Demo on Verification and Validation of Microservice Systems

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September 19, 2022

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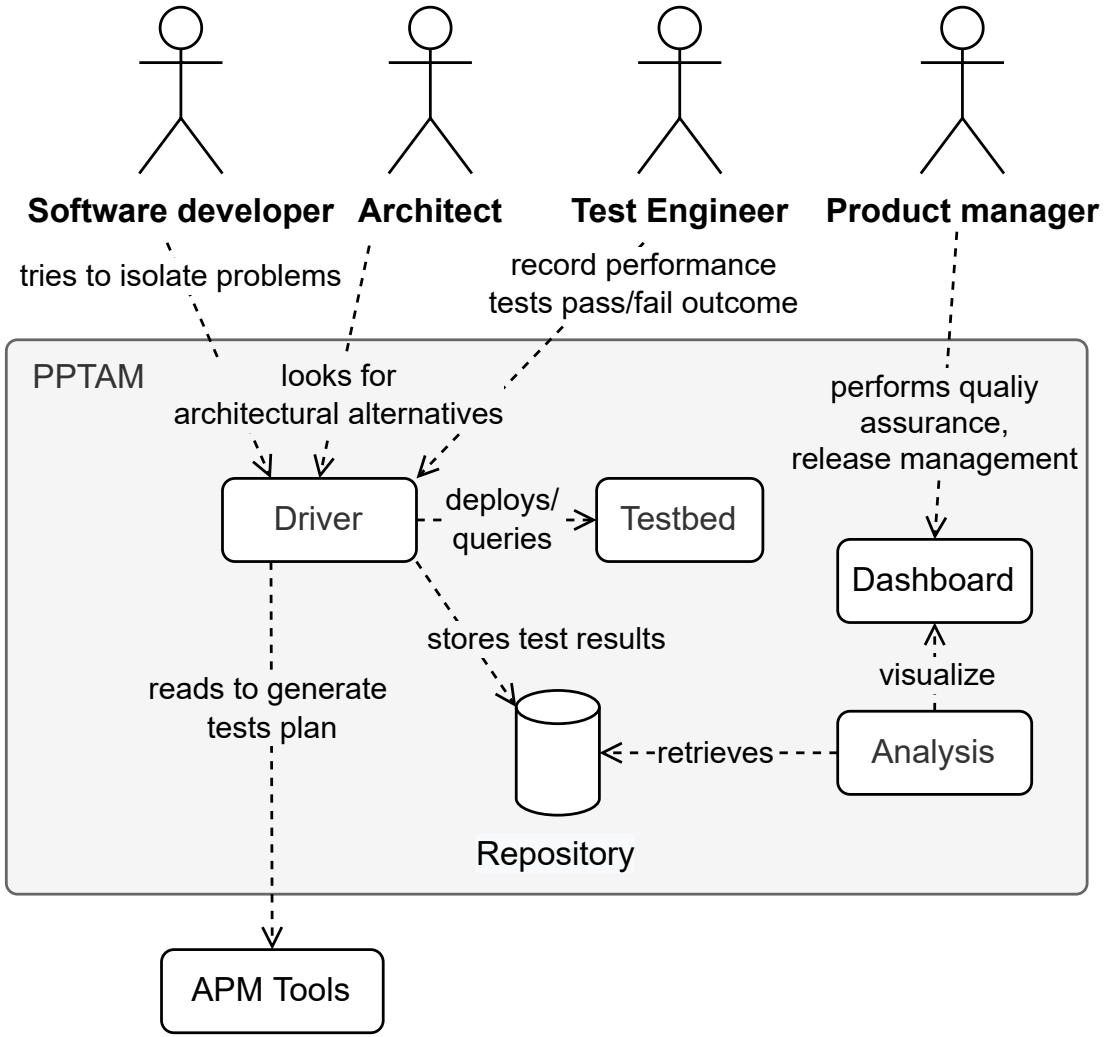
- Analyze the results

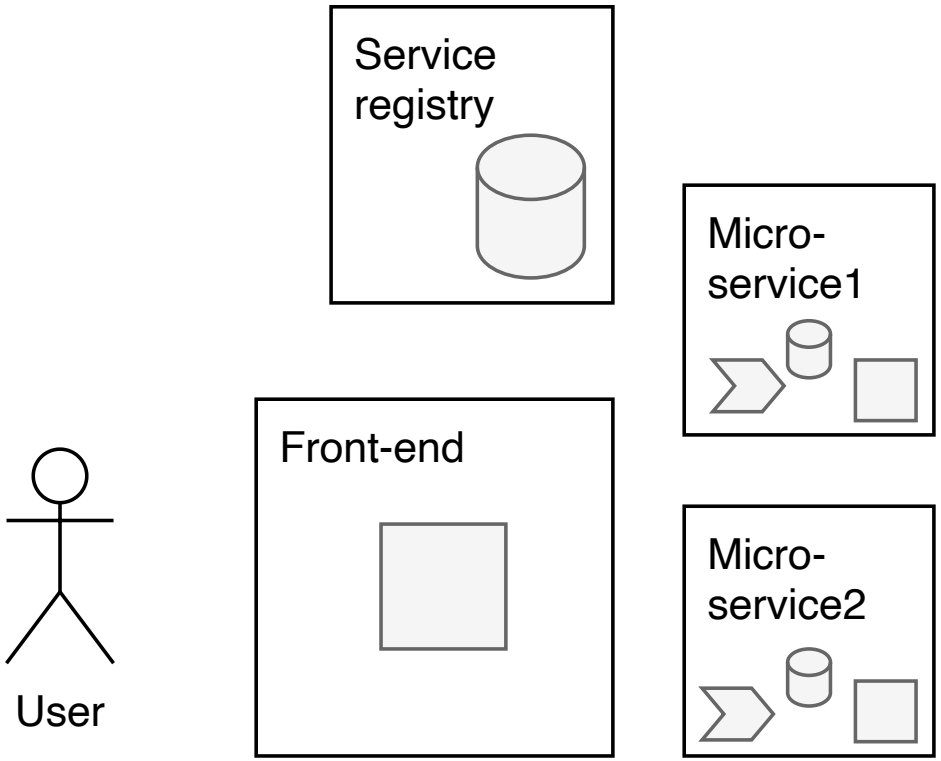
Contents

PPTAM: Overview (container diagram)[1]

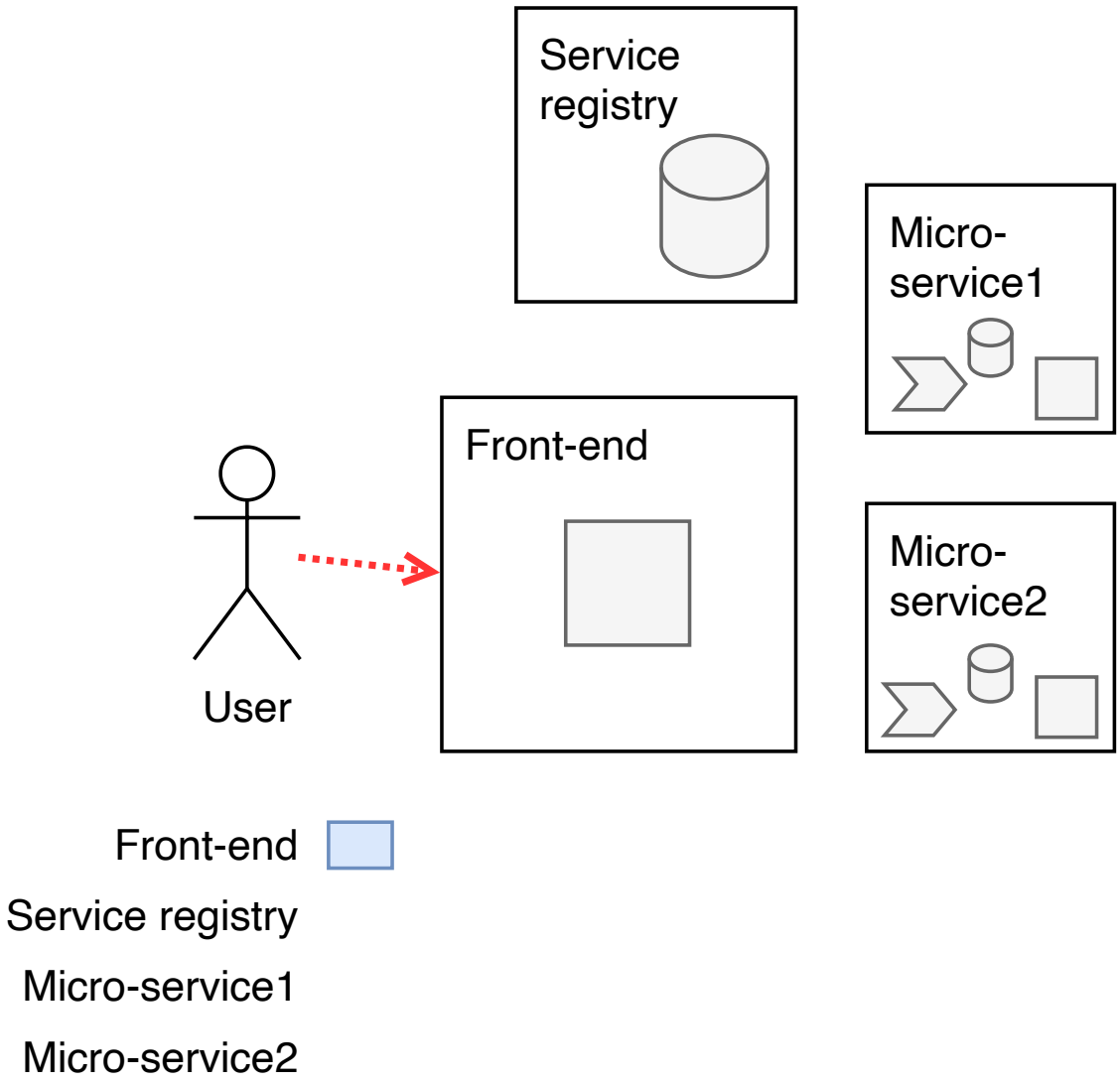


[1] https://github.com/pptam/pptam-tool

Application Performance Monitoring



Application Performance Monitoring



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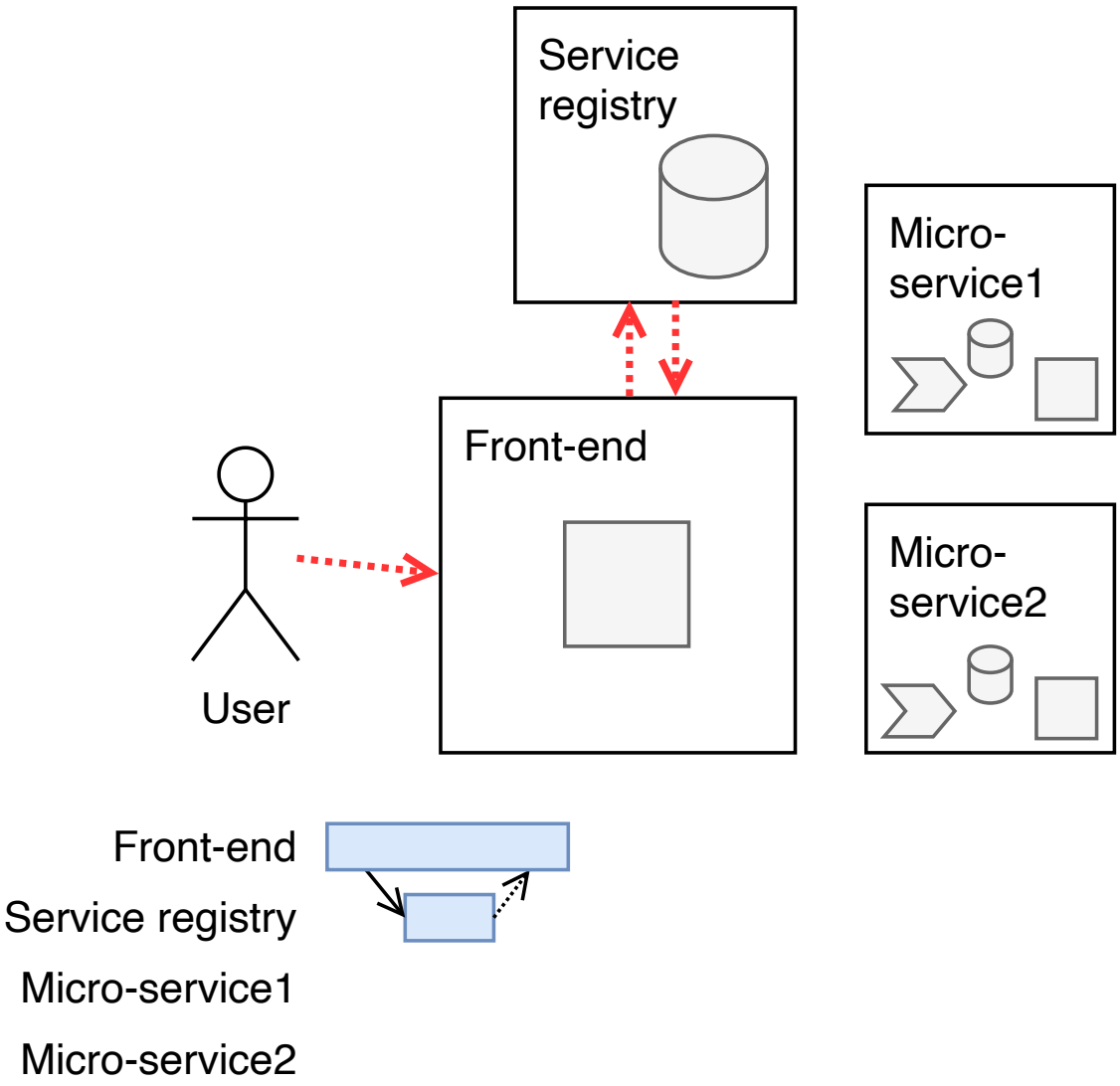
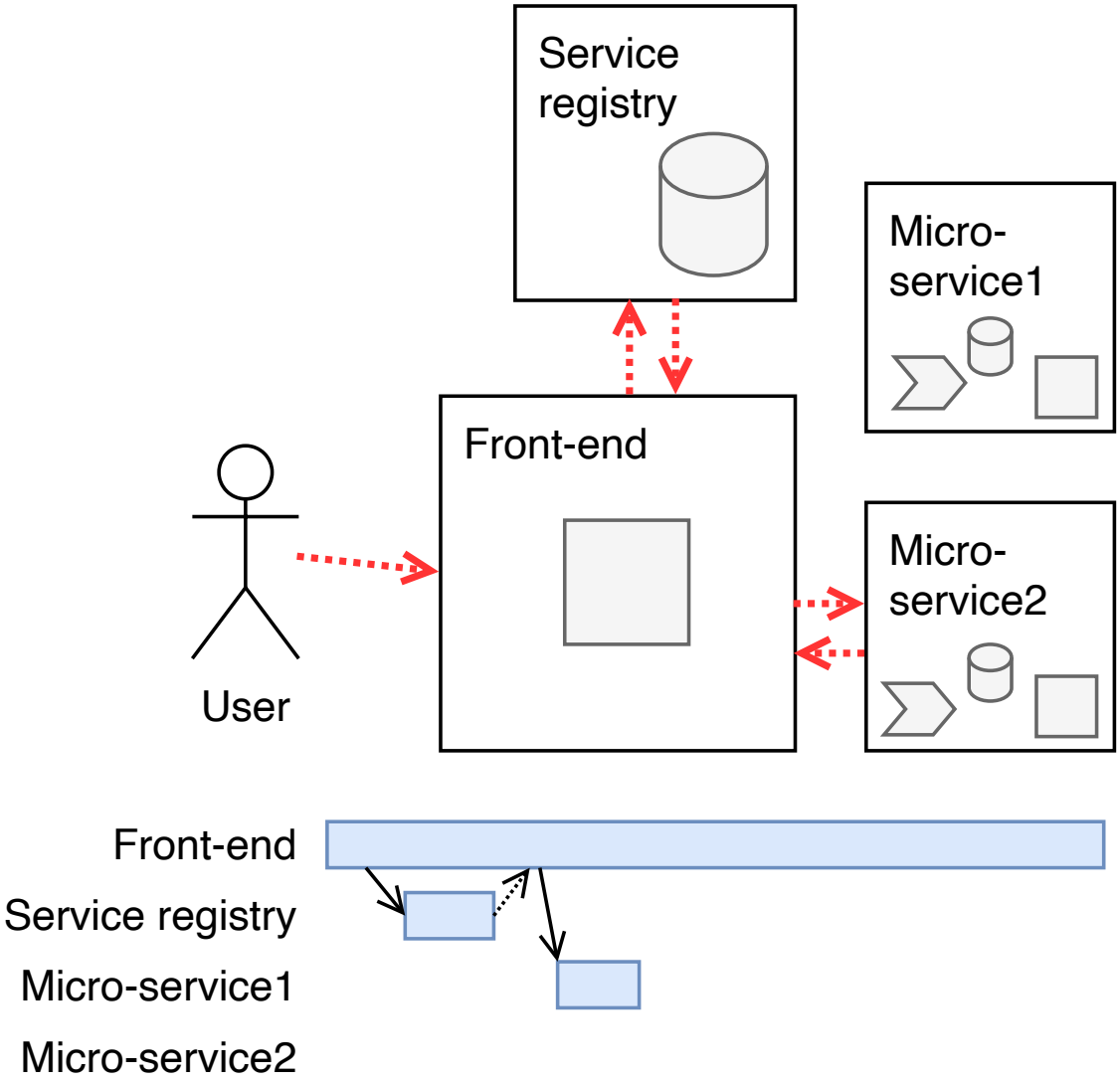
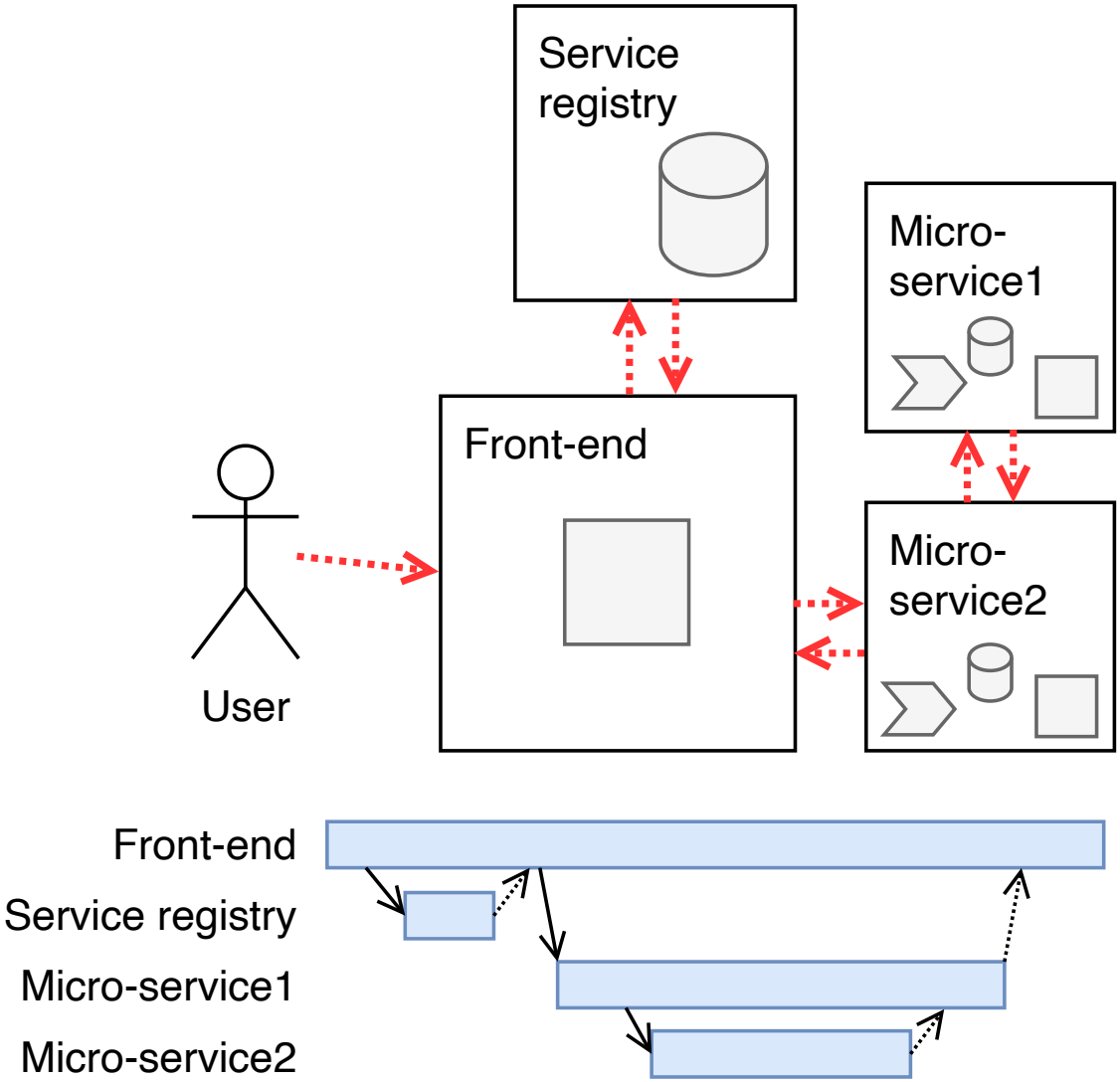


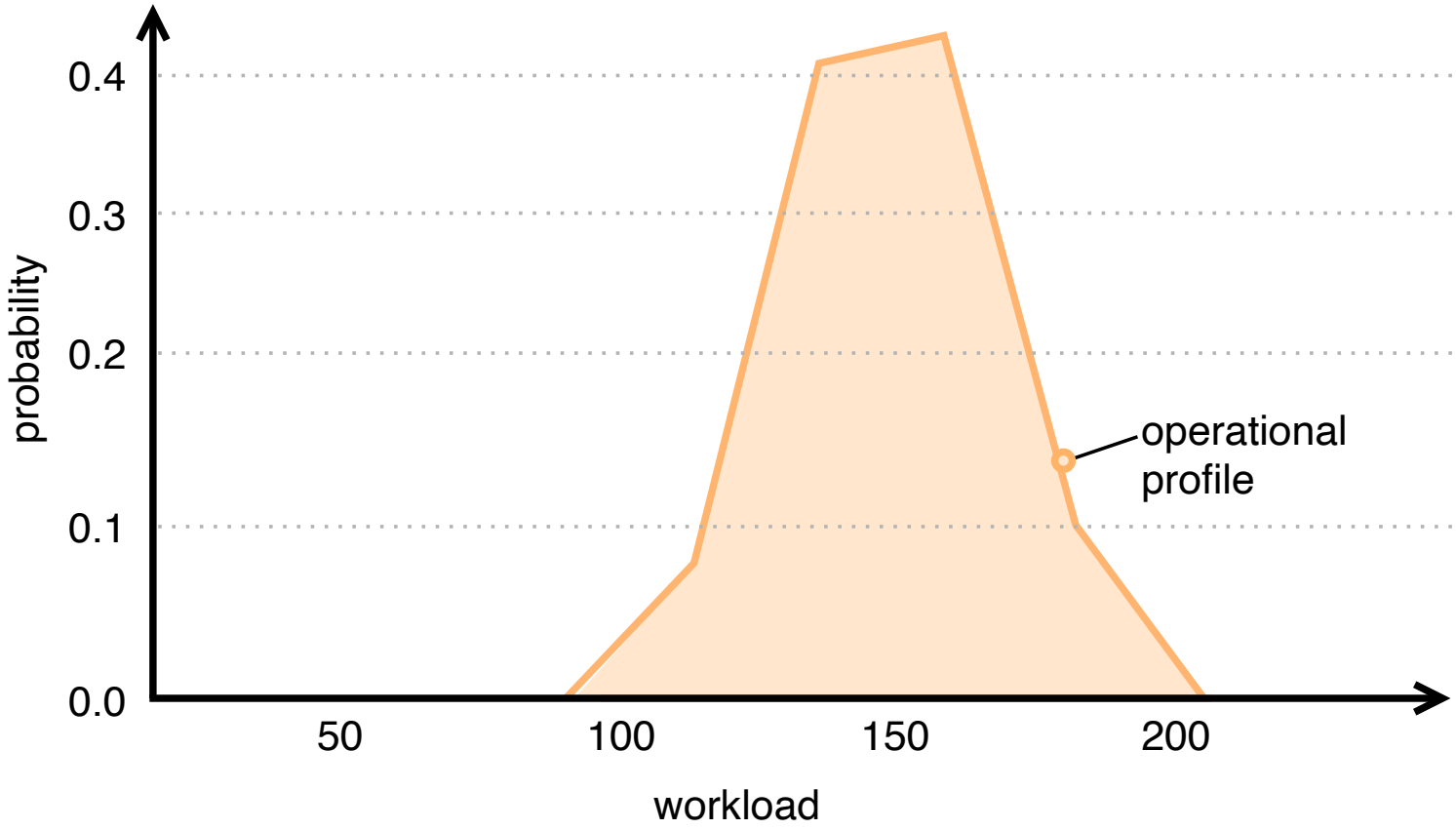
Application Performance Monitoring



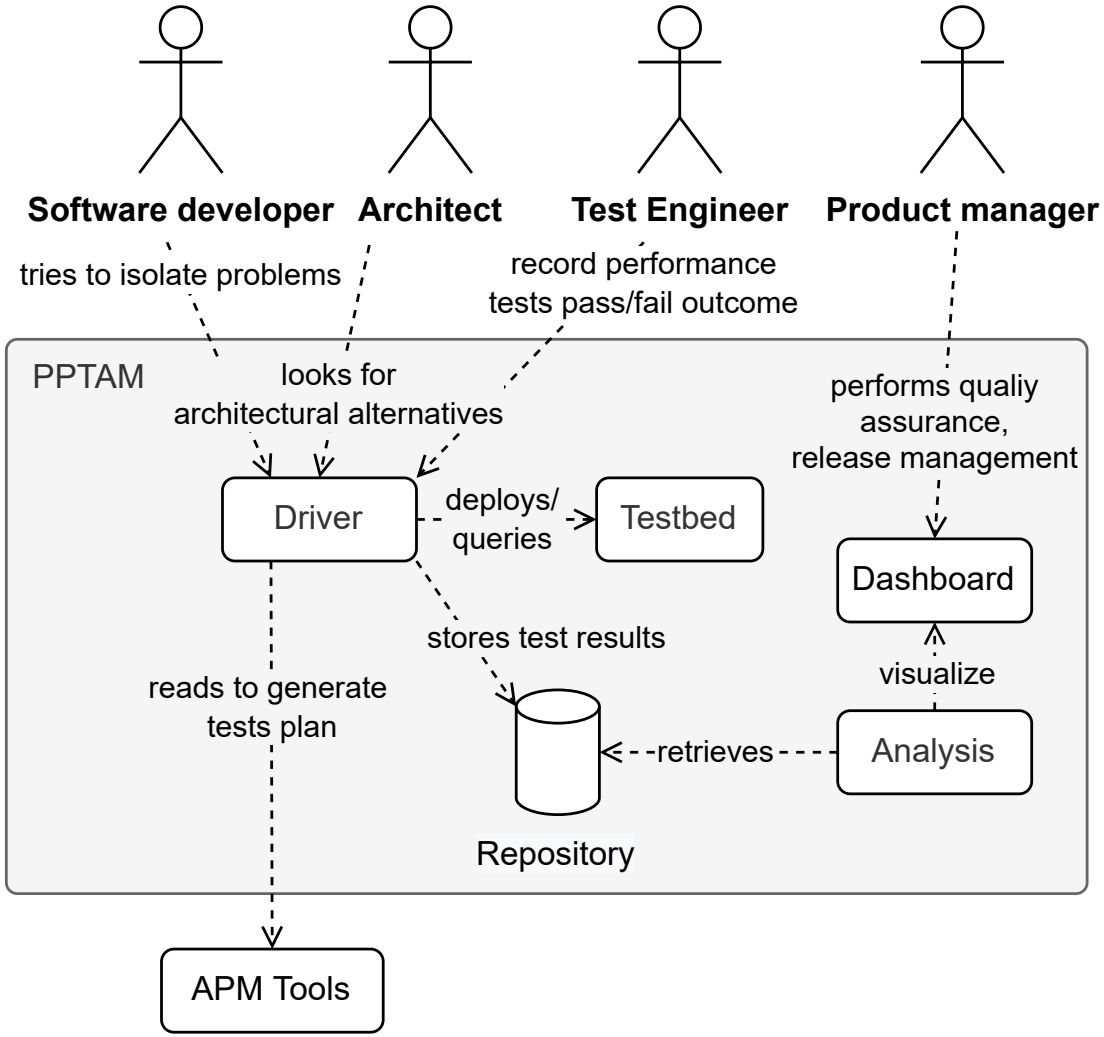
Application Performance Monitoring



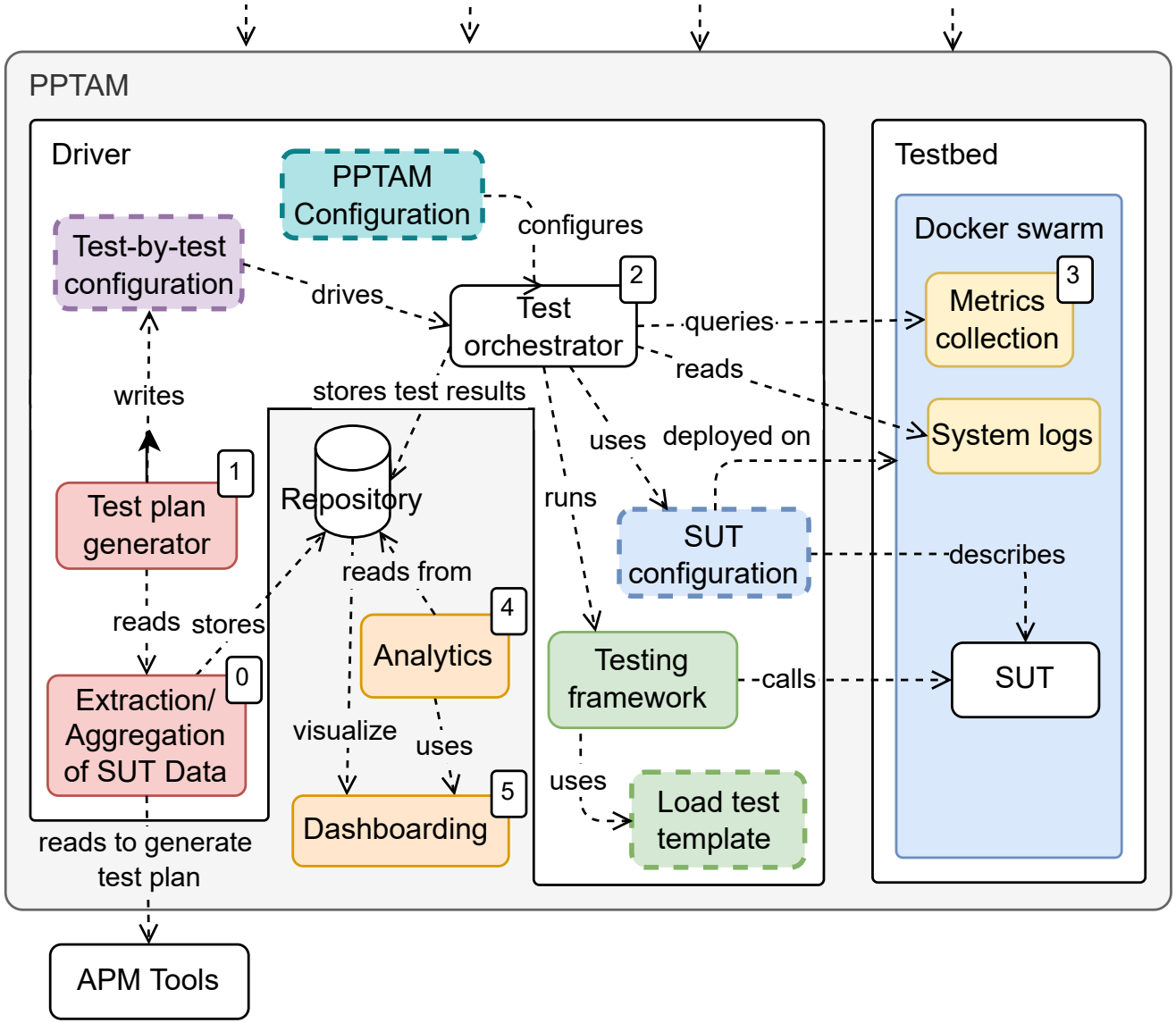
Operational profile



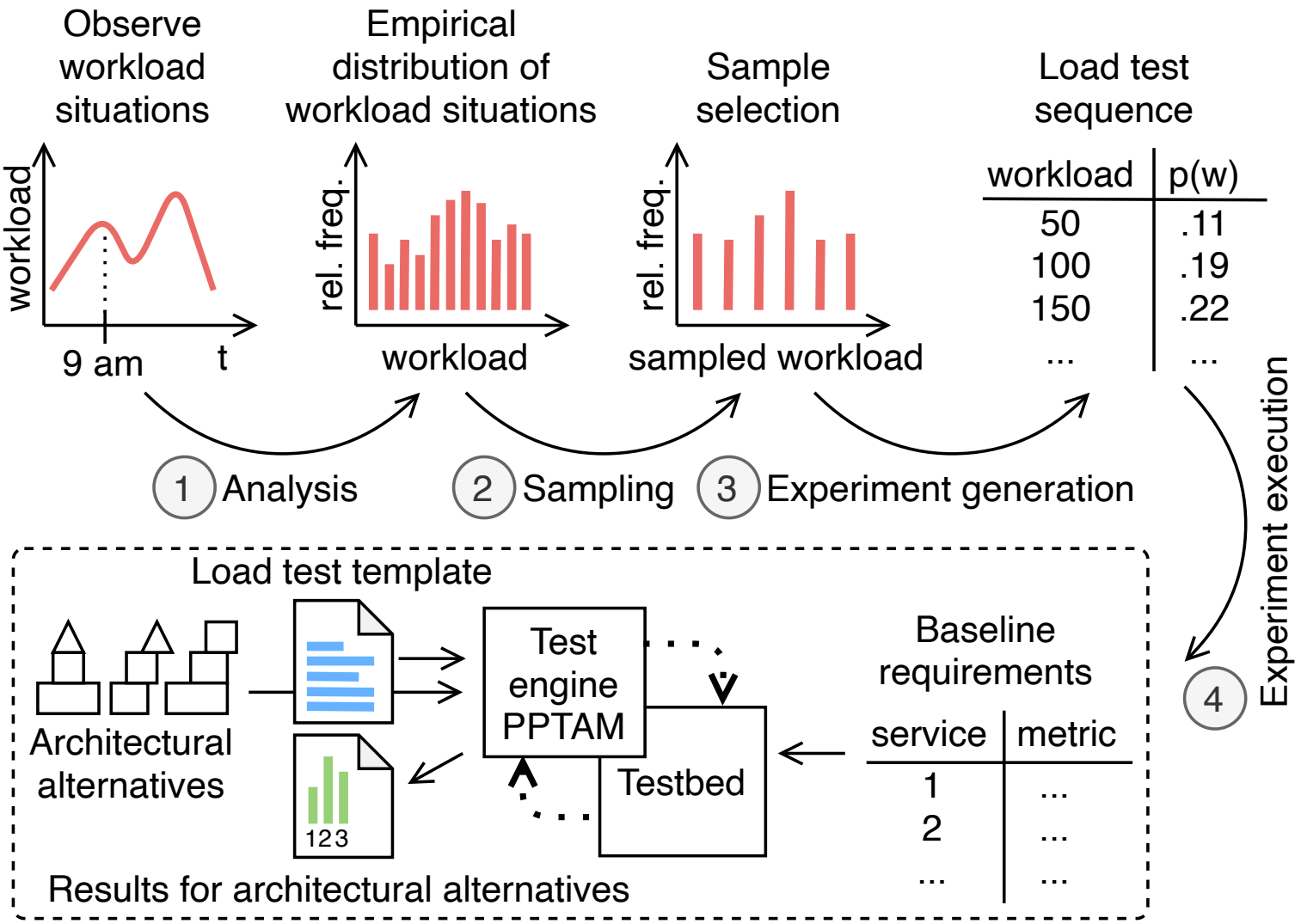
PPTAM: Overview (container diagram)



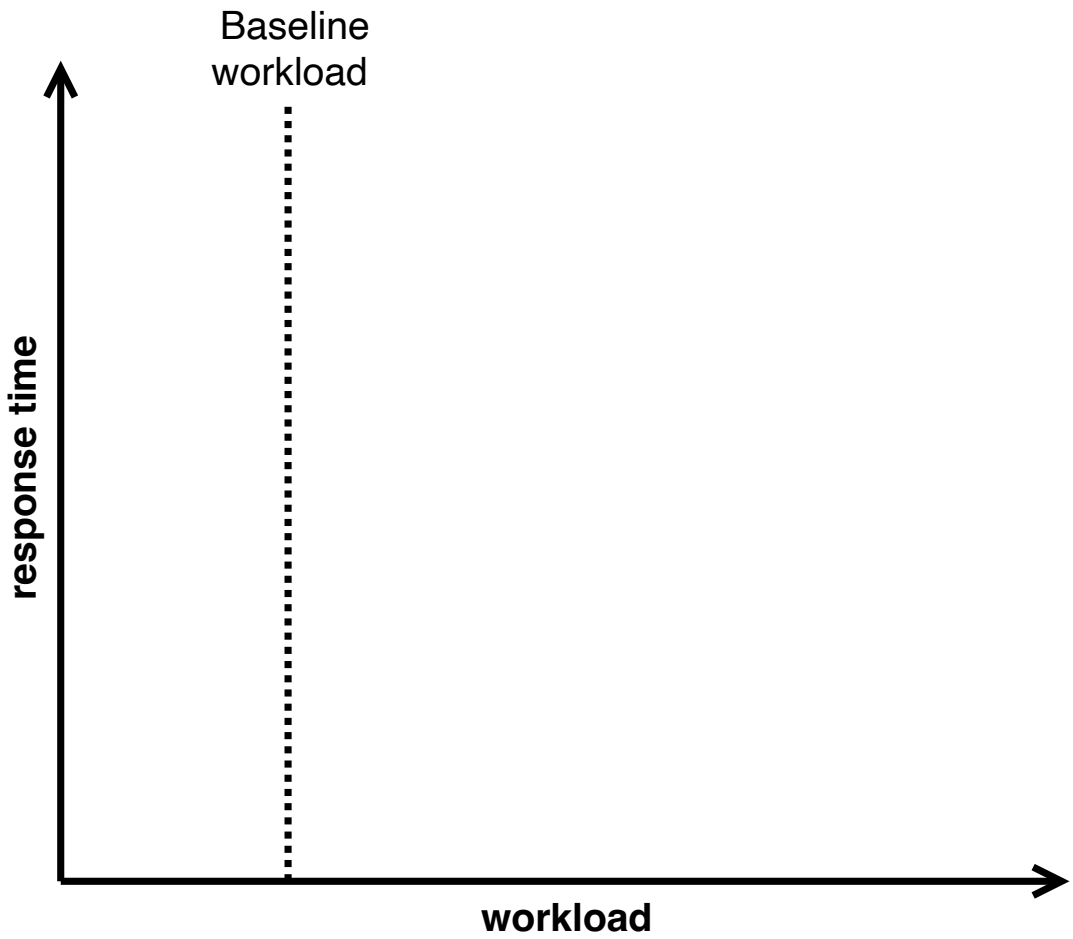
PPTAM: Overview (component diagram)



PPTAM: Process



Analysis of the results



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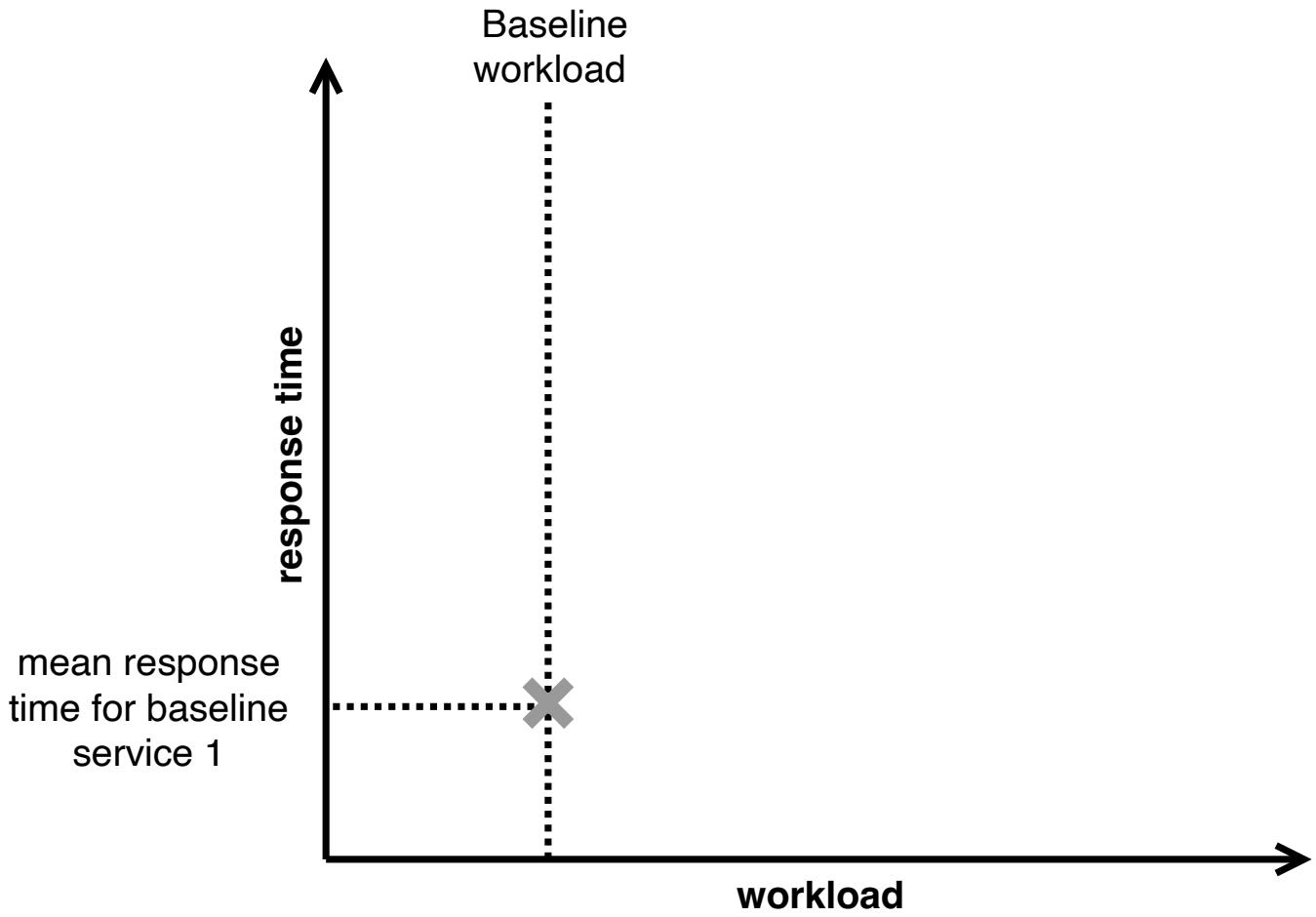

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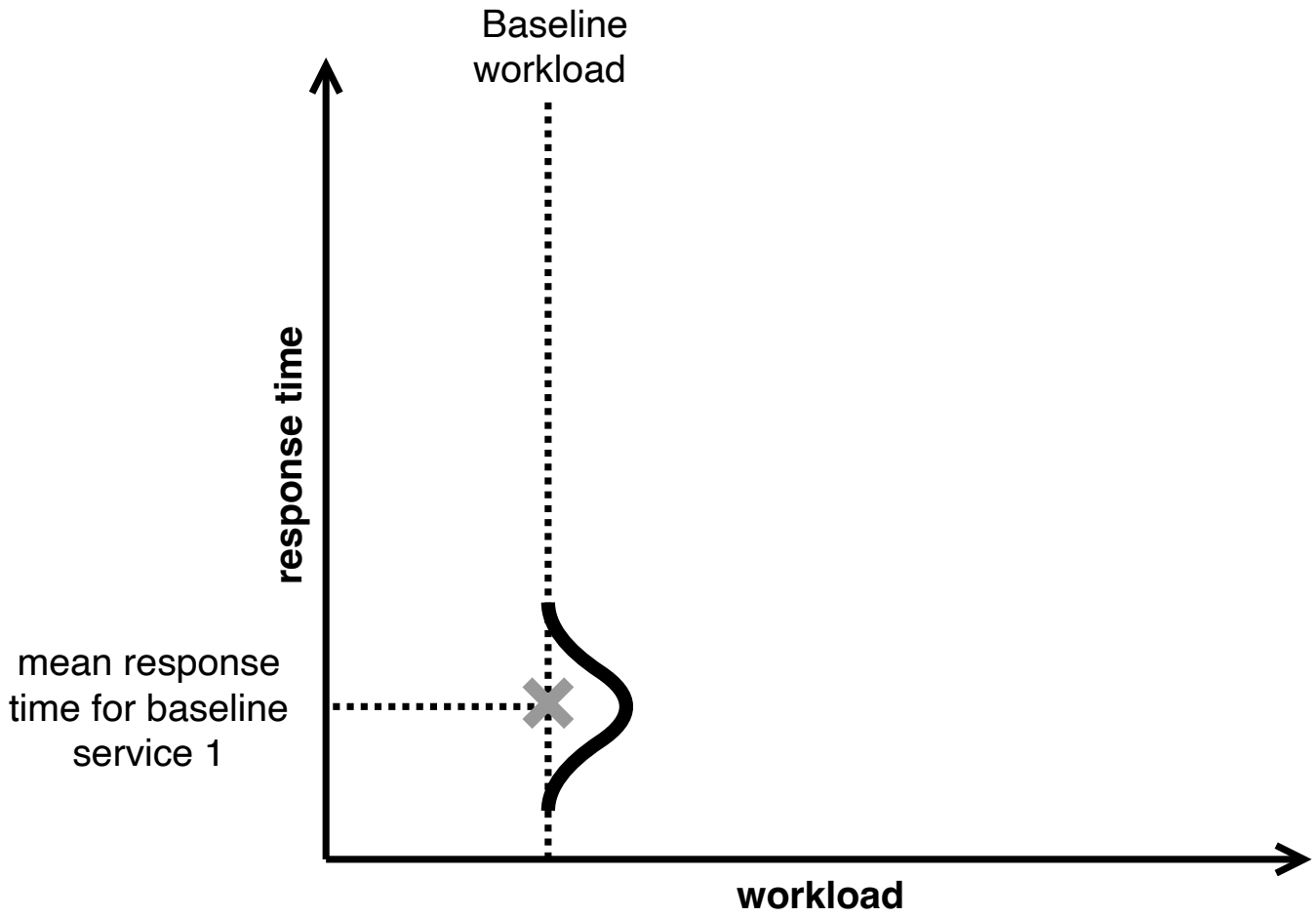

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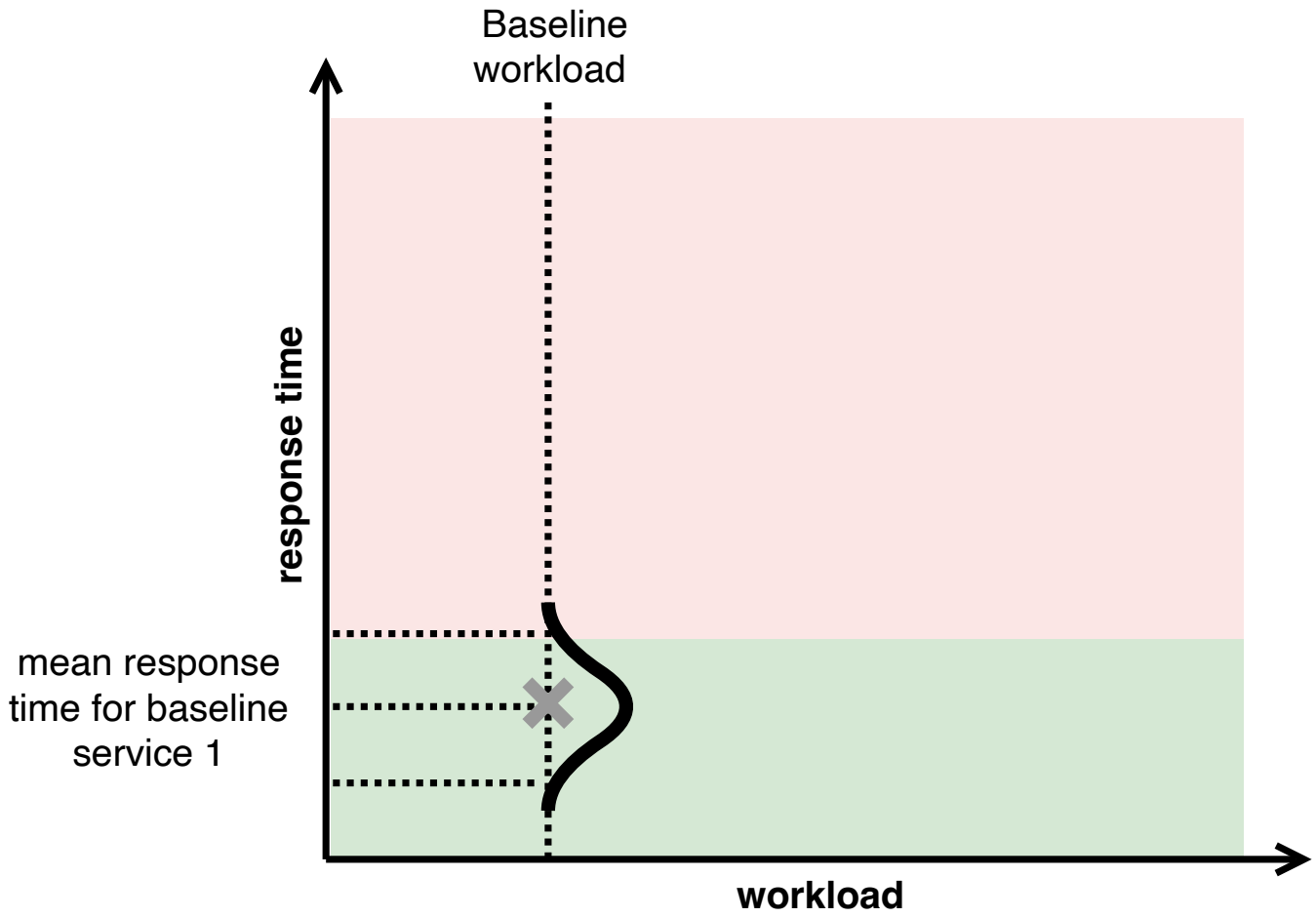

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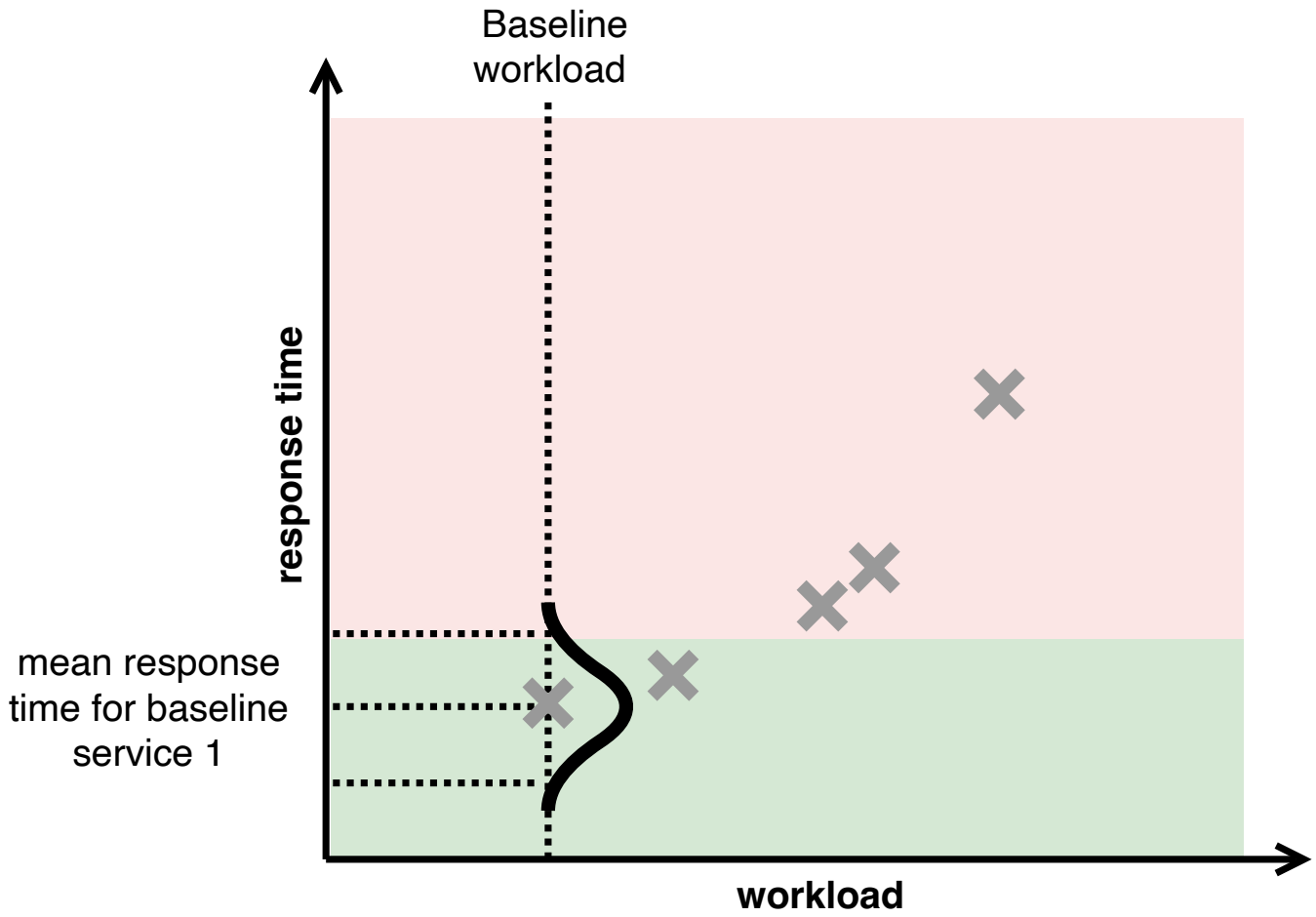

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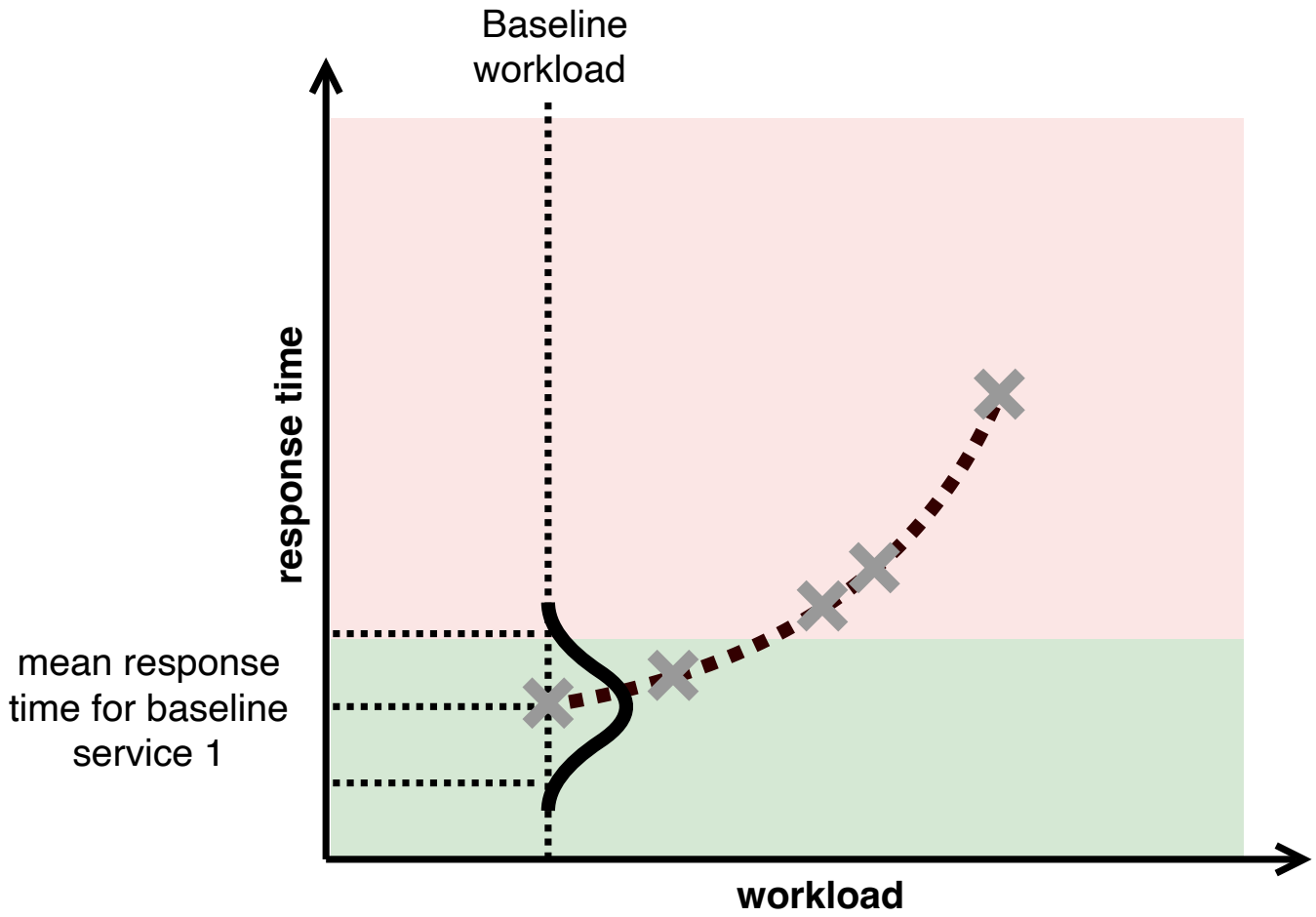

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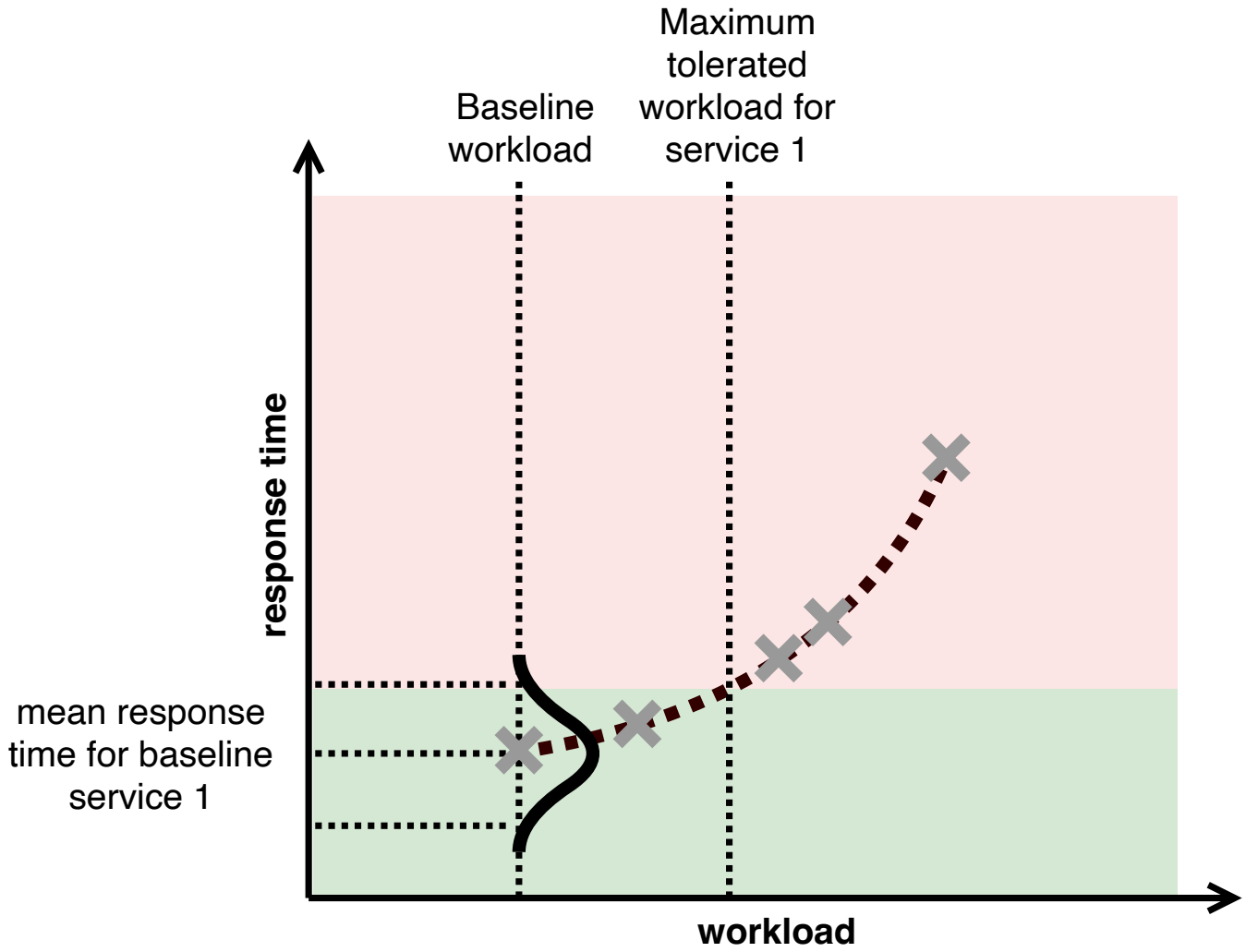

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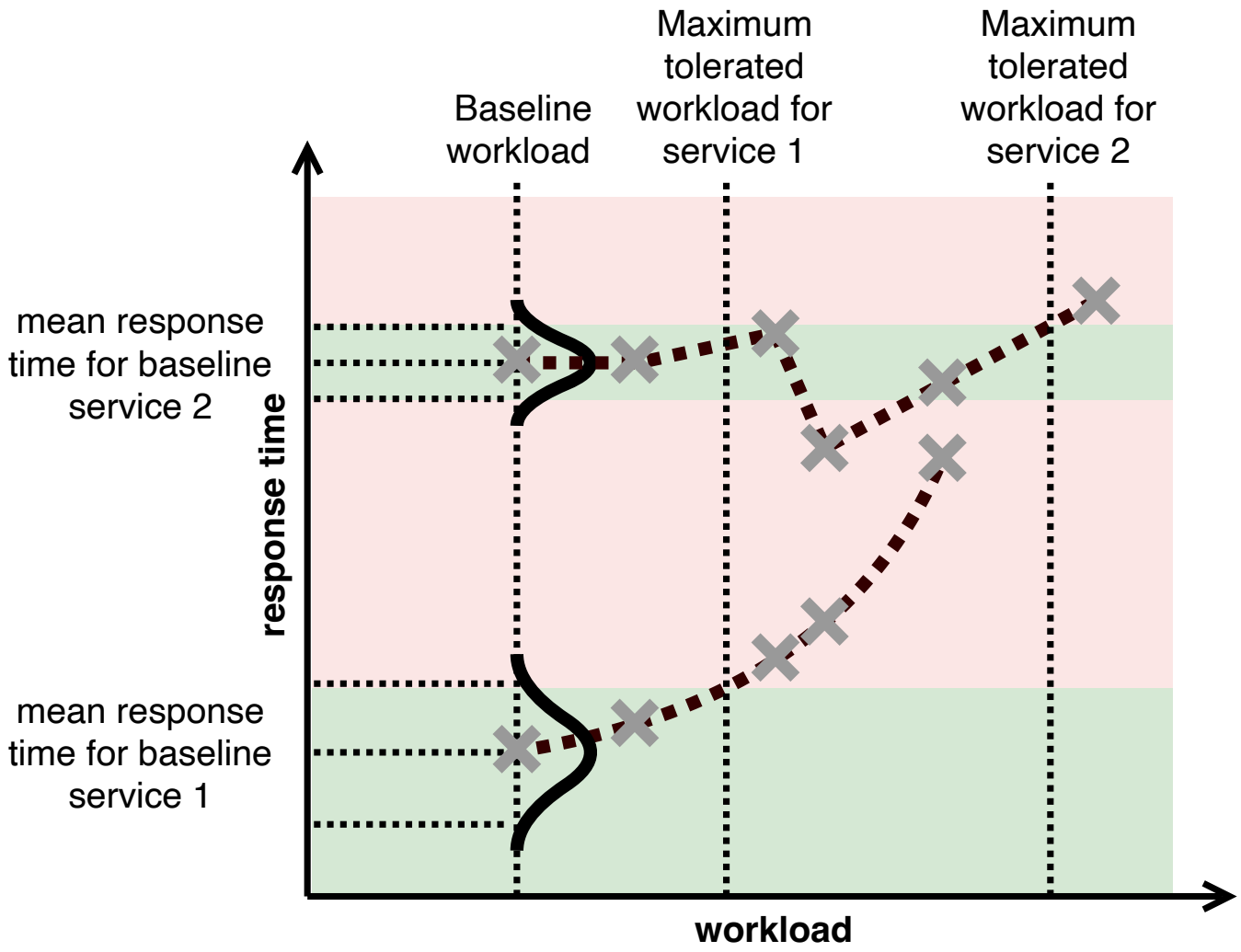

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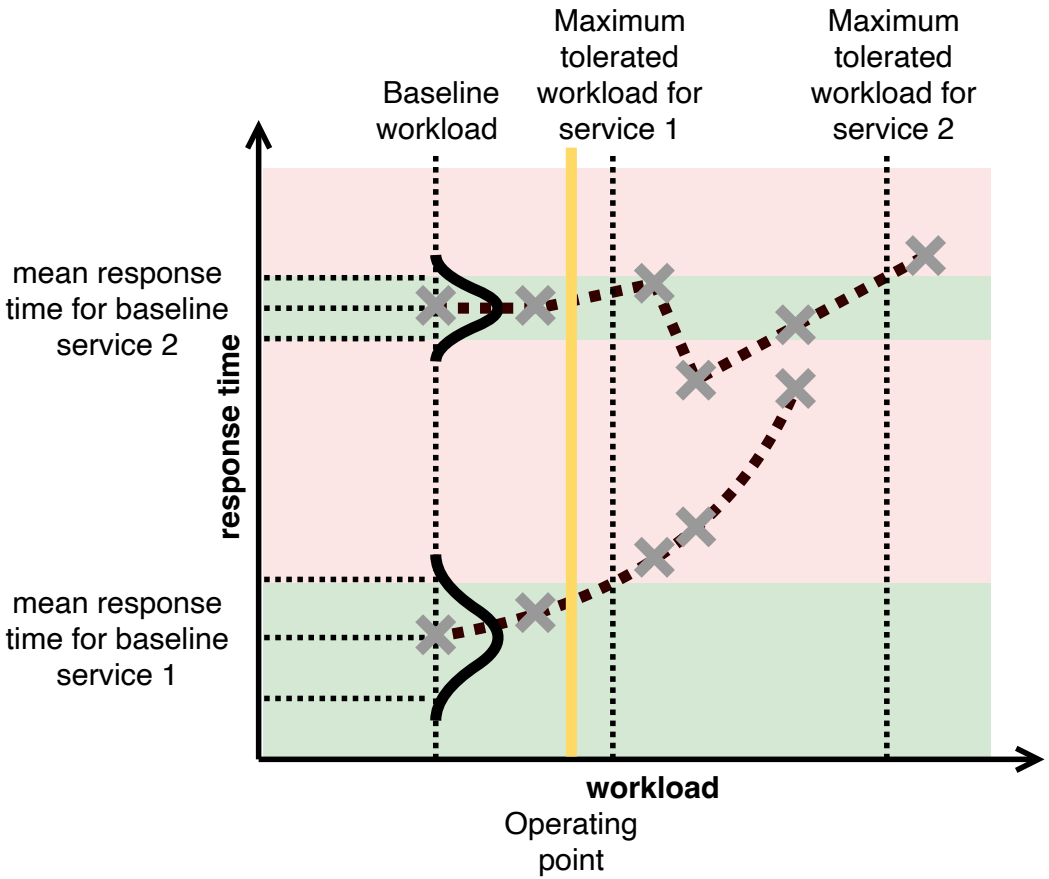

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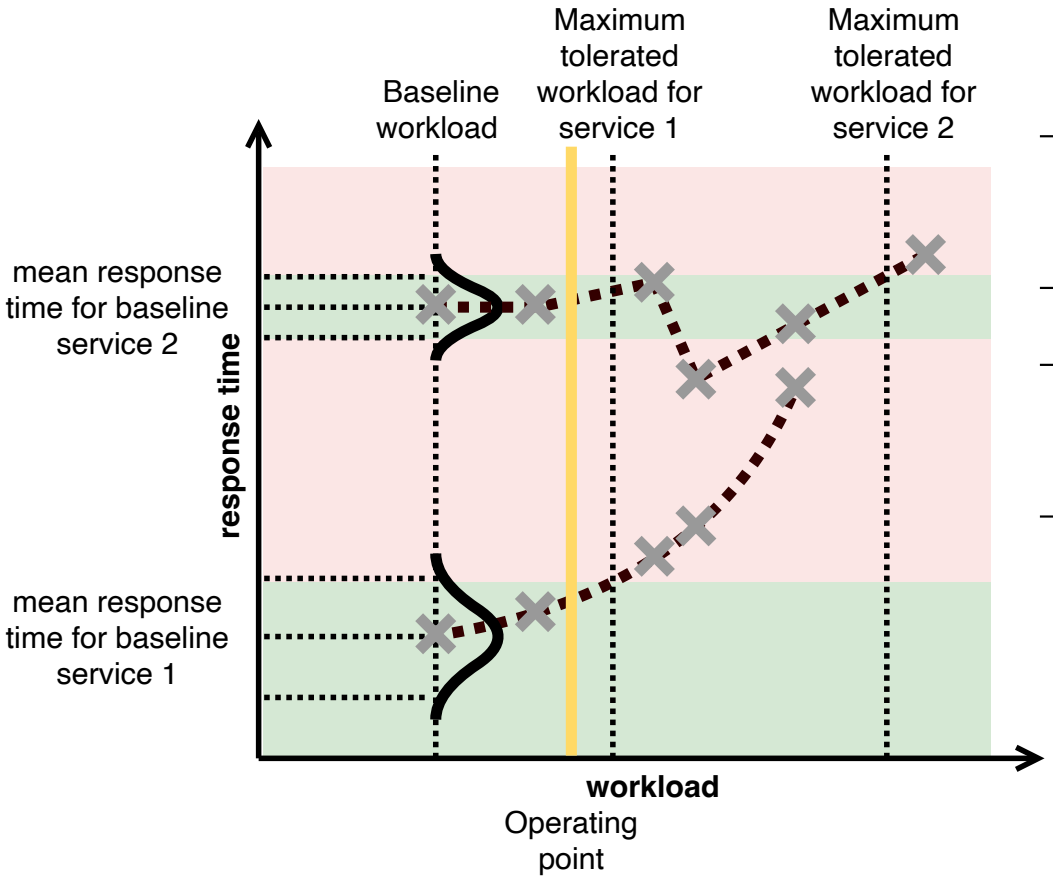
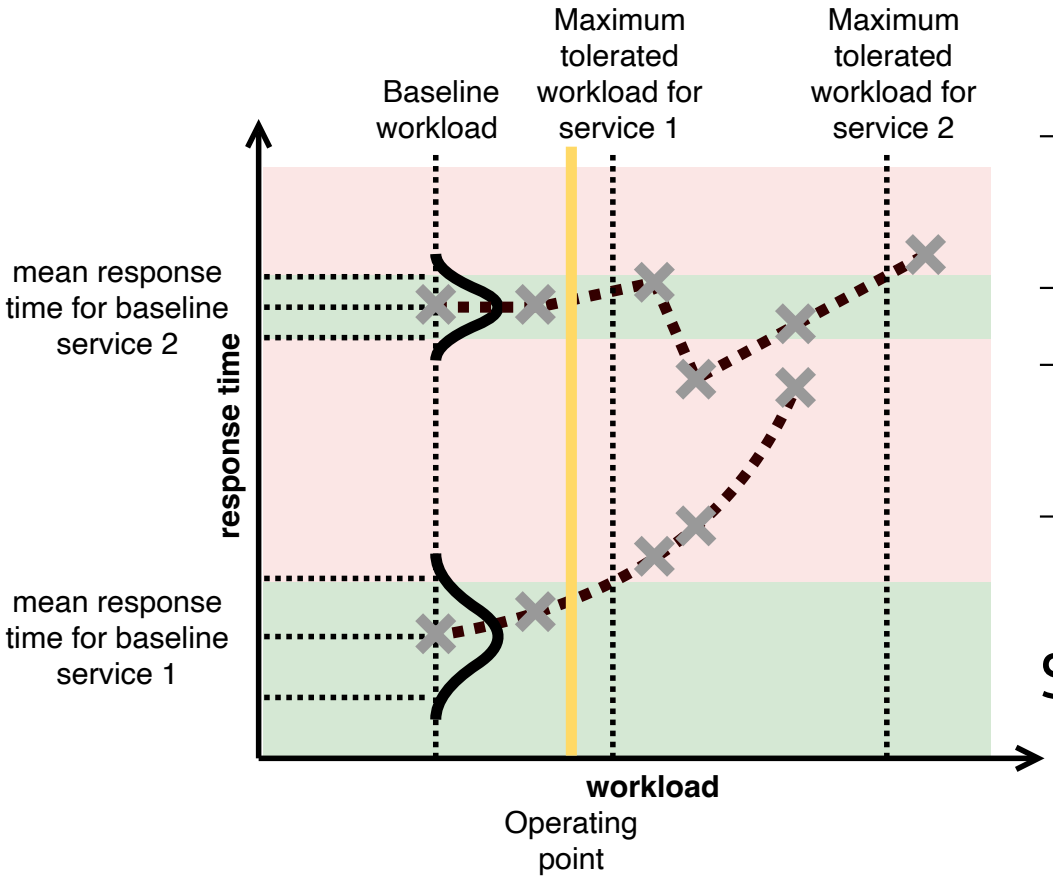


Variable	Service 1	Service 2
$\overline{x}(l_0)$	0.018	2.008
σ	0.008	0.003
Req.	0.042	2.017
$\overline{x}(l_{op})$	0.015	2.009
Pass/fail	pass	pass
Calls	20%	80%

Analysis of the results



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$\overline{x}(l_0)$	0.018	2.008
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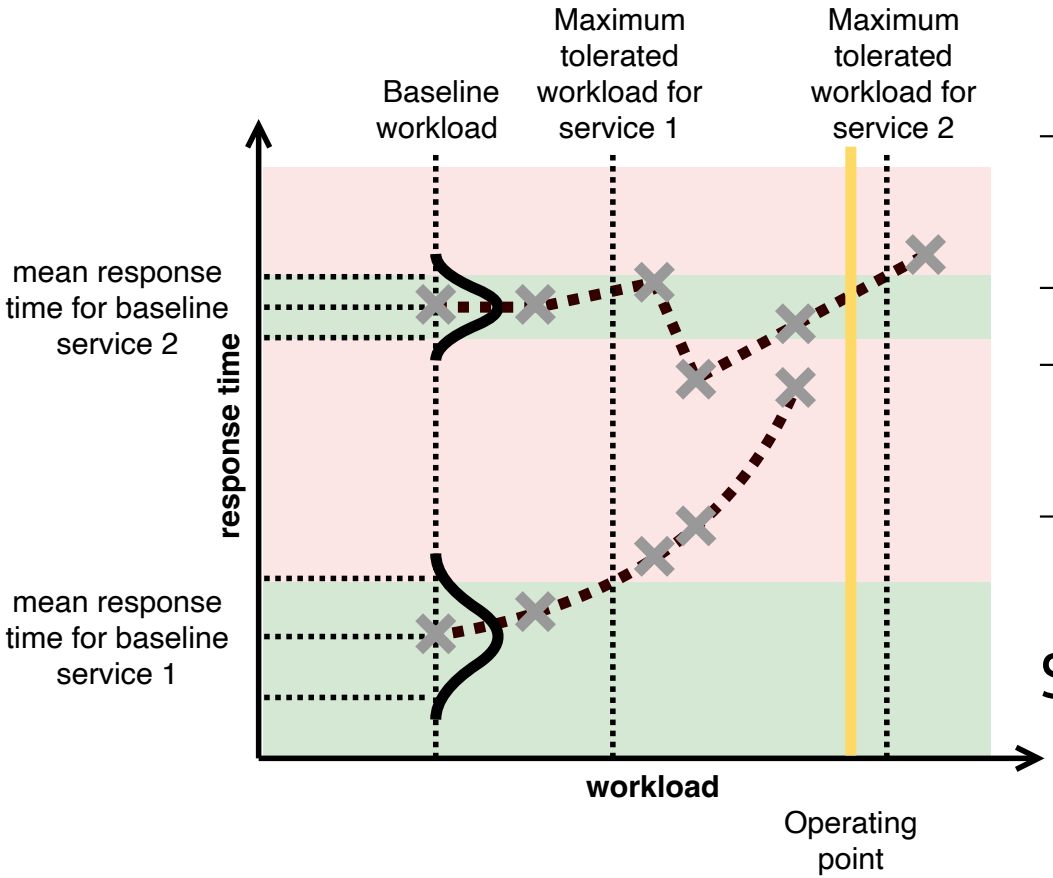
Pass/fail	pass	pass
Calls	20%	80%

Success rate=20% + 80%

Analysis of the results



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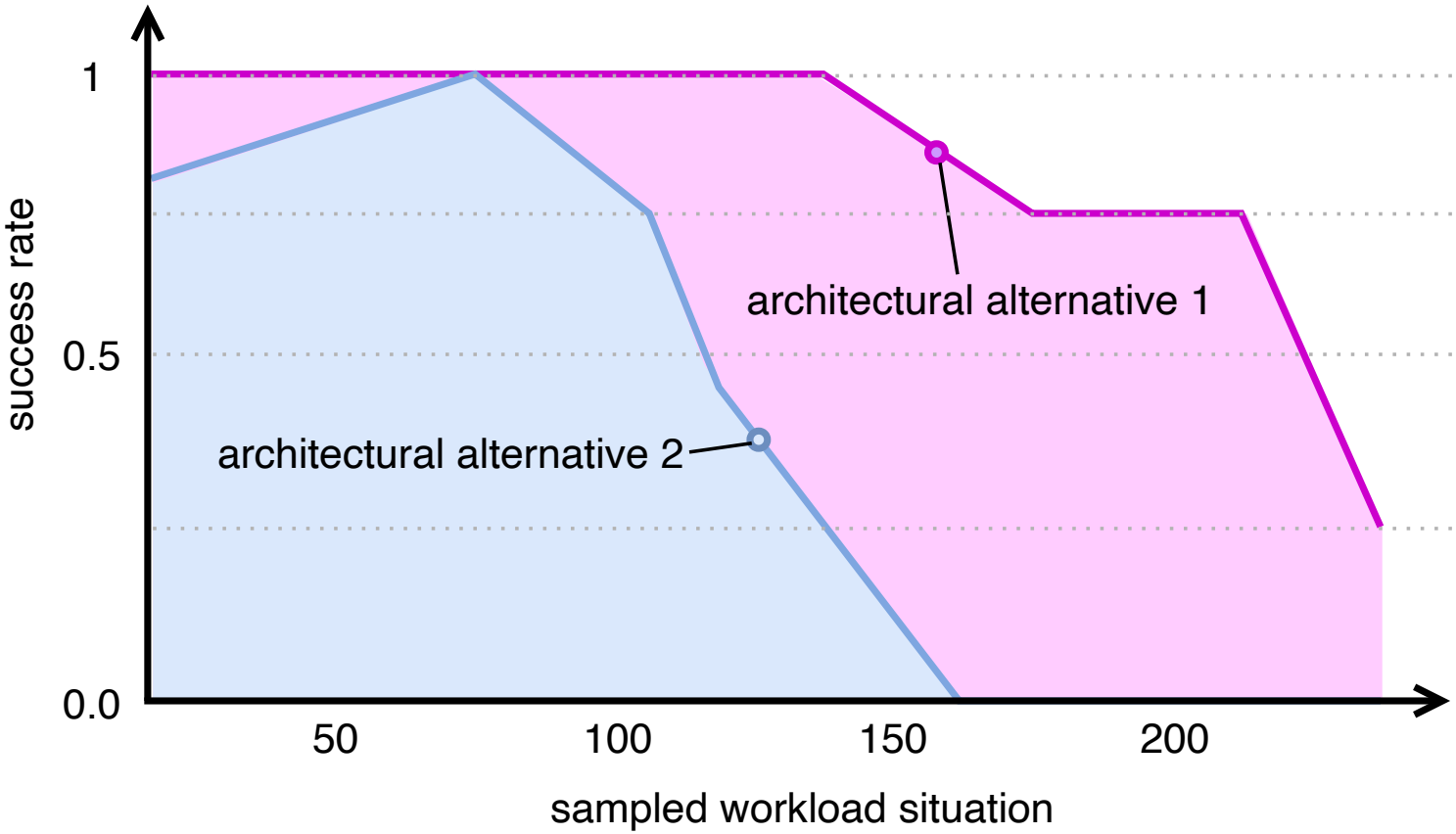
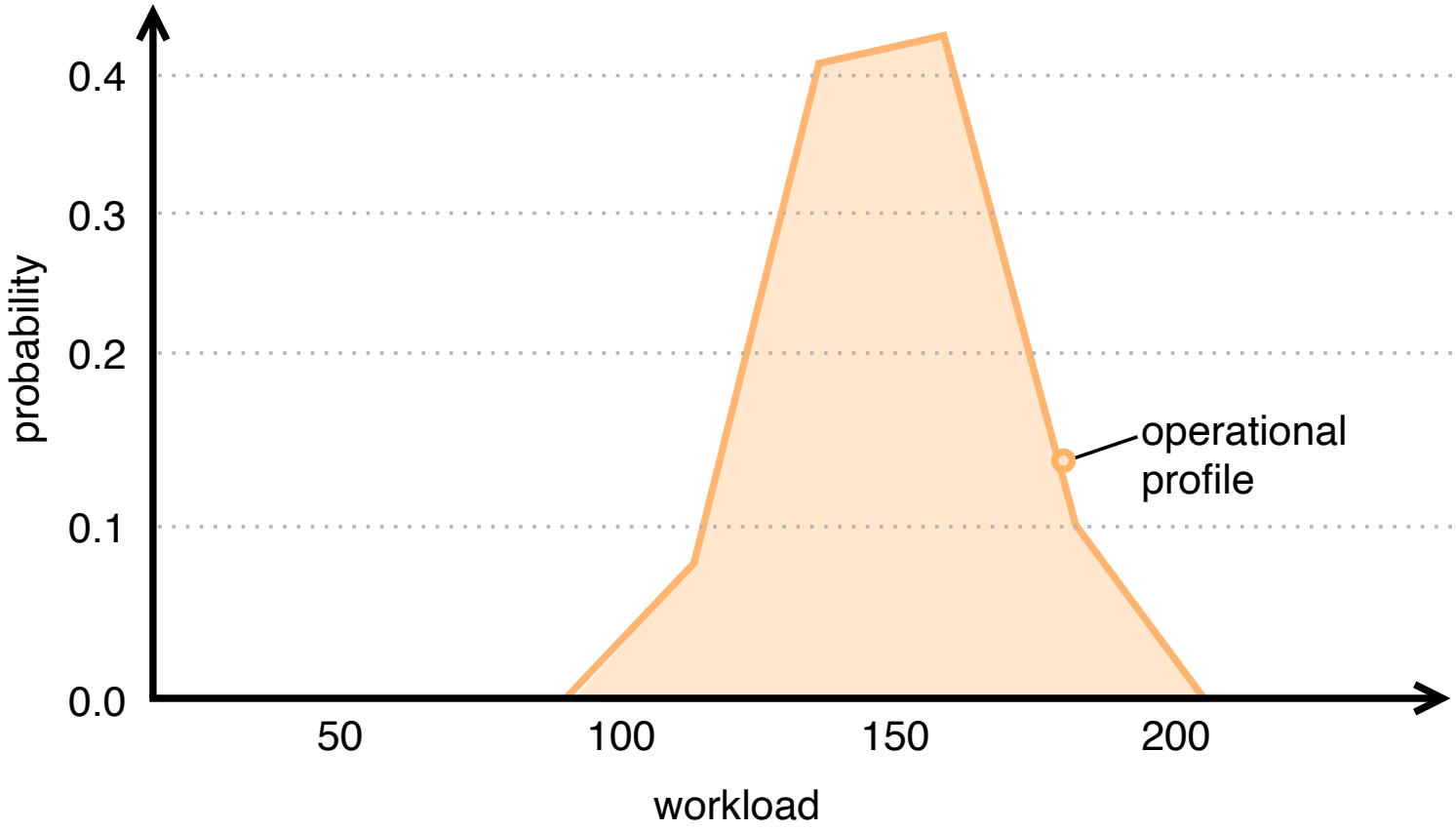
$\overline{x}(l_0)$	0.018	2.008
σ	0.008	0.003
Req.	0.042	2.017
$\overline{x}(l_{op})$	2.015	2.009
Pass/fail	fail	pass
Calls	22%	78%

Success rate=78%

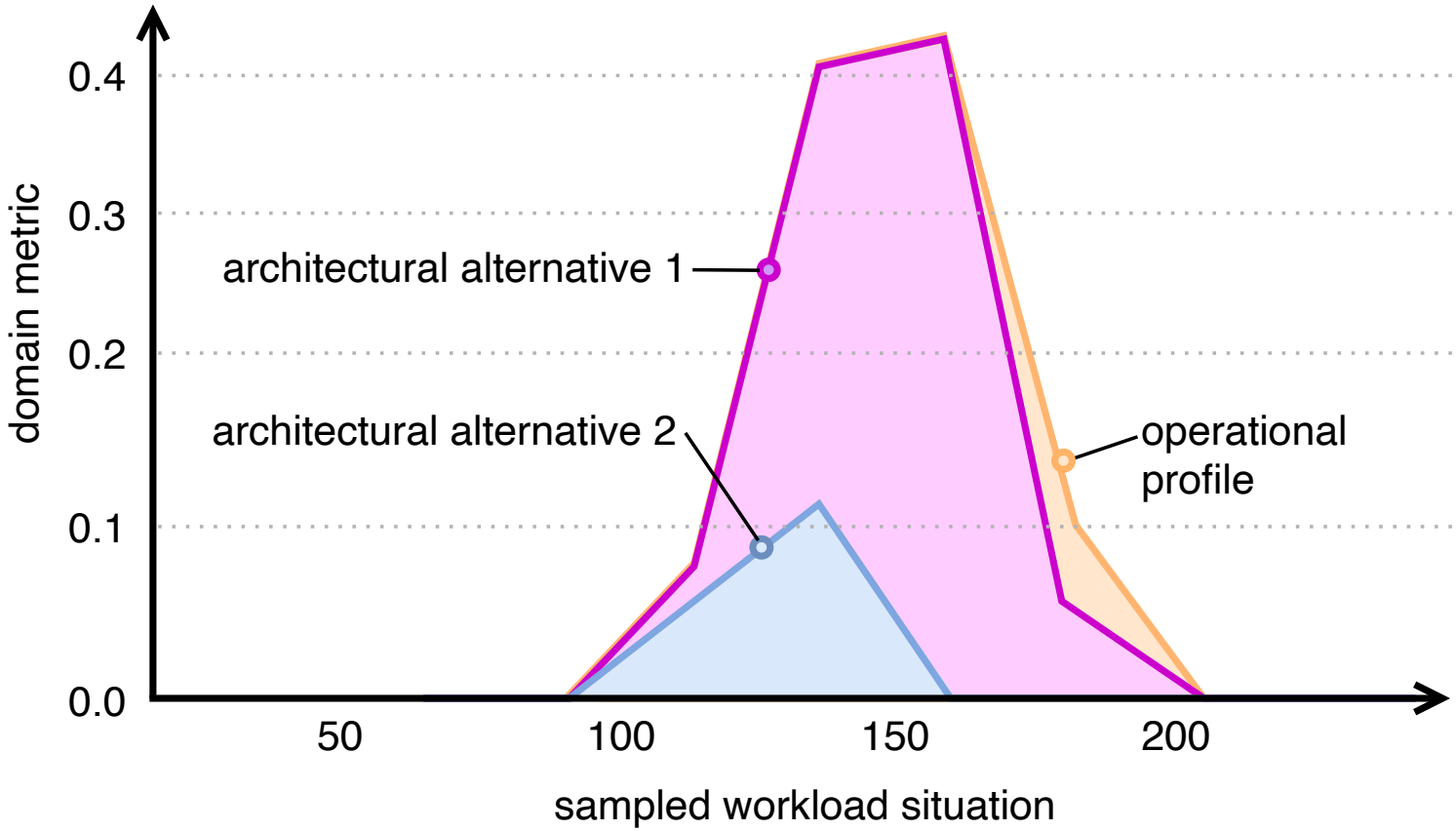
Success rate for different workloads



Operational profile



Success rate × probabilty



Contents

Setup a performance test

- Define the software under test
- Define how this software can be installed automatically
- Define the load test
- Configure PPTAM

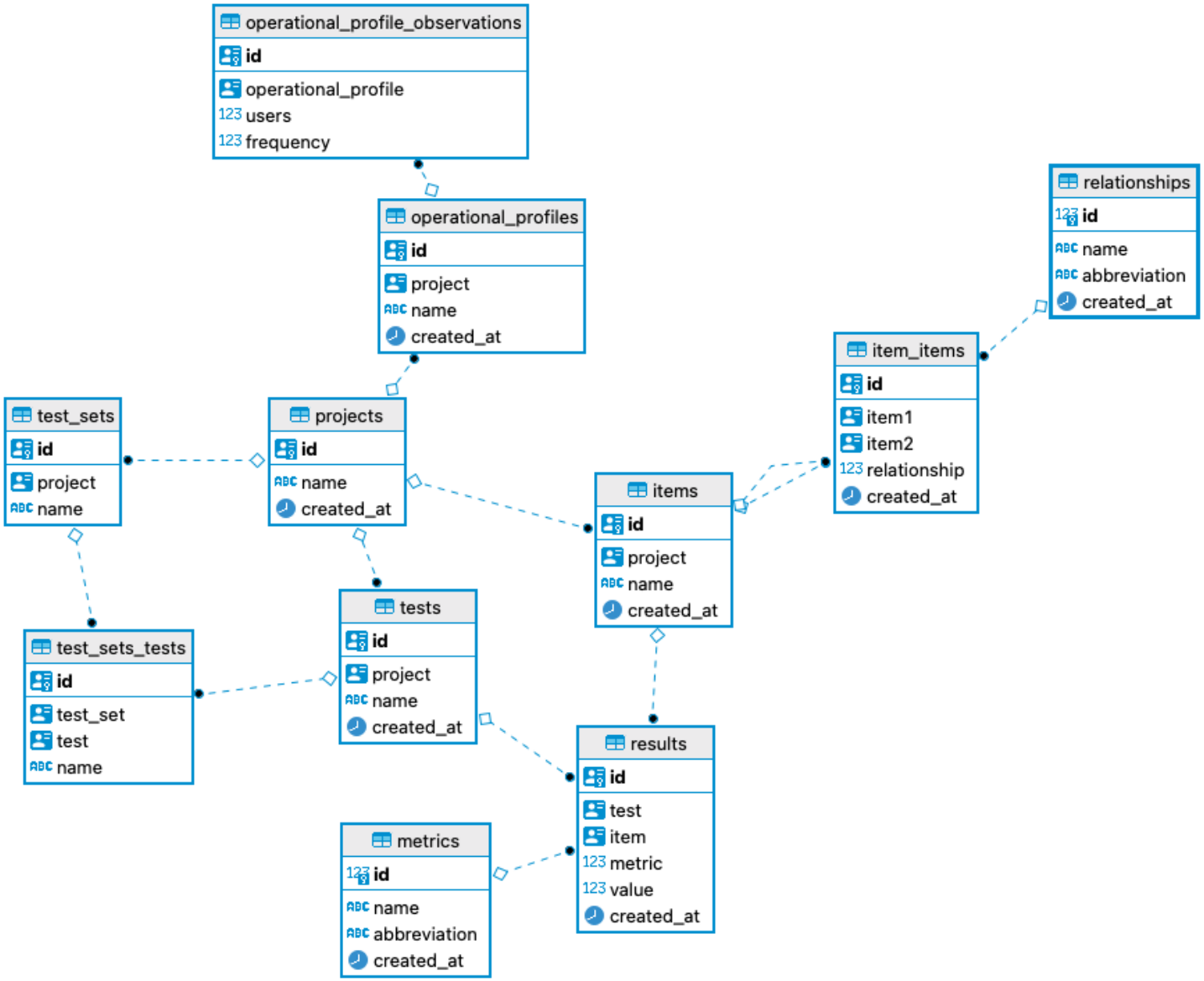
Execute performance tests

- Go to the folder **./toolchain**
- Execute **./execute.py ../design_sockshop_demo**
- Results are stored into the folder **./executed**

Analyze the results: store results into db

- Store each exeperiment into the database using store.py, e.g., **./store.py ../executed/20220919l121-sock_shop-test1**
  - Alternatively: **./store_all_experiments.sh**
- The db is a sqlite database, but you can also use a tool we developed:
  - **./manage.py projects list** visualizes all projects
  - **./manage.py profiles list "Demo Project"** visualizes the operational profiles stored together with the "Demo Project"

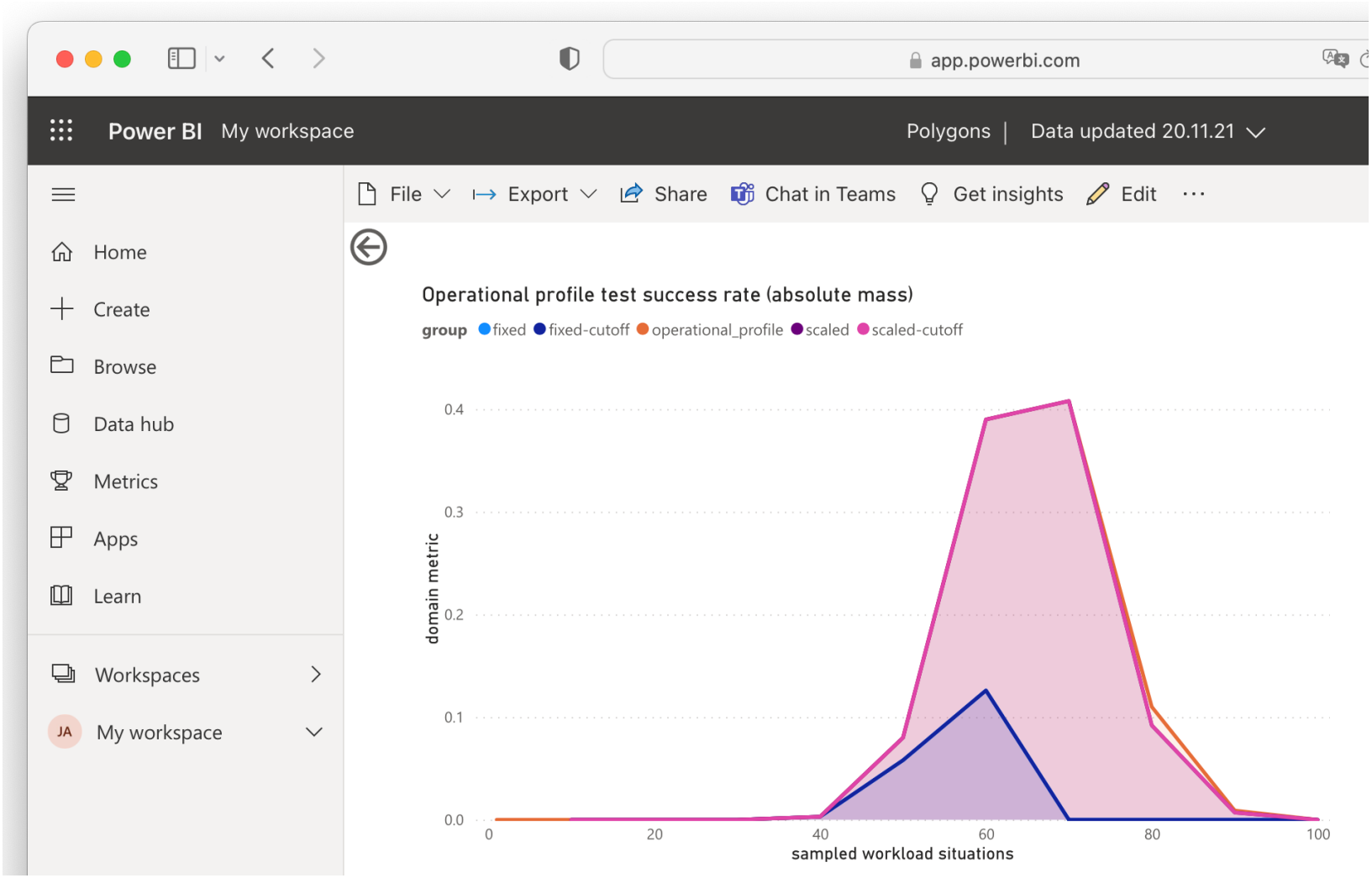
Database structure



Analyze the results: calculate polygons

- Export Polygons using **./analyze_polygons.py "Demo Project"**
- Visualize results e.g., using the Jupyter Notebook file **dashboard.ipynb**

Example Visualization



Thank you for your attention!