



Observe your API with an API Gateway Plugins

By Bobur Umurzokov





About me

Bobur Umurzokov - Developer Advocate

- **LinkedIn:** [Bobur Umurzokov](#)
- **Twitter:** [@BoburUmurzokov](#)
- **Instagram:** [@boburumurzokofficial](#)
- **Website:** [www.iambobur.com](#)



Agenda

- APIs are everywhere – API Observability
- API Gateway – a central point for observation
- About Apache APISIX
- API Observability 3 pillars – logging, tracing, and metrics
- APISIX Plugins for observability
- Demo

A scene from the movie Avatar. Two Na'vi characters are shown in a dark, bioluminescent environment filled with glowing blue and purple bioluminescent plants and floating energy spheres. One character is in the foreground, looking down, while another is in the background. The overall atmosphere is mysterious and futuristic.

APIs

APIs are everywhere



Even ChatGPT uses APIs



Doest ChatGPT use REST API?



ChatGPT can be used through a REST API, which stands for Representational State Transfer API. This type of API allows for communication between different software systems over the internet, typically using the HTTP protocol. In the case of ChatGPT, this would involve sending a text prompt to the API, which would then return a response generated by the model. The API can be accessed by sending a HTTP request and receiving a HTTP response.



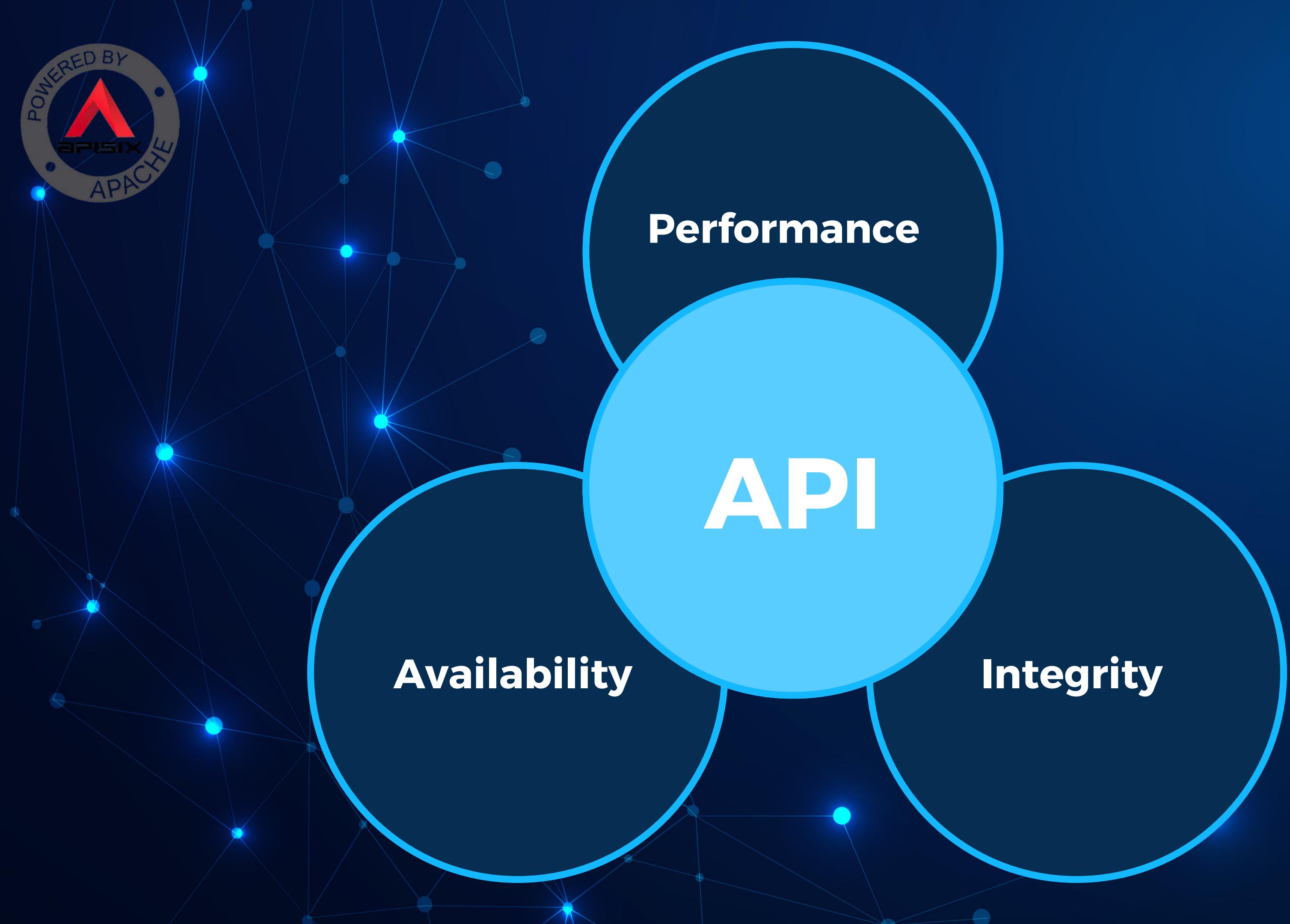


Performance

API

Availability

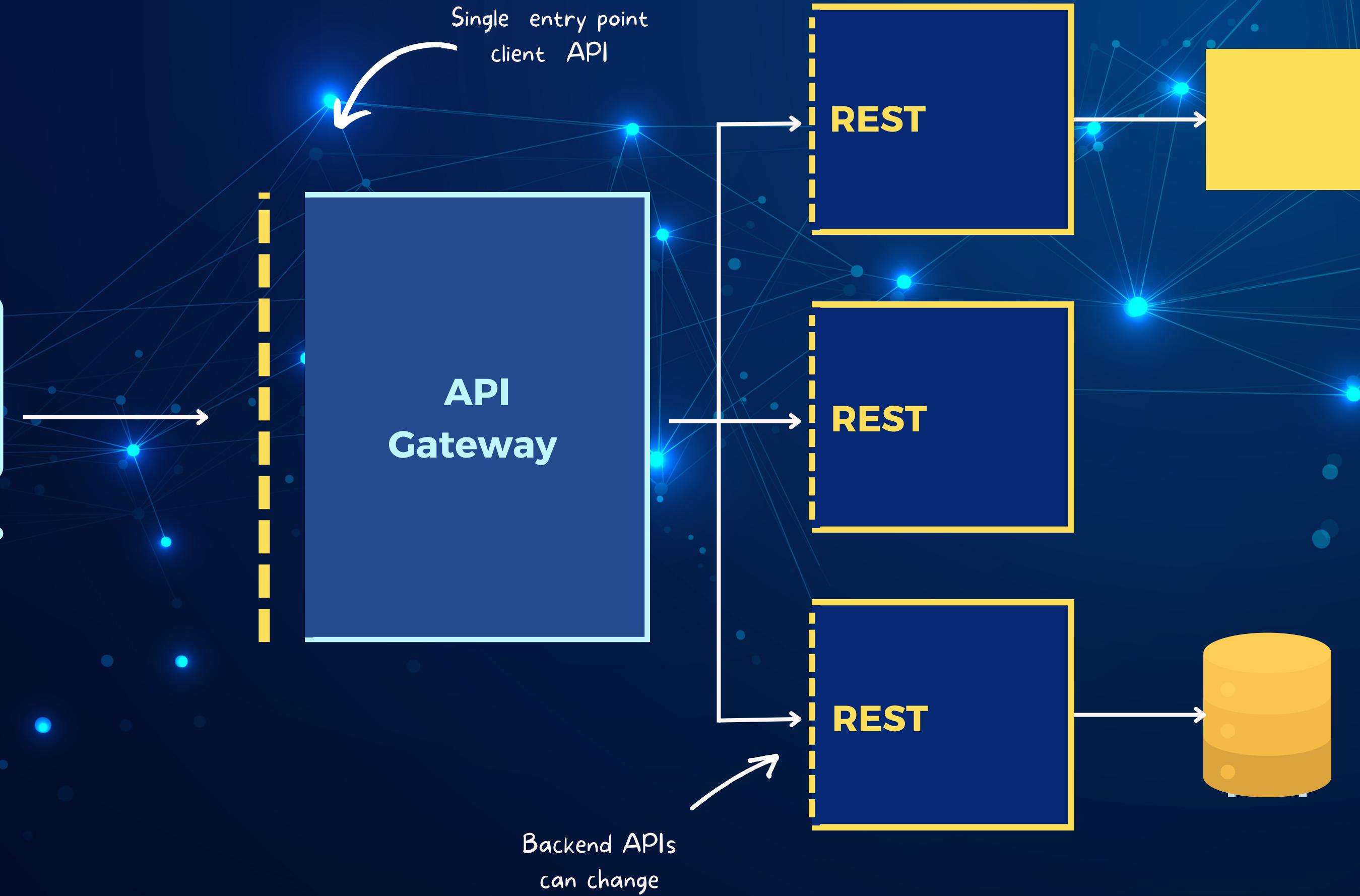
Integrity





API Gateway







A central point for APIs observation







What is Apache APISIX?

- One of the fastest-growing top projects of the Apache Software Foundation in 2022.
- Cloud native API gateway.
- It has rich traffic management features.
- Many well-known organizations use APISIX in production.
- APISIX has a user-friendly dashboard.
- It supports plugin hot reloading.
- You can write custom plugins.





API Gateway Plugins

- Authentication
- Security
- Traffic Control
- Observability
- Serverless
- Transformation
- Other





Custom plugin development



APISIX Dashboard

[Dashboard](#)[Route](#)[Upstream](#)[Service](#)[Consumer](#)[Plugin](#)[SSL](#)[System Info](#)

Configure Route

✓ Define API Request

[Normal](#)[Orchestration](#)

✓ Define API Backend Server

+ Available Nodes

[ip](#)[I](#)

+ General

+ Security

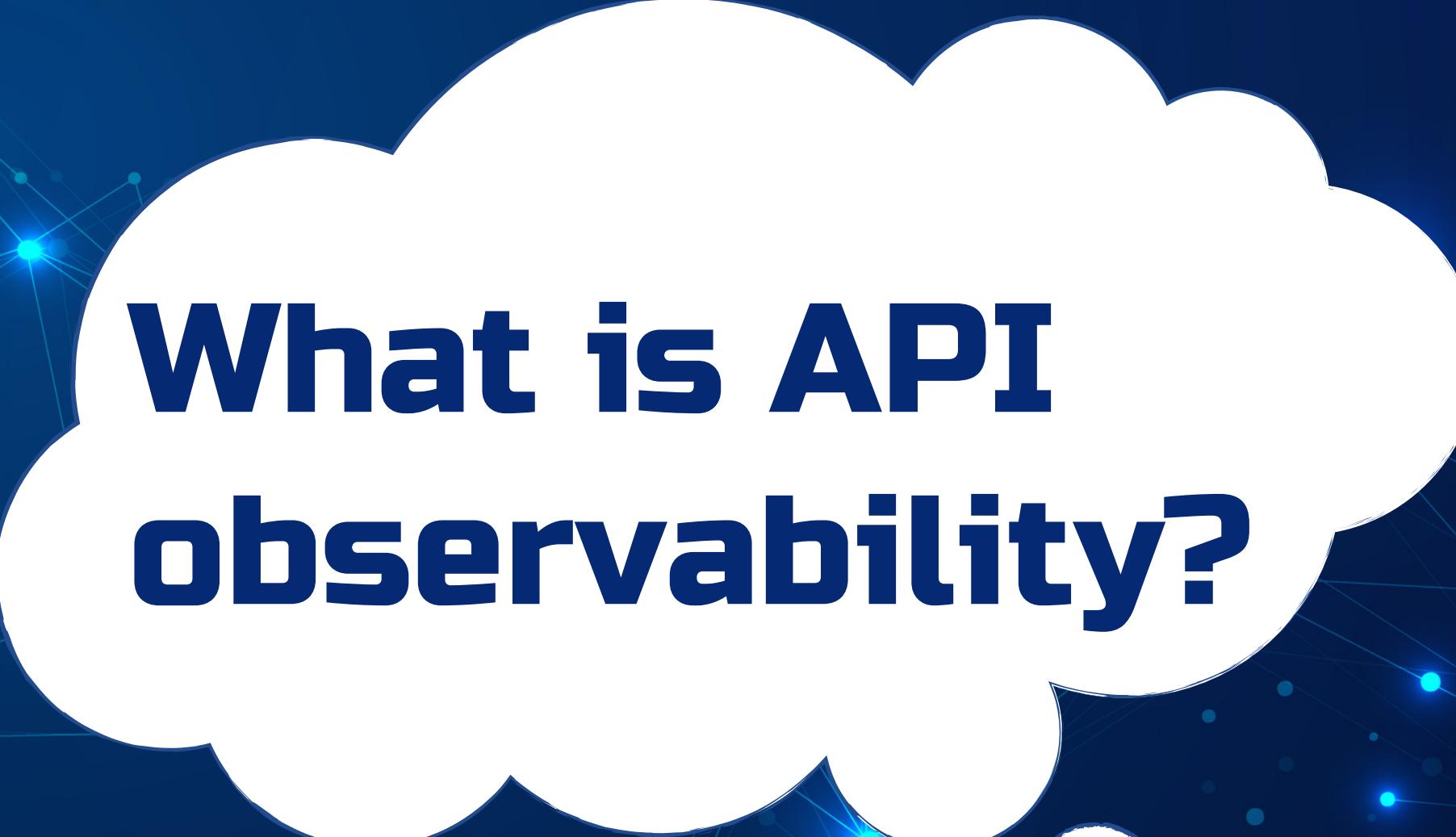
+ Observability

+ Other

3 Plugin Config

4 Preview

[Previous](#)[Next](#)



**What is API
observability?**





Things we are neither aware of nor understand. Future events or situations that are impossible to predict or plan for.

Unknowns

Known Knowns

Things we are aware of and understand.

Unknown Knowns

Things we understand but are not aware of.

Knows

Known Unknowns

Things we are aware of but don't understand .

Unknowns Unknowns

Things we are neither aware of nor understand.

Unknowns

Monitoring



Things we are neither aware of nor understand. Future events or situations that are impossible to predict or plan for.

Unknowns

Known Knowns

Things we are aware of and understand.

Unknown Knowns

Things we understand but are not aware of.

Knows

Known Unknowns

Things we are aware of but don't understand .

Unknowns Unknowns

Things we are neither aware of nor understand.

Unknowns

Observability





API Observability is a part of every API development

- Sales and growth teams to monitor your API usage, free trials, observe expansion opportunities and ensure that API serves the correct data.
- Engineering teams to monitor and troubleshoot API issues.
- Product teams to understand API usage and business value.
- Security teams to detect and protect from API threats.



Observability



Tracing

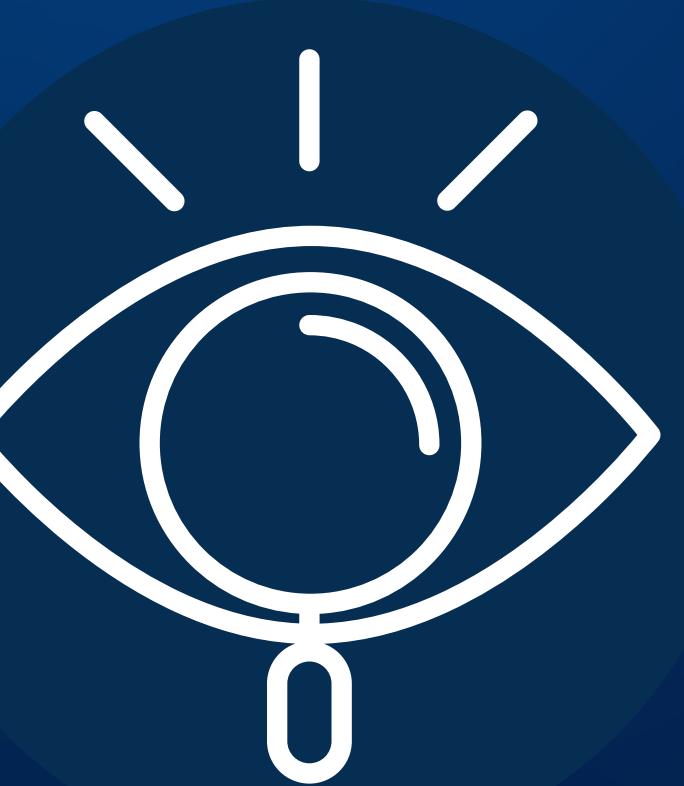


Logging



Metrics





Observability



Tracing



Logging

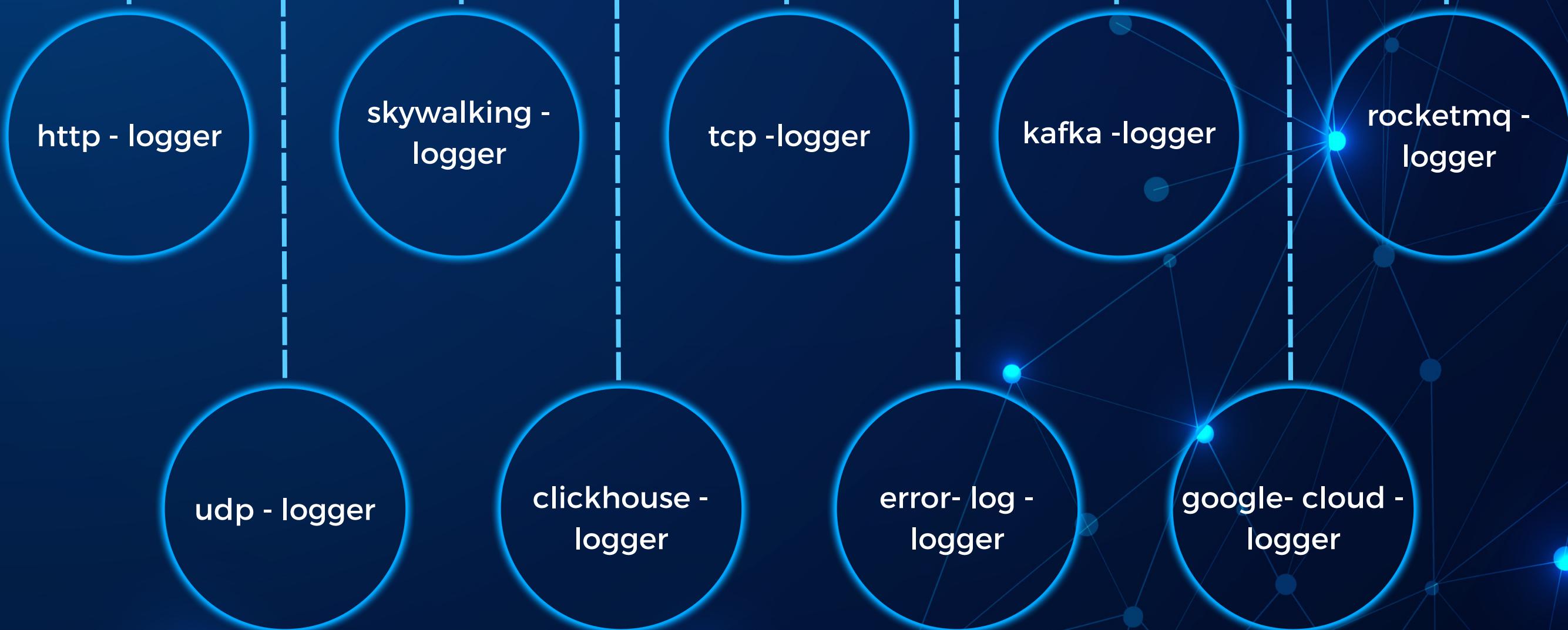


Metrics





Logger Plugins





HTTP logger Plugin



**HTTP logger Plugin pushes Log data requests to
HTTP/HTTPS servers or sends them as JSON objects
to Monitoring tools.**



Observability



Tracing



Logging



Metrics





Prometheus Plugin



**Prometheus plugin can fetch API metrics data and
you can show metrics exported by the plugin in
Grafana.**



Observability



Tracing



Logging



Metrics





Zipkin Plugin

Zipkin an open-source distributed tracing system.
APISIX Zipkin plugin is supported to collect tracing
and report to Zipkin Collector based on **Zipkin API**
specification.



API Gateway Observability

Plugins demo



Observe ASP.NET Core WEB API with APISIX

- Multi-container app (backend, db, apisix and etcd together) with [Docker compose](#).
- Configure APISIX an upstream and a route for Product API.
- Enable Http-logger, Prometheus and Zipkin plugins.
- <https://github.com/Boburmirzo/apisix-dotnet-docker> source code on GitHub and check out the branch api-observability



Takeaways

- Use API Gateway to easily observe your APIs without the need for additional SDKs, libraries, or tools.
- Modern API Gateways have built-in connections to all popular observability platforms.
- You can enable these plugins without writing any code on your API service.
- Use other plugins to enable cross-cutting functionalities.



EXPLORER

APISIX-DOT... D, E, U, B
apisix.conf
apisix.log
cmds
create_an_upstream.sh
enable_http_logger_plu...
enable_logger_tracer_m...
enable_prometheus_plu...
enable_zipkin_plugin.sh
dashboard.conf
etcd.conf
grafana.conf
mkcert
ProductApi
prometheus.conf
.dockerignore
.gitignore
docker-compose.yml
pom.xml

```
cmd$ enable_prometheus_plugin.sh
1 curl http://127.0.0.1:9080/apisix/admin/routes/1 -H 'X-API-KEY: eddic9f034335f136f87ad84b625c8f1' -X PUT -d '
2 {
3     "name": "Route with prometheus plugin enabled",
4     "methods": ["GET"],
5     "uri": "/api/products",
6     "plugins": {
7         "prometheus": {}
8     },
9     "upstream_id": "1"
10 }
11
12 # Send a request to the endpoint to generate metrics
13 curl -i http://127.0.0.1:9080/api/products
14
15 # See metrics
16 curl -i http://127.0.0.1:9091/apisix/prometheus/metrics
17
18 # And we can also check the status of our endpoint at
19 # Prometheus dashboard by pointing to this URL http://localhost:9090/targets
20
21 # In addition to this, you can view Grafana dashboard running in your local instance.
```

PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE

Q wsl + ×

```
'}
{"action":"set","node":{"value":{"id":1,"create_time":1660849339,"upstream_id":1,"methods":["GET"],"status":1,"update_time":1660930846,"plugins":{"http-logger":{"include_resp_body":false,"retry_delay":1,"include_req_body":false,"max_retry_count":0,"auth_header":"","inactive_timeout":5,"concat_method":"json","timeout":3,"ssl_verify":false,"batch_max_size":1000,"uri":"http://mockbin.org/bin/5451b7cd-a\u00e127-41b8-8df1-282ffea13a61","buffer_duration":60,"name":"http logger"}}, "priority":0,"uri":"/api/products","name":"Route with http-logger plugin enabled"},"key":"/apisix/routes/1"}
bumurzokov@DESKTOP-NQ1VR0L:/mnt/c/Users/bumur/Downloads/apisix-dotnet-docker-api-observability$ curl -i -XGET http://127.0.0.1:9080/api/products
HTTP/1.1 200 OK
Content-Type: application/json; charset=utf-8
Transfer-Encoding: chunked
Connection: keep-alive
Date: Fri, 19 Aug 2022 17:41:18 GMT
Server: APISIX/2.13.1
```

```
[{"name": "Macbook Pro", "price": 1500.9}, {"name": "SurfaceBook 3", "price": 1599.9}] bumurzokov@DESKTOP-NQ1VR0L:/mnt/c/Users/bumur/Downloads/apisix-dotnet-docker-api-observability$ bumurzokov@DESKTOP-NQ1VR0L:/mnt/c/Users/bumur/Downloads/apisix-dotnet-docker-api-observability$
```



> OUTLINE

> TIMELINE



References

- [Apache APISIX official website](#)
- [Apache APISIX GitHub repo](#)
- Read [Getting Started](#) guide
- Watch Video Tutorial [Getting Started with Apache APISIX](#)
- [Download Apache APISIX](#)
- Read the full written [guide](#) on our docs
- View the complete [Apache APISIX documentation](#)
- [Read the blog posts](#)
- Learn [plugin development](#)
- Join the [Apache APISIX Community](#)
- Follow us on [Twitter](#)
- Find us on [Slack](#)
- Mail to us with your questions: dev@apisix.apache.org

Questions



Thank You

Bobur Umurzokov



@BoburUmurzokov



@Boburmirzo