Total Hands-Off Globalization

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Tools and Technologies that Lead to Completely Hands-Off, Fully Automated, Product Globalization

Static Code Analysis

Globalization (G11n) Services

Parallel Testing

UI Validation

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Static Code Analysis

Static Code Analysis

- What is static code analysis?
  - Analysis of software that is performed on source/object code without actually executing programs

- Why do static code analysis?
  - Testing cannot keep pace without automation
  - Finding issue earlier in the development cycle
  - More thorough coverage
    - "Testing finds only 1 in 3 bugs in code"*

*https://www.perforce.com/webinars/how-improve-quality-static-code-analysis

Static Code Analysis and the Power of ASTs

- What are Abstract Syntax Trees?

- Why are these important?
  - Accuracy
  - Greater context, for example:
    - parameters
    - return types
    - calling classes
    - surrounding comments
    - And more

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Static Code Analysis w/SonarQube
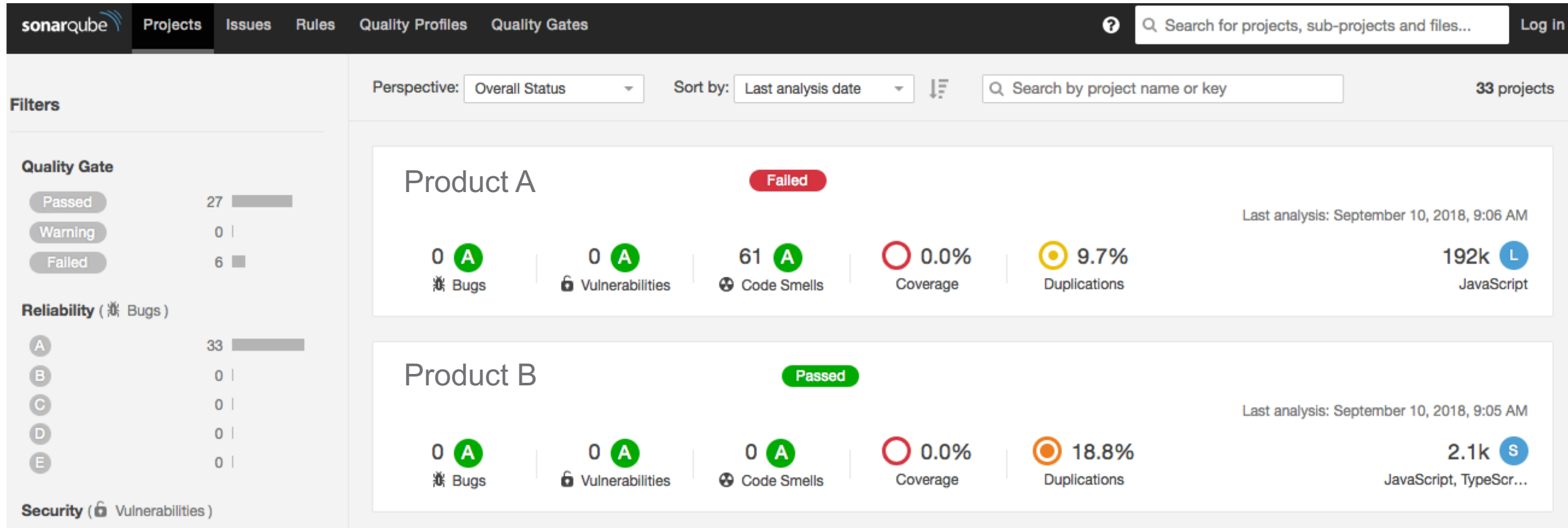
Targeted Rule Set Coverage

Java

- I/O
  - java.io InputStreamReader
  - Java.io.OutputStreamWriter
  - \<String\>.getBytes
  - String constructor
  - \<HttpResponse\>.getOutputStream
  - Legacy encoding (as literals)
- Locale
- Formatting
  - DateFormat & SimpleDateFormat
  - NumberFormat & Currency
- Sorting (Collator)
- ResourceBundle
- MessageFormat & ChoiceFormat

JavaScript

- Locale
- Formatting
  - .toLocaleString() for dates and numbers
  - Intl.DateTimeFormat
  - Intl.NumberFormat
  - Negative scanning for new Date()
- Sorting
  - Negative scanning for Array.prototype.sort()
  - String.prototype.localeCompare
  - Intl.Collator
- Angular pipes
- Other JS Libaries (as literals)

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And more…

True Positive Example

```
    JsonObject wrapper = new JsonObject();
    wrapper.addProperty("$array", className);
    wrapper.add("$value", serialized);
    serialized = wrapper;
} else if (serialized instanceof JsonNull) {
    log.trace("Serializing JSON null due to null input");
} else {
    throw new RuntimeException("Unexpected serialized data for type: " + o);
}

b.writeBytes(serialized.toString().getBytes());
}
```

YES

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False Positive Examples

```java
private List<String> readCertificateChain(File file) throws IOException {
    final List<String> certificate = new ArrayList<>();
    try (FileInputStream in = new FileInputStream(file);
            InputStreamReader inStreamReader = new InputStreamReader(in, StandardCharsets.US_ASCII);
            BufferedReader reader = new BufferedReader(inStreamReader)) {
        String line;
        List<String> current = new ArrayList<>();
```

NO

Have to put it back to business context, although charset US_ASCII appeared in the method

How to write rules with AST?

TypeScript code:


```
this.coexistenceService.addNotification({

           ……

    timestamp: new Date().toLocaleString(),

           ……

});
```

AST - new Date().toLocaleString():

```
- CallExpression
    - PropertyAccessExpression
        - NewExpression
        - Identifier
              …
              text: "toLocaleString"
    - arguments:[ ]
```

From the I18n perspective, toLocaleString() need a locale argument, using AST to check it:
1. The method name: toLocaleString.
2. The argument is empty.
3. Get the NewExpression AST node type by calling TypeScript library: Date.

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SonarQube Demo
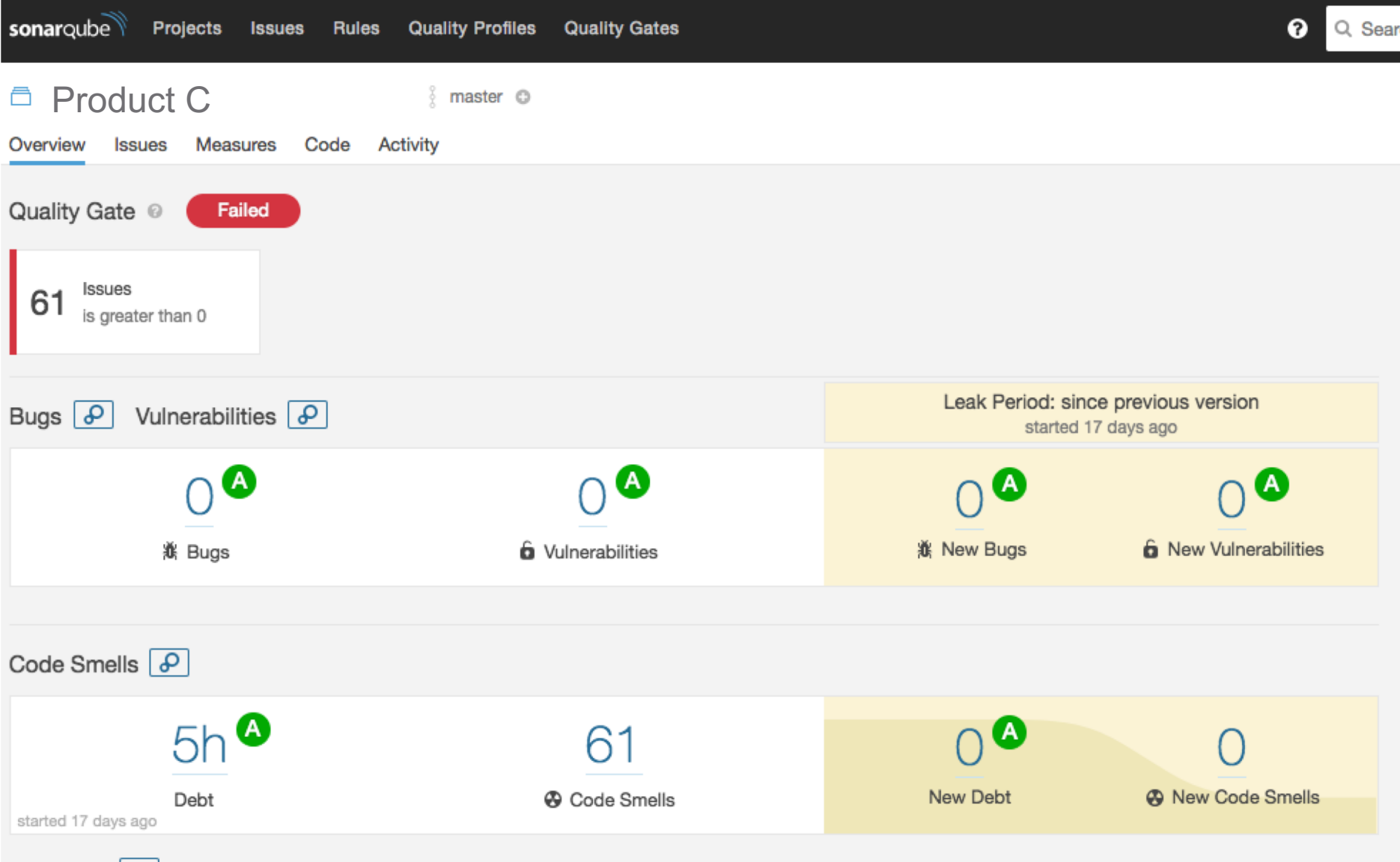
Globalization (G11n) Services

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Product Globalization – Requirements, Tasks, and Goals

- **Requirements**
  - With the advent of SaaS and Agile software development processes, companies like VMware must deliver web/cloud applications in an ever-fast paced environment – moving from traditional, long releases to releases as short as days or even daily and efficiently delivering sim-ship localized products with a high level of quality.
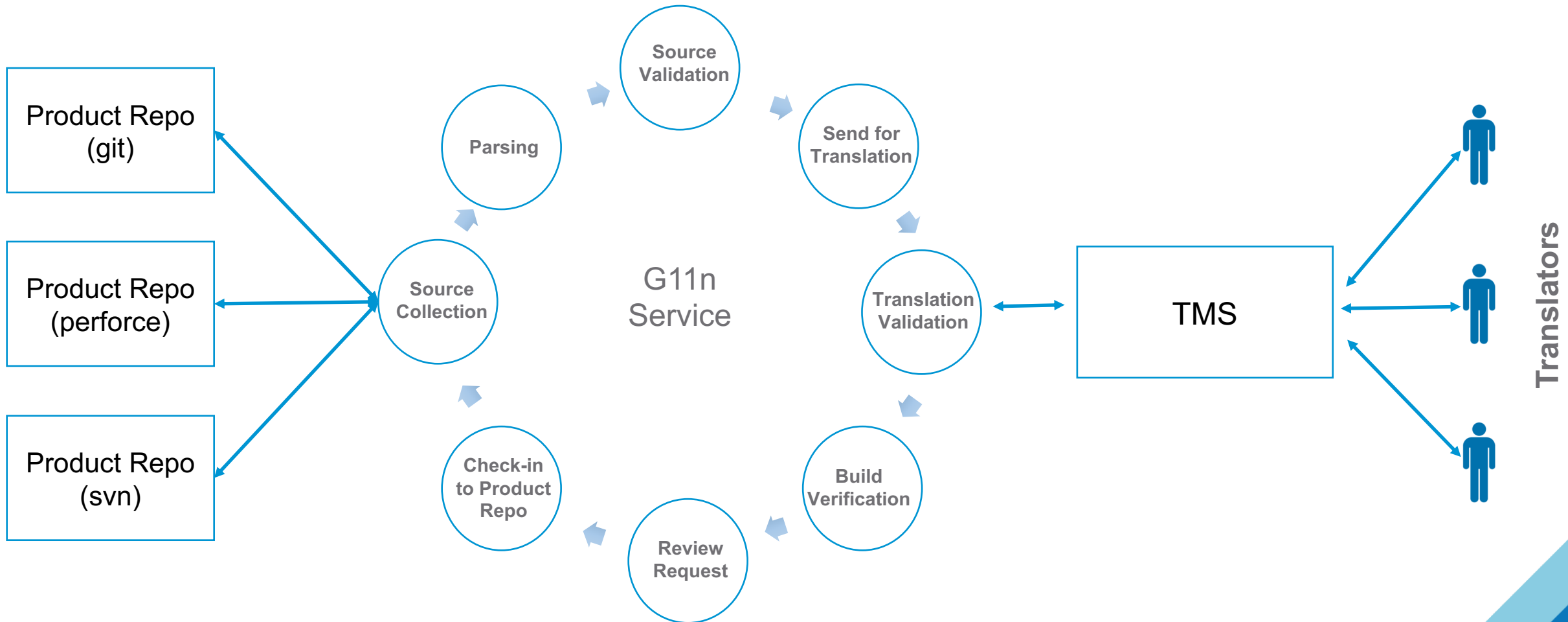
- **Tasks**
  - Collect English Source
  - Send Source for Translation
  - Return Translations to Product

- **Goal**
  - All product globalization tasks and processes are completely hands-off and fully automated

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Product Globalization – The Old Way

Product Repo (git)

Product Repo (perforce)

Product Repo (svn)

Source Collection

Parsing

Source Validation

Send for Translation

Translation Validation

Build Verification

Review Request

Check-in to Product Repo

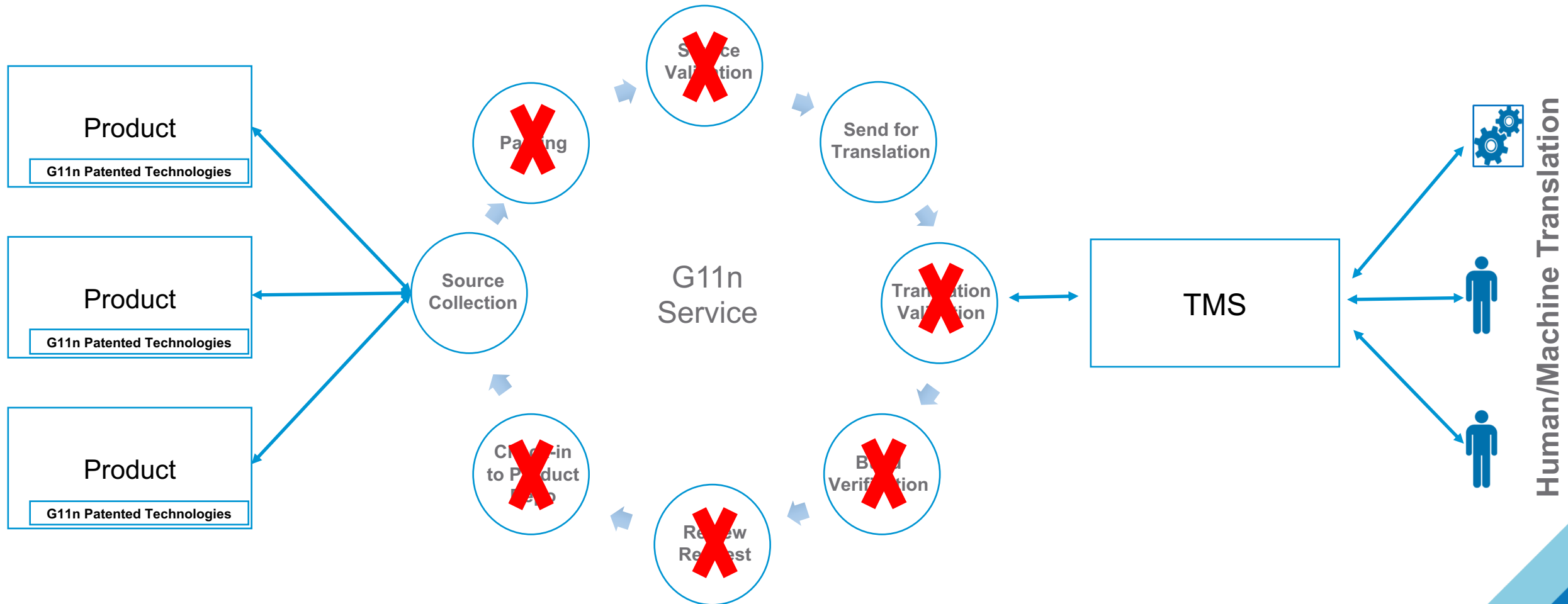G11n Service

TMS

Translators

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Challenges Keeping Us Busy/Still Hands-on

- Source code locations are not always known/shared

- New source file formats keep getting added

- Translators delivery errors in format, encoding, and more frustrate efforts

- Message issue verification paths are anything but clear; where are such messages coming from?

Thoughts

- What if products could automatically inform what source and location are required for translation?

- What if products could send in the source with the same format regardless the programming languages?

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Product Globalization – The New Diagram

Product

G11n Patented Technologies

Product

G11n Patented Technologies

Product

G11n Patented Technologies

Source Collection

Packing

Source Validation

Send for Translation

G11n Service

Translation Validation

Build Verification

Review Request

Check-in to Product DEPO

TMS

Human/Machine Translation

Completely Hands-Off and Fully Automated!

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Hands-Off Globalization Services - Demo

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Parallel Testing

vTaaS: VMware Test as a Service

Key Features

- Automatic VM/Product Deployment
- Parallel Web UI testing for Multiple Languages & Browsers
- vTaaS Automation: Automatic Record & Replay
- Intelligent UI Defect Identification
- One click to Report and Reproduce Bug
- Screenshot Capture, Search Keyword
- UI Change Identification

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vTaaS Reporting

replay
THURSDAY, AUGUST 30 2018, 05:40PM

| 1:12 M | 1 SUITE | 77 TESTS | 77 PASSED | 0 FAILED | 0 PENDING |

0% PENDING   100% PASSING

script/test.spec : chrome
/script/test.spec.js

⏱ 48.429 s   📋 77   ✓ 77   ✗ 0   ❚❚ 0

Tests	⌄
✓ open url https://10.192.219.45	Show Code | **841 ms**
✓ waitBody	Show Code | **1.45 s**
✓ mouse move on username	Show Code | **1.45 s**
✓ single click on username	Show Code | **1.37 s**
✓ sendKeys a	Show Code | **17 ms**

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Product Globalization
- Completely Hands-Off, Fully Automated, Final Flow

Product

G11n Patented Technologies

Product

G11n Patented Technologies

Product

G11n Patented Technologies

G11n Service

Source Collection

Code Analysis

Translation

Parallel Testing

UI Validation

TMS

Human/Machine Translation

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Total Hands-off Globalization

Q&A