

Monitoring Serverless Applications



DATADOG

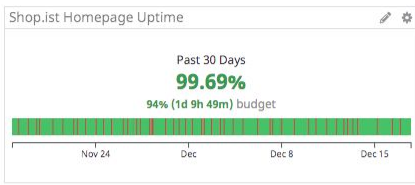


Rachel White
Technical Evangelist

@ohhoe



Service Level Agreements

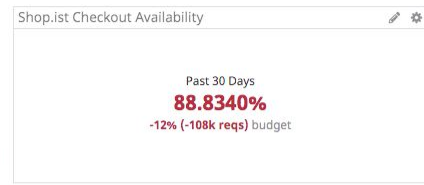
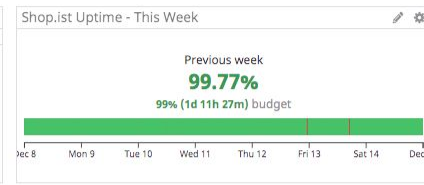


Shop.ist Checkout Latency

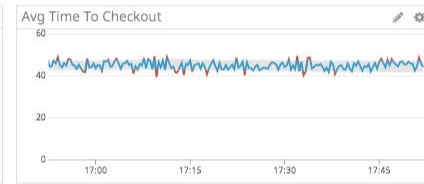
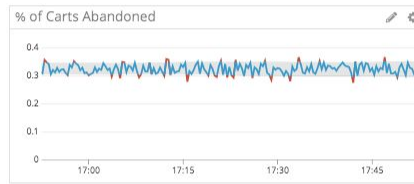
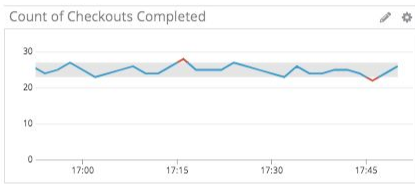
Worst 4 groups sorted by 7d status

Past 7 Days

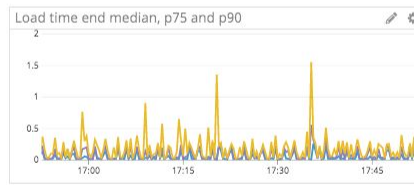
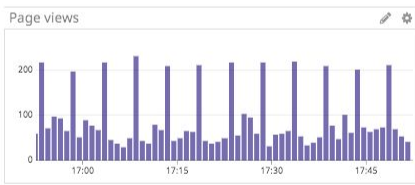
aws:ap-northeast-1	99.99%
aws:eu-west-2	100.00%



Business KPIs



RUM - Frontend Metrics



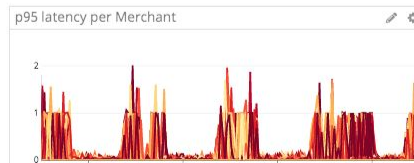
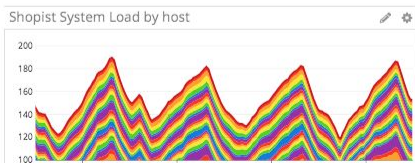
Top URLs

@VIEW.URL_DETAILS.PA	COUNT	MEDIAN:LOAD EVENT
/	1.18K	11.09s
/cart	855	1129.27ms
/department/sofas	747	1246.72ms
/department/sofas/produ	744	1074.26ms
/checkout	542	N/A

Top countries

@NETWORK.CLIENT.GEC	COUNT	MEDIAN:LOAD EVENT
United States	1.49K	922.88ms
United Kingdom	622	865.86ms
Singapore	609	1512.3ms
Ireland	586	1027.09ms
South Korea	500	1494.6ms

Performance



Avg of @duration by @merchant.store_name over "env..."

1.58	Knight-Bryant
1.06	Moore-Bernard
1.00	Washington and Sons
1.00	Lawrence PLC
0.91	Brown, Moreno and Gould
0.70	Hawkins PLC
0.57	Miller, Henderson and Johnson
0.53	Shaffer PLC
0.50	Calderon-Montgomery
0.43	Dudley-Gray
0.34	Dovey P.C.



What is Serverless?

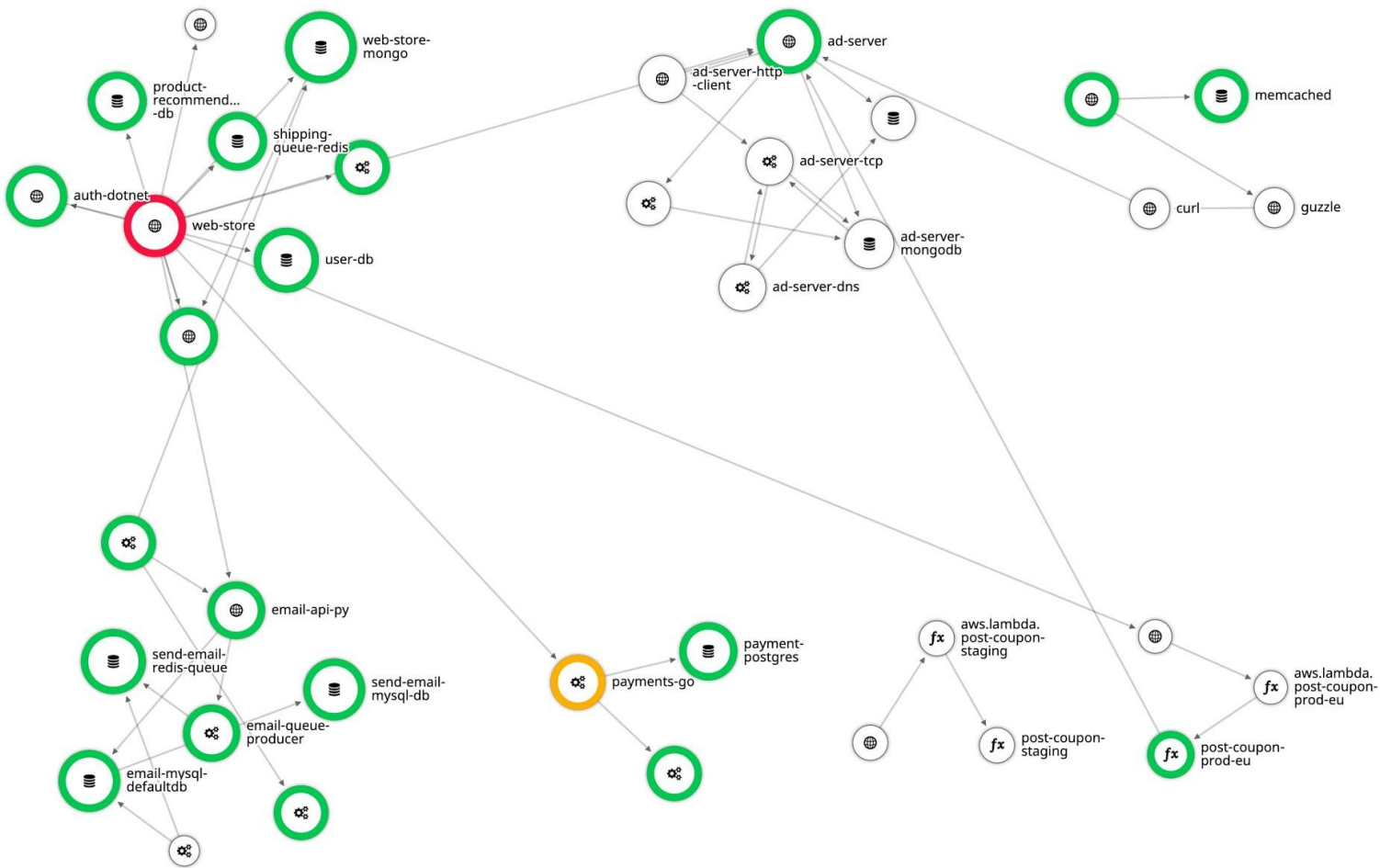


DATADOG

**How do you debug a
server that doesn't exist?**

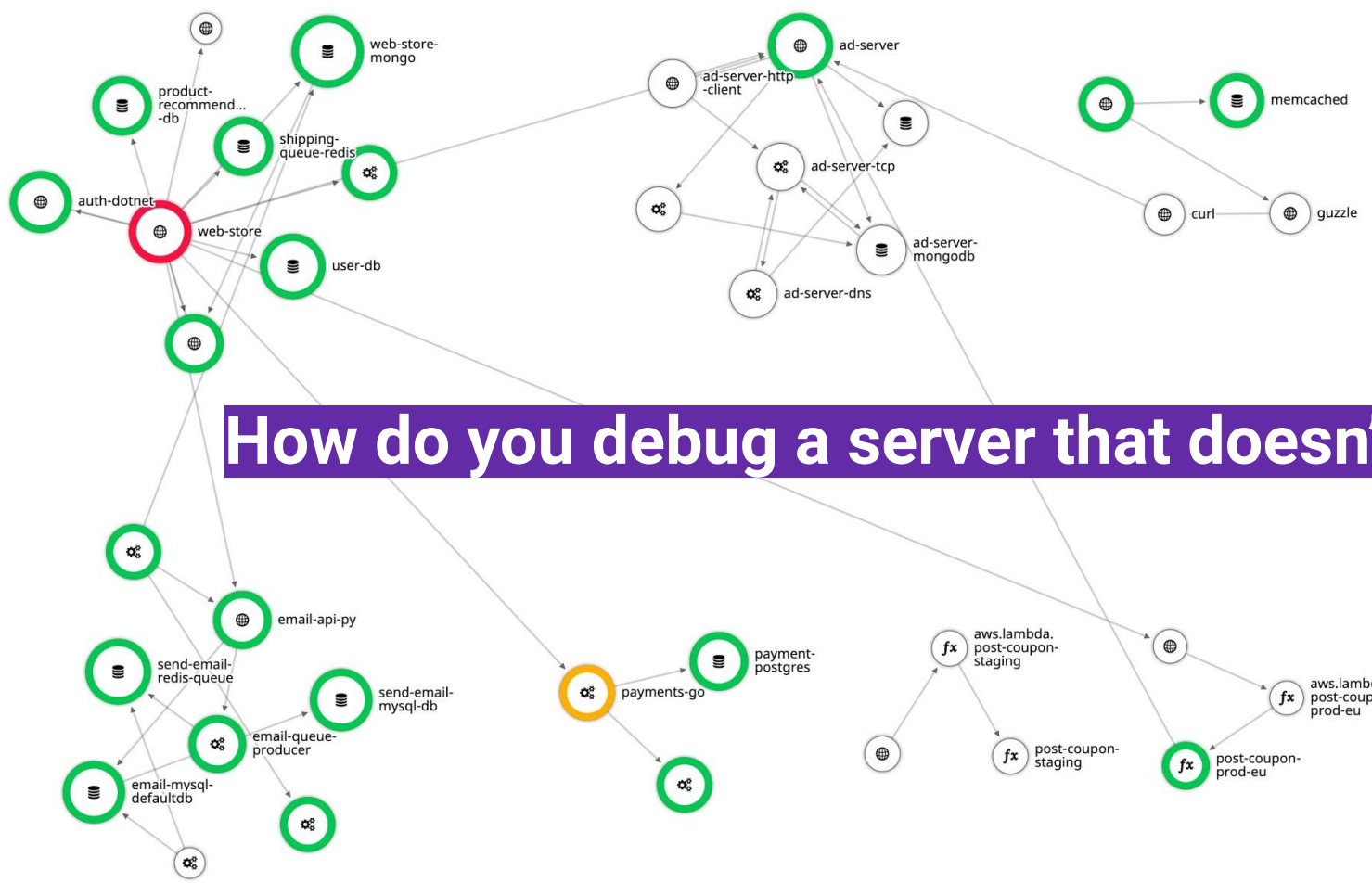


DATADOG



Node Size | Re

Min 0 M



How do you debug a server that doesn't exist... in this?

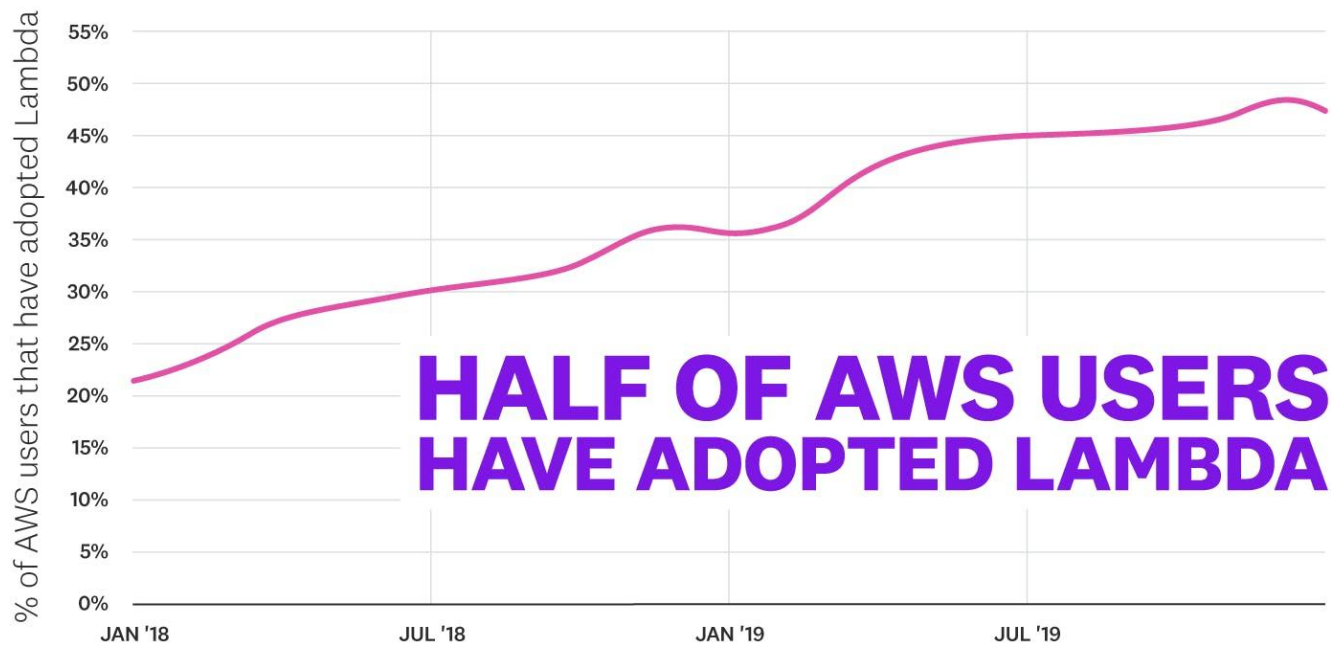
Serverless Platform Specific Constraints

- Allocated Memory Usage
- Cold Starts
- API Gateways as Intermediaries
- Commonly called via queues

The background is a vibrant blue with a grid pattern. It features several circular openings, some of which are filled with a purple sphere. Numerous red ants are shown in various positions: some are marching in lines across the surface, some are entering or exiting the circular openings, and some are carrying green leaves. The overall scene is a metaphor for a distributed, decentralized system like serverless architecture.

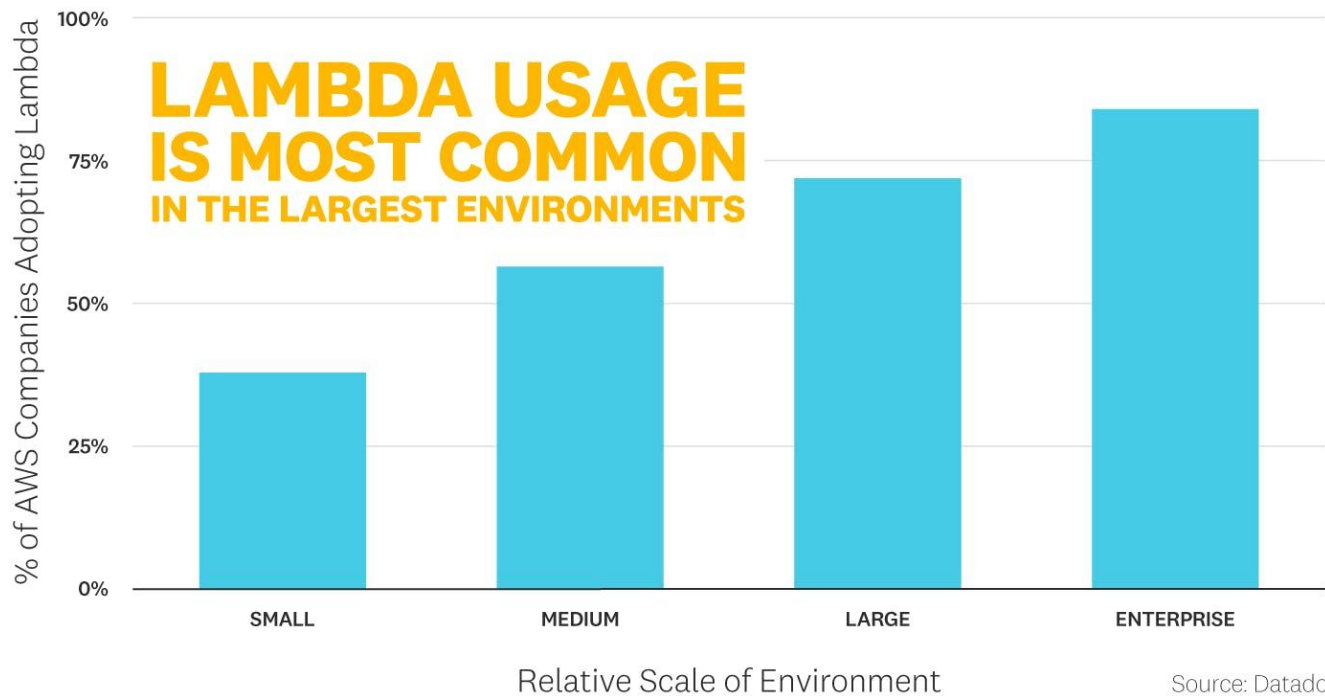
THE STATE
OF
SERVERLESS

Lambda Adoption Among AWS Users



Source: Datadog

Lambda Usage by Environment Size



Source: Datadog

Simple Configuration for Serverless Full Visibility

1. Enable Integration
2. Instrument Your Language



\$aws_account * \$region * \$function *



This dashboard is powered by real-time [enhanced AWS Lambda metrics](#). You need to set up these enhanced metrics before data will appear here.

To dig deeper into your user-facing AWS Lambda execution time, enable percentiles on the `aws.lambda.enhanced.duration` metric. Browse to [Metrics > Distribution Metrics](#) and click [Calculate Percentiles](#).

See [AWS Lambda integration documentation](#).

Invocations	Errors	Cold Starts	Estimated Monthly Cost <small>1mo</small>
29K	1K	637	161.22\$

Invocations

Top invoked functions

9.46K	post-coupon-us-ake-prod
8.62K	post-coupon-prod-us
5.02K	ddbfunction101
1.43K	lambda-laver-steo-functions-dev-step-four
478.00	lambda-laver-steo-functions-dev-step-five
477.00	lambda-laver-steo-functions-dev-step-two
477.00	lambda-laver-steo-functions-dev-step-one
477.00	lambda-laver-steo-functions-dev-step-three
463.00	swf-hello-test
240.00	tian-test-df-tracer
240.00	hello-doo-dev-hello36

Cold Starts & Provisioned Concurrency

Top cold-starting functions

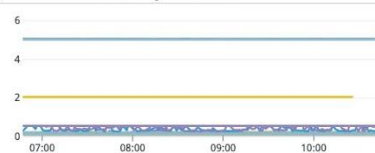
144.00	lambda-oo-test-dev-oo-timeout
144.00	lambda-oo-test-dev-oo-outofmemorv
67.00	lambda-oo-test-dev-oo-raiseserror
66.00	lambda-oo-test-dev-oo-outofmemorv
64.00	lambda-oo-test-dev-oo-timeout
56.00	post-coupon-us-ake-prod
46.00	post-coupon-prod-us
6.00	swf-hello-test
6.00	ddbfunction101
3.00	lambda-oo-test-dev-oo-normalloos
3.00	lambda-laver-steo-functions-dev-step-two
3.00	lambda-laver-steo-functions-dev-step-three

Execution Time

Slowest functions

30.02	lambda-oo-test-dev-node-timeout
30.02	lambda-oo-test-dev-oo-timeout
30.02	lambda-oo-test-dev-oo-timeout-12
30.02	lambda-oo-test-dev-oo-timeout
30.02	lambda-oo-test-dev-rubv-timeout
21.95	lambda-oo-test-dev-node-outofmem-12
18.93	lambda-oo-test-dev-node-outofmem
5.01	xrsv-steo-functions-dev-acuoci-xrsv-steo-one
5.01	oen-ad-preferences-dev-ad-server-model-create-dat...
5.01	xrsv-steo-functions-dev-acuoci-xrsv-steo-five
5.01	xrsv-steo-functions-dev-acuoci-xrsv-steo-two
5.01	xrsv-steo-functions-dev-acuoci-xrsv-steo-three

p95 execution time by function



Errors

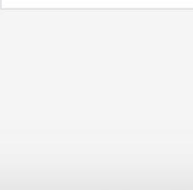
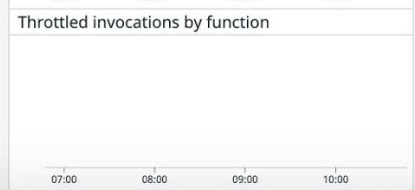
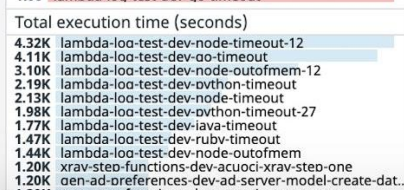
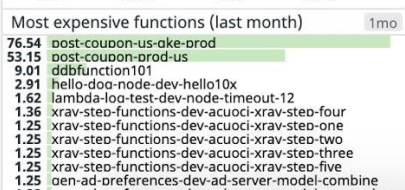
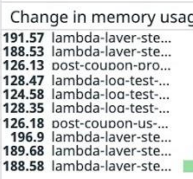
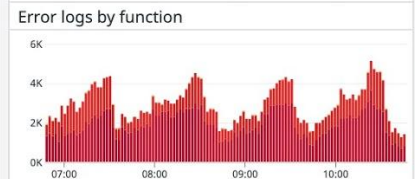
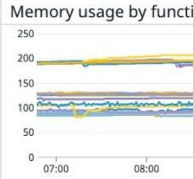
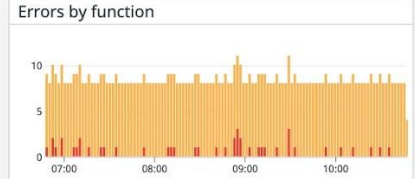
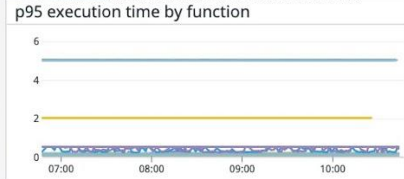
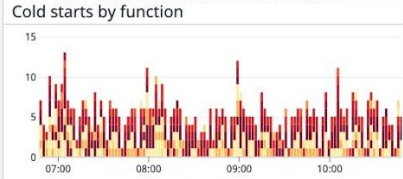
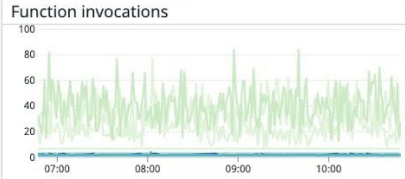
Functions with most errors

956.00	lambda-layer-step-functions...
44.00	swf-hello-test

Memory Usage

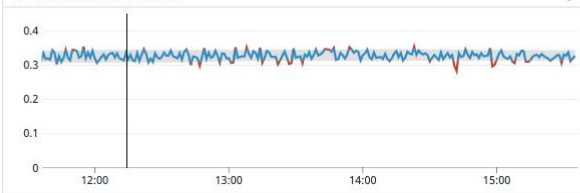
Functions using most memory

196.90	lambda-laver-steo-fu...
191.61	lambda-laver-steo-fu...
189.72	lambda-laver-steo-fu...
188.60	lambda-laver-steo-fu...
188.53	lambda-laver-steo-fu...
128.49	lambda-oo-test-dev-...
128.35	lambda-oo-test-dev-...
126.17	post-coupon-us-ake-...
126.14	post-coupon-prod-us...
124.58	lambda-oo-test-dev-...
123.75	lambda-oo-test-dev-...

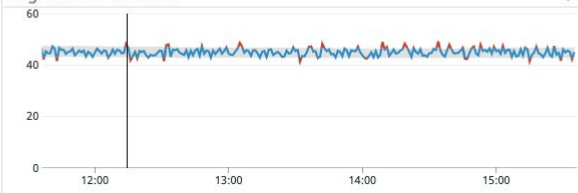


Business KPIs

% of Carts Abandoned

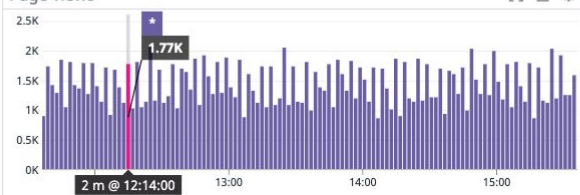


Avg Time To Checkout



RUM - Frontend Metrics

Page views



Load time end median, p75 and p90



Top URLs

VIEW PATH GROUP	↓ COUNT	MEDIAN:LOAD EVENT
/	35.73K	9.51s
/cart	19.36K	1814.07ms
/department/chairs	19.35K	1952.54ms
/department/chairs/product/?	18.97K	1934.57ms
/department/sofas	17.64K	1804.51ms

Service Level Agreements

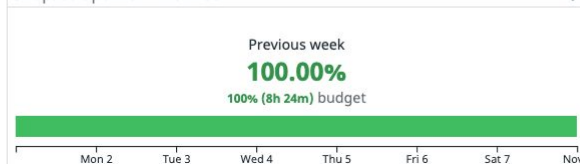
Shop.ist Homepage Uptime



Shop.ist Response Time



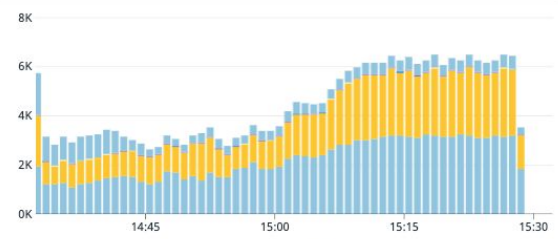
Shop.ist Uptime - This Week



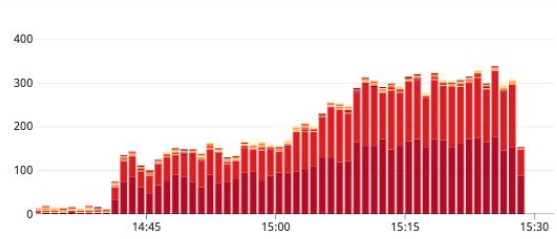


Search serverless functions

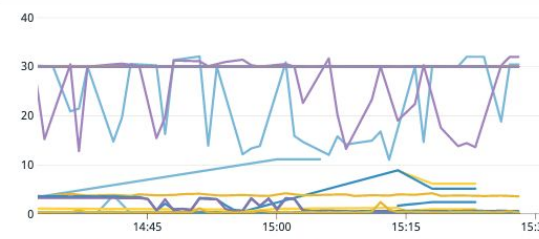
Invocations



Errors



Duration (P95)



Filter Facets

Hide Controls Showing 1-50 of 58 serverless functions

43% Enhanced Metrics 28% Traces 78% Logs

CORE

Function Name

Filter 58 values

- datadog-forwarder-pro... 1
- dd-lti-v2-dev-adduser 1
- dd-lti-v2-dev-checkfork... 1
- dd-lti-v2-dev-checklti 1
- dd-lti-v2-dev-createnew... 1
- dd-lti-v2-dev-createnew... 1
- dd-lti-v2-dev-createnew... 1
- dd-lti-v2-dev-displaykat... 1

Account ID

- 172597598159 58

Region

- us-east-1 41
- us-west-1 16
- us-west-2 1

FUNCTION NAME	↓ INVOCATIONS	DURATION (A...	ERRORS	THROTTLES	EST COST	MEMORY USED	LAST START	% MEMORY U...
post-coupon-us-gke-prod	126k	849 ms	5.51k	229	\$0.40	139 MB	< 1 min ago	72
post-coupon-prod-us	97.0k	962 ms	4.30k	189	\$0.26	123 MB	< 1 min ago	96
datadog-forwarder-prod-org-11287	29.4k	128 ms	0	0	—	—	—	—
dsgdatadogforwarder3	1.46k	337 ms	0	0	—	—	—	—
requestunicorn	226	352 ms	113	2	\$0.00	101 MB	< 1 min ago	79
lambda-layer-step-functions-dev-step-four	169	5.0 ms	112	0	\$0.00	123 MB	< 1 min ago	12
lambda-layer-step-functions-dev-step-one	57	8.0 ms	0	0	\$0.00	121 MB	135 s	12
lambda-layer-step-functions-dev-step-two	57	4.0 ms	0	0	\$0.00	123 MB	< 1 min ago	12
lambda-layer-step-functions-dev-step-three	57	4.0 ms	0	0	\$0.00	123 MB	< 1 min ago	12
lambda-layer-step-functions-dev-step-five	56	4.0 ms	0	0	\$0.00	122 MB	135 s	12
lambda-log-test-dev-ruby-raiseserror	35	6.0 ms	35	0	\$0.00	43 MB	135 s	33
lambda-log-test-dev-python-outofmem	35	1.0 ms	35	0	\$0.00	43 MB	135 s	34
lambda-log-test-dev-java-raiseserror	34	218 ms	34	0	\$0.00	90 MB	< 1 min ago	71
lambda-log-test-dev-node-throwerror-12	34	2.0 ms	34	0	—	—	—	—
lambda-log-test-dev-python-raiseserror	34	1.0 ms	34	0	\$0.00	43 MB	135 s	34



> Properties

Activity in the past week

All Updates

8

Code Updates

Deployments **8** Versions **1** Aliases **0**

Config Updates

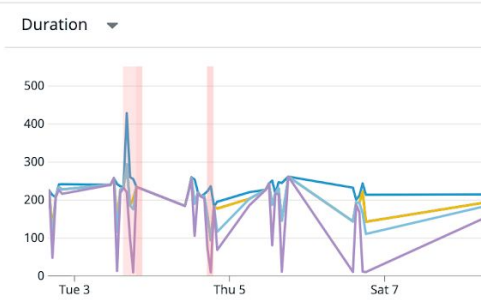
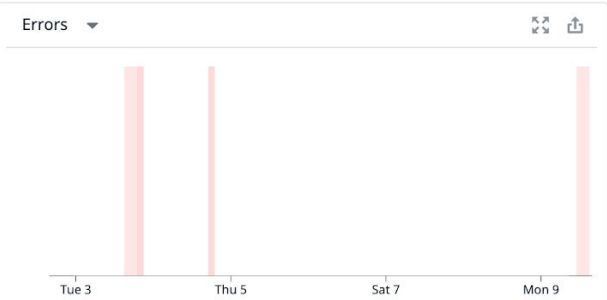
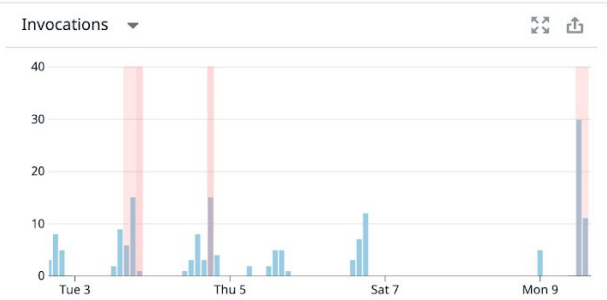
0

Duration Since Last Update

+6ms

Errors Since Last Update

+0%



Deployment Events

[Open in Event Stream](#) [All Events](#) [Deployments](#)

EVENT TIME	EVENT NAME	MESSAGE	USER
Nov 9, 1:32 pm	Delete Function	Delete Function on dd-lti-v2-dev-checkforknownuser	serverlessrepo-lambda-janitor-Clean-1DUCMVP0ISB9
Nov 9, 12:55 pm	Update Function Code	Update Function Code on dd-lti-v2-dev-checkforknownuser	matt.williams
Nov 4, 5:32 pm	Delete Function	Delete Function on dd-lti-v2-dev-checkforknownuser	serverlessrepo-lambda-janitor-Clean-1DUCMVP0ISB9
Nov 4, 5:30 pm	Update Function Code	Update Function Code on dd-lti-v2-dev-checkforknownuser	matt.williams
Nov 3, 7:32 pm	Delete Function	Delete Function on dd-lti-v2-dev-checkforknownuser	serverlessrepo-lambda-janitor-Clean-1DUCMVP0ISB9
Nov 3, 7:26 pm	Update Function Code	Update Function Code on dd-lti-v2-dev-checkforknownuser	matt.williams



Watchdog

Events

Dashboards

Infrastructure

Monitors

Metrics

Integrations

APM

Notebooks

Logs

Security

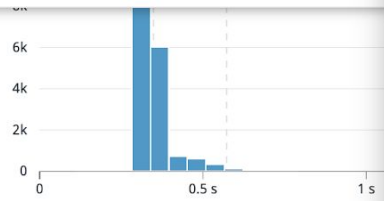
UX Monitoring

Help

Team

Services Traces App Ana

fx aws.lambda aws.lambda



Filtered on:

env:shop.ist service:aws.lambda operation_n



Search facets

CORE

Duration

Min 100ms Max 5.7s



Status

Error 93
 Ok 2.10k

Error Type

No matching values found

Status Code

TRACE ORIGIN

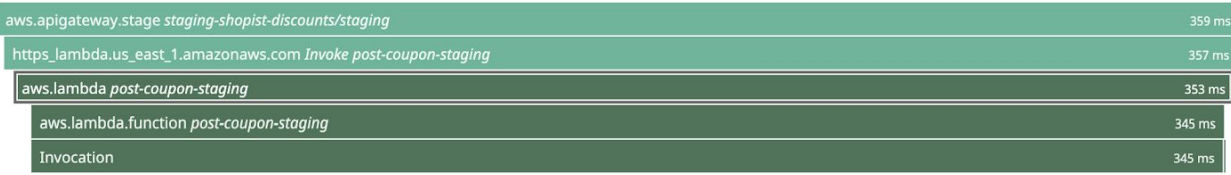
CONTAINERS

Task ID

fx aws.apigateway.stage

Oct 09 15:08:00.753 | 359 ms | POST | https://r4fms5t1p8.execute-api.us-east-1.amazonaws... 200 OK

Flame Graph Span List (6)



fx aws.lambda

Tags Metrics Logs (4)

```
{
  duration: 353000192
  env: shop.ist
  http: {
    content_length: 0
    status_code: 200
  }
  request_id: dc262c7a-59f3-4f62-a85b-b6ed015a8554
  resource_arn: arn:aws:lambda:us-east-1:172597598159:function:post-coupon-staging
  trace_type: xray
  xray: {
    trace_id: 1-5f80b510-69b3c7fd195dfc5c3cd9b980
  }
}
```

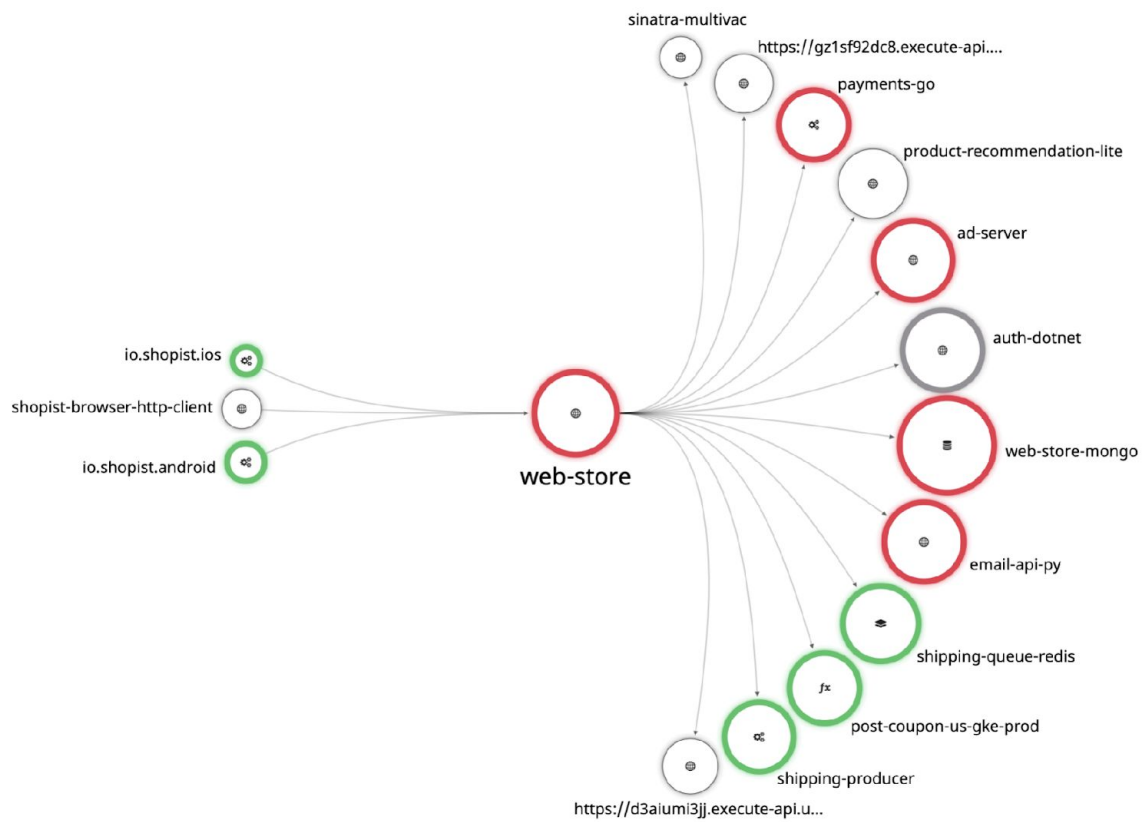
Traces, Logs and Metrics Across Infra Platforms



aws.lambda.post-coupon-prod-eu aws.lambda | post-coupon-prod-eu 164 ms (27.8%)

Span Metadata Logs (3)

```
{
  env      shop.ist
  http {
    content_length 0
    status_code    200
  }
  request_id 411379b7-3008-4852-82f7-7172461dfb41
  resource_arn arn:aws:lambda:us-east-1:172597598159:function:post-coupon-prod-eu
  trace_type  xray
  xray {...}
}
```



Node Size | Requests (req/s)

Min < 0.01 Max 2.25k

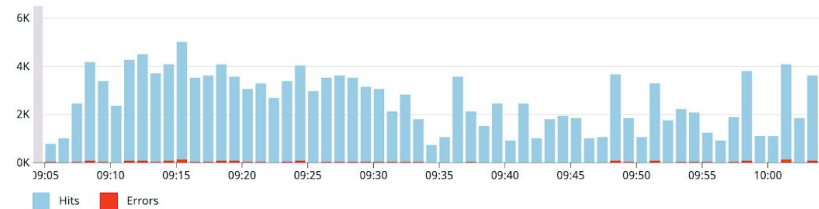


DATADOG

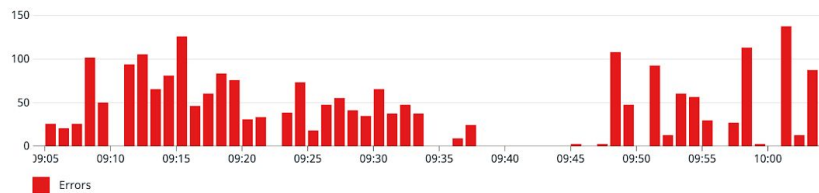
- Watchdog
- Events
- Dashboards
- Infrastructure
- Monitors
- Metrics
- Integrations
- APM
- Notebooks
- Logs
- Security
- UX Monitoring
- Live Support
- Help
- Team

ALERT: 2 Monitors

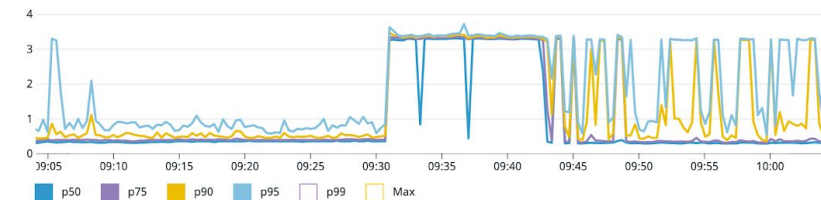
Total Requests 154k total (42.7 req/s)



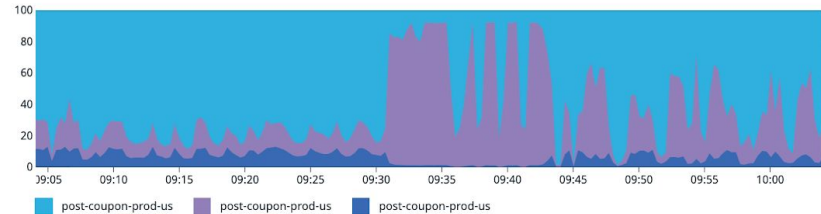
Total Errors 2.35k total (0.7 req/s)



Latency



% of Time Spent by Service



[Add version tagging to compare requests and errors by deployment](#) [View Docs](#)

Latency Distribution



p90 p95 p99 All

Use Datadog to Pivot Between Abstractions

- APM for Service / Application Level Problems
- Serverless Metrics & Dashboards for Platform State
- Service Map for Overall Application Architecture
- Metrics for Overall Business Processes / State
- Enrich with RUM for Visibility into End User Experience



DATADOG

Thank You!