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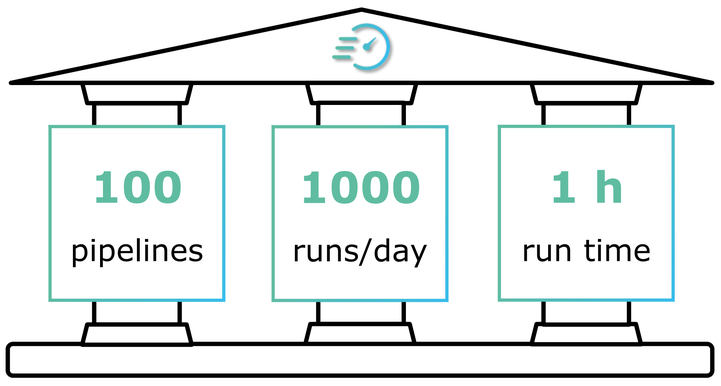
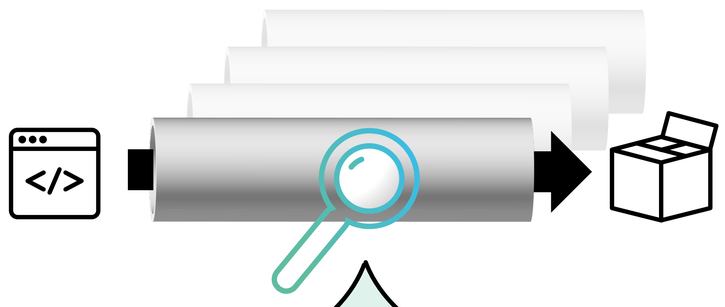
ContinuITy: Automated Load Testing in DevOps

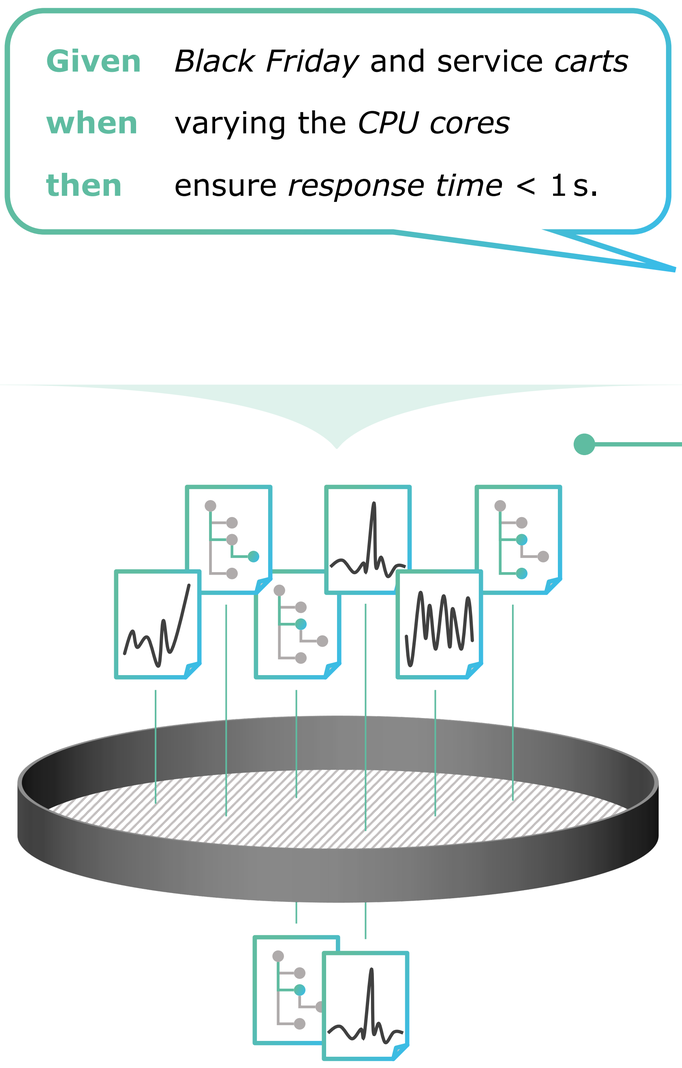
Load Testing vs. DevOps



Typical **CI/CD pipelines** in DevOps have huge dimensions, short execution times, and are **automated**. However, load tests need much time, resources, and expertise.

With ContinuITy, we make load testing **easy to use** and automatically generate **time-efficient** and **resource-efficient** load tests, which fit into CI/CD pipelines.

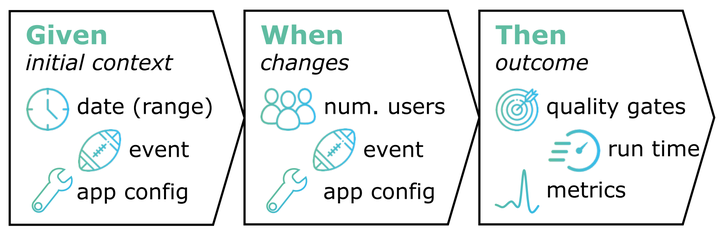




Describing Tests in Natural Language

A user creates a load test description in a template-based natural language – the **behavior-driven load testing** language. In this way, the level of expertise required to define a load test is reduced.

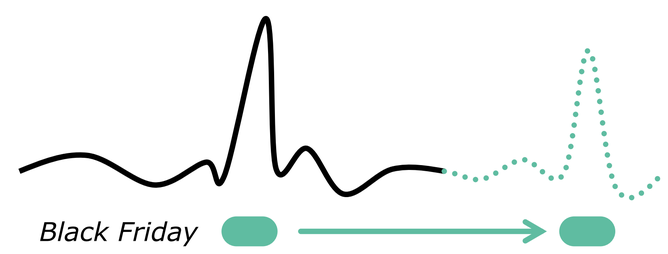
A test consists of *given*, *when*, and *then* clauses, defining the initial test and workload context, the changes made to the initial context, and the expected outcome. This is based on behavior-driven (functional) testing.



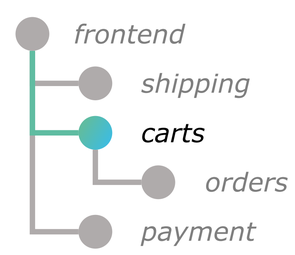
Elements of behavior-driven load tests.

We add a concept of **events**, which influence the workload, e.g., *Black Friday*.

Tailoring to Relevant Contexts & Services



Workload forecasting for the Black Friday.

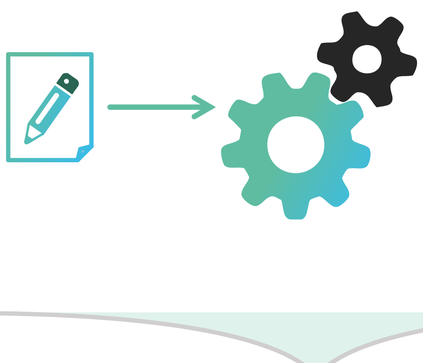


Tracing a request to the service carts.

Based on the test description, we generate a load test that is tailored to the specified test and workload context. We use **time series forecasting** to predict the future workload, respecting influencing events such as *Black Fridays*.

Also, we restrict the test's workload to the relevant **microservices** (e.g., *carts*) by tracing the individual requests through the application. Hence, the required test infrastructure is minimized.

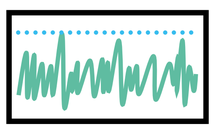
Automated Execution & Analysis



We **parameterize** the generated load test automatically by using pre-defined annotations. It is then automatically executed by **BenchFlow** for all explored configurations, e.g., *CPU cores*.

We apply **regression analysis** on the results for detecting and locating regressions in multiple application versions.

The maximum response time *was 942 ms.*



Natural-language report with a chart.

Finally, we provide a **report** about the test results based on the user concern defined in the behavior-driven load test.

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