



NIAGARA SUMMIT 2026

SEAMLESS CONNECTIVITY,
POWERFUL INTELLIGENCE

TRIDIUM 

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Logistics

- Accessibility – please ask the team
- Slides and videos will be published later
- Q&A Session
- support@tridium.com



Photography allowed

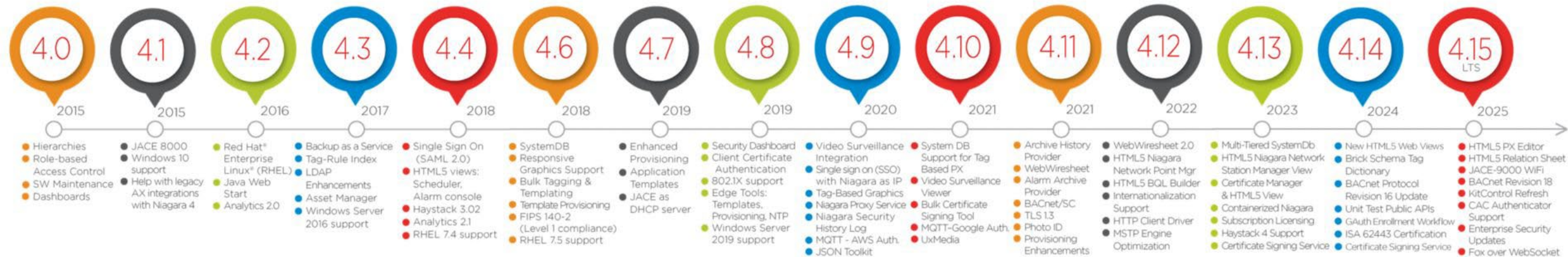


Fire exit – behind you



Silence Electronic Devices

Niagara 4 Timeline



Niagara 5 Module Transition



PATRICK SAGER
Sr Advanced Software
Engineer | Tridium



MIKE JAMES
Sr Advanced Software
Architect | Tridium



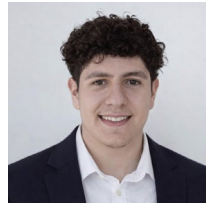
**PRINSTON
REBELLO**
Software Engineer 2 |
Tridium



**UDAY KUMAR
RAPURU**
Sr Advanced Software
Engineer | Tridium



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Tridium





INTRO TO NIAGARA 5

PATRICK SAGER

**NIAGARA
SUMMIT
2026
DEVELOPER**

Java 25

- New language features
- Modularity
- Security Manager removal



Security

- Deprecation of non-TLS Fox and Web
- Module signing



Installer and Directory Structure

- New installers and install locations
- Niagara Home read-only
- Niagara Config Home

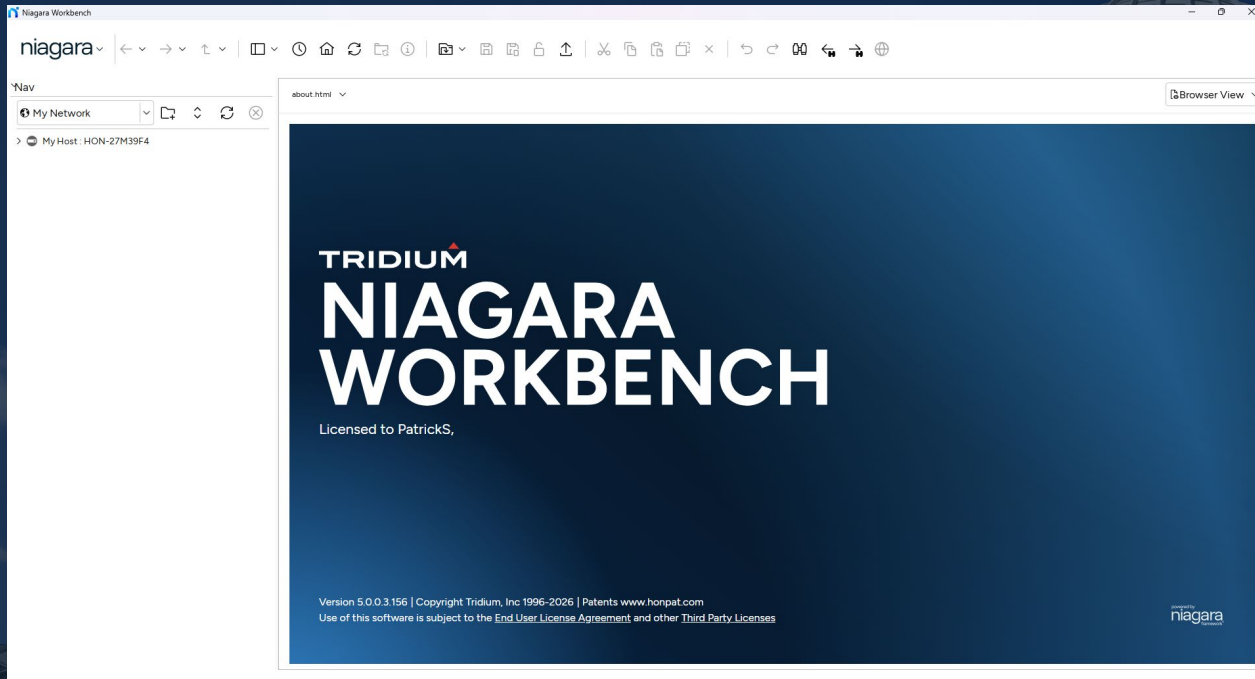
Directory	Niagara 4 Location	Niagara 5 Location
Niagara Home	C:\Niagara\Niagara-4.x.y.z	C:\Program Files\Niagara\5.x.y.z
Niagara Config Home	N/A	C:\ProgramData\Niagara\<brandId>\config\5.x.y.z
Niagara User Home	C:\Users\<username>\Niagara4.x\<brandId>	C:\Users\<username>\Niagara\<brandId>\5.x
Daemon User Home	C:\ProgramData\Niagara4.x\<brandId>	C:\ProgramData\Niagara\<brandId>\daemon\5.x

Public API Updates

- javax.baja -> niagara
- Newly public APIs
- Breaking changes



UI Updates



- Workbench overhaul
- Enhancements to Theme API and NSS
- Removal of WebLauncher
- BajaUx updates

Miscellaneous

- Module part removal
- Gradle updates
- Jetty 12.1 and jakarta.servlet





**UP NEXT:
MODULE COMBINATION
WITH MIKE**



MIGRATING TO N5: MODULE PART REUNION

Mike James

**NIAGARA
SUMMIT
2026
DEVELOPER**

Hi!



WHAT ARE WE TRYING TO DO?

Let's do this

AX

N4
Multi-Part

N4
Single-Part

N5

niagaraTenantBilling.jar
niagaraTenantBillingTest.jar



niagaraTenantBilling-rt.jar
niagaraTenantBilling-rtTest.jar
niagaraTenantBilling-wb.jar
niagaraTenantBilling-wbTest.jar
niagaraTenantBilling-ux.jar
niagaraTenantBilling-uxTest.jar



niagaraTenantBilling-rt.jar
niagaraTenantBilling-rtTest.jar



niagaraTenantBilling.jar
niagaraTenantBillingTest.jar

WHAT ARE WE NOT TRYING TO DO?

We are not converting N4 to N5 here, stay tuned.



REUNION ANXIETY?

Don't worry. Combining modules is **much easier** than separating them.

Module already single part?
Step One: You're done!

REUNION ANXIETY?

What were the steps for separation?

1. acme.jar

2. ??????????

3. acme-rt.jar acme-ux.jar acme-wb.jar

REUNION ANXIETY?

What are the steps for reunion?

1. acme-rt.jar acme-ux.jar acme-wb.jar
2. (acme-rt.jar **U** acme-ux.jar **U** acme-wb.jar)
3. acme.jar

WHAT YOU NEED TO BEGIN

N4 Module(s) (I'll use niagaraTenantBilling)

3-way Diff Tool (I'll use WinMerge)

... a little bit of Set Theory know-how wouldn't hurt

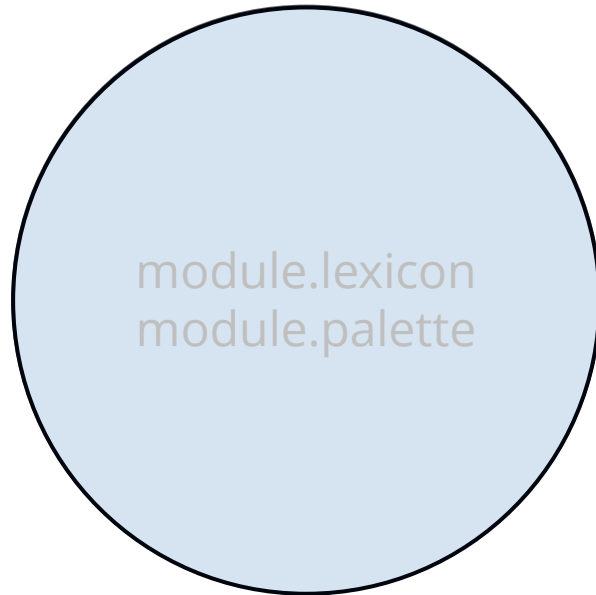
REUNION START

Filename	Comparison Result
> src	Folders are different
> srcTest	Folders are different
> tutorials	Middle only: D:\NS2026\niagaraTenantBilling-ux
Gruntfile.js	Middle only: D:\NS2026\niagaraTenantBilling-ux
module-include.xml	Text files are different
module-permissions.xml	Right only: D:\NS2026\niagaraTenantBilling-wb
module.lexicon	Left only: D:\NS2026\niagaraTenantBilling-rt
module.palette	Left only: D:\NS2026\niagaraTenantBilling-rt
moduleTest-include.xml	Does not exist in D:\NS2026\niagaraTenantBilling-ux
niagaraTenantBilling-rt.gradle.kts	Left only: D:\NS2026\niagaraTenantBilling-rt
niagaraTenantBilling-ux.gradle.kts	Middle only: D:\NS2026\niagaraTenantBilling-ux
niagaraTenantBilling-wb.gradle.kts	Right only: D:\NS2026\niagaraTenantBilling-wb
package-lock.json	Middle only: D:\NS2026\niagaraTenantBilling-ux
package.json	Middle only: D:\NS2026\niagaraTenantBilling-ux
tags.gradle	Text files are different (Left and right are identical)
yarn.lock	Middle only: D:\NS2026\niagaraTenantBilling-ux

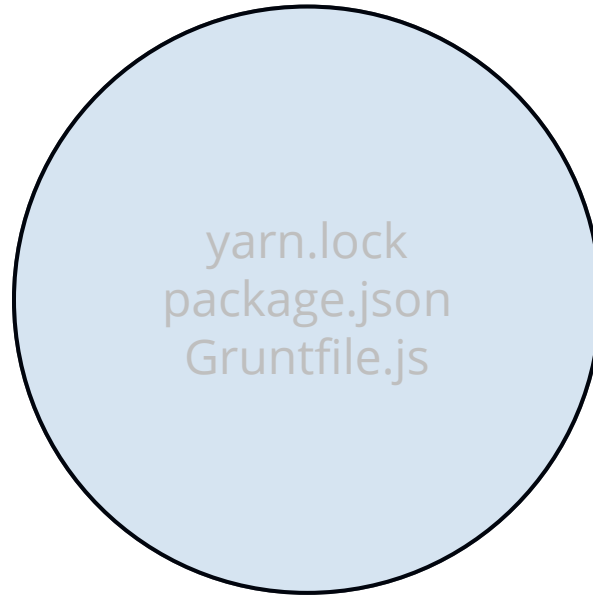
Elapsed time: 944 ms ** Full Contents Item 1 of 16

LET'S START WITH EASY CASES...

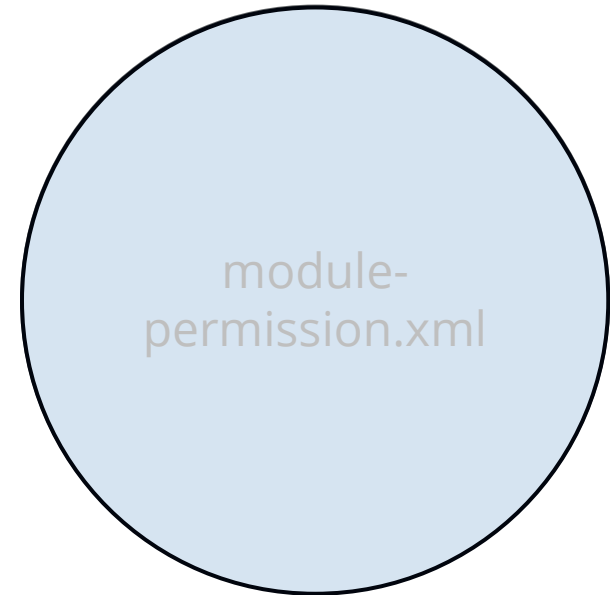
-rt



-ux

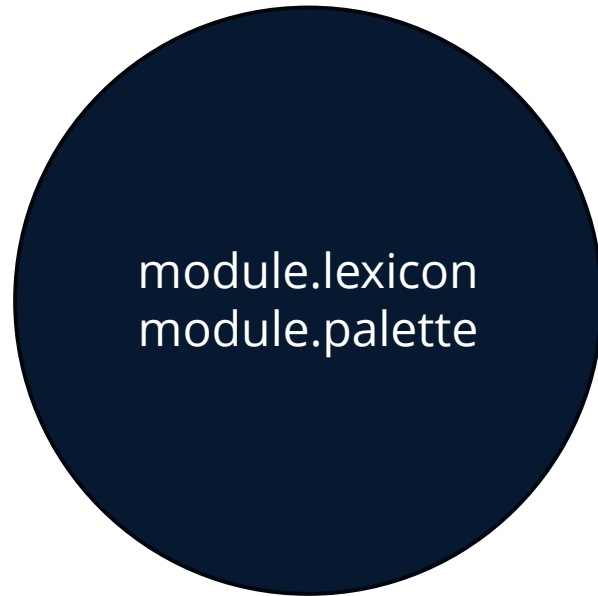


-wb



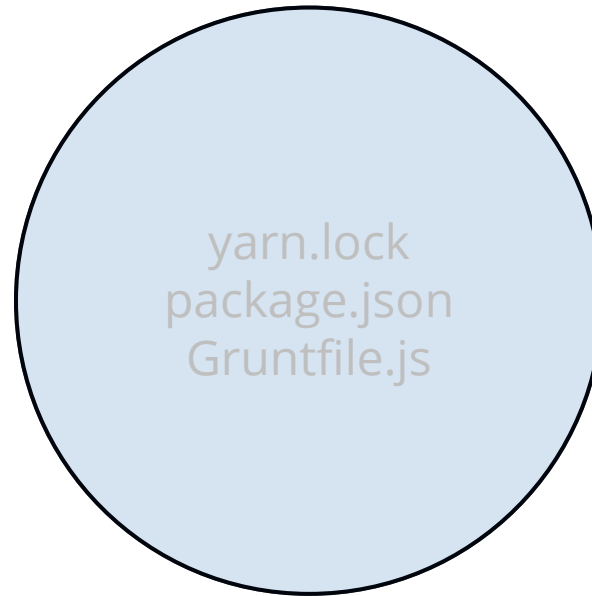
LET'S START WITH EASY CASES...

-rt

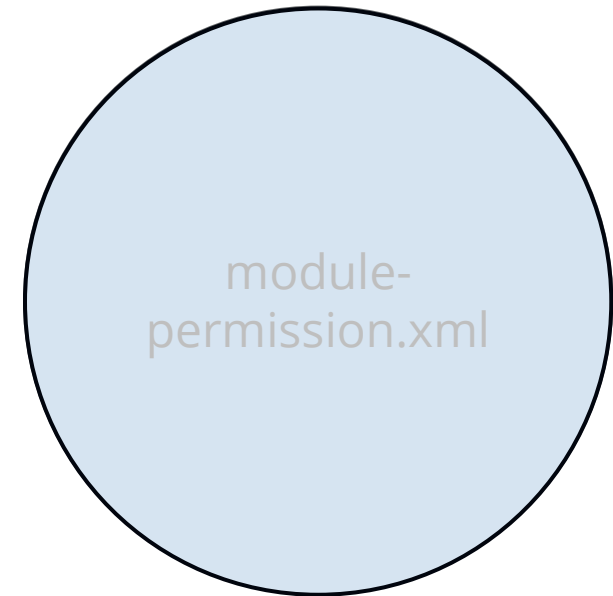


“Left Only”

-ux

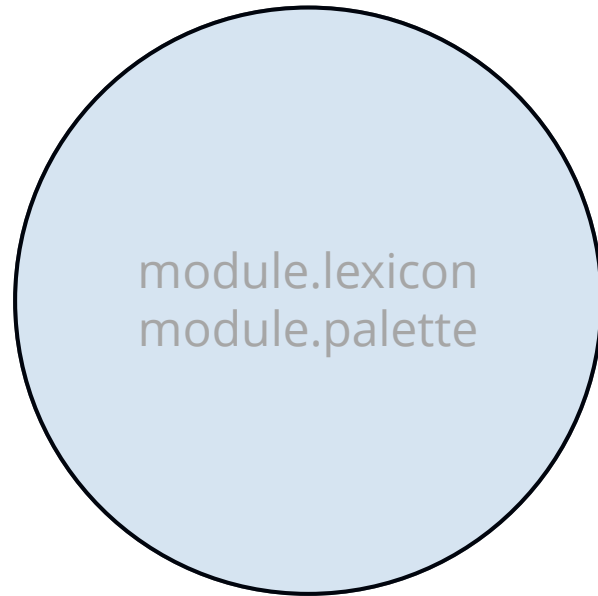


-wb



LET'S START WITH EASY CASES...

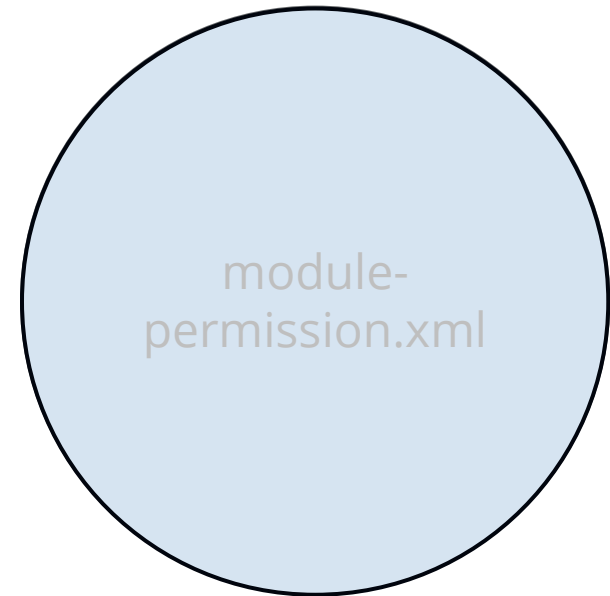
-rt



-ux



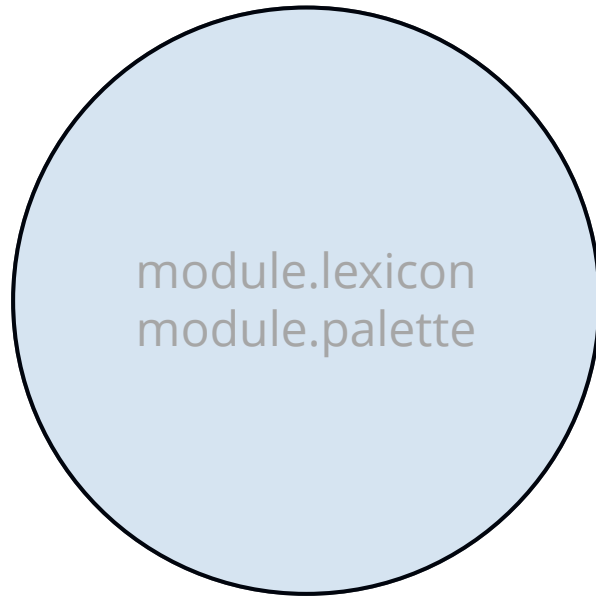
-wb



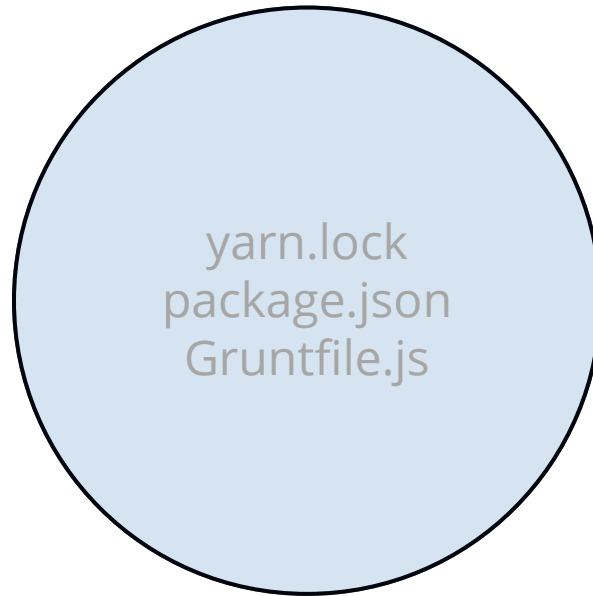
“Middle Only”

LET'S START WITH EASY CASES...

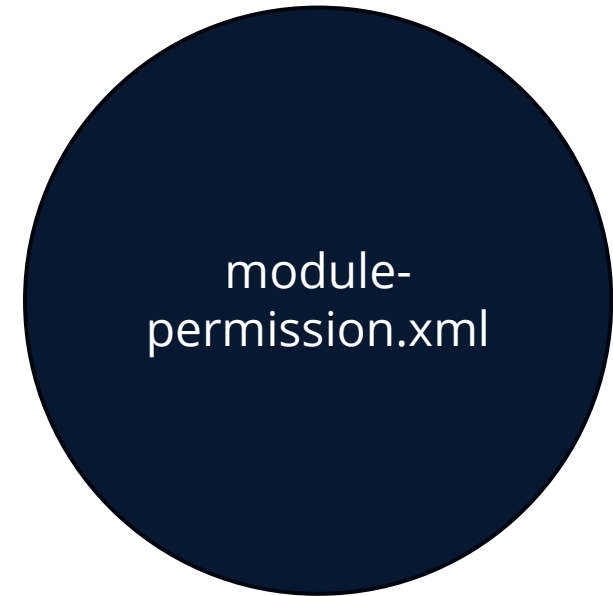
-rt



-ux



-wb

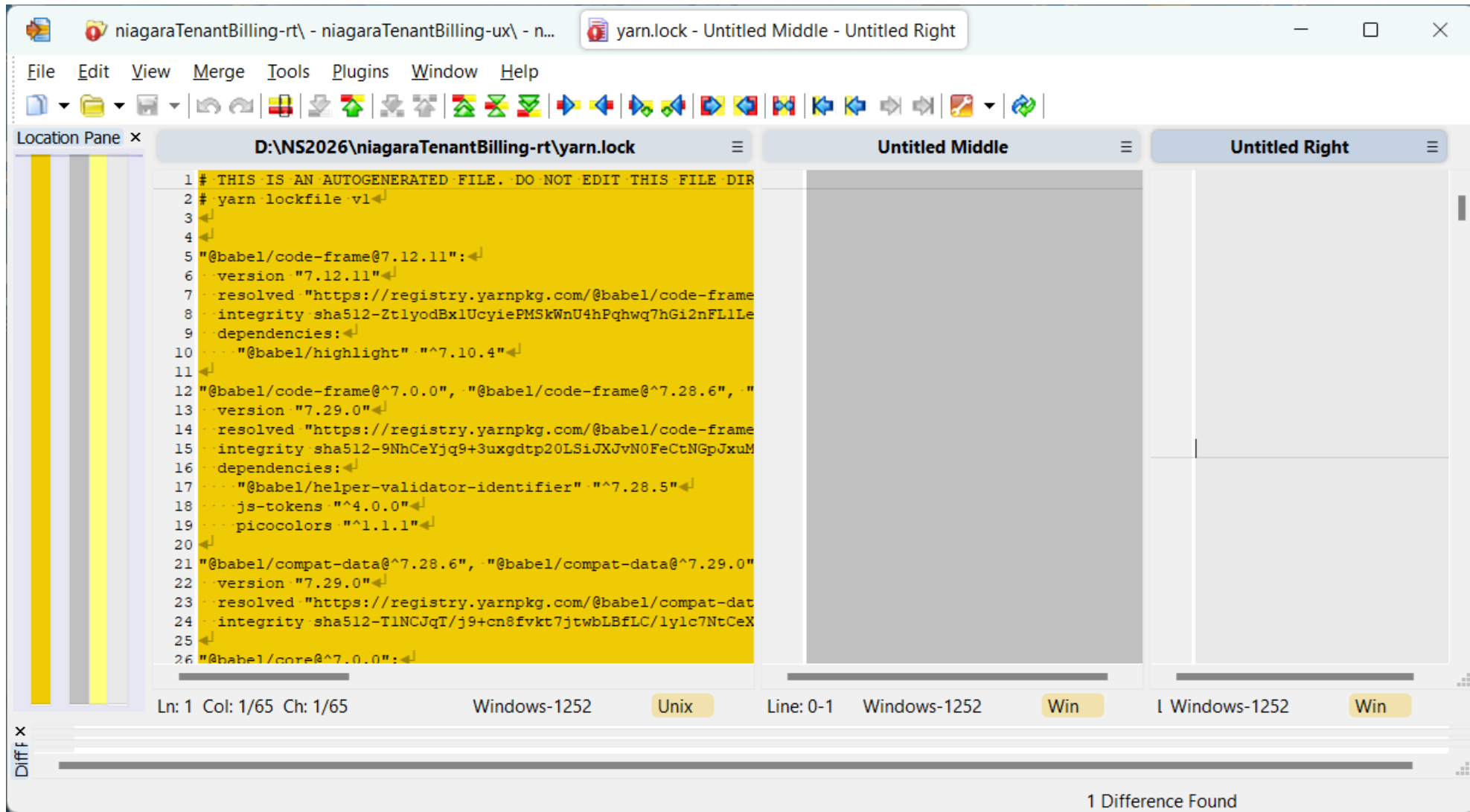


“Right Only”

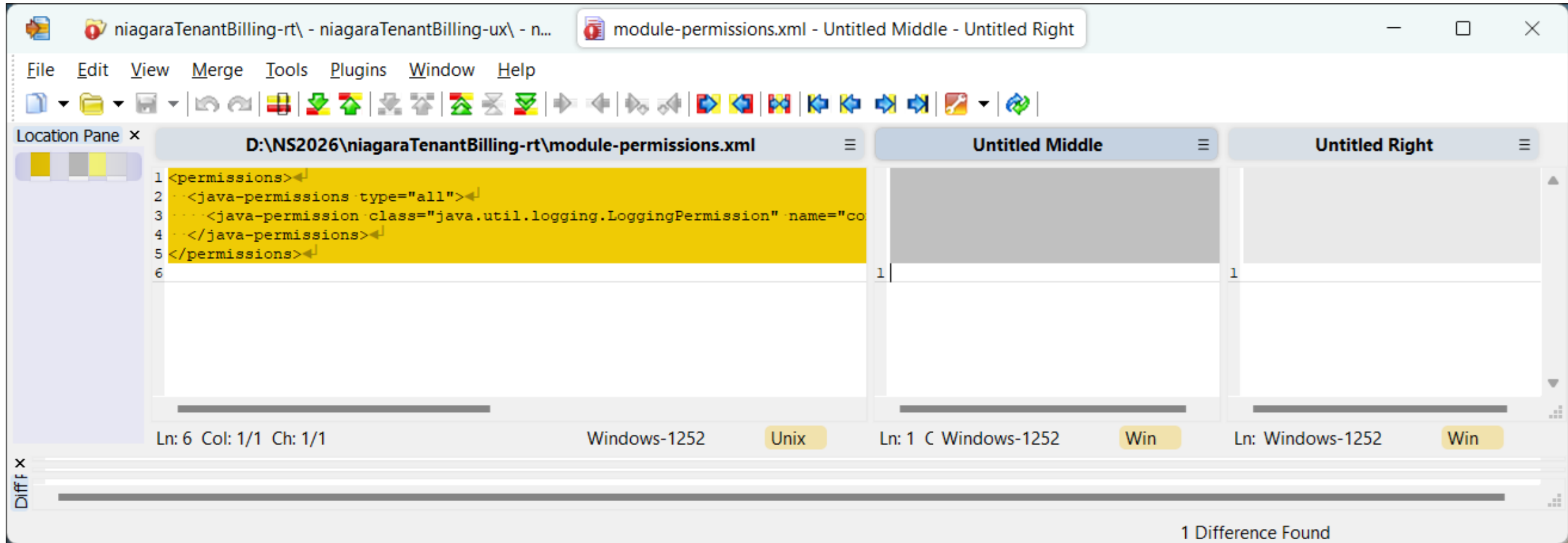
HANDLING “Left Only” (-rt)

```
module.lexicon - Untitled Middle - Untitled Right
File Edit View Merge Tools Plugins Window Help
D:\NS2026\start\niagaraTenantBilling-rt\module.lexicon
#
# Lexicon for the niagaraTenantBilling module.
#
#####
# Help and documentation
#####
# Engineering guide
help.guide.base=module://docNiagaraTenantBilli
# End user guide
help.user.base=module://docNiagaraUsrTenantBil
#####
# Commands
#####
commands.details.label=Meter Details
commands.details.description=Breakdown of perc
Ln: 291 Col: 1/65 Ch: 1/65 Windows-1252 Unix Lin Windows-1252 Win Lin Windows-1252 Win
Diff Pane
1 Difference Found
```

HANDLING “Middle Only” (-ux)

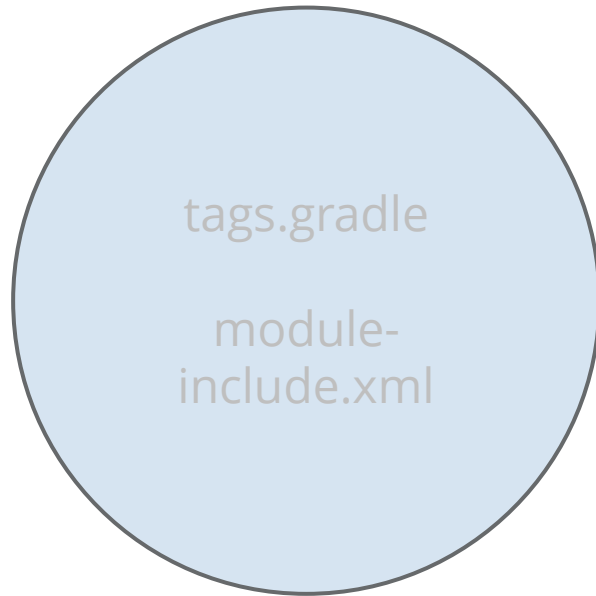


HANDLING “Right Only” (-wb)

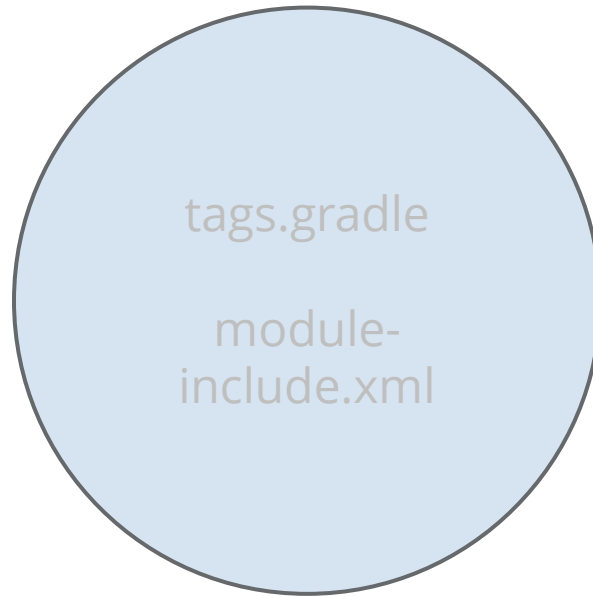


...LET'S HAVE A BIT MORE FUN...

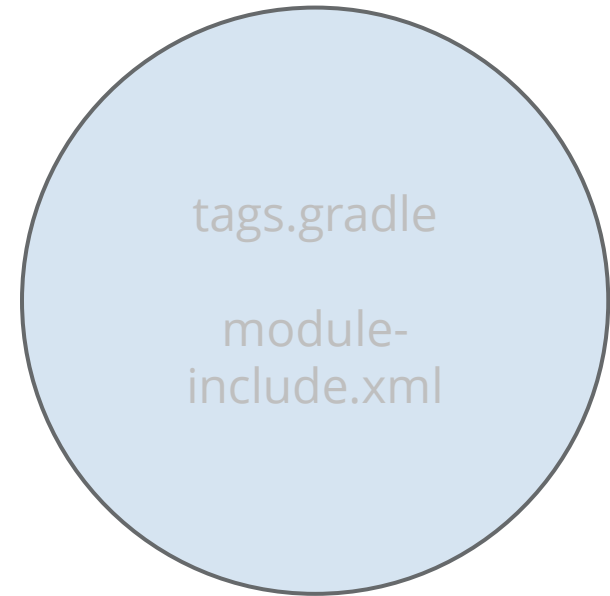
-rt



-ux



-wb



...LET'S HAVE A BIT MORE FUN...

-rt



-ux

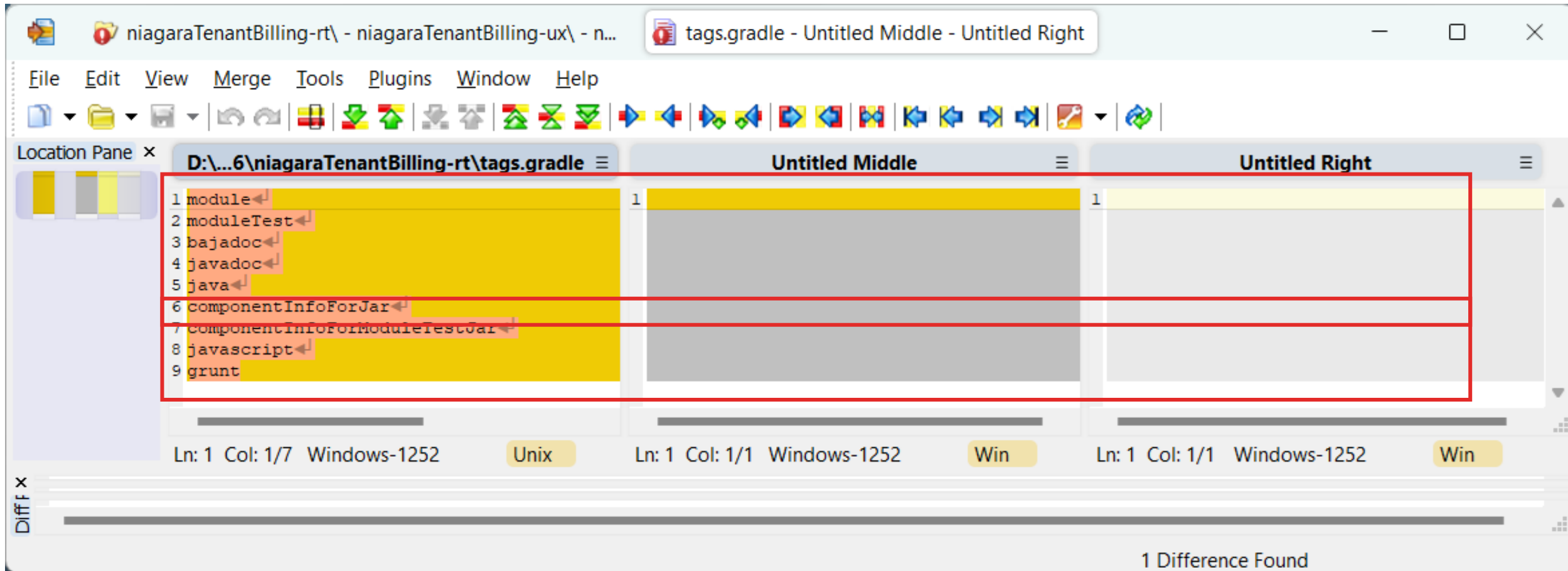


-wb



“Text files are different”

HANDLING tags.gradle



The screenshot shows an IDE window with a diff view for the file `tags.gradle`. The window title is `tags.gradle - Untitled Middle - Untitled Right`. The menu bar includes `File`, `Edit`, `View`, `Merge`, `Tools`, `Plugins`, `Window`, and `Help`. The toolbar contains various icons for file operations and navigation. The Location Pane on the left shows the file path `D:\...6\niagaraTenantBilling-rt\tags.gradle`. The diff view consists of three panels: `Untitled Middle` and `Untitled Right`. The `Untitled Middle` panel shows the original content of the file, which is highlighted in yellow. The `Untitled Right` panel is currently empty. A red box highlights the first six lines of the original content: `1 module`, `2 moduleTest`, `3 bajadoc`, `4 javadoc`, `5 java`, and `6 componentInfoForJar`. The status bar at the bottom indicates `1 Difference Found`.

```
1 module
2 moduleTest
3 bajadoc
4 javadoc
5 java
6 componentInfoForJar
7 componentInfoForModuleTestJar
8 javascript
9 grunt
```

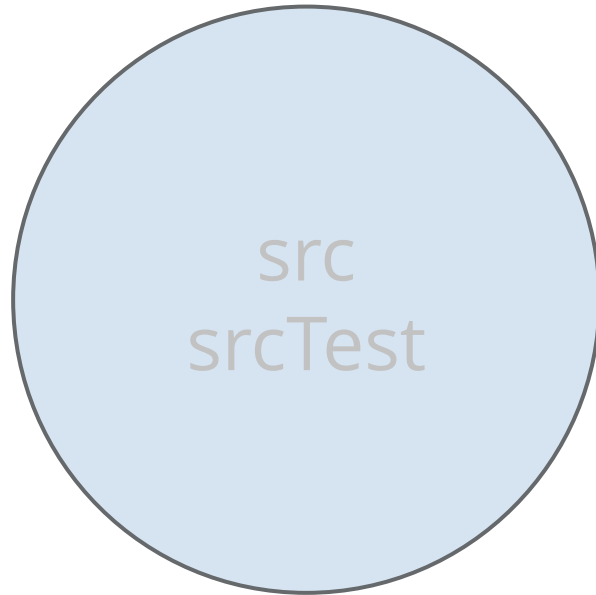
HANDLING module(Test)-include.xml

The screenshot displays an IDE window with three panes. The left pane, titled 'D:\NS2026\niagaraTenantBilling-rt\module-include.xml', shows XML code with lines 1 through 19 highlighted in yellow. The code includes various XML tags for class definitions and comments. The middle and right panes, titled 'Untitled Middle' and 'Untitled Right', are currently empty. The status bar at the bottom indicates 'Ln: 1 Col: 1/8 Ch: 1/8' for the left pane, 'Line: 0-1' for the middle pane, and 'Line Windows-1252' for the right pane. A 'Diff x' icon is visible on the left side, and the text '1 Difference Found' is displayed at the bottom right.

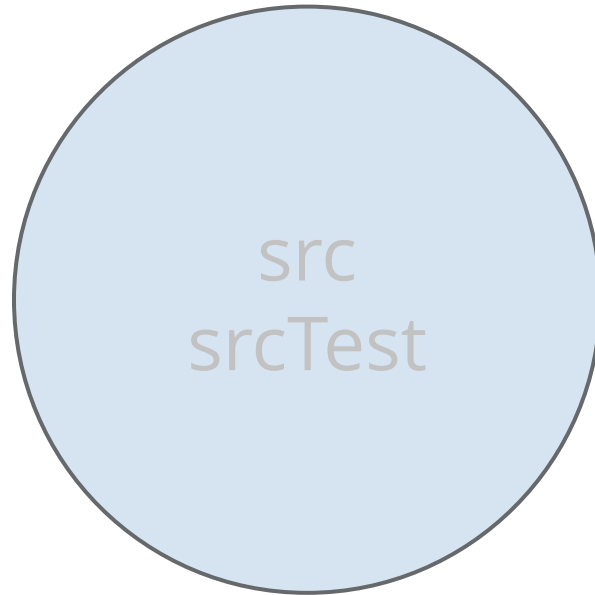
```
1 <types>
2 <!--com.tridiumapps.niagaratenantbilling.autobilling-->
3 <type class="com.tridiumapps.niagaratenantbilling.autobilling.BAutoBillingGroup" name="BAutoBillingGroup" />
4 <type class="com.tridiumapps.niagaratenantbilling.autobilling.BAutoBillingProfile" name="BAutoBillingProfile" />
5 <!--com.tridiumapps.niagaratenantbilling-->
6 <type class="com.tridiumapps.niagaratenantbilling.BDetails" name="Details" />
7 <type class="com.tridiumapps.niagaratenantbilling.BTenantBillingComponent" name="TenantBillingComponent" />
8 <type class="com.tridiumapps.niagaratenantbilling.BTenantBillingService" name="TenantBillingService" />
9 <type class="com.tridiumapps.niagaratenantbilling.BTenantBillingStatusEnabledComponent" name="TenantBillingStatusEnabledComponent" />
10 <type class="com.tridiumapps.niagaratenantbilling.BUserDetails" name="UserDetails" />
11 <!--com.tridiumapps.niagaratenantbilling.contract-->
12 <type class="com.tridiumapps.niagaratenantbilling.contract.BContract" name="Contract" />
13 <!--com.tridiumapps.niagaratenantbilling.dynamicpx-->
14 <type class="com.tridiumapps.niagaratenantbilling.dynamicpx.BDynamicPxHistoryView" name="DynamicPxHistoryView" />
15 <!--com.tridiumapps.niagaratenantbilling.enums-->
16 <type class="com.tridiumapps.niagaratenantbilling.enums.BAutoBillingScheduleMonthly" name="AutoBillingScheduleMonthly" />
17 <type class="com.tridiumapps.niagaratenantbilling.enums.BAutoBillingScheduleOption" name="AutoBillingScheduleOption" />
18 <type class="com.tridiumapps.niagaratenantbilling.enums.BMeterType" name="MeterType" />
19 <!--com.tridiumapps.niagaratenantbilling.history-->
```

...SO MUCH FUN...

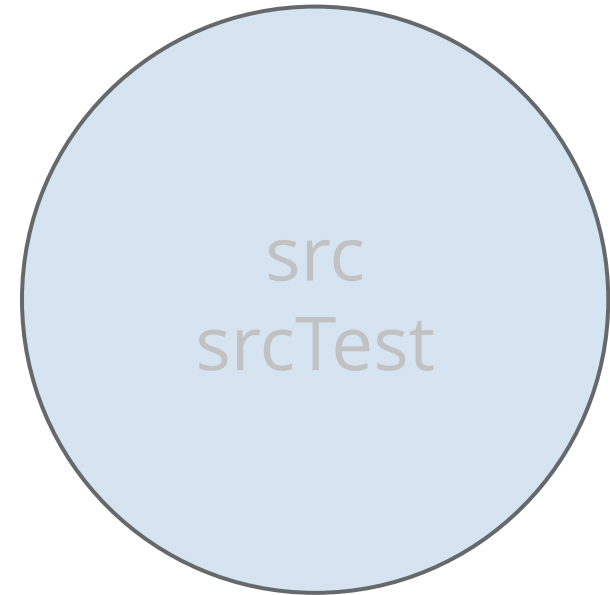
-rt



-ux



-wb



...SO MUCH FUN...

-rt



-ux



-wb



“Folders are different”

HANDLING src and srcTest

The screenshot shows an IDE window with three tabs open, comparing source code across different projects. The main window displays a comparison table with three columns: 'Filename', 'Folder', and 'Comparison Result'.

Filename	Folder	Comparison Result
com		Left only: D:\NS2026\start\niagaraTenantBilling-rt\src
tridiumapps	com	Left only: D:\NS2026\start\niagaraTenantBilling-rt\src\com
niagaratenantbilling	com\tridiumapps	Left only: D:\NS2026\start\niagaraTenantBilling-rt\src\com\tridiumapps
autobilling	com\tridiumapps\niagaratenantbilling	Left only: D:\NS2026\start\niagaraTenantBilling-rt\src\com\tridiumapps\niagaratenantbilling
contract	com\tridiumapps\niagaratenantbilling	Left only: D:\NS2026\start\niagaraTenantBilling-rt\src\com\tridiumapps\niagaratenantbilling
dynamicpx	com\tridiumapps\niagaratenantbilling	Left only: D:\NS2026\start\niagaraTenantBilling-rt\src\com\tridiumapps\niagaratenantbilling
enums	com\tridiumapps\niagaratenantbilling	Left only: D:\NS2026\start\niagaraTenantBilling-rt\src\com\tridiumapps\niagaratenantbilling
history	com\tridiumapps\niagaratenantbilling	Left only: D:\NS2026\start\niagaraTenantBilling-rt\src\com\tridiumapps\niagaratenantbilling
importcsv	com\tridiumapps\niagaratenantbilling	Left only: D:\NS2026\start\niagaraTenantBilling-rt\src\com\tridiumapps\niagaratenantbilling
invoice	com\tridiumapps\niagaratenantbilling	Left only: D:\NS2026\start\niagaraTenantBilling-rt\src\com\tridiumapps\niagaratenantbilling
meter	com\tridiumapps\niagaratenantbilling	Left only: D:\NS2026\start\niagaraTenantBilling-rt\src\com\tridiumapps\niagaratenantbilling
owner	com\tridiumapps\niagaratenantbilling	Left only: D:\NS2026\start\niagaraTenantBilling-rt\src\com\tridiumapps\niagaratenantbilling
template	com\tridiumapps\niagaratenantbilling	Left only: D:\NS2026\start\niagaraTenantBilling-rt\src\com\tridiumapps\niagaratenantbilling
tenant	com\tridiumapps\niagaratenantbilling	Left only: D:\NS2026\start\niagaraTenantBilling-rt\src\com\tridiumapps\niagaratenantbilling
util	com\tridiumapps\niagaratenantbilling	Left only: D:\NS2026\start\niagaraTenantBilling-rt\src\com\tridiumapps\niagaratenantbilling
utility	com\tridiumapps\niagaratenantbilling	Left only: D:\NS2026\start\niagaraTenantBilling-rt\src\com\tridiumapps\niagaratenantbilling
BDetails.java	com\tridiumapps\niagaratenantbilling	Left only: D:\NS2026\start\niagaraTenantBilling-rt\src\com\tridiumapps\niagaratenantbilling
BTenantBillingComponent.java	com\tridiumapps\niagaratenantbilling	Left only: D:\NS2026\start\niagaraTenantBilling-rt\src\com\tridiumapps\niagaratenantbilling
BTenantBillingService.java	com\tridiumapps\niagaratenantbilling	Left only: D:\NS2026\start\niagaraTenantBilling-rt\src\com\tridiumapps\niagaratenantbilling
BTenantBillingStatusEnabledComponent.java	com\tridiumapps\niagaratenantbilling	Left only: D:\NS2026\start\niagaraTenantBilling-rt\src\com\tridiumapps\niagaratenantbilling
BUserDetails.java	com\tridiumapps\niagaratenantbilling	Left only: D:\NS2026\start\niagaraTenantBilling-rt\src\com\tridiumapps\niagaratenantbilling
res		Left only: D:\NS2026\start\niagaraTenantBilling-rt\src

Elapsed time: 154 ms ** Full Contents Item 1 of 22

...IS THE FUN OVER YET?

-rt

niagaraTenant
Billing-
rt.gradle.kts

-ux

niagaraTenant
Billing-
ux.gradle.kts

-wb

niagaraTenant
Billing-
wb.gradle.kts

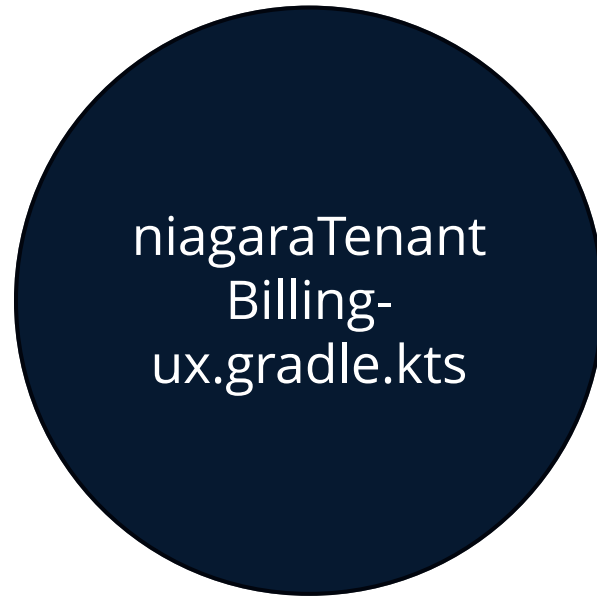
...IS THE FUN OVER YET?

-rt



“Left Only”

-ux



“Middle Only”

-wb



“Right Only”

REUNION END

The screenshot shows a Reunion tool window with three tabs. The active tab is 'D:\NS2026\niagaraTenantBilling-rt\'. The window displays a comparison of files between three directories. The 'rt' directory contains all the files, while the 'ux' and 'wb' directories are empty.

Filename	Comparison Result
> build	Left only: D:\NS2026\niagaraTenantBilling-rt
> src	Left only: D:\NS2026\niagaraTenantBilling-rt
> srcTest	Left only: D:\NS2026\niagaraTenantBilling-rt
> tutorials	Left only: D:\NS2026\niagaraTenantBilling-rt
Gruntfile.js	Left only: D:\NS2026\niagaraTenantBilling-rt
module-include.xml	Left only: D:\NS2026\niagaraTenantBilling-rt
module-permissions.xml	Left only: D:\NS2026\niagaraTenantBilling-rt
module.lexicon	Left only: D:\NS2026\niagaraTenantBilling-rt
module.palette	Left only: D:\NS2026\niagaraTenantBilling-rt
moduleTest-include.xml	Left only: D:\NS2026\niagaraTenantBilling-rt
niagaraTenantBilling-rt.gradle.kts	Left only: D:\NS2026\niagaraTenantBilling-rt
package-lock.json	Left only: D:\NS2026\niagaraTenantBilling-rt
package.json	Left only: D:\NS2026\niagaraTenantBilling-rt
tags.gradle	Left only: D:\NS2026\niagaraTenantBilling-rt
yarn.lock	Left only: D:\NS2026\niagaraTenantBilling-rt

Elapsed time: 3166 ms ** Full Contents
Item 1 of 15

CAVEATS

You can migrate “down to” rt **or** “up to” the highest part

```
description = "The Niagara Tenant Billing Application"

moduleManifest {
    moduleName.set("niagaraTenantBilling")
    runtimeProfile.set(rt)
    //NOTE: Temporarily ignore rt module part checks for module conversion exercise
    ignoreRuntimeProfileCheck.set("true")
}

dependencies {
    // Compile dependencies are declared here.
    // Only direct dependencies are required. Transitive dependencies will be resolved by Gradle.
    api(project(":alarm-rt"))
    api(project(":baja"))
    api(project(":bajaScript-ux"))
    api(project(":bajavi-ux"))
}
```

WHY DON'T WE DO IT IN THE SHOW?



**UP NEXT:
BUILD SCRIPTS AND
BREAKING CHANGES
WITH PRINSTON**



BUILD SCRIPT UPDATES & BREAKING CHANGES

PRINSTON REBELLO

**NIAGARA
SUMMIT
2026
DEVELOPER**

Build Script Updates

- Gradle Changes
- Plugin Updates
- Niagara Home Changes
- Module Part Cleanup

Gradle Updates

JAVA 25

- Need Java 25 JDK with JavaFX
- Included in your Niagara 5 installation

Gradle Updates

Gradle Wrapper

- Gradle version updated to 9.2.1
- Run:

```
>gradlew wrapper --gradle-version 9.2.1  
>gradlew -version
```

Gradle Updates

settings.gradle.kts

- Change method `it.toLowerCase()` to `it.lowercase()`

```
val isWindows = providers.systemProperty("os.name").map {  
    it.lowercase(java.util.Locale.ENGLISH)  
}.get().contains("windows")
```

Niagara Plugins

settings.gradle.kts

- Update the gradlePluginVersion & settingsPluginVersion:

```
val gradlePluginVersion: String = "5.0.25.8.14"  
val settingsPluginVersion: String = "5.0.6.8.14"
```

- These versions may update with each build prior to release

Niagara Plugins

Plugin Names

Update plugin names in

- build.gradle.kts
- settings.gradle.kts
- <module>-<modulePart>.gradle.kts

Niagara Plugins

Niagara 4	Niagara 5
com.tridium.niagara-grunt	com.tridium.grunt
com.tridium.settings.local-settings-convention	com.tridium.set.lsc
com.tridium.niagara	com.tridium.niagara
com.tridium.vendor	com.tridium.vendor
com.tridium.niagara-module	com.tridium.n-module
com.tridium.niagara-signing	com.tridium.sign
com.tridium.convention.niagara-home-repositories	com.tridium.conv.n-repo
com.tridium.niagara-jacoco	com.tridium.jacoco
com.tridium.settings.multi-project	com.tridium.set.mpr

Niagara Home Changes

gradle.properties

niagara_home=C:\\Program Files\\Niagara\\5.0.0.1

niagara_user_home=C:\\Users\\e333963\\Niagara\\tridium\\5.0

niagara_config_home=C:\\ProgramData\\Niagara\\tridium\\config\\5.0.0.1

org.gradle.java.installations.paths=C:\\Program Files\\Niagara\\5.0.0.1\\jre

Niagara Home Changes

settings.gradle.kts

- Update the gradlePluginRepoUrl from

```
“file:///${gradlePluginHome.replace("\\", '/')}”
```



```
“file:///${gradlePluginHome.replace("\\", '/').replace(" ", "%20")}”
```

Niagara 5 Changes

<module>.gradle.kts

- `niagaraAnnotationProcessors` is split out from the `nre` module

```
dependencies {  
    // annotation processor for building module-include.xml  
    annotationProcessor(":niagaraAnnotationProcessors")  
  
    // NRE dependencies  
    nre(":niagaraAnnotationProcessors")  
    nre(":nre")  
}
```

Module Part Cleanup

<module>.gradle.kts

- Rename this file and its directory
- For instance:

myModule-rt/myModule-rt.gradle.kts



myModule/myModule.gradle.kts

Module Part Cleanup

<module>.gradle.kts

- Remove `id("com.tridium.niagara-annotation-processors")` from the plugins section.
- Remove the `runtimeProfile.set(...)` line
- Remove `RuntimeProfile` import statement:

```
com.tridium.gradle.plugins.module.util.ModulePart.RuntimeProfile.*
```

Module Part Cleanup

<module>.gradle.kts

```
moduleManifest {  
    moduleName.set("myModule")  
}
```

Module Part Cleanup

niagara-module.xml

- Remove the runtimeProfiles attribute.
 - Previously:

```
<?xml version="1.0" encoding="UTF-8"?>  
<niagara-module moduleName="myModule" preferredSymbol="mm" runtimeProfiles="rt"/>
```

- Now:

```
<?xml version="1.0" encoding="UTF-8"?>  
<niagara-module moduleName="myModule" preferredSymbol="mm"/>
```

Module Part Cleanup

4.15 (post module part reunion)

```
// Niagara dependencies
api(":alarm-rt")
api(":baja")
api(":bajau-wb")
api(":control-rt")
api(":driver-wb")
api(":gx-wb")
api(":ndriver-wb")
api(":workbench-wb")

// Project dependencies
api(project(":myOtherModule-rt"))

// Test dependencies
moduleTestImplementation(":test-wb")
```



5.0

```
// Niagara dependencies
api(":alarm")
api(":baja")
api(":bajau")
api(":control")
api(":driver")
api(":gx")
api(":ndriver")
api(":workbench")

// Project dependencies
api(project(":myOtherModule"))

// Test dependencies
moduleTestImplementation(":test")
```

Build Script Updates

Now your Gradle build scripts are:

- Compatible with Niagara 5
- Won't compile yet due to errors like:
 “cannot find symbol javax.baja.sys.BObject”

Niagara 5 Breaking Changes

- Security Manager
- Public API Namespace
- Private API → Public API

Security Manager

- Removed in Java 25.
- Resolve most of the Security Manager related compilation failures by making some changes

`java.security.AccessController` → `niagara.nre.util.SecurityUtil`

Security Manager

- Replace calls to `AccessController.doPrivileged()` with `SecurityUtil.doPrivileged()`
- Delete `module-permissions.xml` file.
- Permissions are now granted as annotations in `module-info.java` file

Security Manager

Permissions

Niagara 4 Permission Group	Niagara 5 Permission Annotation
SET_SYSTEM_TIME	@GrantPublicNiagaraPermission(PublicNiagaraPermission. SET_TIME)
BACKUPS	@GrantPublicNiagaraPermission(PublicNiagaraPermission. RESTORE_BACKUP)
MANAGE_SERVER_TRUST_ANCHORS	@GrantPublicNiagaraPermission(PublicNiagaraPermission. MANAGE_SERVER_TRUST_ANCHORS)
RDB	@GrantPublicNiagaraPermission(PublicNiagaraPermission. RDB_CONNECTION)
RENAME_AND_RESTART_STATION	@GrantPublicNiagaraPermission(PublicNiagaraPermission. RENAME_AND_RESTART)

Public API

javax.baja.* → niagara.*

JSON-Java

Private API moved to Public API

- JSON-Java API repackaged under org.json namespace
- Search and replace imports com.tridium.json
- In <module>.gradle.kts file, add `api("org.json:json:20251224")` to the dependencies section

nre Module

Private API moved to Public API

`com.tridium.nre.security` → `niagara.nre.security`

- `EncryptionKeySource`
- `SecretChars`
- `SecretBytes`
- `ISecretBytesSupplier`

nre Module

Private API moved to Public API

`com.tridium.nre.util.IElement` → `niagara.nre.util.IElement`

`com.tridium.nre.util.tuple` → `niagara.nre.util.tuple`

- Single
- Pair
- Triple

nre Module

Private API moved to Public API

`com.tridium.util.ArrayUtil` → `niagara.util.ArrayUtil`

- Some API changes were made.
- Additional code changes may be needed

baja Module

Private API moved to Public API

`com.tridium.security` → `niagara.security`

- `BCertificateStatusEnum`
 - `BCertificateStatusHealth`
-
- No changes to methods in these classes

baja Module

Private API moved to Public API

`com.tridium.data` → `niagara.data`

- `BDataTable`
 - `BDataRow`
-
- No changes to methods in these classes

Jetty

Servlets

- Niagara 5 ships with Jetty 12.1
- `nre(":javax.servlet-api:4.0.1")`



`nre(":jakarta.servlet-api:6.1.0")`

- `javax.servlet.*` → imports to `jakarta.*`
- Update the class attribute in WEB-INF/ jetty-web.xml:

```
<Configure id="webApp" class="org.eclipse.jetty.ee11.webapp.WebAppContext">
```

Deprecated Methods

Core

Deprecated methods have been removed

Fox Connections

Core

- Support for non-TLS fox connections will be removed in a future Niagara 5 release
- Good time to understand compatibility between stations when using `BFoxProxySession`

Sys.getLanguage

Core

- New methods are added:
 - `Sys.getLanguageCode()`
 - `Context.getLanguageCode()`
- Returns a language and variant (separated by underscore).
`en_US` instead of `en`
- `Sys.getLanguage()` and `Context.getLanguage()` have been removed.



UP NEXT: DRIVER MIGRATION WITH UDAY



DRIVER MIGRATION CHANGES

UDAY KUMAR RAPURU

**NIAGARA
SUMMIT
2026
DEVELOPER**

Driver Breaking Changes

niagara⁴ → niagara

Unsupported

- basicDriver
- devDriver

Supported

- nDriver

Mitigation

Add @SuppressWarnings("deprecation")


Remove -Xlint:deprecation

Niagara 5 Driver Frameworks

TRIDIUM

NIAGARA BENCHMARK

New Driver Wizard

 **New Driver Wizard**
Step 1

Please select a driver framework

NDriver

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powered by
niagara
framework

nDriver Public API

com.tridium.ndriver → niagara.ndriver

```
import niagara.ndriver.comm.*;
import niagara.ndriver.datatypes.*;
import niagara.ndriver.discover.*;
import niagara.ndriver.io.*;
import niagara.ndriver.point.*;
import niagara.ndriver.poll.*;
import niagara.ndriver.ui.*;
import niagara.ndriver.util.*;
import niagara.ndriver.ux.*;
```

nDriver Enhancements

- Poll Grouping
- Coalesce
- Security Dashboard

New APIs

`isUnoperational()` → `isNonOperational()`

`if (!isNonOperational()) { .. }` → `if (isOperational()) { .. }`

BACnet updates..

- Removed BACnetOws module
- bacnetAlarmRouter -> bacnetUtil
- Updated APIs



Descriptors

readProperty(PropertyReference propertyReference)



readProperty(int id, int arrayIndex, Context context)

readProperty(int pld, int ndx)

readOptionalProperty(int pld, int ndx)

doReadProperty(int id, int arrayIndex, Context cx)

Context carries BACnet user details for permission check

Private APIs → Public APIs

`com.tridium.bacnet.asn` → `niagara.bacnet.asn`

`com.tridium.bacnet.asn.AsnInputStream`
`com.tridium.bacnet.asn.AsnOutputStream`
`com.tridium.bacnet.asn.AsnUtil`



`niagara.bacnet.asn.AsnInputStream`
`niagara.bacnet.asn.AsnOutputStream`
`niagara.bacnet.asn.AsnUtil`

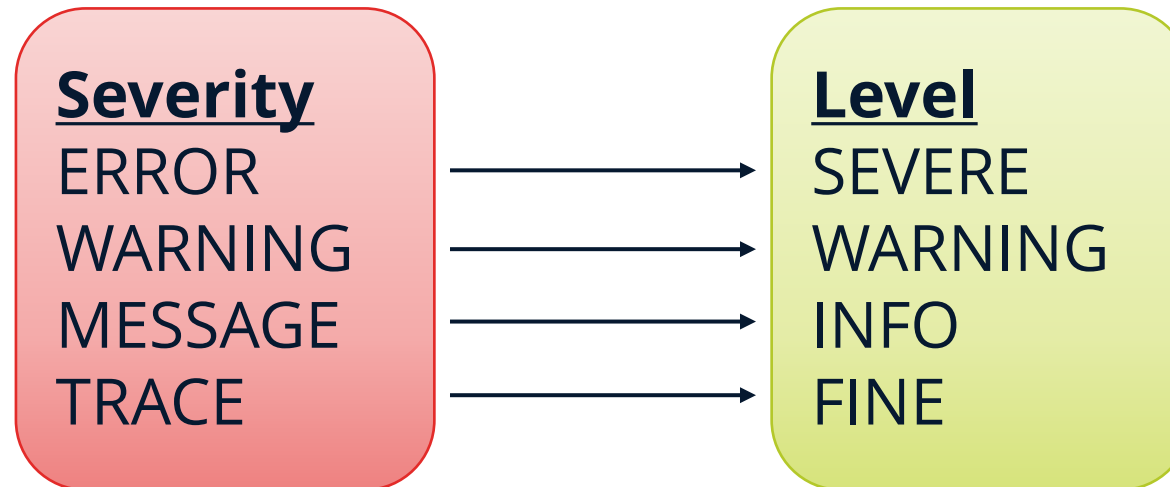
Logger

baja Log replaced with java.util.Logging

BDeviceNetwork.getLog() → BDeviceNetwork.getLogger()

Logger

baja Log replaced with java.util.Logging



```
Log.getLog("yourModule").error("Your message", e);
```

```
Logger.getLogger("yourModule").log(Level.SEVERE, "Your message", e);
```



**UP NEXT:
UI BREAKING CHANGES
WITH NUTAN**



BREAKING CHANGES FOR BAJA UI/UX VIEWS

NUTAN NAIK

**NIAGARA
SUMMIT
2026
DEVELOPER**

Impact of Migrating BajaUI Code to Niagara 5

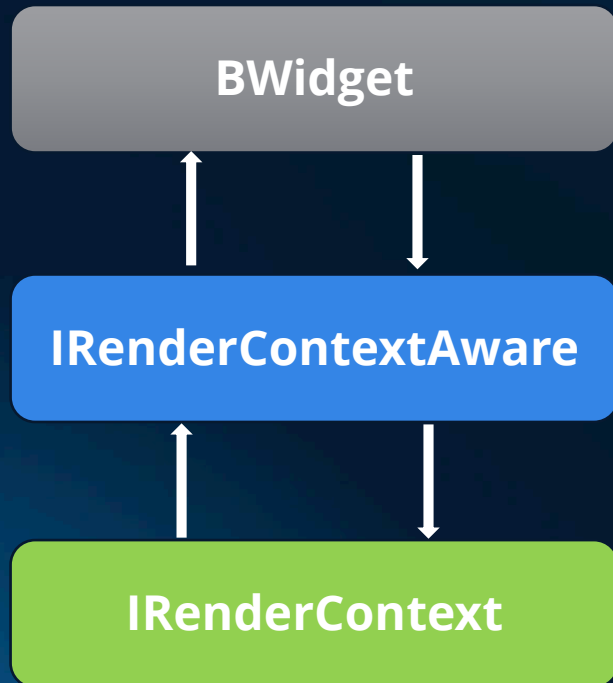
- **No Custom Widgets:** No changes needed.
- **Custom Widgets:** Implement required changes for breaking issues.

Improve appearance and stylability with non-breaking changes.

Breaking Changes for BajaUI

- Theme API is deprecated.
Ex: Theme.label().getUIFont() is unsupported.
- Introducing IRenderContextAware widgets.

IRenderContext & IRenderContextAware



Implements Interface and
Gets IRenderContext as parameter

Marks the widget to use
IRenderContext

Provides styling information
ex: Font, color

BWidget Subclasses to IRenderContextAware

- **Method Updates:**

Current Method	Updated Method
paint(Graphics)	doPaint(Graphics, IRenderContext)
doLayout(BWidget[])	doLayout(IRenderContext)
computePreferredSize()	computePreferredSize(ILayoutConstraints, IRenderContext)

Final Methods: old-style methods made final.

Widgets follow the bajaux pattern

- Implement doPaint() and never call it directly.
- call paint() directly and never implement it.

More Changes to API with IRenderContext Integration

Many public API methods now accept an IRenderContext instance

Ex :

- **BAbstractButton#paintBackground**
- **BWbCellEditor#paintBackground**
- **ListRenderer**
- **TableCellRenderer**

IRenderScaleProvider interface is now a parameter for methods requiring OS scaling knowledge, like **BFont#width**.

Niagara 4

```
mlabel = new BLabel(  
    lex.getText("sharedMeterManager.property.column.meterName"), BAlign.left);  
mlabel.setFont(Theme.label().getBoldText());  
details.add(null, mlabel, null);
```

Niagara 5

```
mlabel = new BLabel(  
    lex.getText("sharedMeterManager.property.column.meterName"), BAlign.left);  
mlabel.setStyleClasses("strong"); // let the theme style it  
details.add(null, mlabel, null);
```

NSS:

```
bajoui|Label {  
    column-gap: 4;  
    row-gap: 4;  
    background-color: null;  
    &.strong { font: bold 11pt sansserif; }
```

Breaking API Changes in IStylable

- **getStyleSelector() renamed to getTagName()**
 - returns a tag name formatted as moduleName|TypeName
- **setStyleClasses() and setStyleId() has been removed**
are now part of IConfigurableStylable.

Added/Removed Methods & Slots




- Added **style** slot to BWidget
- Changed type of **label** slot on BLabelPane from BLabel to BWidget



- IWidgetFacade
- BTitlePane#getTopBorder
- BImage#setPixels() (replaced by BImage#makeImageWithPixels)

Non-compile-time API Changes

- **BBorder#make** Handling of Invalid Strings
- **BBorder#paint** Now Pixel-Accurate
- Colon No Longer Optional in NSS
- Workbench TextEditor Options Migration
 - niagara_user_home/etc/options/bajoui-TextEditorOptions.options
 - Must be reconfigured in N5



UP NEXT: JAVA MODULARITY WITH RAYAN

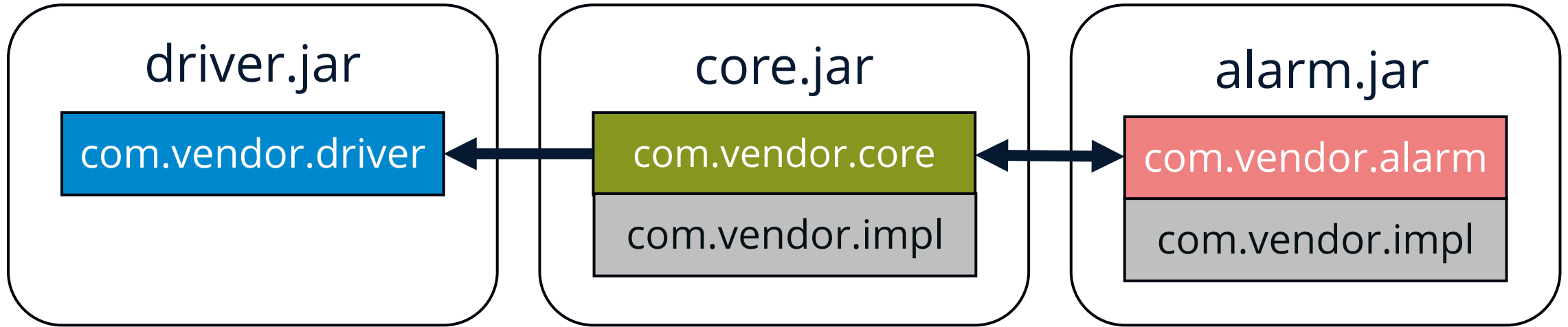


MIGRATING TO N5: MODULARITY

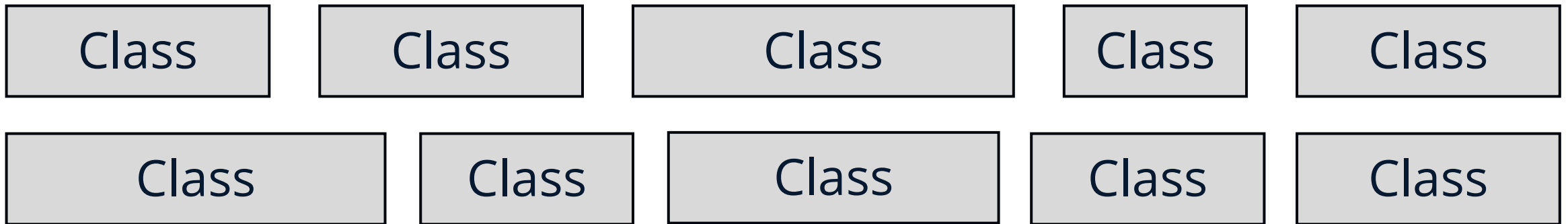
RAYAN BOUHAL

**NIAGARA
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Developer View



JVM View (Classpath)





Java Modularity

- Java 9+
- a.k.a **Project Jigsaw**, Java Platform Module System (**JPMS**)
- Defines module boundaries, dependencies, visibility

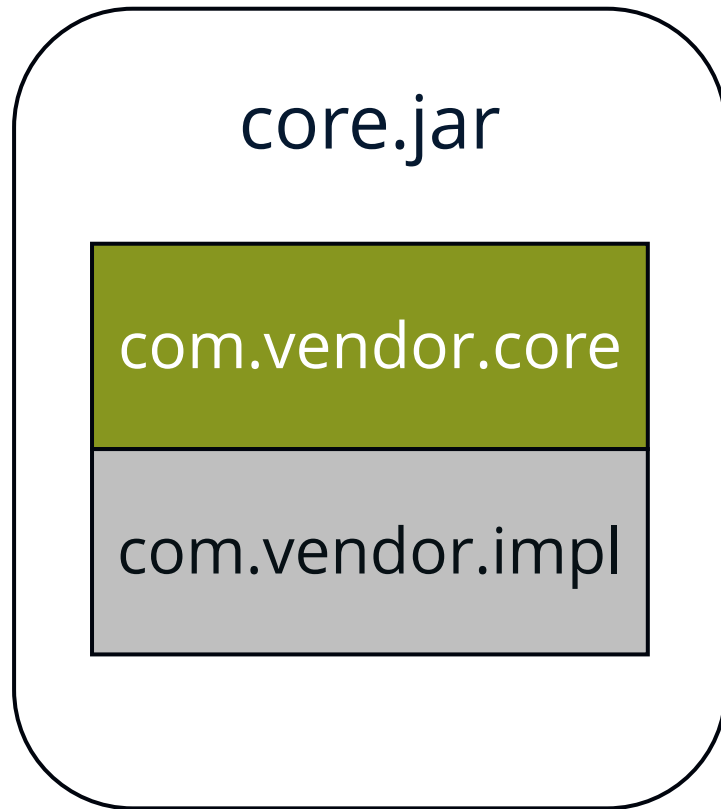
Java Module

A set of packages designed for reuse

- Name – Unique identifier
- Dependencies – Required modules
- Exports – Public API packages

Rules defined in `module-info.java` (module descriptor)

Declaring a Module

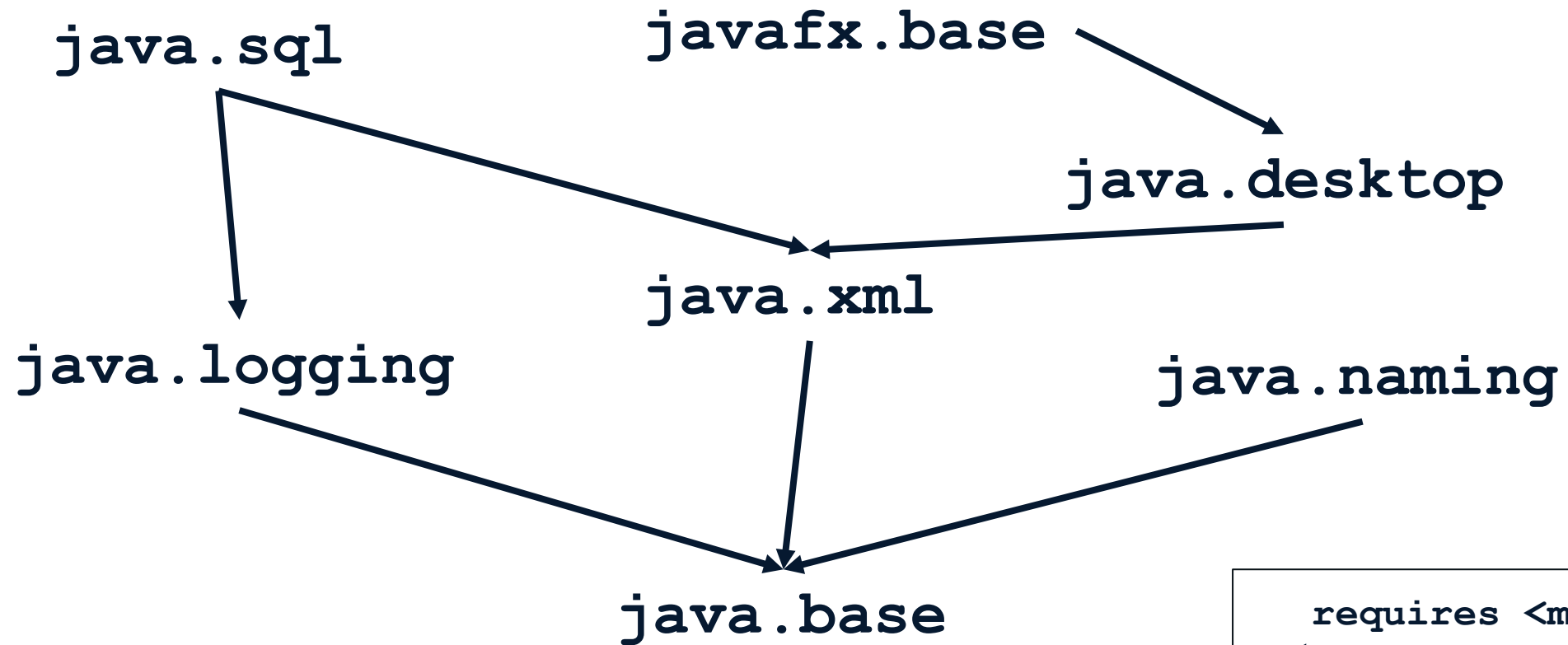


```
// module-info.java  
module vendor.core {  
    requires security;  
    exports com.vendor.core;  
    // .impl is concealed  
}
```

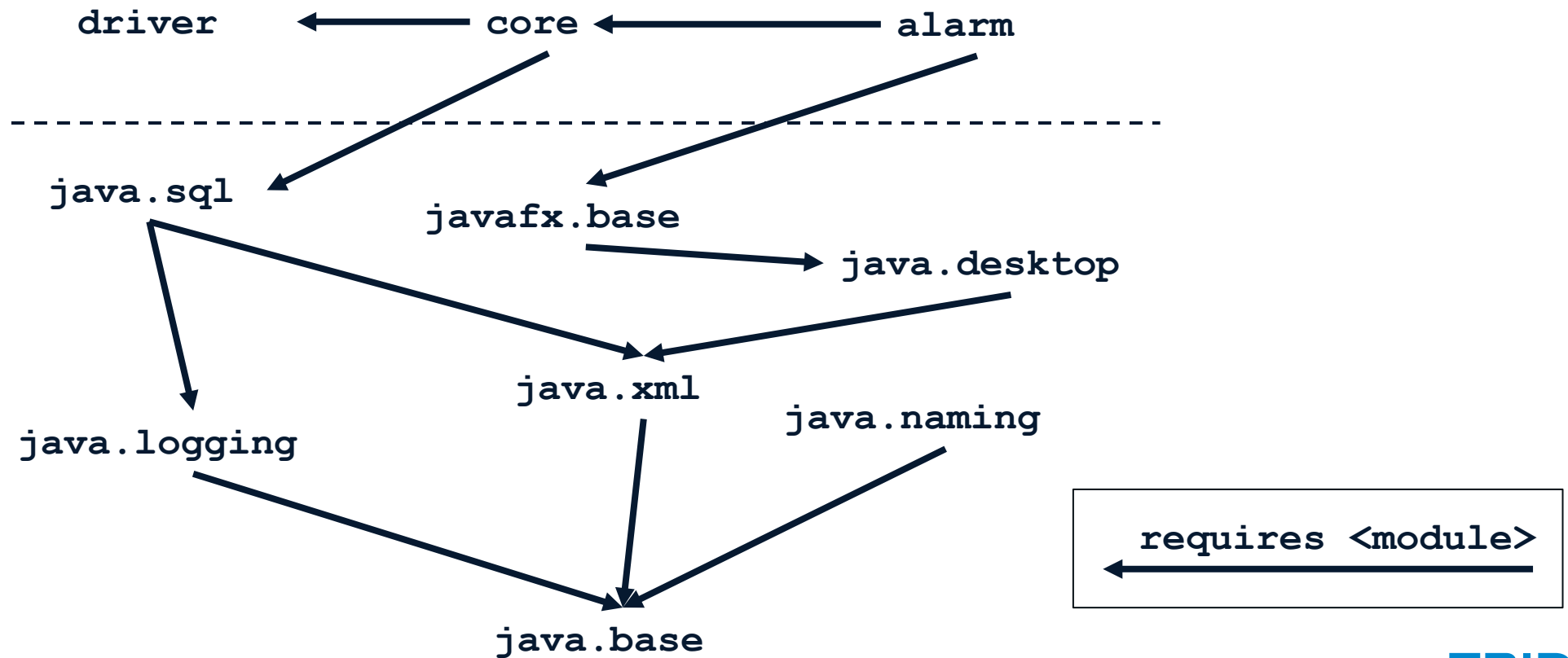
Controlling Access

Directive	Purpose
requires	Declares a dependency on another module.
requires transitive	Indicates that a required module should also be exposed to modules that depend on yours.
requires static	Declares an optional dependency used only at compile time, not required at runtime.
exports	Makes a package accessible to other modules.
exports...to	Exports a package only to specific modules.
opens	Allows deep reflection on a package at runtime.
opens...to	Opens a package for reflection only to specific modules.
uses	Indicates that the module consumes a service.
provides	Declares a service implementation the module offers.

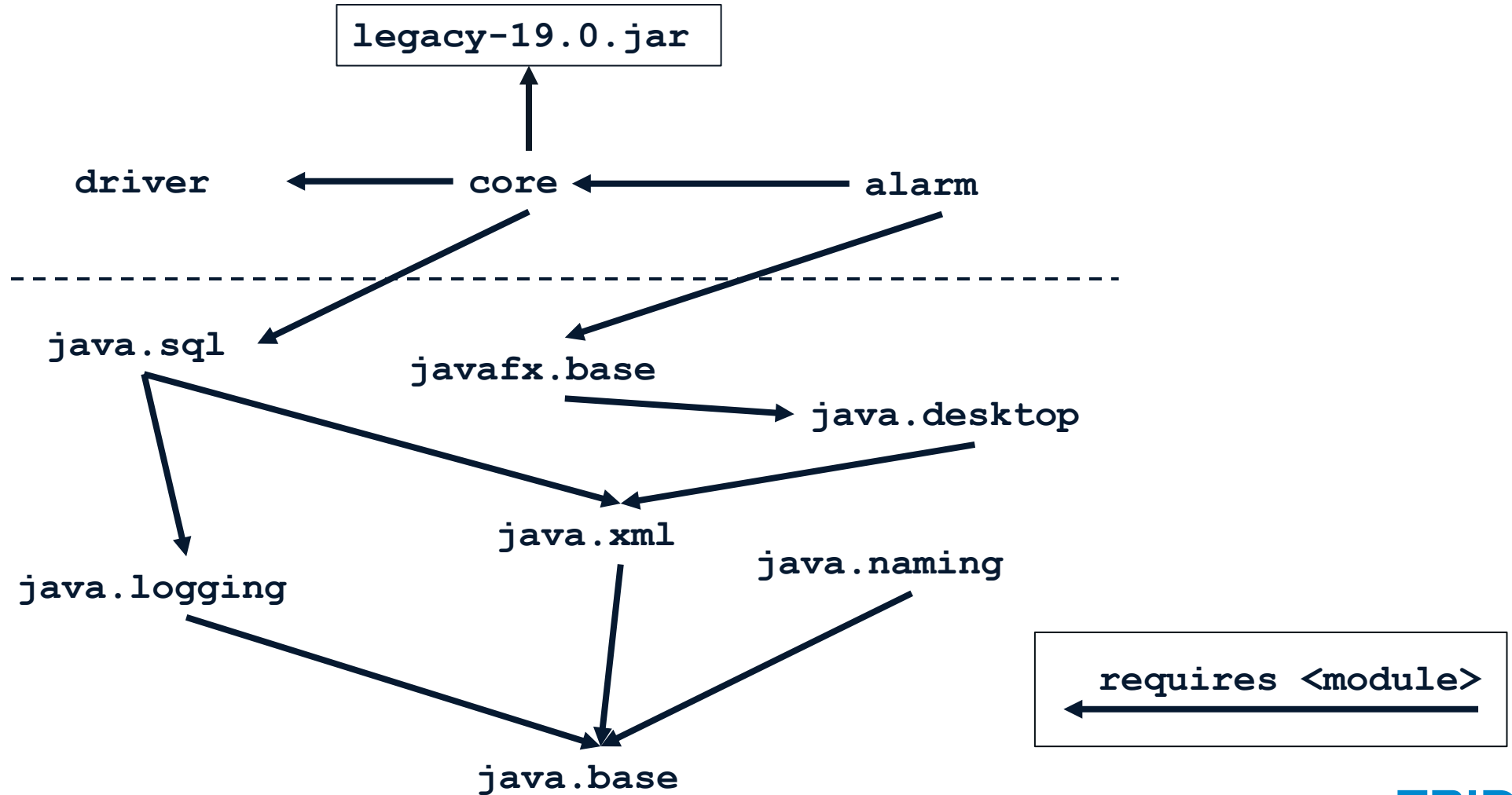
Module Graph



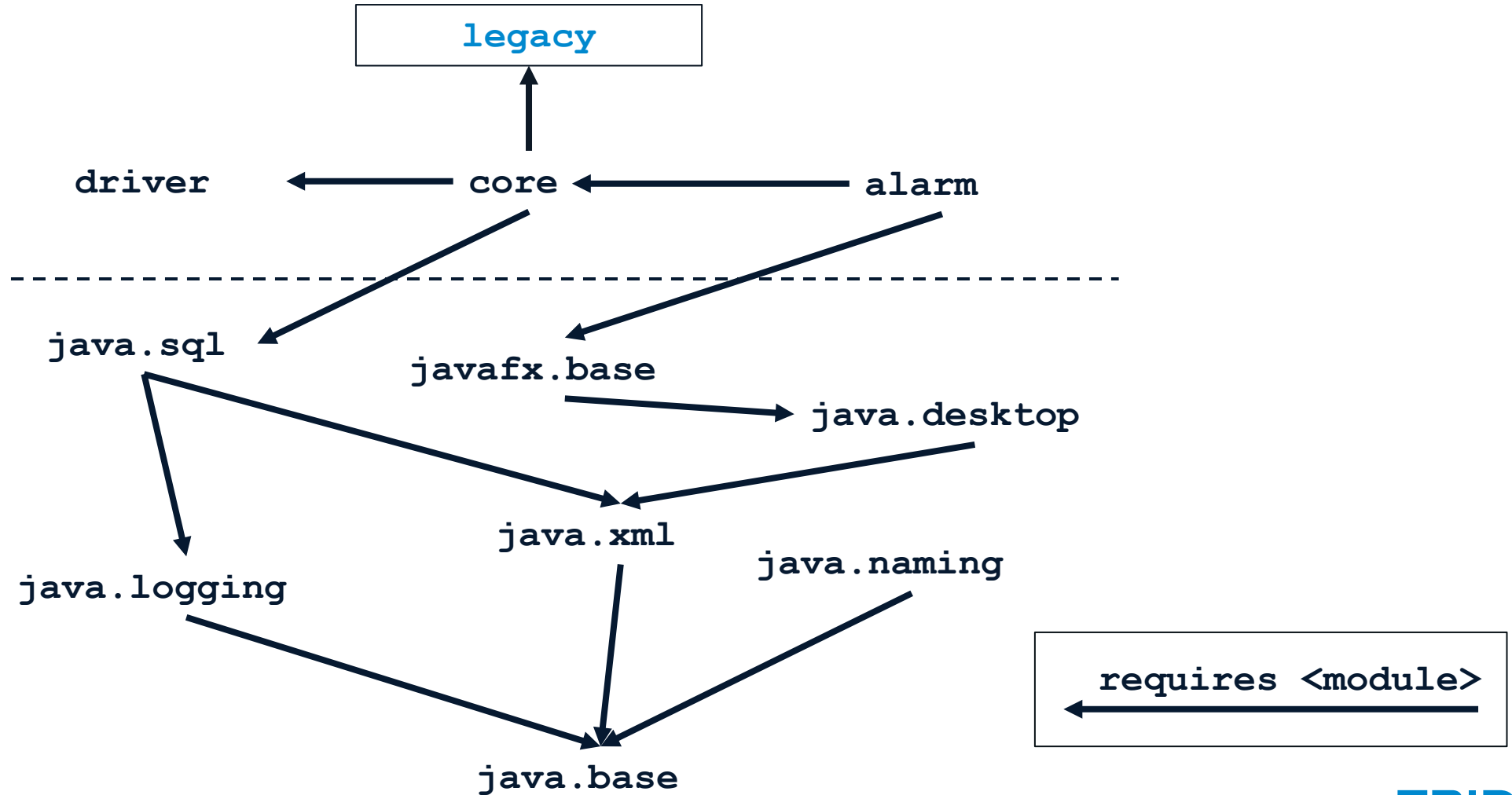
Incremental Migration



Incremental Migration

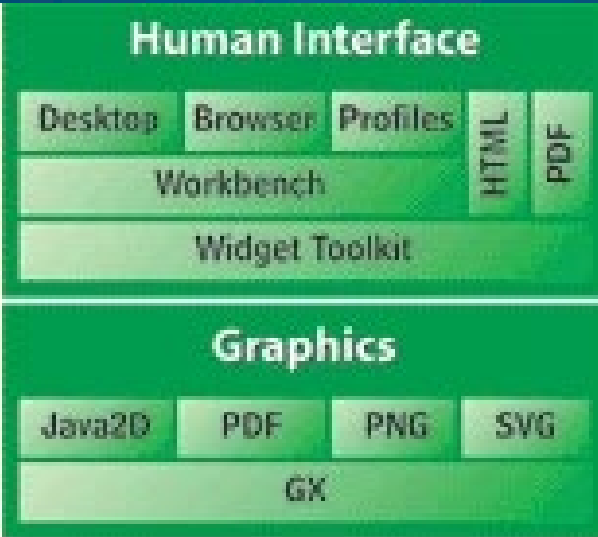
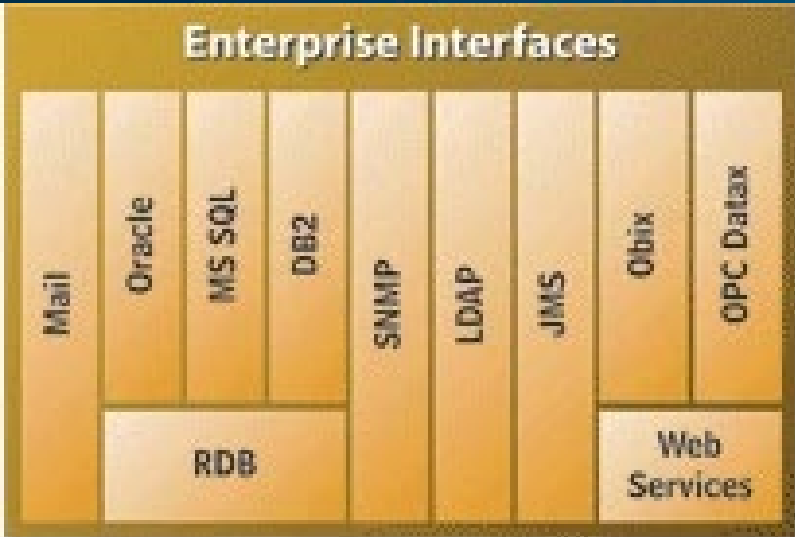
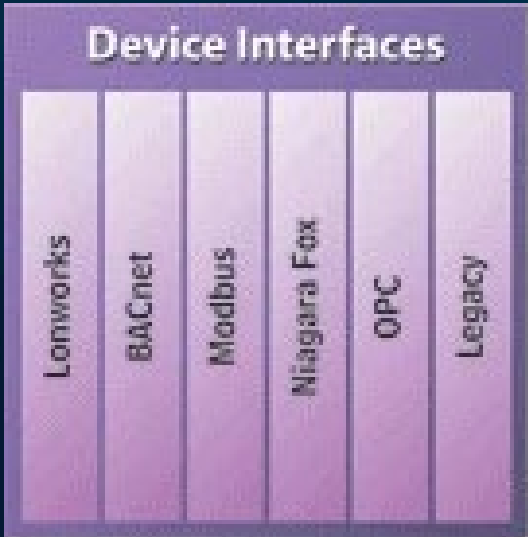


Automatic Modules



Java Modularity

- Adds new layer of abstraction over packages
- `module-info.java` builds the module graph
- **Automatic modules** assist with the migration to modules



Module
Name

Required
Dependencies

```
<module>.gradle.kts
description = "The Niagara Tenant Billing Application"

moduleManifest {
    moduleName.set("niagaraTenantBilling")
}

dependencies {
    nre(":niagaraAnnotationProcessors")
    nre(":nre")
    api(":baja")
    ...
}
```

Exported
Code

```
module-include.xml
<types>
    <type class="com.niagaratenantbilling.BExample" name="Example"/>
</types>
...
```

```

  ▾ folder niagaraTenantBilling
    ▾ folder niagaraTenantBilling [niagaraTenantBilling.niagaraTenantBilling]
      ▾ folder src [main] sources root
        > folder com.tridiumapps.niagaratenantbilling
        > folder rc.wb
        > folder res
          ☕ module-info.java ←
        ▾ folder srcTest [moduleTest] sources root
          > folder rc
          > folder test.com.tridiumapps.niagaratenantbilling
            ☕ module-info.java ←
          > folder tutorials
            Js Gruntfile.js
            ≡ module.lexicon
            ≡ module.palette
            </> module-include.xml
            </> moduleTest-include.xml
            🐛 niagaraTenantBilling.gradle.kts

```

Naming your module



- project-style or reverse-DNS
(my.module) (com.mycompany.mymodule)
- Names must be unique
- Follow standard Java package conventions



- niagara.* or com.tridium.*
- dashes (-)
- camelCase, trailing numbers, or version info

module-info.java

```
module tridiumapps.niagaratenantbilling {
```

```
    requires niagara.alarm;  
    requires transitive niagara.baja;  
    requires niagara.email;  
    requires niagara.history;  
    requires niagara.niagaraAnnotationProcessors;  
    requires niagara.nre;
```

```
    ...
```


```
    // example of Qualified v.s. Unqualified exports
```

```
    exports com.tridiumapps.niagaratenantbilling;  
    exports com.tridiumapps.niagaratenantbilling.invoice to <module name>;
```


```
    ...
```

```
}
```

each dependency in your
<module>.gradle.kts file



any packages
containing a Niagara
Type (BObject)



module-info.java (Annotations)

```
@SuppressWarnings({
    "requires-automatic",
    "requires-transitive-automatic",
    "opens"
})
module tridiumapps.niagaratenantbilling {
    ...
}
```

gradlew jar

```
> warning: [requires-automatic] requires directive for an automatic module
> warning: [requires-transitive-automatic] requires transitive directive for an automatic module
> warning: [opens] package is empty or does not exist
```

module-info.java (Annotations)

```
import static niagara.nre.security.permissions.PublicNiagaraBasicPermission.SET_TIME

@GrantNiagaraBasicPermission(SET_TIME)
module tridiumapps.niagaratenantbilling {
...
}
```

Niagara 4 Permission Group	Niagara 5 Permission Annotation
SET_SYSTEM_TIME	@GrantPublicNiagaraPermission(PublicNiagaraPermission. SET_TIME)
BACKUPS	@GrantPublicNiagaraPermission(PublicNiagaraPermission. RESTORE_BACKUP)
MANAGE_SERVER_TRUST_ANCHORS	@GrantPublicNiagaraPermission(PublicNiagaraPermission. MANAGE_SERVER_TRUST_ANCHORS)
RDB	@GrantPublicNiagaraPermission(PublicNiagaraPermission. RDB_CONNECTION)
RENAME_AND_RESTART_STATION	@GrantPublicNiagaraPermission(PublicNiagaraPermission. RENAME_AND_RESTART)

<module>.gradle.kts

```
tasks.withType<JavaCompile>().configureEach {  
    val niagaraEnvironment = project.niagaraEnvironmentService  
    options.compilerArgs.addAll(  
        listOf(  
            "-Xlint:deprecation", "-Xlint:overrides", "-Xlint:unchecked", "-Werror",  
            "--module-path", niagaraEnvironment.niagaraHome.dir("bin/ext").get().asFile.absolutePath +  
            File.pathSeparator +  
            niagaraEnvironment.niagaraConfigHome.dir("modules").get().asFile.absolutePath +  
            File.pathSeparator + classpath.asPath  
        )  
    )  
}
```

Additional Steps for EA - Subject to Change

<module>.gradle.kts

```
// error: module not found: org.apache.xmlgraphics.batik.awt.util
```

```
compileOnly("org.apache.xmlgraphics:batik-awt-util:1.19")
```

```
moduleTestCompileOnly("org.apache.xmlgraphics:batik-awt-util:1.19")
```

```
compileOnly("jakarta.mail:jakarta.mail-api:2.1.5")
```

```
moduleTestCompileOnly("jakarta.mail:jakarta.mail-api:2.1.5")
```

```
compileOnly("com.nimbusds:oauth2-oidc-sdk:11.26:jdk11")
```

```
moduleTestCompileOnly("com.nimbusds:oauth2-oidc-sdk:11.26:jdk11")
```

Additional Steps for EA - Subject to Change

Unterjar()

- Replaces uberjar() to avoid JPMS split-packages
- Keeps external JARs intact
- Preserves clean module boundaries

Helpful Resources

- Modules section of Doc Developer
- `spy:/sysManagers/moduleConfiguration`
- Niagara Community ✨

Niagara 5

- Niagara modules = **700+** JPMS modules
- Existing modules work without changes
- Maintainable architecture as applications grow!

Congratulations! 🎉

Your module is now a Niagara 5 module.



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SEAMLESS CONNECTIVITY,
POWERFUL INTELLIGENCE

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