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Best Practices for Productizing APIs

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Measure APIs as Products by Three Key Factors...

Quality

83%

of all web traffic is API traffic

Akamai's "State of the Internet Report"

Security

95%

of cloud security failures [through 2022]]will be the customer's fault

Jay Heiser, VP at Gartner

Reliability

$2.8 Trillion

will be lost to poor quality software

CISQ

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Go Beyond Uptime

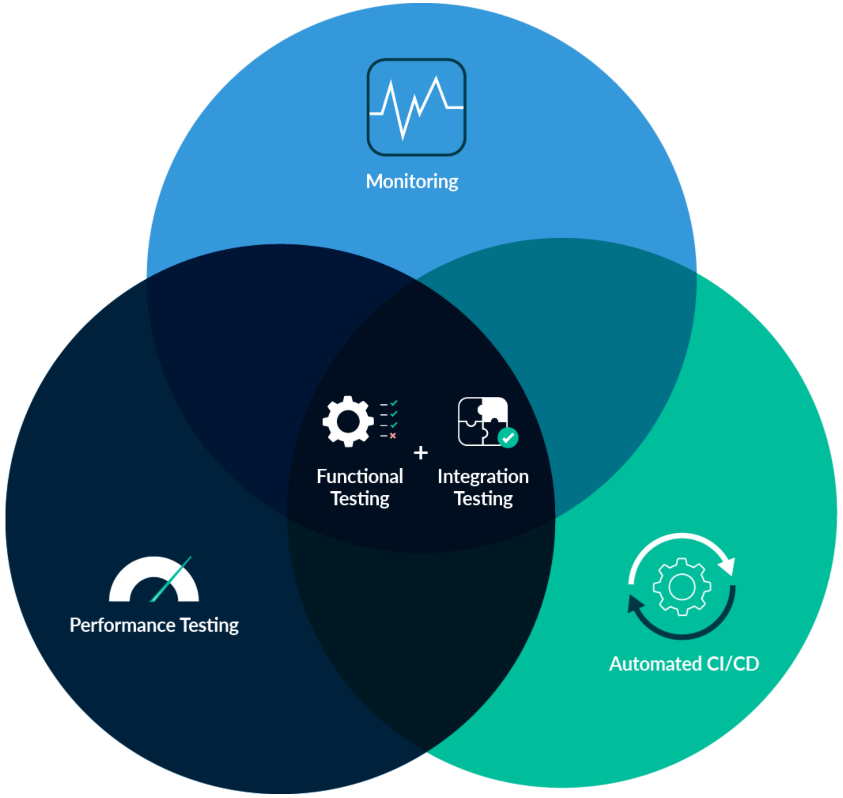
Internal and External SLAs need a better metric:

Functional Uptime

How is that achieved?

At the core of your entire testing and monitoring strategy has to be a collection of intelligent tests that capture real world scenarios.

Functional Testing + Integration Testing



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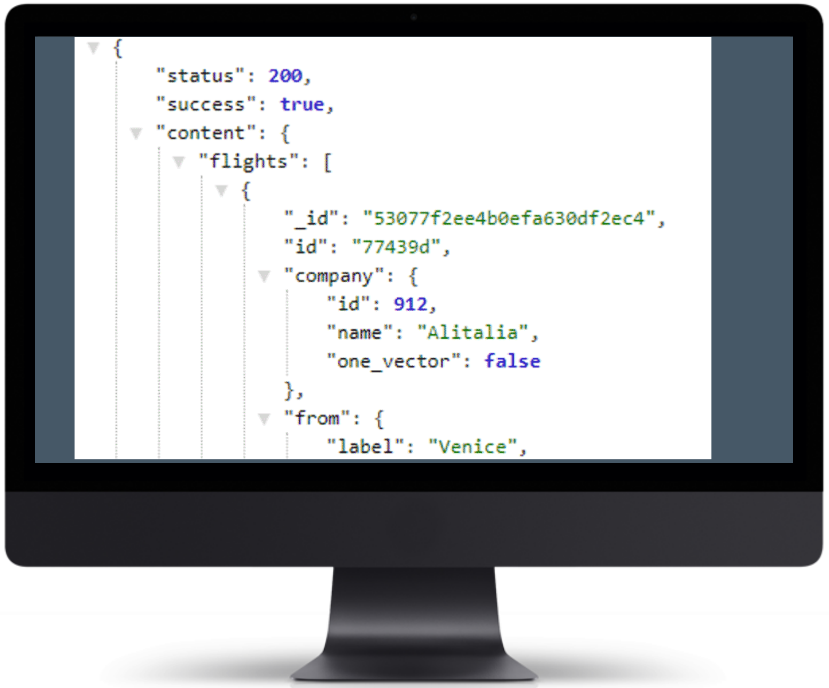
What’s a Good Functional API Test?

Many companies we work with set up tests that simply make a call and look for a Status 200 OK. An API is very verbose and detailed. So a proper monitor should be analyzing the entire payload, every object, and the data associated.



```
{
    "status": 200,
    "success": true,
    "content": {
        "flights": [
            {
                "_id": "53077f2ee4b0efa630df2ec4",
                "id": "77439d",
                "company": {
                    "id": 912,
                    "name": "Alitalia",
                    "one_vector": false
                },
                "from": {
                    "label": "Venice",
```

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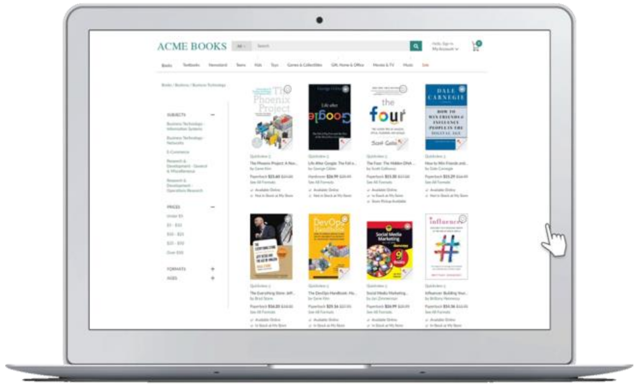
CASE STUDY



BEFORE

A large publisher was monitoring their APIs using single calls and status code checks. Their monitoring data was being fed to a centralized analytics dashboard that reported nothing wrong with API uptime for weeks, but partners were complaining of outages.

ON BOARDING

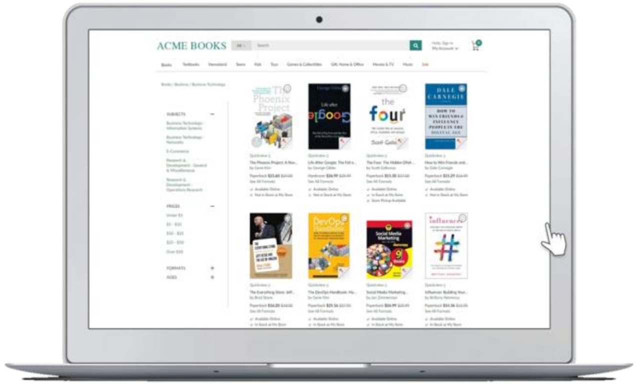
API Fortress changed the publisher's API monitors to data-driven multi-step API tests that reproduced their partners' normal flows.

AFTER

Soon, we realized that every Monday morning for two hours, the publisher's product API was listing hundreds of bad ISBNs. The "false-positive" problem was fixed, but in the postmortem, the publisher did not know which business or technical stakeholder owned the problem.

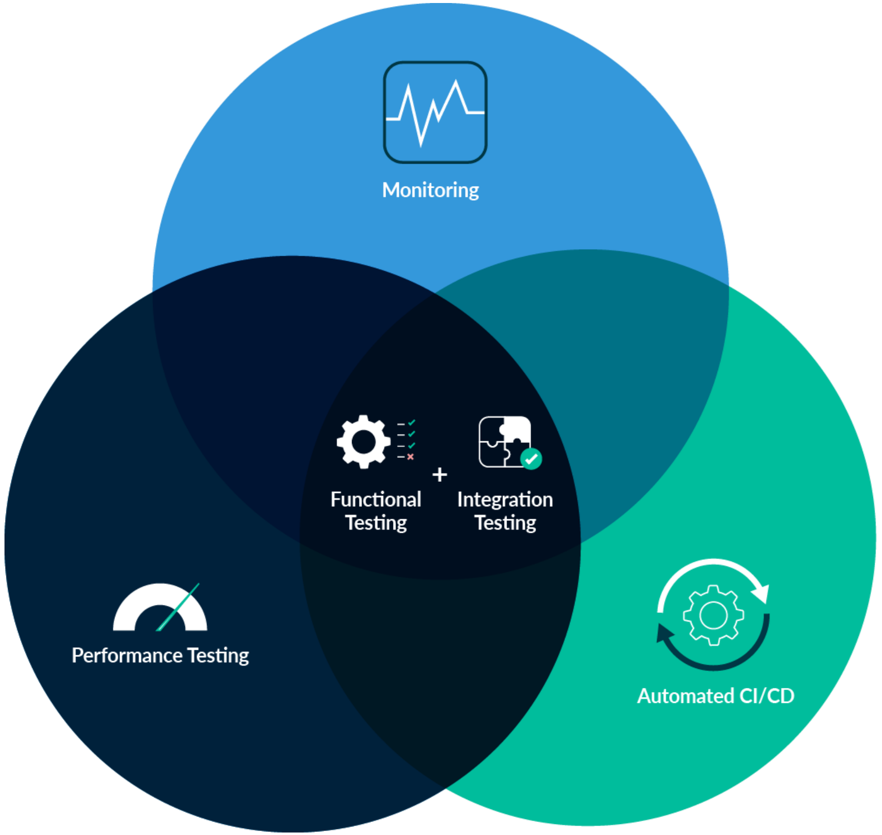
THE CAUSE

The publisher had their API gateway cache their product listing API, but when the database was updated that meant their list was out of date. API tests help capture all sorts of issues that can't be caught any other way, and that can even include API gateway configuration issues.



By leveraging integration (E2E) testing as part of their monitoring strategy, API Fortress caught the huge API error for the publisher quickly.

Functional Testing
+
Integration Testing



How to Build a Good Test

Functional Testing

Step One is to create a good functional test. Imagine you work at an ecommerce company. A typical user journey may start in many places, and one of them is with search. So for a search endpoint you want to call that search API, and then test the entire result.

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http://demoapi.apifortress.com/api/retail/product?q=red

```
[
        {
                quantity: 5,
                color: ["white","red"],
                price: 29.99,
                imageURL: http://apif.com/baseball_cap.jpg,
                name: "Baseball Cap",
                description: "Boston Red Sox Baseball Cap",
                id: 1,
                category: "head",
        },
        {
                quantity: 7,
                color: ["blue","yellow","red"],
                price: 39.99,
                imageURL: http://apif.com/long_sleev_shirt.jpg,
                name: "Long Sleeve Shirt",
                description: "A wonderful long sleeve shirt",
                id: 2,
                category: "body",
        },
        {
                quantity: 50,
                color: ["red","gray"],
                price: 49.99,
                imageURL: http://apif.com/earmuffs.jpg,
                name: "Earmuffs",
                description: "Keep those ears warm in the winter!",
                id: 3,
                category: "ears",
        },
]
```

End to End Testing

In the ecommerce example, you might start with a search for “red,” then you’d use that search **as your data** for the next call, which randomly dives into a handful of products (but we’ll just choose one).

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```
http://demoapi.apifortress.com/api/retail/product?q=red
```

↓

```
http://demoapi.apifortress.com/api/retail/product/3
```

↓

```
[
    {
        quantity: 50,
        color: ["red","gray"],
        price: 49.99,
        imageURL: http://apif.com/earmuffs.jpg,
        name: "Earmuffs",
        description: "Keep those ears warm in the winter!",
        id: 3,
        category: "ears",
    },
]
```

So when we talk about an “integration test,” we’re really talking about a single test that recreates a regular API consumer flow.

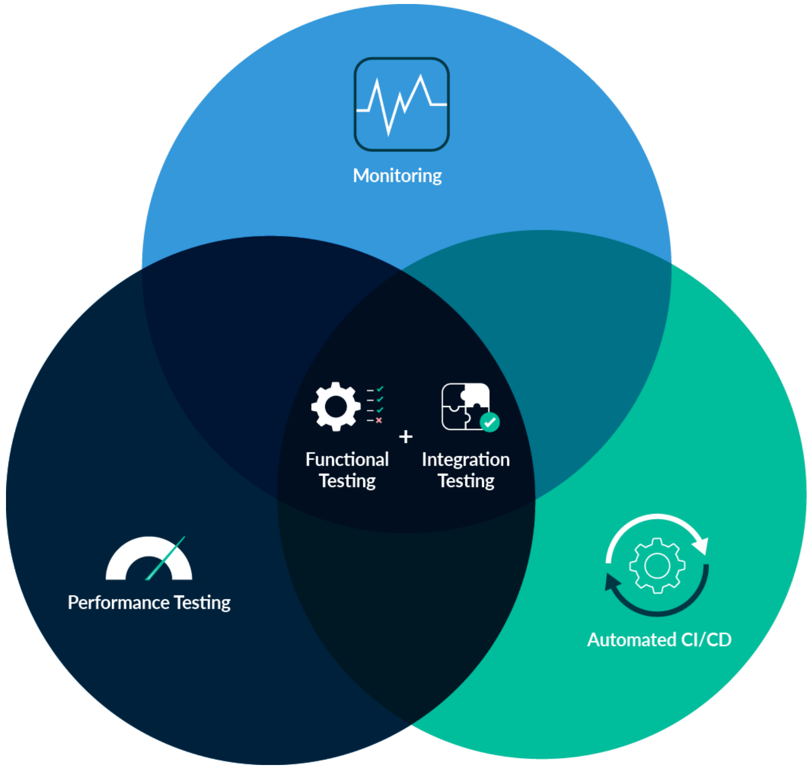
A good functional test requires the full flow in every single test.

In Summary

Testing and monitoring are interconnected: both require the same level of detail. Monitors must also be able to reproduce entire consumer flows for common use cases.

However, many companies cannot achieve these goals as their functional testing teams, load testing teams, and monitoring teams work in silos. While that org style may be okay for websites, APIs are different.

APIs and data are continually changing throughout the lifecycle. The only way to stay on top of APIs is test them as we have explained for Quality, Security, and Reliability… or increase the risk of going (or being) live with bugs and vulnerabilities.



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At http://APIFortress.com/blog, read about three recent API vulnerabilities that went live due to a simple lack of proper testing and monitoring. Failures to take corporate responsibility by the companies and government organizations cited on our blog resulted in huge API breaches that exposed the private data of many individuals and businesses.

API Security

Twitter	India	USPS
17 million accounts	1.1 billion identities	60 million personal account details

One Test Suite to Rule Them All

CONCLUSION

Use your functional and end-to-end tests for *everything,* from automated testing on releases to monitoring and performance testing. The tests and monitors must be combined into one version of API health that drives API quality success across all teams.

Create a good process, standardize it across all teams, and go live faster with greater confidence that your customers and partners will love to use your APIs.

Thanks!

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