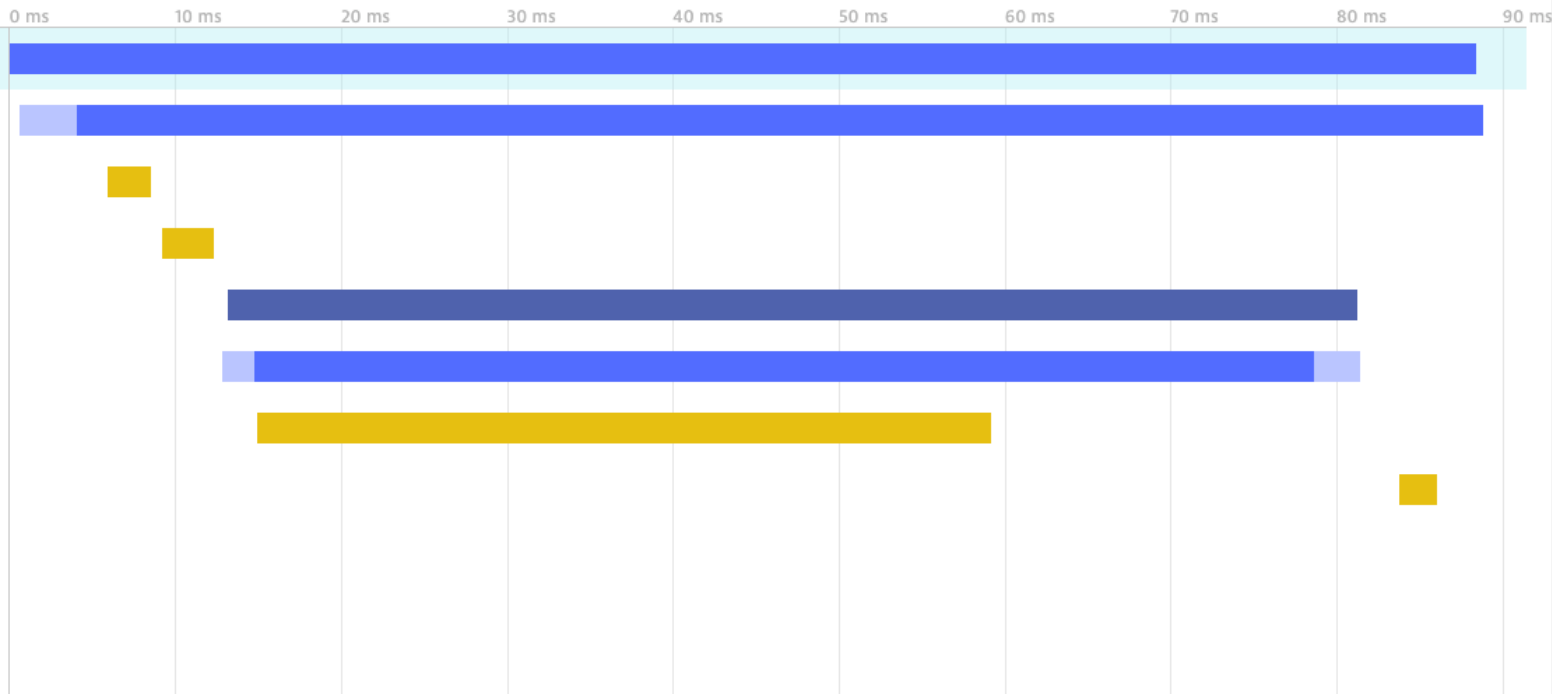


Request attributes

- ClientIP: 69.79.208.216
- sessionid: frontendre...
- SourceIP: 69.79.208.216
- URL: frontendreverse...
- ValidUsers: applicatio...

Search name, URL, SQL, attribute...

- ✓  /broker-service/v1/instrument [eks][easytrade] :80
- ✓  /v1/instrument [eks][easytrade] BrokerService
 -  SELECT ... FROM [Instruments] AS [i] TradeManagement
 -  SELECT ... FROM [Ownedinstruments] AS [o] WHERE [o].[AccountId] = @_acc TradeManagement
 -  System.Net.Http.HttpRequestOut
- ✓  /v1/prices/latest [eks][easytrade] :8080
 -  SELECT * FROM "Pricing" WHERE Timestamp = (SELECT max(Timestamp) FR [eks][easytrade] TradeManagement
 -  SELECT ... FROM [Products] AS [p] TradeManagement





Logs and events Powered by Grail™

Explore your log data and Kubernetes events in simple mode. For deeper analysis, or to query business events, switch to advanced mode powered by [DQL](#)

Switch to Simple Mode

```
1 fetch logs
2 | filter matchesValue(trace_id, "846f75fdb46c3f80f62ca4995480a528") or matchesValue(trace.id, "846f75fdb46c3f80f62ca4995480a528")
3 | fields timestamp, status, content, process.technology
4 | sort timestamp desc
```

[▶ Run query](#)

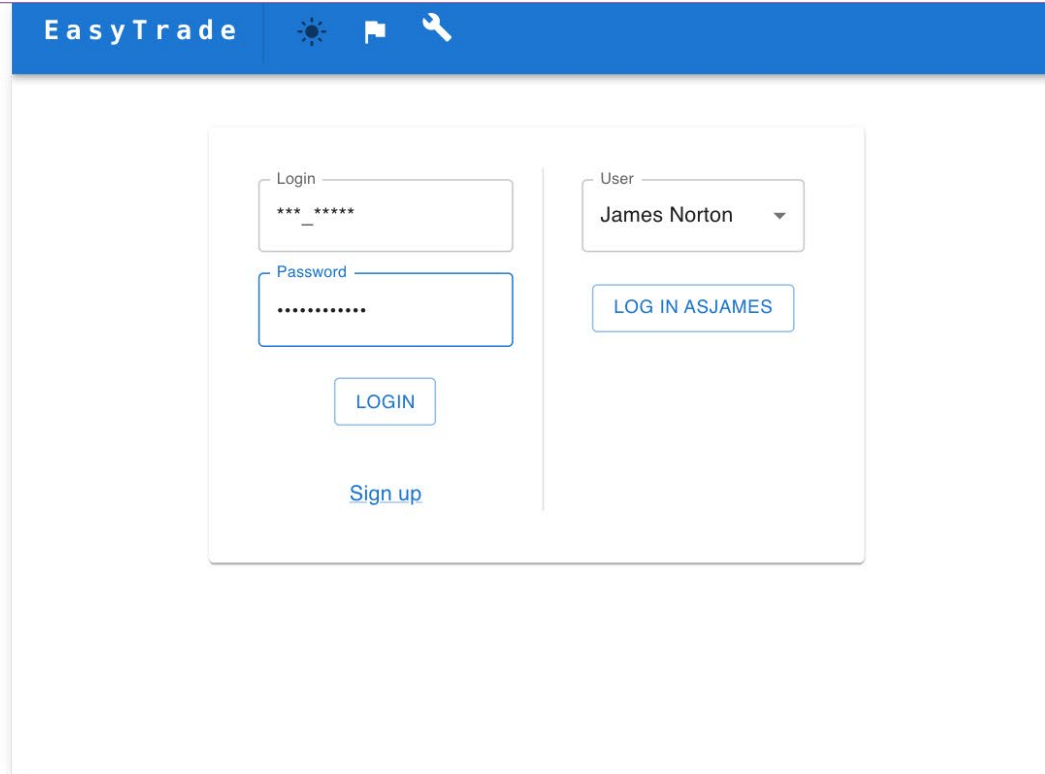
Search results | Execution time: 1 s | Scanned data: 28.8 GB | Visualization type: [Table](#) [Single value](#) [Bar](#)

[Open with...](#) [Actions](#)

timestamp	status	content	process.technology
2023-11-20 08:34:27.771	ERROR	[20/11/23 07:34:27 Error] Exception not handled: (System.Collections.Generic.KeyNotFoundException: The given key '3' was not present in the dictionary.) ExceptionHandling.BrokerExceptionHandler	[".NET","CLR","Docker"]
2023-11-20 08:34:27.697	INFO	[20/11/23 07:34:27 Information] Fetching latest prices Entities.Prices.ServiceConnector.PriceServiceConnector	[".NET","CLR","Docker"]
2023-11-20 08:34:27.690	INFO	[20/11/23 07:34:27 Information] Get instruments with account ID [10] Entities.Instruments.Service.InstrumentService	[".NET","CLR","Docker"]
2023-11-20 08:34:27.000	NONE	172.31.23.183 - [20/Nov/2023:07:34:27 +0000] "GET /broker-service/v1/instrument?accountId=10 HTTP/1.1" 500 4284 "http://frontendreverseproxy-easytrade/login" "Opera/9.26.(Windows NT 10.0; ht-HT) Presto/2.9.182 Version/10.00"	["C-Library","Docker","Nginx"]
2023-11-20 08:34:27.000	INFO	time="2023-11-20T07:34:27Z" level=info msg="Getting current prices" dt.span_id=283aff0cb9d76ecc dt.trace_id=846f75fdb46c3f80f62ca4995480a528 dt.trace_sampled=true	["Docker","Go"]
2023-11-20 08:34:27.000	INFO	time="2023-11-20T07:34:27Z" level=info msg="Data pushed to RabbitMQ queue." dt.span_id=283aff0cb9d76ecc dt.trace_id=846f75fdb46c3f80f62ca4995480a528 dt.trace_sampled=true	["Docker","Go"]
2023-11-20 08:34:27.000	INFO	time="2023-11-20T07:34:27Z" level=info msg="Request finished" dt.span_id=283aff0cb9d76ecc dt.trace_id=846f75fdb46c3f80f62ca4995480a528 dt.trace_sampled=true ip=172.31.9.116 latency=63.103314ms request="GET /v1/prices/latest" status=200	["Docker","Go"]

No more records to display.

Session started by 648628500625ZW3ZYHQTW59AU169DTOXA59WSLQVYB01 on Nov 20, 2023 - 08:34.
This session consumed 1 user session of your [licensed quota](#).



Events and actions

Time	Replay	Type	Events and Actions	Duration	Conversion	Errors and annoyances	Apdex rating	Details
08:34:23		Load	loading of page /login	724 ms	-	-	Satisfying	
08:34:23		Page change	/	-	-	-	-	
08:34:23		Page change	/login	-	-	-	-	
08:34:27		Xhr	/loginservice/api/login	223 ms	-	1	Frustrating	

Business impact analysis

Davis observed the following number of service calls and affected real users during the first 30 minutes of the problem timeframe.

202 observed users
 9.37k affected service calls
 107 affected sessions
[Replay sessions](#)
[Show more](#)

2 impacted services

1.77k+ Requests per minute impacted

feds frontend
Web request service

- Kubernetes cluster: gke
- Kubernetes namespace: hipster-feds
- Kubernetes service: frontend
- Kubernetes workload: frontend

Response time degradation
The current response time (~1.13 s) exceeds the auto-detected baseline (~25.98 ms) by 4255.62 %. All dynamic requests are slow.

Affected requests	Service method
1.77k+ /min	12 Service methods

RecommendationService
RPC service

- Kubernetes cluster: gke
- Kubernetes namespace: hipster-feds
- Kubernetes service: recommendationsservice
- Kubernetes workload: recommendationsservice

Response time degradation
The current response time (203.91 ms) exceeds the auto-detected baseline (~1.14 ms) by 17718.07 %. Service RecommendationService has a slowdown.

Affected requests	Service method
1.16k+ /min	2 Service methods

Root cause

Based on our dependency analysis all incidents have the same root cause

RecommendationService
RPC service

- Kubernetes cluster: gke
- Kubernetes namespace: hipster-feds
- Kubernetes service: recommendationsservice
- Kubernetes workload: recommendationsservice

Workload spec change event
Field 'replicas' in 'spec' changed from '4' to '1'.

change_details

- Kubernetes workload: recommendationsservice
- Kubernetes namespace: hipster-feds
- Kubernetes cluster: gke
- dt.kubernetes.event.involved_object.kind: Deployment
- dt.kubernetes.event.involved_object.name: recommendationsservice

Events on:
Kubernetes workload recommendationsservice

Metric anomalies detected

Review the metrics which show abnormal or outlying behavior.

Containers: CPU throttling, mCores
+ 241 mCores

Kubernetes: Pod count (by workload)
- 3

Kubernetes: Workload - desired pod count
- 3

[Analyze metric anomalies](#)



Memory requests efficiency – hipstershop

Compares the actual usage of memory to the requested memor...

47.372 %



-50.364 %

65 %

75 %

0 / 0

-1w



View

Graph

Table

Metric selector `builtin:kubernetes.workload.memory_working_set:splitBy("dt.entity.cloud_application_namespace")/builtin:kubernetes.workload.requests_memory:splitBy("dt.entity.cloud_application_namespace")*(100)`

Entity selector `type("CLOUD_APPLICATION_NAMESPACE"), entityID("CLOUD_APPLICATION_NAMESPACE-5892B4FA36559165")`

Error budget burn rate 1.378 [More...](#)

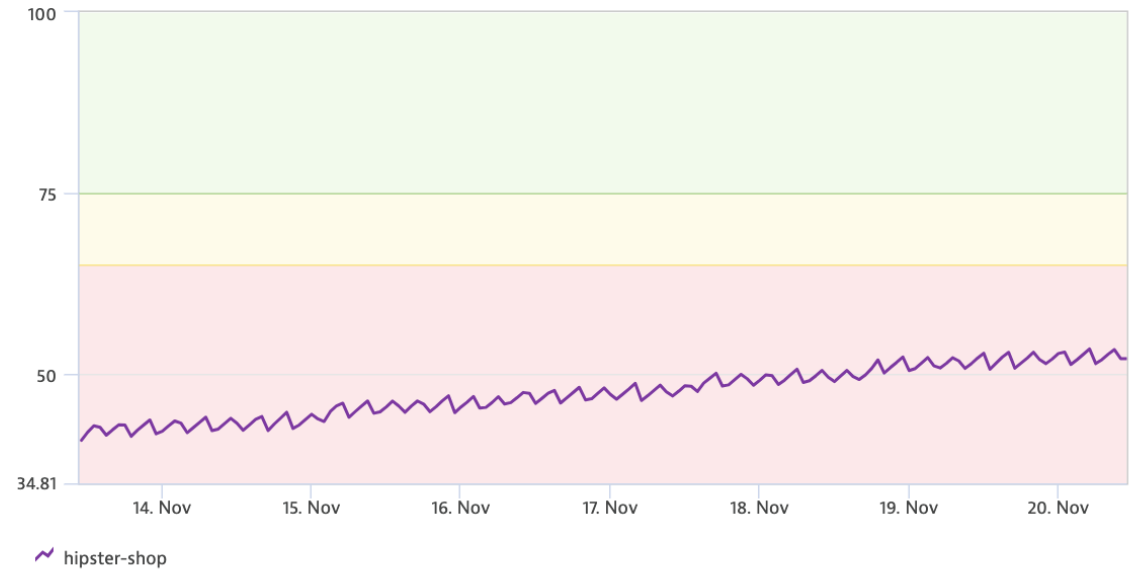
Generated metric keys ⓘ

Status `func:slo.memory_request_efficiency__hipstershop`

Error budget `func:slo.errorBudget.memory_request_efficiency__hipstershop`

Normalized error budget `func:slo.normalizedErrorBudget.memory_request_efficiency__hipstershop`

Error budget burn rate `func:slo.errorBudgetBurnRate.memory_request_efficiency__hipstershop`



CASO 3

Well Architected Framework

CLOUD WELL ARCHITECTED FRAMEWORK

Pillars



Reliability

Ensures that the workload meets the uptime and recovery targets by building redundancy and resiliency at scale.



Security

Protect the workload from attacks by maintaining confidentiality and data integrity.



Cost Optimization

Adopt an optimization mindset by at organizational, architectural, and tactical levels to keep your spending within budget.



Operational Excellence

Reduce issues in production by building holistic observability and automated systems.



Performance Efficiency

Adjust to changes in demands placed on the workload by through horizontal scaling and testing changes before deploying to production.

Six Pillars - Performance Efficiency - simplenodeservice

Automate Validate

Configure objective

Guardian settings Delete

Last run on 11/20/2023, 6:57:03 AM Pass

Description

Performance Guardian - Validate an application performance under high load

Tags

usecase:sixpillars

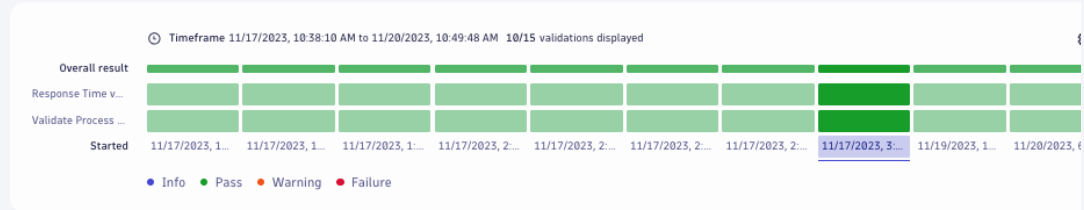
Validation history

Select a validation event to see its details.

Select timeframe

2023-11-17 10:38 to now

Heatmap Timeline



Validation result

Here's the summary of this validation.

Result Context Variables

Started 11/17/2023, 3:46:19 PM

Values from Thu 11:11 AM to Thu 11:18 AM

2 objectives validated

2 Passes

Pass
All objectives were reached

Validated objectives

Here are the details about each objective.

Search State Sort by
Search by name All Failure first

Response Time validation

Result **0**

Fails if result >0.5
Warns if result >0.4

Pass
Target hit

Validate Process CPU Usage

Result **0.2**

Fails if result >10
Warns if result >5

Pass
Target hit

Objective name*

Response Time validation

Description

Validate if response time is increasing under high load utilizing OpenTelemetry Spans

Fetch your data from*

Grail using DQL

SLO

Input a query that results in a single value. If your query shows an error, fine-tune it and [Leverage Notebooks](#) for further data analysis.

DQL query*

```

1  fetch spans
2  | fields dt.entity.process_group_instance,endpoint.name,duration,http.response.status_code
3  | filter isNotNull(dt.entity.process_group_instance)
4  | filter http.response.status_code == 200
5  | filter endpoint.name == "/api/invoke"
6  | lookup
7  [ fetch dt.entity.process_group_instance
8    | fields id,metadata,tags,lifetime
9    | filter(matchesPhrase(metadata,"DT_RELEASE_STAGE=staging"))
10   | filter(matchesPhrase(metadata,"DT_RELEASE_PRODUCT=simplenodeservice"))
11   | filter(matchesPhrase(tags,"DT_RELEASE_VERSION:$version"))
12   | sort lifetime desc
13   | summarize count(),by:{id}
14 ],sourceField:dt.entity.process_group_instance,lookupField:id
15 | filter dt.entity.process_group_instance == lookup.id
16 | summarize median(toDouble(toString(duration)))
17

```

Run query

[Learn more about Dynatrace Query Language](#)

Preview your query

Run your query and set warning and failure thresholds (optional). The query result previews how your objective will be classified.

I want to add thresholds

Define thresholds for your objective

Higher than these numbers is good

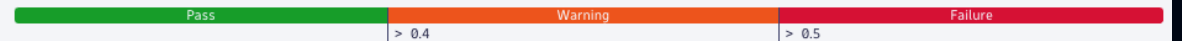
Lower than these numbers is good

Failure

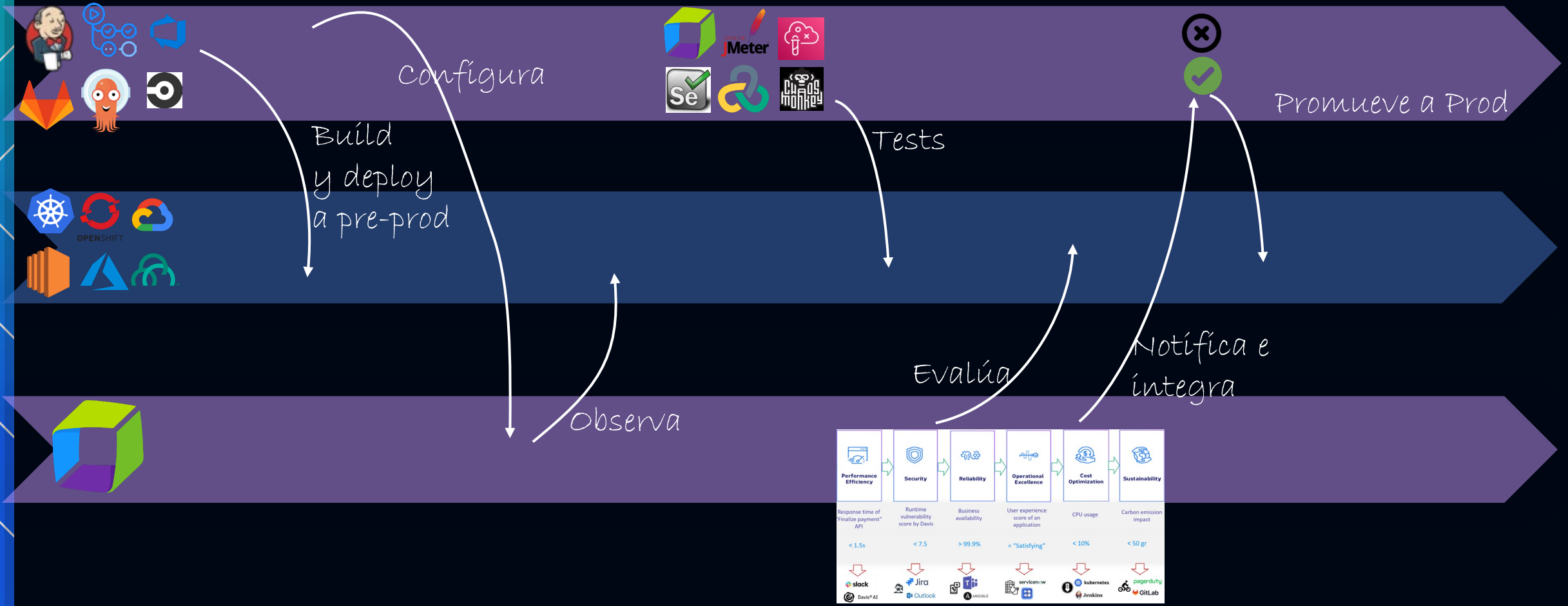
0.5

Warning

0.4

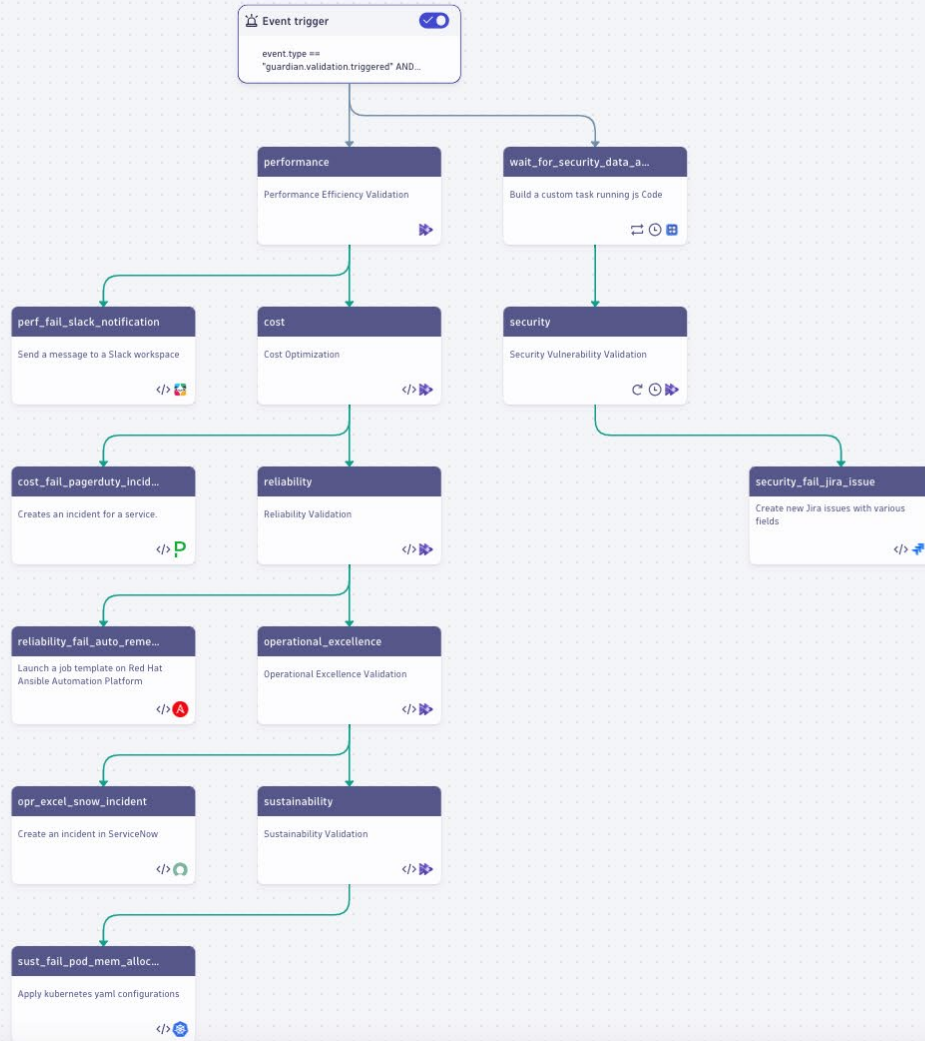


VALIDACIÓN DE RELEASES AUTOMÁTICA CON DYNATRACE (CI/CD)



Demo AWS Six Pillars SRG Evaluation - simplenodeservice

Save Run Executions



Event trigger

Run workflow based on a custom event filter.

Change trigger

Event type

bizevents

Filter query

```
1 event.type == "guardian.validation.triggered"
2 AND tag.service=="simplenodeservice" AND tag.stage=="staging"
```

The workflow is triggered when an event matching the criteria above is ingested. The filter supports a subset of the DQL filter syntax, including ==, and, or, and grouping with brackets (). For more options, see the [documentation](#).

Query past events



CLOUD DONE RIGHT



IMMERSE

📍 MADRID

📅 21.11.23