Optimal configuration and development

PLMIF
Innovation Forum

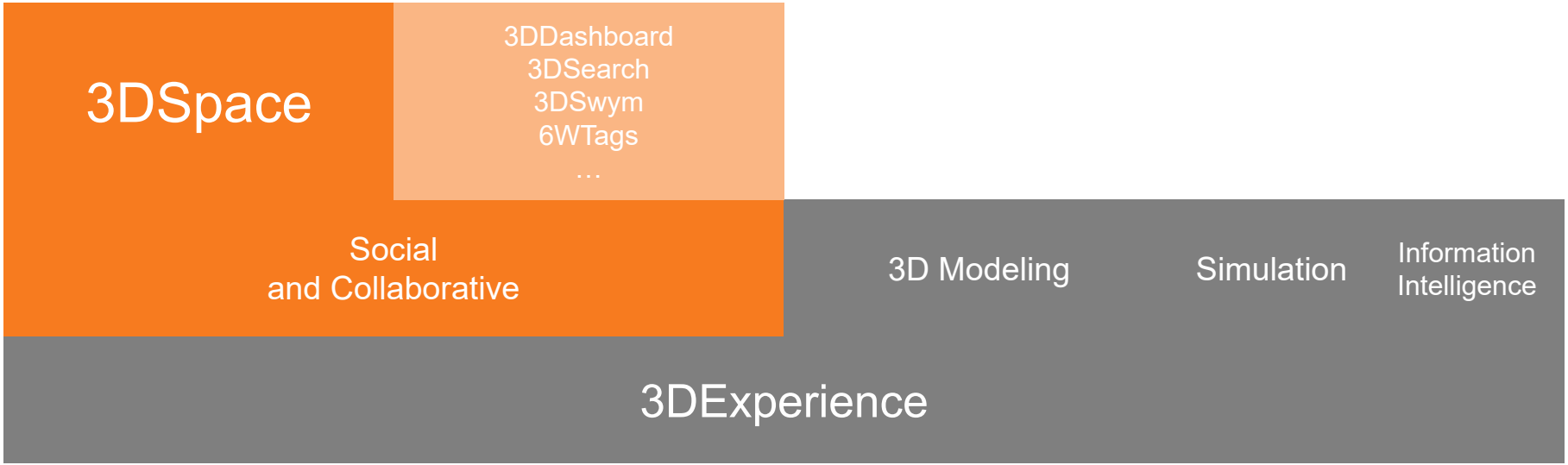
Dmitry Ponomarev
Application Developer, TECHNIA

DIGITALIZATION FOR SUSTAINABLE PRODUCT DEVELOPMENT AND MANUFACTURE

Content

- Scope
- General aspects:
  - Performance
  - Code quality
- Code Management
- Productivity tools

Scope



Scope

Tech stack

- Java
- Java Server Pages
- JavaScript
- Apache Tomcat
- MQL/TCL
- Other (VBScript, EKL, …)

Performance

Layers where developer can affect performance:

- Database interaction

- Java coding

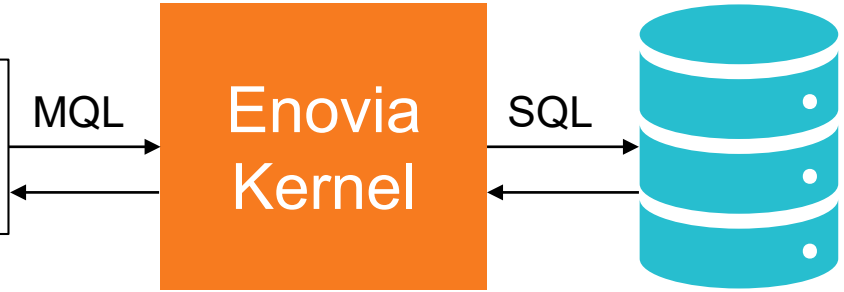
- Access model

Performance

Database interaction

- Main goal: minimize number of database calls

```
mql temp query bus Document * *
where 'current==Released &&
owner==Philip'
```



Performance

Database interaction

- Example: OOTB table vs. TVC DataHandler

Type	Name	Revision	Description
Part	A-0001	1	Shaft
`select type`	`select name`	`select revision`	`select description`

4 queries

Type	Name	Revision	Description
Part	A-0001	1	Shaft
`select type, name, revision, description`			

1 query

Performance

Database interaction

- Example: never retrieve data in a loop

```
// Never do something like this:
String[] objectIds = ...
for (String objectId : objectIds) {
      String type = ObjectUtils.select(objectId, Statement.TYPE);
}
// Do instead:
String[] types = ObjectUtils.select(objectIds, Statement.TYPE);
```

Performance

Database interaction

- Example: limit on queries and expansions

```
mql temp query bus Part * * limit 1 where 'attribute[Title]==Shaft'
```

- If the same object is used several times it should be cached

Performance

Java coding tips

- Keep low memory imprint: don’t create large amounts of objects unless necessary
- Use proper collection implementations
- Switching context is a slow operation
- Don’t reinvent basic functionality (e.g. sorting methods)

Performance

Access model

- Is user a system administrator?
  - Does user person definition doesn't allow the action?
    - Does the revoke definition of the policy prevent the action?
      - Does the policy definition allow the action (public, owner, user)?
        - Has this user been granted the access?
          - Is there a rule preventing the action?

Performance

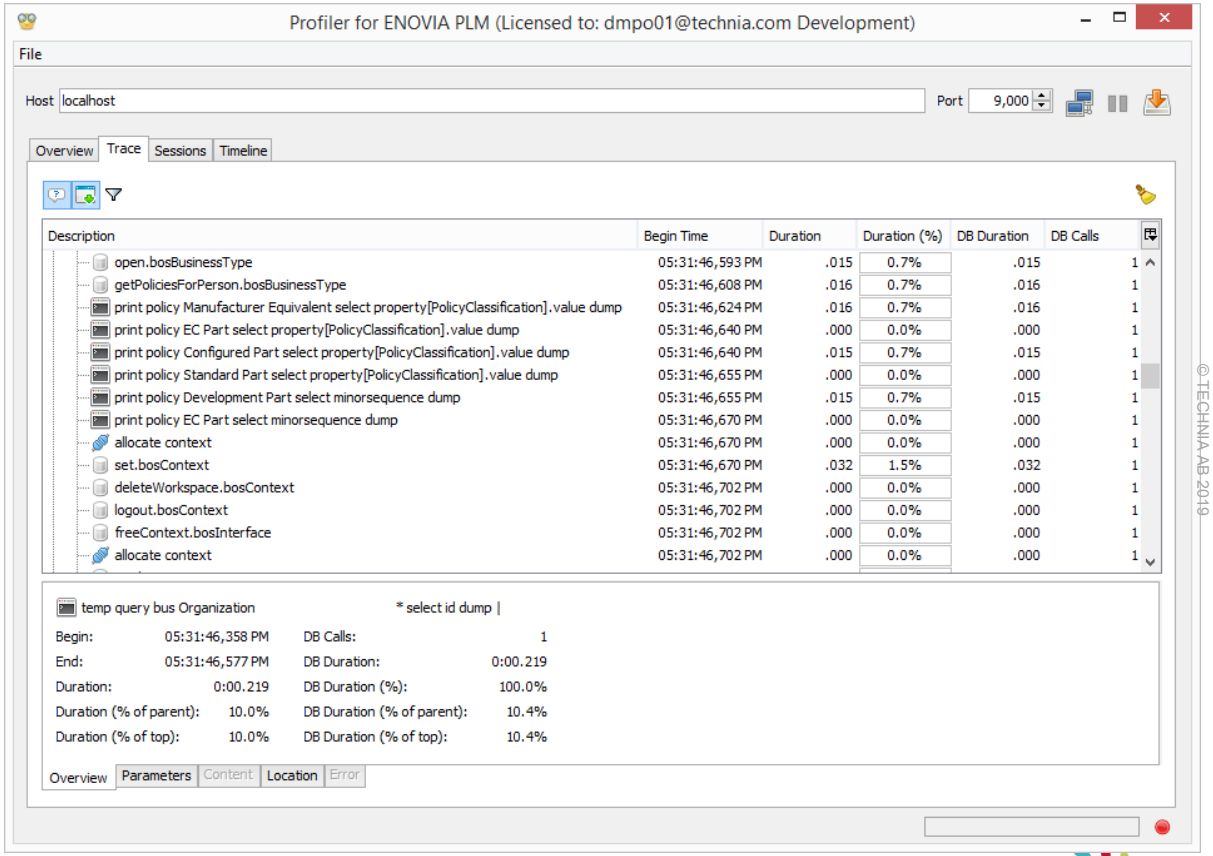
Tools

Technia Profiler

- Dynamic performance analysis

Set KPIs and follow up:

- No query over 4 seconds
- Max 20 queries per action



Code quality

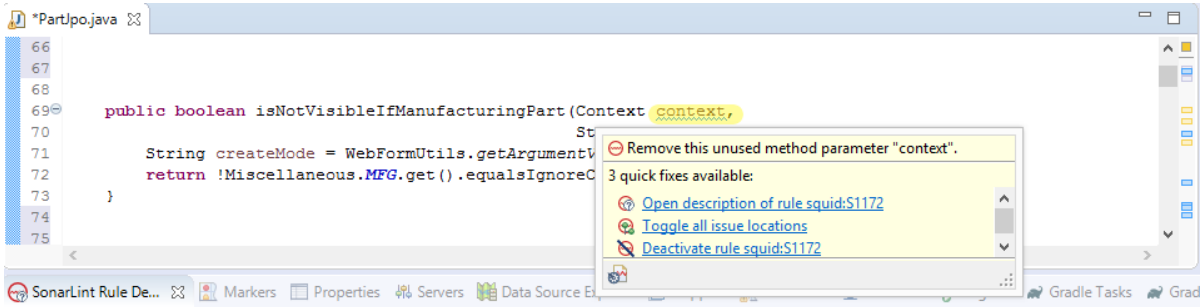
Java coding tips

- Design for high cohesion and loose coupling
- Don’t duplicate code
- Know the rules of using Enovia context
- Avoid nested transactions
- Store custom logic in POJOs instead of JPOs
- Methods should never return null
- Define detailed custom exceptions

Code quality

Tools: Static Code Analysis

- SonarLint
  - Detects bugs and bad practices
  - Instant feedback
  - Facilitates learning



Unused method parameters should be removed (squid:S1172)

Code smell Major

Unused parameters are misleading. Whatever the values passed to such parameters, the behavior will be the same.

Noncompliant Code Example

```
void doSomething(int a, int b) {     // "b" is unused
  compute(a);
}
```

Compliant Solution

```
void doSomething(int a) {
  compute(a);
}
```

Code quality

Tools: Static Code Analysis

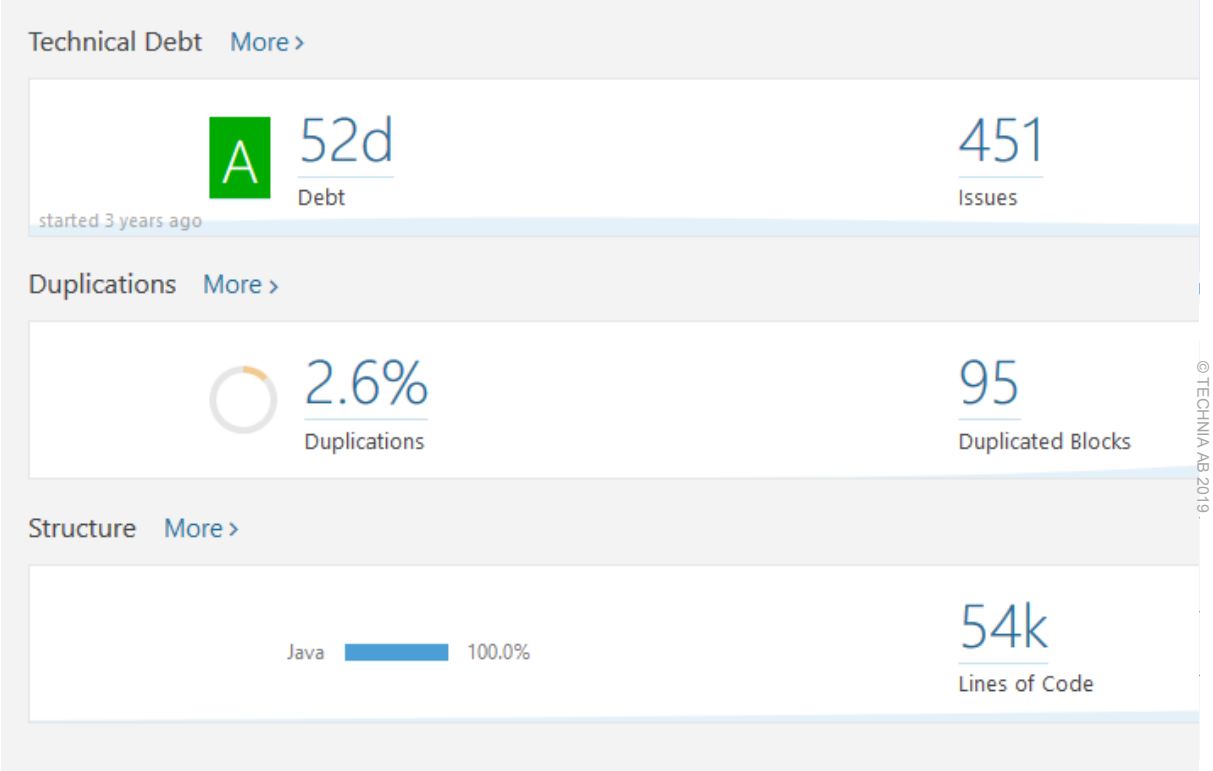
- SonarQube
  - Detects bugs and bad practices
  - 25+ languages
  - Custom rule sets

sonarqube

Code quality

Tools: Static Code Analysis

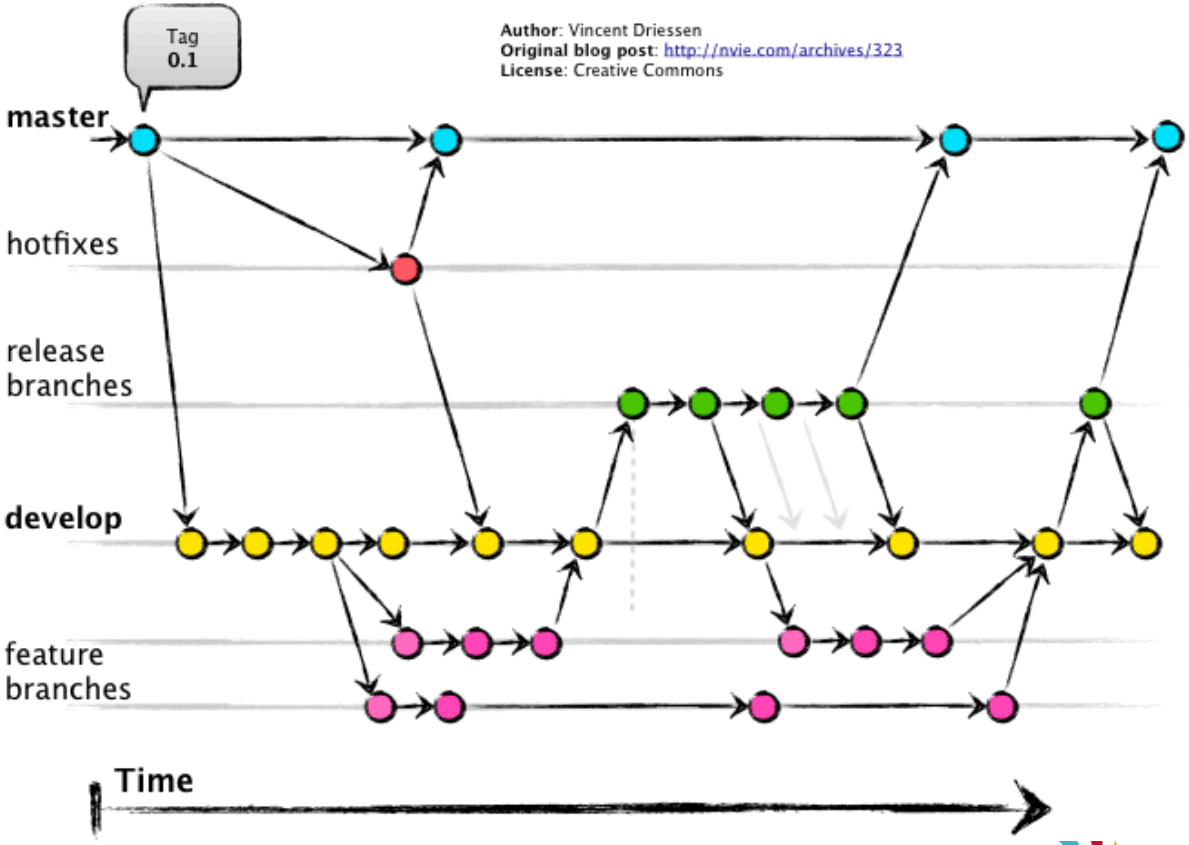
- SonarQube
  - Code quality metrics
  - Technical debt tracking



Code Management

Tools: Version Control

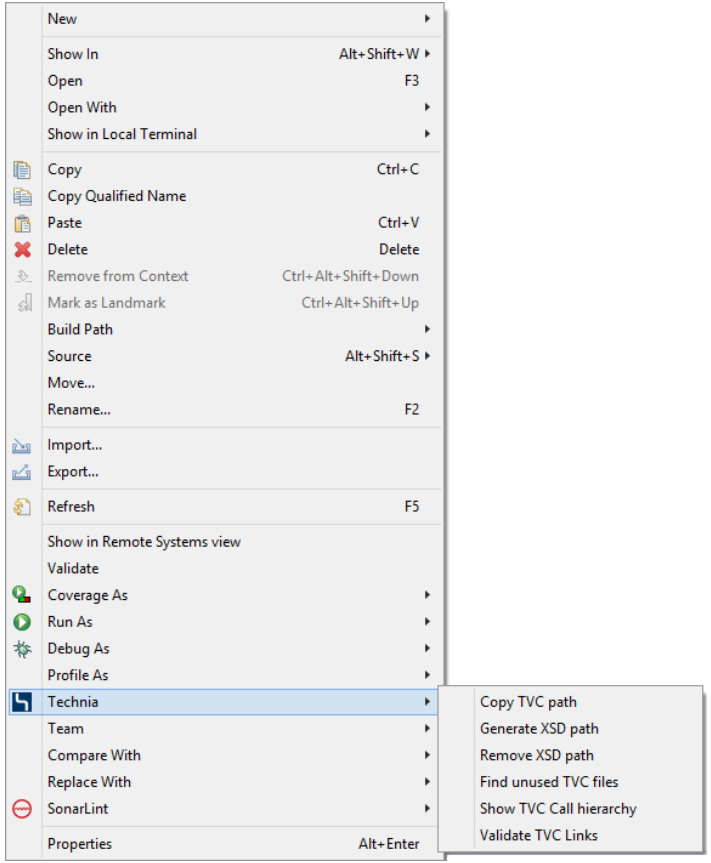
- GIT (GitFlow)
  - Full history tracking
  - Branching model



Productivity Tools

Eclipse plugin

- Faster and simpler configuration of TVCs:
  - Generates links for config files
  - Enables quick navigation through config files
  - Validates configs against schema
  - Finds related configurations
  - Finds unused files



Productivity Tools

Runtime class redefinition

- JRebel/DCEVM + HotswapAgent
  - “Hot deployment” of code changes:
    - Java classes
    - Resource files
    - Web application files

Q & A

Optimal configuration and development
Best practices for efficient and reliable 3DX configuration and customization

Dmitry Ponomarev
Application Developer
dmitry.ponomarev@technia.com

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