



devonfw-ide

The devonfw community
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Table of Contents

Introduction	1
Features	1
Setup	4
1. Usage	6
1.1. Developer	6
1.2. Admin	7
1.3. Configuration	9
1.4. Variables	11
1.5. Devon CLI	14
1.6. Structure	36
2. Advanced Features	45
2.1. Cross-Plattform Tooling	45
2.2. Windows Tooling	45
2.3. MacOS Tooling	49
2.4. Linux Tooling	55
2.5. Lombok	55
3. Support	57
3.1. Migration from oasp4j-ide	57
3.2. License	59

Introduction

devonfw provides a solution to building applications which combine best-in-class frameworks and libraries as well as industry proven practices and code conventions. It massively speeds up development, reduces risks and helps deliver better results.

This document contains the instructions for the tool `devonfw-ide` to set up and maintain your development tools including your favorite IDE (integrated development environment).

Features

Every developer needs great tools to work efficiently. Setting up these tools manually can be tedious and error-prone. Furthermore, some projects may require different versions and configurations of such tools. Especially configurations like code-formatters should be consistent within a project to avoid diff-wars.

The `devonfw-ide` will solve these issues. Here are the features you will find through `devonfw-ide`:

- **Efficient**

Set up your IDE within minutes tailored for the requirements of your project.

- **Automated**

Automate the setup and update, avoid manual steps and mistakes.

- **Simple**

KISS (Keep It Small and Simple), no native installers that globally mess your OS or tool-integrations that break with every release. Instead, use templates and simple shell scripts.

- **Configurable**

You can change the `configuration` depending on your needs. Furthermore, the `settings` contain configuration templates for the different tools (see `configurator`).

- **Maintainable**

For your project you should copy these `settings` to an own `git` repository that can be maintained and updated to manage the tool configurations during the project lifecycle. If you use github or gitlab every developer can easily suggest changes and improvements to these `settings` via pull/merge requests, which is easier to manage with big teams.

- **Customizable**

Do you need an additional tool you had never heard of before? Put it in the `software` folder of the `structure`. The `devon CLI` will then automatically add it to your `PATH` variable.

Further you can create your own `commandlet` for your additional tool. For closed-source tools you can create your own archive and distribute it to your team members as long as you care about the terms and licenses of these tools.

- **Multi-platform**

It works on all major platforms: Windows, Mac and Linux.

- **Multi-tenancy**

You can have several instances of the `devonfw-ide` "`installed`" on your machine for different projects with different tools, tool versions and configurations. You won't need to set up any physical installation nor changing your operating system. "Installations" of `devonfw-ide` do not

interfere with each other nor with other installed software.

- **Multiple Workspaces**

It supports working with different [workspaces](#) on different branches. You can create and update new workspaces with a few clicks. You can see the workspace name in the title-bar of your IDE so you do not get confused and work on the right branch.

- **Free**

The [devonfw-ide](#) is free just like everything from [devonfw](#). See [LICENSE](#) for details.

IDEs

We support the following IDEs:

- [Eclipse](#)
- [Visual Studio Code](#)
- [IntelliJ](#)

Platforms

We support the following platforms:

- [java](#) (see also [devon4j](#))
- [C#](#) (see [devon4net](#))
- [node.js](#), [angular](#) and [ionic](#) (see [devon4ng](#))

Build-Systems

We support the following build-systems:

- [mvn](#) (maven)
- [npm](#)
- [gradle](#)

However, also other IDEs, platforms, or tools can be easily integrated as [commandlet](#).

Motivation

TL;DR? Lets talk to developers a correct language. Here are some examples with [devonfw-ide](#):

```

[/]$ devon
You are not inside a devonfw-ide installation: /
[/]$ cd /projects/devonfw
[devonfw]$ mvn
zsh: command not found: mvn
[devonfw]$ devon
devonfw-ide environment variables have been set for /projects/devonfw in workspace
main
[devonfw]$ mvn -v
Apache Maven 3.6.0 (97c98ec64a1fdfee7767ce5ffb20918da4f719f3; 2018-10-
24T20:41:47+02:00)
Maven home: /projects/devonfw/software/maven
Java version: 1.8.0_191, vendor: Oracle Corporation, runtime:
/projects/devonfw/software/java
Default locale: en_DE, platform encoding: UTF-8
OS name: "mac os x", version: "10.14.3", arch: "x86_64", family: "mac"
[devonfw]$ cd /projects/ide-test/workspaces/test/my-project
[my-project]$ devon
devonfw-ide environment variables have been set for /projects/ide-test in workspace
test
[my-project]$ mvn -v
Apache Maven 3.6.0 (97c98ec64a1fdfee7767ce5ffb20918da4f719f3; 2018-10-
24T20:41:47+02:00)
Maven home: /projects/ide-test/software/maven
Java version: 11.0.2, vendor: Oracle Corporation, runtime: /projects/ide-
test/software/jdk/Contents/Home
Default locale: en_DE, platform encoding: UTF-8
OS name: "mac os x", version: "10.14.3", arch: "x86_64", family: "mac"
[ide-test]$ devon eclipse
launching Eclipse for workspace test...
[my-project]$ devon build
[INFO] Scanning for projects...
...
[INFO] BUILD SUCCESS

```

This was just a very simple demo of what **devonfw-ide** can do. For further details have a look at our [CLI documentation](#).

Now you might ask:

- But I use Windows/Linux/MacOS/... - it works on all platforms!
- But how about Windows CMD or Power-Shell? - it works!
- But what if I use cygwin or git-bash on windows? - it works!
- But I love to use ConEmu or Commander - it works with full integration!
- How about MacOS Terminal or iTerm2? - it works with full integration!
- But I use zsh - it works!
- ...? - it works!

Wow! So let's get started with [download & setup](#).

Setup

Prerequisites

We try to make it as simple as possible for you. However, there are some minimal prerequisites:

- You need to have a tool to extract `*.tar.gz` files (`tar` and `gzip`). On Windows before Version 10 (1803) use `7-zip`. On all other platforms this comes out of the box.
- You need to have `git` and `curl` installed.
 - On Windows you only need to download and install [git for windows](#). This also ships with `bash` and `curl`.
 - On Linux you might need to install the above tools in case they are not present (e.g. `sudo apt-get install git curl` or `sudo yum install git-core curl`)
 - On MacOS you only need to download and install [git for mac](#).

Download

The latest release of `devonfw-ide` can be downloaded from [here](#) (You can find all releases in [maven central](#)).

Install

Create a central folder like `C:\projects` or `/projects`. Inside this folder, create a sub-folder for your new project such as `my-project` and extract the contents of the downloaded archive (`devonfw-ide-scripts-*.tar.gz`) to this new folder. Run the command `setup` in this folder (on windows double clicking on `setup.bat`). That's all. To get started read the [usage](#).

Uninstall

To "uninstall" your `devonfw-ide` you only need to call the following command:

```
devon ide uninstall
```

Then you can delete the `devonfw-ide` top-level folder(s) (`${DEVON_IDE_HOME}`).

The `devonfw-ide` is designed to be **non-invasive** to your operating system and computer. Therefore it is not "installed" on your system in a classical way. Instead you just create a folder and extract the [downloaded](#) archive to it. You only have to install regularly in advance some specific prerequisites like `git`. All the other softwares remain locally in your `devonfw-ide` folder. However, there are the following excuses (what is reverted by `devon ide uninstall`):

- The `devon` command is copied to your home directory (`~/.devon/devon`)
- The `devon` alias is added to your shell config (`~/.bashrc` and `~/.zshrc`, search for `alias devon="source ~/.devon/devon"`).

- On Windows the `devon.bat` command is copied to your home directory (`%USERPROFILE%\scripts\devon.bat`)
- On Windows this `%USERPROFILE%\scripts` directory is added to the `PATH` of your user.
- The `devonfw-ide` will download a third party software to your `~/Downloads` folder to reduce redundant storage.

Testing SNAPSHOT releases

Whenever a story in devonfw-ide is completed by merging a [PR](#), our [github actions](#) will build a new SNAPSHOT release and on success deploy it to nexus on OSSRH. You can therefore find the latest devonfw SNAPSHOT releases [here](#). Simply choose the latest SNAPSHOT version folder and then inside the `*.tar.gz` file for the latest version. Once downloaded, you can proceed as with official releases (see [install](#)).

If you test the latest SNAPSHOT please also give feedback to bug or feature tickets to let us know if things are working or not. Thanks for your testing, support and help to make devonfw better!

1. Usage

This section explains the usage of `devonfw-ide` according to your role:

- Everybody should read and follow the usage for a [developer](#).
- In case you want to administrate `devonfw-ide` settings for your project, you should also read the usage for the [ide-admin](#).

1.1. Developer

As a developer you are supported to [setup](#) your IDE automated and fast while you can have a nice cup of coffee (after you provided `settings-URL` and accepted the license). You only need the settings URL from your [ide-admin](#). Experienced developers can directly call `setup <<settings-URL>>`. Otherwise if you just call `setup` (e.g. by double-clicking it), you can enter it when you are prompted for `Settings URL` (using copy&paste to avoid typos).

Note: `devonfw-ide` supports autocompletion (since `2021.04.001`). Currently this only works in bash (on windows use git bash). Simply type `devon` and hit `[Tab]` to get completion.

1.1.1. Update

To update your IDE (if instructed by your [ide-admin](#)), you only need to run the following command:

```
devon ide update
```

Please note that windows is using file-locking what can have ugly side-effects. To be safe, you should have your IDE tools shut down before invoking the above update command. E.g. if a tool needs to be updated, the old installation folder will be moved to a backup and the new version is installed on top. If there are windows file locks in place this can fail and mess up things. You can still delete the according installation from your `software` folder and rerun `devon ide update` if you ran into this error.

1.1.2. Working with multiple workspaces

If you are working on different branches in parallel you typically want to use multiple workspaces.

1. Go to the [workspaces](#) folder in your `${DEVON_IDE_HOME}` and create a new folder with the name of your choice (e.g. `release2.1`).
2. Check out (`git clone ...`) the according projects and branch into that workspace folder.
3. Open a shell in that new workspace folder (`cd` to it) and according to your IDE run e.g. [eclipse](#), [vscode](#), or [intellij](#) to create your workspace and launch the IDE. You can also add the parameter `create-script` to the IDE [commandlet](#) in order to create a launch-script for your IDE.

You can have multiple instances of eclipse running for each workspace in parallel. To distinguish these instances you will find the workspace name in the title of eclipse.

1.2. Admin

You can easily customize and [configure devonfw-ide](#) for the requirements of your project. In order to do so, you need to create your own project-specific settings git repository and provide the URL to all developers for the [setup](#). With tools such as gitlab, bitbucket or github every developer can easily propose changes and improvements. However, we suggest that one team member is responsible to ensure that everything stays consistent and works. We will call this person the *ide-admin* of your project.

The following are the suggested step-by-step instructions how an *ide-admin* should prepare [devonfw-ide](#) for his new project:

1. Fork [ide-settings](#) to a git repository specific for your project (e.g. a new project in the [gitlab](#) of your [production-line](#) instance). In case you are using github, all you need to do is use the [Fork](#) button. In other cases simply create a new and empty git repository and clone this to your machine. Then add the default ide-settings as origin, fetch and pull from it:

```
git remote add upstream https://github.com/devonfw/ide-settings.git
git fetch upstream
git pull upstream master
git push
```

Now you should have a full fork as a copy of the [settings](#) git repo with all its history that is ready for upstream merges.

2. Study the [structure](#) of this git repository to understand where to find which configuration.
3. Study the [configuration](#) and understand that general settings can be tweaked in the toplevel [devon.properties](#) file of your settings git repository.
4. Configure the tools and their versions for your project. Here is an example:

```
DEVON_IDE_TOOLS=(java mvn eclipse)
ECLIPSE_VERSION=2020-06
# use e.g. 8u242b08 for Java 8
#JAVA_VERSION=8u242b08
JAVA_VERSION=11.0.5_10
MAVEN_VERSION=3.6.2
```

This way you will take over control of the tools and their versions for every developer in your project team and ensure that things get reproducible.

5. In case you need a proprietary or unsupported tool, you can study [how to include custom tools](#).
6. In case you have very restrictive policies about downloading tools from the internet, you can create and configure a [software repository](#) for your project or company.
7. Some of the tools (especially the actual IDEs) allow extensions via plugins. You can customize them to your needs for [eclipse](#), [VS code](#), or [intelliJ](#).

8. In your `settings` git repository you will find a `projects` folder. Here you will find configurations files for every git project relevant for your actual project. Feel free to create new projects for your needs and delete the `devonfw` specific default projects. The `projects` documentation will explain you how to do this.
9. For every IDE you will also find an according folder in your `settings` git repository. Here are the individual configuration settings for that IDE. You can change them by directly editing the according configuration files directly with a text-editor in your `settings` git repository. However, this is a really complex way and will take you a lot of time to find the right file and property to tweak for your actual need. Instead we suggest to study [how to customize IDE specific settings](#).
10. You may also create new sub-folders in your `settings` git repository and put individual things according to your needs. E.g. you could add scripts for `greasemonkey` or `tampermonkey`, as well as scripts for your database or whatever may be useful and worth to share in your team. However, to share and maintain knowledge we recommend to use a wiki instead.
11. You may want to customize the [Eclipse spellchecker dictionary](#) for your project and your language.

All described in the above steps (except the first one) can be used to manage and update the configuration during the project lifecycle. However, when you have done changes especially in a larger project, please consider the following best-practices to avoid that a large teams gets blocked by a non-functional IDE:

- Commit your changes to a feature-branch.
- First test the changes yourself.
- If all works as expected, pick a pilot user of the team to test the changes from the feature branch (go to `settings` folder, `git fetch`, `git checkout -t origin/feature/<<name>>`, `devon ide update`).
- Only after that works well for a couple of days, inform the entire team to update.

1.2.1. Announce changes to your team

In order to roll out the perfectly configured `devonfw-ide` to your project initially or when new members join, you only have to provide the `Settings URL` to the `developers` of your team. You can also provide a specific branch with `Settings URL#branch` to use variations of common settings or to test new settings before making them public to the team.

After you changed and tested your `settings` git repository (main branch), you only need to announce this to your `developers` (e.g. via email or some communication tool) so that they will can `devon ide update` and automatically get up-to-date with the latest changes (see [update](#)).

In case you want to go to a new version of `devonfw-ide` itself, `developers` have to call `devon ide update scripts`.

1.3. Configuration

The `devonfw-ide` aims to be highly configurable and flexible. The configuration of the `devon` command and environment variables takes place via `devon.properties` files. The following list shows these configuration files in the order they are loaded so files can override variables from files above in the list:

1. build in defaults (for `JAVA_VERSION`, `ECLIPSE_PLUGINS`, etc.)
2. `~/devon.properties` - user specific global defaults (on windows in `%USERPROFILE%/devon.properties`)
3. `scripts/devon.properties` - defaults provided by `devonfw-ide`. Never directly modify this file!
4. `devon.properties` - vendor variables for custom distributions of `devonfw-ide-scripts`, may e.g. tweak `SETTINGS_PATH` or predefine `SETTINGS_URL`.
5. `settings/devon.properties` (`${SETTINGS_PATH}/devon.properties`) - project specific configurations from `settings`.
6. `workspaces/${WORKSPACE}/devon.properties` - optional workspace specific configurations (especially helpful in projects using docker).
7. `conf/devon.properties` - user specific configurations (e.g. `M2_REPO=~/.m2/repository`). During setup this file is created by copying a template from `${SETTINGS_PATH}/devon/conf/devon.properties`.
8. `settings/projects/*.properties` - properties to configure [project checkout and import](#)

1.3.1. devon.properties

The `devon.properties` files allow to define environment variables in a simple and OS independent way:

- `#` comments begin with a hash sign (`#`) and are ignored
- `variable_name=variable_value` with space etc.
- `variable_name=${predefined_variable}/folder_name`

variable values can refer to other variables that are already defined, which will be resolved to their value. You have to use `${...}` syntax to make it work on all platforms (never use `%...%`, `$...`, or `$(...)` syntax in `devon.properties` files).

- `export exported_variable=this value will be exported in bash, in windows CMD the export prefix is ignored`
- `variable_name=`

this will unset the specified variable

- `variable_name=~ /some/path/and.file`

tilde is resolved to your personal home directory on any OS including windows.

- `array_variable=(value1 value2 value3)`

This will only work properly in `bash` worlds but as no arrays are used in CMD world of `devonfw-`

ide it does not hurt on windows.

- Please never surround values with quotes (`var="value"`)
- This format is similar to Java `*.properties` but does not support advanced features as unicode literals, multi-lined values, etc.

In order to know what to configure, have a look at the available [variables](#).

Please only tweak configurations that you need to change and take according responsibility. There is a price to pay for flexibility, which means you have to be careful what you do.

Further, you can configure [maven](#) via `conf/settings.xml`. To configure your IDE such as [eclipse](#) or [vscode](#) you can tweak the [settings](#).

1.4. Variables

The `devonfw-ide` defines a set of standard variables to your environment for [configuration](#) via `variables[.bat]` files. These environment variables are described by the following table. Those variables printed **bold** are also exported in your shell (except for windows CMD that does not have such concept). Variables with the value `-` are not set by default but may be set via [configuration](#) to override defaults. Please note that we are trying to minimize any potential side-effect from `devonfw-ide` to the outside world by reducing the number of variables and only exporting those that are required.

Table 1. Variables of `devonfw-ide`

Variable	Value	Meaning
<code>DEVON_IDE_HOME</code>	e.g. <code>./projects/my-project</code>	The top level directory of your <code>devonfw-ide</code> structure .
<code>PATH</code>	<code>\$PATH:\$DEVON_IDE_HOME/software/java:...</code>	You system path is adjusted by <code>devon</code> command .
<code>DEVON_HOME_DIR</code>	<code>~</code>	The platform independent home directory of the current user. In some edge-cases (e.g. in cygwin) this differs from <code>~</code> to ensure a central home directory for the user on a single machine in any context or environment.
<code>DEVON_IDE_TOOLS</code>	<code>(java mvn node npm)</code>	List of tools that should be installed and upgraded by default for your current IDE.
<code>DEVON_IDE_CUSTOM_TOOLS</code>	<code>-</code>	List of custom tools that should be installed additionally. See software for further details.
<code>DEVON_CREATE_START_SCRIPTS</code>	<code>(eclipse vscode)</code>	List of IDEs that shall be used by developers in the project and therefore start-scripts are created on setup.
<code>DEVON_OLD_PATH</code>	<code>...</code>	A "backup" of <code>PATH</code> before it was extended by <code>devon</code> to allow recovering it. Internal variable that should never be set or tweaked.
<code>WORKSPACE</code>	<code>main</code>	The workspace you are currently in. Defaults to <code>main</code> if you are not inside a workspace . Never touch this variable in any variables file.

Variable	Value	Meaning
WORKSPACE_PATH	\$DEVON_IDE_HOME/workspaces/\$WORKSPACE	Absolute path to current workspace . Never touch this variable in any variables file.
JAVA_HOME	\$DEVON_IDE_HOME/software/java	Path to JDK
SETTINGS_PATH	\$DEVON_IDE_HOME/settings	Path to your settings . To keep oasp4j-ide legacy behaviour set this to \$DEVON_IDE_HOME/workspaces/main/development/settings .
M2_REPO	\$DEVON_IDE_HOME/conf/.m2/repository	Path to your local maven repository. For projects without high security demands, you may change this to the maven default ~/.m2/repository and share your repository amongst multiple projects.
MAVEN_HOME	\$DEVON_IDE_HOME/software/maven	Path to Maven
MAVEN_OPTS	-Xmx512m -Duser.home=\$DEVON_IDE_HOME/conf	Maven options
DEVON_SOFTWARE_REPOSITORY	-	Project specific or custom software-repository .
DEVON_SOFTWARE_PATH	-	Globally shared user-specific local software installation location .
ECLIPSE_VMARGS	-Xms128M -Xmx768M -XX:MaxPermSize=256M	JVM options for Eclipse
deprecated: ECLIPSE_PLUGINS	-	Array with "feature groups" and "update site URLs" to customize required eclipse plugins . Deprecated - see Eclipse plugins .
<<TOOL>>_VERSION	-	The version of the tool <<TOOL>> to install and use (e.g. ECLIPSE_VERSION or MAVEN_VERSION).
<<TOOL>>_BUILD_OPTS	e.g. clean install	The arguments provided to the build-tool <<TOOL>> in order to run a build.
<<TOOL>>_RELEASE_OPTS	e.g. clean deploy -Dchangelist=-Pdeploy	The arguments provided to the build-tool <<TOOL>> in order to perform a release build.

Variable	Value	Meaning
DEVON_IDE_TRACE		If value is not an empty string, the <code>devonfw-ide</code> scripts will trace each script line executed. For bash two lines output: before and again after expansion. ATTENTION: This is not a regular variable working via <code>devon.properties</code>. Instead manually do <code>export DEVON_IDE_TRACE=true</code> in bash or <code>DEVON_IDE_TRACE=true</code> in windows CMD before running a devon command to get a trace log that you can provide to experts in order to trace down a bug and see what went wrong.

1.5. Devon CLI

The `devonfw-ide` is shipped with a central command `devon`. The `setup` will automatically register this command so it is available in any shell on your system. This page describes the Command Line Interface (CLI) of this command.

1.5.1. Devon

Without any argument the `devon` command will determine your `DEVON_IDE_HOME` and setup your `environment variables` automatically. In case you are not inside of a `devonfw-ide` folder the command will echo a message and do nothing.

```
[/]$ devon
You are not inside a devon IDE installation: /
[/]$ cd /projects/my-project/workspaces/test/my-git-repo
[my-git-repo]$ devon
devonfw-ide has environment variables have been set for /projects/my-project in
workspace main
[my-git-repo]$ echo $DEVON_IDE_HOME
/projects/devon
[my-git-repo]$ echo $JAVA_HOME
/projects/my-project/software/java
```

1.5.2. Commandlets

The `devon` command supports a pluggable set of *commandlets*. Such commandlet is provided as first argument to the devon command and may take additional arguments:

```
devon <<commandlet>> [<<arg>>]*
```

Technically, a commandlet is a bash script located in `$DEVON_IDE_HOME/scripts/command`. So if you want to integrate another tool with `devonfw-ide` we are awaiting your pull-request. Every commandlet takes the following generic arguments:

Table 2. Generic arguments of every commandlet

Argument(s)	Meaning
<code>-b</code> or <code>--batch</code>	run in non-interactive mode (do not ask any questions).
<code>-q</code> or <code>--quiet</code>	be quiet and avoid output.

Command-wrapper

For many commandlets the `devon` command acts as a wrapper. Similar to `mvnw` or `gradlew` you can use it as a proxy command. Therefore `devon mvn clean install` will be the same as `mvn clean install`. The benefit when using `devon` as wrapper is that it will even work when the command (`mvn`, `node`, `npm`, etc.) is not on your `PATH` variable or even not yet installed. We see the main benefit in this for writing portable scripts that you may commit to your git repository and that will then run

everywhere and will lazily install the required tools on the fly. In your daily usage you can and surely should avoid to always type **devon** as prefix to every command. However, when you automate and want to avoid "command not found" errors, you can simply prefix the command with **devon**.

Commandlet overview

The following commandlets are currently available:

- [build](#)
- [cobigen](#)
- [docker](#)
- [eclipse](#)
- [gradle](#)
- [help](#)
- [ide](#)
- [intellij](#)
- [ionic](#)
- [jasypt](#)
- [java](#)
- [jenkins](#)
- [kubernetes](#)
- [mvn](#)
- [ng](#)
- [node](#)
- [npm](#)
- [release](#)
- [sonar](#)
- [vscode](#)
- [yarn](#)

1.5.3. build

The **build** commandlet is an abstraction of build systems like [maven](#), [gradle](#), [yarn](#), [npm](#), etc. It will auto-detect your build-system (via existence of files like [pom.xml](#), [package.json](#), etc.). According to this detection it will simply delegate to the according commandlet of the specific build system. If that build-system is not yet available it will be downloaded and installed automatically.

So **devon build** allows users to build any project without bothering about the build-system. Further specific build options can be configured per project. This makes **devon build** a universal part of every *definition of done*. Before pushing your changes, please always run the following command to

verify the build:

```
devon build
```

You may also supply additional arguments as `devon build <args>`. This will simply delegate these arguments to the detected build command (e.g. call `mvn <args>`).

1.5.4. docker

The `docker` commandlet allows to install and use `docker`. On Windows [WSL 2](#)(Windows Subsystem for Linux) has to be installed properly as a prerequisite.

ATTENTION: Currently this feature is new and therefore experimental. It may change in incompatible ways in the next releases until we reach a stable state. We hope that all is working fine for you. However, do not expect everything to work out of the box. In case you are facing issues (e.g. network problems with Cisco AnyConnect, etc.) please give us feedback so we can improve.

The arguments (`devon docker <args>`) are explained by the following table:

Table 3. Usage of `devon docker`

Argument(s)	Meaning
<code>setup</code>	setup Docker (install and verify) as per above flow.
<code><args></code>	call docker with the specified arguments. Call <code>docker help</code> for details or use docker directly as preferred." (<code><args></code>)

setup

The `docker` commandlet will install `docker` automatically. Please note that besides the sandbox concept of devonfw-ide this is a global installation on your system. When uninstalling devonfw-ide, you may have to manually uninstall `docker` and `kubernetes` if you do not need it anymore.

requirements

Running docker and especially `kubernetes` on your machine in the background will require quite some resources. This will allocate at least 2GB of additional RAM.

You will need at least 8GB of total RAM while we recommend to use 16GB+.

You may also tune and scale it to your needs. When using Docker Desktop (Windows or MacOS) simply go to the [resources tab in the settings](#). It will depend on your usage frequency if you want to have it running in the background all the time. This is a balance between resource utilization and convenience. If you use docker and kubernetes on your local machine on a daily basis this makes sense.

In case you only use docker rarely, you can save resources by stopping it when not needed after it has been installed.

Windows and Mac

To enable or disable autostart, you can launch **Docker Desktop** on Windows or MacOS got to the **Preferences** (gear icon in the title bar). Then in the **General** tab you can check or uncheck the option **Start Docker Desktop when you login** (see also [here](#)). When autostart is disabled and you launch **Docker Desktop** it will notice and ask your to start the service or do this automatically for you. On Windows you can also manually tweak this:

- Hit `[windows][r]`
- Enter `services.msc`
- Confirm with `OK`
- In the services app search for the **Docker Desktop Service** in the list and select it.
- Now you can start or stop the service by clicking on the according link text.
- Also when right clicking on **Docker Desktop Service** and selecting **Options** from the context-menu, you can change the start type to `automatic` or `manual`.

Mac A1

In case you have a new Mac with A1 CPU, we automatically download and install the according ARM version of **Docker Desktop for Mac**. However, if you use docker and search for images you may end up with errors like:

```
docker: no matching manifest for linux/arm64/v8 in the manifest list entries.
```

So with A1 CPU you may need to add `--platform linux/x86_64` as option to your docker command to find the expected container image.

Linux

There is no Docker Desktop for Linux. As docker initially comes from the Linux world, it is easy to set it up on a Linux machine and use it from the commandline. Therefore we do not install a GUI for you in case you are a Linux user. In case you need a GUI for docker and kubernetes on Linux you can choose from the following options:

- [DockStation](#)
- [Portainer](#)
- [Kitematic](#)
- [Shipyard](#)

usage

Once installed via setup, you can run docker directly from any shell of your OS directly. Run `docker help` to get started and use the online documentations and resources on the web to get familiar with docker. It is not our intention to repeat this here.

Please note that the `docker` commandlet is a [command wrapper](#).

1.5.5. eclipse

The `eclipse` commandlet allows to install, configure, and launch the [Eclipse IDE](#). To launch Eclipse for your current workspace and devonfw-ide installation simply run: `devon eclipse`

You may also supply additional arguments as `devon eclipse <<args>>`. These are explained by the following table:

Table 4. Usage of `devon eclipse`

Argument(s)	Meaning
<code>--all</code>	if provided as first arg then to command will be invoked for each workspace
<code>setup</code>	setup Eclipse (install or update)
<code>add-plugin <<id>> [<<url>>]</code>	install an additional plugin
<code>run</code>	launch Eclipse (default if no argument is given)
<code>start</code>	same as <code>run</code>
<code>ws-up[<date>]</code>	update workspace
<code>ws-re[verse]</code>	reverse merge changes from workspace into settings
<code>ws-reverse-add</code>	reverse merge adding new properties
<code>create-script</code>	create launch script for this IDE, your current workspace and your OS

There are variables that can be used for Eclipse. These are explained by the following table:

Table 5. Variables of `devonfw-ide` for Eclipse

Variable	Default-Value	Meaning
<code>ECLIPSE_VERSION</code>	<code>2020-12</code>	The version of the tool Eclipse to install and use.
<code>ECLIPSE_EDITION_TYPE</code>	<code>java</code>	The edition of the tool Eclipse to install and use. You can choose between 'java' for standard edition or 'jee' for enterprise edition.

plugins

To be productive with Eclipse you need plugins. Of course `devonfw-ide` can automate this for you: In your [settings](#) git repository create a folder [eclipse/plugins](#) (click on this link to see more examples and see which plugins come by default). Here you can create a properties file for each plugin. This is an example [tmterminal.properties](#):

```

plugin_url=http://download.eclipse.org/tm/terminal/marketplace
plugin_id=org.eclipse.tm.terminal.feature.feature.group,org.eclipse.tm.terminal.view.f
eature.feature.group,org.eclipse.tm.terminal.control.feature.feature.group,org.eclipse
.tm.terminal.connector.ssh.feature.feature.group,org.eclipse.tm.terminal.connector.tel
net.feature.feature.group
plugin_active=true

```

The variables are defined as follows:

- **plugin_url** defines the URL of the Eclipse update site of the plugin
- **plugin_id** defines the feature group ID(s) to install. To install multiple features/plugins provide a coma-separated list of IDs. If you want to customize **devonfw-ide** with new plugins you can first install them manually and then go to **About Eclipse > Installation Details** then you can filter for your newly installed plugin and find the values in the **Id** column. Copy & paste them from here to make up your own custom config.
- **plugin_active** is an optional parameter. If it is **true** (default) the plugin will be installed automatically during the project **setup** for all developers in your team. Otherwise, developers can still install the plugin manually via **devon eclipse add-plugin «plugin-name»** from the config file **settings/eclipse/plugins/«plugin-name».properties**. See the **settings/eclipse/plugins** folder for possible values of «plugin-name».

In general you should try to stick with the configuration pre-defined by your project. But some plugins may be considered as personal flavor and are typically not predefined by the project config. This e.g. applies for devstyle that allows a real dark mode for eclipse and tunes the theming and layout of Eclipse in general. Such plugins should be shipped with your **settings** as described above with **plugin_active=false** allowing you to easily install it manually.

As the maintainer of the **settings** for your project you should avoid to ship too many plugins that may waste resources but are not used by every developer. By configuring additional plugins with **plugin_active=false** you can give your developers the freedom to install some additional plugins easily.

legacy plugin config

For downward compatibility we still support the deprecated legacy configuration if the folder **settings/eclipse/plugins** does not exist: The project **configuration** typically defines the plugins that will be installed via **ECLIPSE_PLUGINS** variable. Otherwise defaults from this **eclipse commandlet** will apply. Be aware that this comes at your own risk and sometimes plugins can conflict and break your IDE.

Here is an example how a project can configure the plugins in its **devon.properties** inside the **settings**:

```

ECLIPSE_PLUGINS=("AnyEditTools.feature.group"
"https://raw.githubusercontent.com/iloveeclipse/plugins/latest/"
"com.ess.regexutil.feature.group" "http://regex-util.sourceforge.net/update/")

```

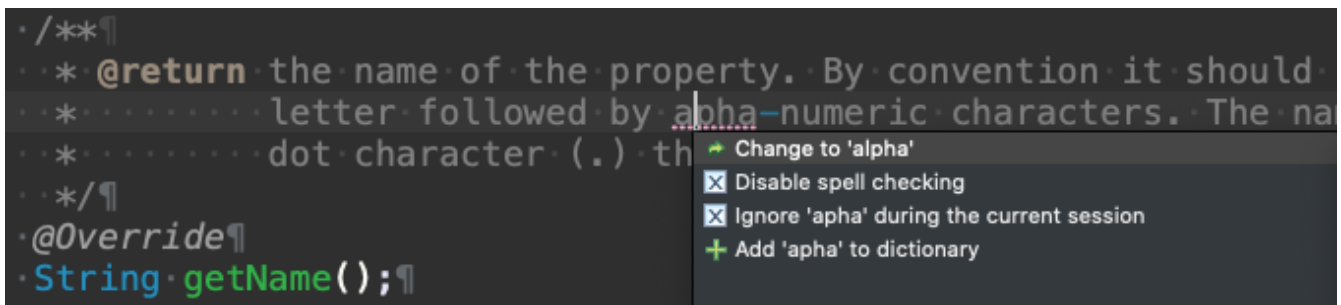
For the above listed plugins you can also use the short form:

```
ECLIPSE_PLUGINS=("anyedit" "" "regexutil" "")
```

Of course you may also mix plugin IDs with fully qualified plugins.

dictionary

Eclipse already comes with a build-in spellchecker. This is very helpful when writing comments. The default settings of `devonfw-ide` ship with a project specific [dictionary file](#) and according configurations to enable spellchecking and configuring this dictionary. When typing JavaDoc, inline comments or other texts the spellchecker will underline unknown words in red. If your cursor is located at such a word you can hit `[Ctrl][1]` to get a context menu with additional options. There you can either choose similar correct words to correct a typo or you may even add the word (maybe a new business term) to your local dictionary.



In the latter case, you should commit the changes to your [settings](#) so that it will be available to your entire team. For further details about committing changes to the settings please consult the [admin usage](#).

non-english dictionary

In case your project has to write documentation or text in languages other than English, you might want to prefill your project dictionary for that language. Here we collect a list of such dictionaries that you can download and merge into your project dictionary:

- German: <https://sourceforge.net/projects/germandict/> (has to be converted to UTF-8 e.g. with [Notepad++](#) via `Encoding > Convert to UTF-8`)

1.5.6. gradle

The `gradle` commandlet allows to install, configure, and launch `gradle`. It is similar to `gradle-wrapper`. So calling `devon gradle <args>` is more or less the same as calling `gradle <args>` but with the benefit that the version of gradle preferred by your project is used (and will be installed if not yet available).

The arguments (`devon gradle <args>`) are explained by the following table:

Table 6. Usage of `devon gradle`

Argument(s)	Meaning
setup	setup gradle (install and verify), configurable via <code>GRADLE_VERSION</code>
<<args>>	run gradle with the given arguments (<<args>>)

1.5.7. help

The `help` commandlet provides help for the CLI.

Table 7. Usage of `devon help`

Argument(s)	Meaning
	Print general help
<<command>>	Print help for the commandlet <<command>>.

Please note that `devon help <<command>>` will do the same as `devon <<command>> help`.

1.5.8. ide

The `ide` commandlet manages your `devonfw-ide`. You need to supply additional arguments as `devon ide <<args>>`. These are explained by the following table:

Table 8. Usage of `devon ide`

Argument(s)	Meaning
setup [<<SETTINGS_URL>>]	setup devonfw-ide (cloning the settings from the given URL, optionally from specific branch URL#branch)
update [<<package>>]	update devonfw-ide
update scripts [to <<version>>]	update devonfw-ide
uninstall	uninstall devonfw-ide (if you want remove it entirely from your system)

setup

Run `devon ide setup` to initially setup your `devonfw-ide`. It is recommended to run the `setup` script in the top-level directory (`$DEVON_IDE_HOME`). However, in case you want to skip some system specific integrations, you may also run this command directly instead. The setup only needs to be called once after a new `devonfw-ide` instance has been created. It will follow this process:

- `install` the `devon` command on your system (if not already installed).
- clone the `settings` (you may provide a git URL directly as argument or you will be prompted for it).
- install all required `software` from `DEVON_IDE_TOOLS` variable (if not already installed).
- configure all these tools

- create IDE launch scripts
- perform OS specific system integration such as WindowsExplorer integration (only done from `setup` script and not from `devon ide setup`)

update

Run `devon ide update` to update your `devonfw-ide`. This will check for updates and `install` them automatically. The optional extra argument (`<<package>>`) behaves as follows:

- `scripts`: check if a new version of `devonfw-ide-scripts` is available. If so it will be downloaded and installed. As Windows is using file-locks, it is tricky to update a script while it is executed. Therefore, we update the `scripts` folder as an async background task and have to abort further processing at this point on windows as a workaround.
- `settings`: update the `settings` (`git pull`).
- `software`: update the `software` (e.g. if versions have changed via `scripts` or `settings` update).
- `projects`: update the `projects` (checkout and import repositories into workspace/IDEs).
- `all`: do all the above sequentially.
- `none`: `settings` and `software` are updated by default if no extra argument is given. This is the regular usage for project developers. Only perform an update of `scripts` when you are requested to do so by your technical lead. Bigger projects especially need to test updates before rolling them out to the entire team. If developers always updated the latest release of the `scripts` which is released globally, some project functionality would break causing problems and extra efforts in the teams.

In order to update to a specific version of `scripts` an explicit version can be specified after the additional `to` argument:

```
devon ide update scripts to 3.1.99
```

The above example will update to the exact version `3.1.99` no matter if this is an upgrade or a downgrade of your current installed version. If you just use `devon ide update scripts` then the latest available version will be installed. In larger teams it is recommended to communicate exact version updates to avoid that a new release can interfere and break anything. Therefore, some pilot user will test a new version for the entire team and, only after a successful test, they will communicate to the team to update to that exact version by providing the complete command as in the above example.

uninstall

We hope you love `devonfw-ide`. However, if you don't and want to get rid of it entirely and completely remove all integrations, you can use this command:

```
devon ide uninstall
```

This will remove `devonfw-ide` from all central places of your OS (user home directory such as

`scripts`, `.devon`, `.bashrc`, as well as windows registry, etc.). However, it will not remove your current installations (or shared `software` folder). So after running this `uninstall`, simply remove your `DEVON_IDE_HOME` directory of all `devonfw-ide` installations and potential shared `software` folder. You may also want to clean up your `~/Downloads` directory from files downloaded by `devonfw-ide`. We do not automate this as deleting a directory is a very simple manual step and we do not want to take responsibility for severe data loss if your workspaces contained valuable work.

1.5.9. intellij

The `intellij` commandlet allows to install, configure, and launch `IntelliJ`. To launch IntelliJ for your current workspace and `devonfw-ide` installation, simply run: `devon intellij`

You may also supply additional arguments as `devon intellij <args>`. These are explained by the following table:

Table 9. Usage of `devon intellij`

Argument(s)	Meaning
<code>--all</code>	if provided as first arg then to command will be invoked for each workspace
<code>setup</code>	setup IntelliJ (install or update)
<code>run</code>	launch IntelliJ (default if no argument is given)
<code>start</code>	same as <code>run</code>
<code>ws-up[date]</code>	update workspace
<code>ws-re[verse]</code>	reverse merge changes from workspace into settings
<code>ws-reverse-add</code>	reverse merge adding new properties
<code>create-script</code>	create launch script for this IDE, your current workspace and your OS

There are variables that can be used for IntelliJ. These are explained by the following table:

Table 10. Variables of `devonfw-ide` for `intellij`

Variable	Default-Value	Meaning
<code>INTELLIJ_VERSION</code>	<code>latest_tested_version</code>	The version of the tool IntelliJ to install and use.

Variable	Default-Value	Meaning
INTELLIJ_EDITION_TYPE	C	The edition of the tool IntelliJ to install and use. The value C mean Community edition and the value U mean Ultimate edition. The Ultimate edition requires a license. The user has to buy the license separately and it is not part of devonfw-ide. The devonfw-ide only supports download and installation.

1.5.10. ionic

The **ionic** commandlet allows to install, configure, and launch **ionic** (ionic-cli). Calling **devon ionic <args>** is more or less the same as calling **ionic <args>** but with some advanced features and ensuring that **ionic** is properly set up for your project.

The arguments (**devon ionic <args>**) are explained by the following table:

Table 11. Usage of **devon ionic**

Argument(s)	Meaning
setup	setup yarn (install and verify), configurable via YARN_VERSION
create	Create a new devon4ng ionic project.
cicd <args>	generate cicd files for the current devon4ng project
<args>	run ionic with the given arguments (<args>)

1.5.11. jasypt

The **jasypt** commandlet allows to install **jasypt** and encrypt or decrypt secrets using strong encryption given a secure masterpassword. See also [devon4j password encryption guide](#) for further details.

The arguments (**devon jasypt <args>**) are explained by the following table:

Table 12. Usage of **devon mvn**

Argument(s)	Meaning
setup	setup jasypt (install and verify), configurable via JASYPT_VERSION
encrypt	Encrypt a secret with a masterpassword

Argument(s)	Meaning
decrypt	Decrypt an encrypted secret with a masterpassword

example

```
devon jasypt encrypt
Enter masterpassword: master
Enter secret to encrypt/decrypt: secret
```

----ENVIRONMENT-----

Runtime: AdoptOpenJDK OpenJDK 64-Bit Server VM 11.0.9.1+1

----ARGUMENTS-----

```
input: secret
password: master
ivGeneratorClassName: org.jasypt.iv.RandomIvGenerator
algorithm: PBWITHHMACSHA512ANDAES_256
```

----OUTPUT-----

fQPbaDd8wq0h0q0Zw/AEKp2TD4Y07Y//M5PzaLgF3qL7YnBQjiGLtW8s5XkP3Ly9

```
devon jasypt decrypt
Enter masterpassword: master
Enter secret to encrypt/decrypt:
fQPbaDd8wq0h0q0Zw/AEKp2TD4Y07Y//M5PzaLgF3qL7YnBQjiGLtW8s5XkP3Ly9
```

----ENVIRONMENT-----

Runtime: AdoptOpenJDK OpenJDK 64-Bit Server VM 11.0.9.1+1

----ARGUMENTS-----

```
input: fQPbaDd8wq0h0q0Zw/AEKp2TD4Y07Y//M5PzaLgF3qL7YnBQjiGLtW8s5XkP3Ly9
password: master
ivGeneratorClassName: org.jasypt.iv.RandomIvGenerator
algorithm: PBWITHHMACSHA512ANDAES_256
```

----OUTPUT-----

secret

1.5.12. java

The `java` commandlet allows to install and setup [Java](#). Also it supports [devon4j](#). The arguments (`devon java <<args>>`) are explained by the following table:

Table 13. Usage of `devon java`

Argument(s)	Meaning
<code>setup</code>	setup OpenJDK (install or update and verify), configurable via <code>JAVA_VERSION</code> (e.g. <code>8u242b08</code> or <code>11.0.6_10</code>)
<code>create <<args>></code>	create a new Java project based on devon4j application template . If a single argument is provided, this is the package name and is automatically split into groupId and artifactId. Use <code>-DbType=<<db>></code> to choose the database (hana, oracle, mssql, postgresql, mariadb, mysql, h2, hsqldb). Any option starting with dash is passed as is."
<code>migrate [from <<version>>] [single]</code>	migrate a devon4j project to the latest version. If for some reasons the current devonfw version (e.g. <code>oasp4j:2.6.0</code>) can not be auto-detected you may provide it manually after the 'from' argument. Also the 'single' option allows to migrate only to the next available version."
<code>cicd <<args>></code>	generate cicd files for the current devon4java project

create

Examples for create a new devon4j application:

```
devon java create com.example.domain.myapp
```

Will create an app with package `com.example.domain.myapp`, groupId `com.example.domain`, artifactId `myapp`, version `1.0.0-SNAPSHOT`, and h2 database.

```
devon java create -Dversion=0.0.1-alpha1 com.example.domain.myapp
```

Will create an app with package `com.example.domain.myapp`, groupId `com.example.domain`, artifactId `myapp`, version `0.0.1-alpha1`, and h2 database.

```
devon java create com.example.domain.myapp com.example.group
```

Will create an app with package `com.example.domain.myapp`, groupId `com.example.group`, artifactId

`myapp`, version `1.0.0-SNAPSHOT`, and h2 database.

```
devon java create com.example.domain.myapp com.example.group demo-app
```

Will create an app with package `com.example.domain.myapp`, groupId `com.example.group`, artifactId `demo-app`, version `1.0.0-SNAPSHOT`, and h2 database.

```
devon java create com.example.domain.myapp -DartifactId=demo-app -DdbType=hana
```

Will create an app with package `com.example.domain.myapp`, groupId `com.example.group`, artifactId `demo-app`, version `1.0.0-SNAPSHOT`, and SAP hana database.

```
devon java create com.example.domain.myapp -DdbType=oracle -Dversion=0.0.1
com.example.group -Dbatch=batch
```

Will create an app with package `com.example.domain.myapp`, groupId `com.example.group`, artifactId `myapp`, version `0.0.1`, oracle database, and with a batch module.

migrate

Example for migrating a devon4j application:

```
devon java migrate
```

Will migrate current devon4j application to the latest version available.

1.5.13. jenkins

The `jenkins` commandlet allows to install, configure, and launch [Jenkins](#).

Table 14. Usage of `devon jenkins`

Argument(s)	Meaning
<code>setup</code>	Setup Jenkins (install and verify)
<code>start</code>	Start your local Jenkins server
<code>stop</code>	Stop your local Jenkins server
<code>add</code>	Add current project as CI job to your local Jenkins

1.5.14. kubernetes

The `kubectl` commandlet allows to install and use [kubernetes](#). On Windows [WSL 2](#) (Windows Subsystem for Linux) has to be installed properly as a prerequisite. The setup on windows will then install kubernetes with [K3D](#). K3D will create a cluster with a single node with a default name as

"devonfw-cluster"

ATTENTION: Currently this feature is new and therefore experimental. It may change in incompatible ways in the next releases until we reach a stable state. We hope that all is working fine for you. However, do not expect everything to work out of the box. In case you are facing issues (e.g. network problems with Cisco AnyConnect, etc.) please give us feedback so we can improve.

The arguments (`devon kubectl <<args>>`) are explained by the following table:

Table 15. Usage of `devon kubectl`

Argument(s)	Meaning
<code>setup</code>	setup Kubernetes (install and verify) as per above flow.
<code><<args>></code>	call kubectl with the specified arguments. Call <code>kubectl help</code> for details or use kubectl directly as preferred.

setup

Please note that on Windows and MacOS `kubernetes` support comes together with `Docker Desktop` that is installed via `docker` commandlet. When you have installed and launched `Docker Desktop`, you can once [enable kubernetes in the Preferences](#).

On Linux however, kubernetes is installed separately by this commandlet.

usage

Once installed via setup, you can run `kubectl` directly from any shell of your OS directly. Run `kubectl help` to get started and use the online documentations and resources on the web to get familiar with kubernetes. It is not our intention to repeat this here.

Please note that the `kubectl` commandlet is a [command wrapper](#).

1.5.15. mvn

The `mvn` commandlet allows to install, configure, and launch `maven`. It is similar to `maven-wrapper` and `mdub`. So calling `devon mvn <<args>>` is more or less the same as calling `mvn <<args>>` but with the benefit that the version of maven preferred by your project is used (and will be installed if not yet available).

The arguments (`devon mvn <<args>>`) are explained by the following table:

Table 16. Usage of `devon mvn`

Argument(s)	Meaning
	run default build, configurable via <code>MVN_BUILD_OPTS</code>

Argument(s)	Meaning
setup	setup Maven (install and verify), configurable via <code>MAVEN_VERSION</code>
get-version	Print the version of your current project. Will consolidate the version for multi-module projects ignoring <code>dev[-SNAPSHOT]</code> versions and fail on mixed versions.
set-version «nv» [«cv»]	Set the version of your current project to «nv» (assuming your current version is «cv»).
check-no-snapshots	Check if no «version»-SNAPSHOT dependencies are used.
check-top-level-project	Check if you are running on a top-level project or fail if in a module or no maven project at all.
release	Start a clean deploy release build, configurable via <code>MVN_RELEASE_OPTS</code>
«args»	run maven with the given arguments («args»)

1.5.16. ng

The `ng` commandlet allows to install, configure, and launch `ng` (angular-cli). Calling `devon ng «args»` is more or less the same as calling `ng «args»` but with some advanced features and ensuring that `ng` is properly set up for your project.

The arguments (`devon ng «args»`) are explained by the following table:

Table 17. Usage of `devon ng`

Argument(s)	Meaning
setup	setup yarn (install and verify), configurable via <code>NG_VERSION</code>
create	Create a new <code>devon4ng</code> project.
cicd «args»	generate cicd files for the current <code>devon4ng</code> project
«args»	run <code>ng</code> with the given arguments («args»)

1.5.17. node

The `node` commandlet allows to install and setup `node.js`. The arguments (`devon node «args»`) are explained by the following table:

Table 18. Usage of `devon node`

Argument(s)	Meaning
setup	setup node.js (install and verify), configurable via <code>NODE_VERSION</code>
create «name» [«args»]	create a new devon4node application (same as <code>devon4node new</code>)
generate «s» [«args»]	generate devon4node components using the schematic «s» (same as <code>devon4node generate</code>)
db «c» [«args»]	execute a TypeORM command «c» (same as <code>devon4node db</code>)
cicd «args»	generate cicd files for the current devon4node project
«args»	call NodeJS with the specified arguments

1.5.18. npm

The `npm` commandlet allows to install, configure, and launch `npm`. Calling `devon npm «args»` is more or less the same as calling `npm «args»` but with the benefit that the version of npm preferred by your project is used (and will be installed if not yet available).

The arguments (`devon npm «args»`) are explained by the following table:

Table 19. Usage of `devon npm`

Argument(s)	Meaning
	run default build, configurable via <code>NPM_BUILD_OPTS</code>
setup	setup NPM (install and verify), configurable via <code>NPM_VERSION</code>
get-version	print the version of your current project
set-version «nv» [«cv»]	set the version of your current project to «nv» (assuming your current version is «cv»)
check-top-level-project	check if you are running on a top-level project or fail if in a module or no NPM project at all
release	Start a clean deploy release build, configurable via <code>NPM_RELEASE_OPTS</code>
«args»	run NPM with the given arguments («args»)

1.5.19. release

Create a release in a standardized way including the following steps:

- verify the current project (no local changes, etc.)
- warn if «version»-`SNAPSHOT` dependencies are used

- determine `<<version>>` (if currently `<<version>>-SNAPSHOT`) and print out release information.
- ask user for confirmation
- bump release to `<<version>>` in build configuration (e.g. `pom.xml` files)
- commit the change
- create annotated tag for your release as `release/<<version>>`
- invoke deployment on build-system
- set next version as `(<<version>>+1)-SNAPSHOT` in build configuration (e.g. `pom.xml` files)
- commit the change
- push your changes

Table 20. Usage of `devon java`

Argument(s)	Meaning
...	any optional argument will directly be passed to the actual command to build the deployment

Build-Tools

This `release` commandlet utilizes the `build` commandlet to support multiple build-tools such as `maven`, `gradle`, or `npm`. Each of those commandlets should respect the variable `<<TOOL>>_RELEASE_OPTS` to customize the parameters for the release build.

So e.g. if a `pom.xml` is detected, maven will be used. In this example the variable `MVN_RELEASE_OPTS` is used that defaults to `clean deploy -Dchangelist= -Pdeploy`. If you provide a specific argument this will be passed additionally. So if you invoke the command `devon release -P myProfile`, the above step `invoke deployment on build-system` would technically call this:

```
mvn clean deploy -Dchangelist= -Pdeploy -P myProfile
```

Please also note that it is very tricky to determine and modify the version of a project in a fully generic way. Even though we try our best to support different scenarios, we can not ensure this is working for edge-cases. Therefore, we strongly encourage to follow best practices such as `ci-friendly maven`. Further, sticking to the defaults and follow the devonfw standard to name the profile for custom goals in deployment simply `deploy` is recommended.

1.5.20. sonar

The `sonar` commandlet allows to install, configure, and launch `SonarQube`.

Table 21. Usage of `devon sonar`

Argument(s)	Meaning
<code>setup</code>	Setup SonarQube (install and verify)
<code>start</code>	Start your local SonarQube server

Argument(s)	Meaning
<code>stop</code>	Stop your local SonarQube server
<code>analyze</code>	Analyze current project with SonarQube

1.5.21. vscode

The `vscode` commandlet allows to install, configure, and launch [Visual Studio Code](#). To launch VSCode for your current workspace and `devonfw-ide` installation, simply run: `devon vscode`

You may also supply additional arguments as `devon vscode <<args>>`. These are explained by the following table:

Table 22. Usage of `devon vscode`

Argument(s)	Meaning
<code>--all</code>	if provided as first arg then to command will be invoked for each workspace
<code>setup</code>	setup VSCode (install or update)
<code>run</code>	launch VSCode (default if no argument is given)
<code>start</code>	same as <code>run</code>
<code>ws-up[date]</code>	update workspace
<code>ws-re[verse]</code>	reverse merge changes from workspace into settings
<code>ws-reverse-add</code>	reverse merge adding new properties
<code>create-script</code>	create launch script for this IDE, your current workspace and your OS

plugins

To be productive with VS Code you need plugins (called `extensions` in VS Code). Of course `devonfw-ide` can automate this for you: In your [settings](#) git repository create a folder `vscode/plugins` (click this link to see more examples and see which plugins come by default). Here you can create a properties file for each plugin. This is an example [devonfw-extension-pack.properties](#):

```
plugin_id=devonfw.devonfw-extension-pack
plugin_active=true
```

The variables are defined as following:

- `plugin_id` defines the unique ID of the plugin to install. If you want to customize `devonfw-ide` with new plugins click on `Extensions` at the bottom of the left navigation icon bar in VS code. Then use the search to find the plugin of your choice. If you click on it the plugin ID is displayed in grey beside the official title at the top of the plugin details page. Copy & paste the ID from here to make up your own custom config.

- `plugin_active` is an optional parameter. If it is `true` (default) the plugin will be installed automatically during the project `setup` for all developers in your team. Otherwise developers can still install the plugin manually via `devon vscode add-plugin <<plugin-name>>` from the config file `settings/vscode/plugins/<<plugin-name>>.properties`. See the `settings/vscode/plugins` folder for possible values of `<<plugin-name>>`.

In general you should try to stick with the configuration pre-defined by your project. But some plugins may be considered as personal flavor and are typically not predefined by the project config. Such plugins should be shipped with your `settings` as described above with `plugin_active=false` allowing you to easily install it manually. Surely, you can easily add plugins via the UI of VS code. However, be aware that some plugins may collect sensitive data or could introduce other vulnerabilities. So consider the governance of your project and talk to your technical lead before installing additional plugins that are not pre-defined in your `settings`.

As maintainer of the `settings` for your project you should avoid to ship too many plugins that may waste resources but are not used by every developer. By configuring additional plugins with `plugin_active=false` you can give your developers the freedom to install some additional plugins easily.

cleaning plugins on update

If you want to strictly manage the plugins for `VS code` in your project, you can create or edit the file `settings/vscode/plugins` in your `settings` and add this variable:

```
clean_plugins_on_update=true
```

This will wipe all plugins when an update of `VS code` is performed (e.g. via `devon ide update`) and reinstall all configured plugins. While this gives you more control over the governance of the plugins and allows to remove a plugin later during project lifecycle. However, this will delete all manually installed plugins automatically without asking.

1.5.22. yarn

The `yarn` commandlet allows to install, configure, and launch `npm`. Calling `devon yarn <<args>>` is more or less the same as calling `yarn <<args>>` but with the benefit that the version of `npm` preferred by your project is used (and will be installed if not yet available).

The arguments (`devon yarn <<args>>`) are explained by the following table:

Table 23. Usage of `devon yarn`

Argument(s)	Meaning
	run default build, <code>configurable</code> via <code>YARN_BUILD_OPTS</code>
<code>setup</code>	setup yarn (install and verify), <code>configurable</code> via <code>YARN_VERSION</code>
<code>get-version</code>	print the version of your current project

Argument(s)	Meaning
set-version <<nv>> [<<cv>>]	set the version of your current project to <<nv>> (assuming your current version is <<cv>>)
check-top-level-project	check if you are running on a top-level project or fail if in a module or no NPM project at all
release	start a clean deploy release build, configurable via YARN_RELEASE_OPTS
<<args>>	run yarn with the given arguments (<<args>>)

1.6. Structure

The directory layout of your **devonfw-ide** will look like this:

Listing 1. File structure of your devonfw-ide

```
/ projects (or C:\Projects, etc.)
├── / my-project ($DEVON_IDE_HOME)
│   ├── / conf
│   ├── / log
│   ├── / scripts
│   ├── / settings
│   ├── / software
│   ├── / system
│   ├── / updates
│   ├── / workspaces
│   ├── setup
│   ├── setup.bat
│   └── devon-ide-doc.pdf
```

The elements of the above structure are described in the individual sections. As they are hyperlinks you can simply click on them to get more details.

1.6.1. conf

This folder contains configurations for your IDE:

Listing 2. File structure of the conf folder

```
/ conf
├── / .m2
│   ├── / repository
│   │   ├── / ant
│   │   ├── / ...
│   │   └── / zw
│   ├── settings-security.xml
│   └── settings.xml
├── / .sonar
├── / ...
└── variables
```

The **.m2** folder is used for configurations of **maven**. It contains the local **repository** folder used as cache for artifacts downloaded and installed by maven (see also **maven repositories**). Further, there are two configuration files for maven:

- **settings.xml** initialized from a template from your **devonfw-ide settings**. You may customize this to your needs (configuring HTTP proxies, credentials, or other user-specific settings). Secrets can be specified as `${<<variable.name>>}` and will be prompted, encrypted and replaced automatically during the setup (unless in **batch mode**). In case your credentials have changed or

you made a typo, you can simply redo this step by first moving your `${DEVON_IDE_HOME}/conf/.m2/settings.xml` file to a temporary folder and then calling `devon mvn setup`.

- `settings-security.xml` is auto-generated for you by `devonfw-ide` with a random password. This should make it easier for `devonfw-ide` users to use `password encryption` and never add passwords in plain text for better security.

Finally, there is a file `variables` for the user-specific `configuration` of `devonfw-ide`.

1.6.2. log

The log directory is used to store log files e.g. for the IDE `configurator`. You may look here for debug information if something goes wrong.

1.6.3. scripts

This directory is the heart of the `devonfw-ide` and contains the required `scripts`.

Listing 3. File structure of the conf folder

```
/scripts
├── / command
│   ├── build
│   ├── docker
│   ├── eclipse
│   ├── gradle
│   ├── help
│   ├── ide
│   ├── intellij
│   ├── ionic
│   ├── jasypt
│   ├── java
│   ├── jenkins
│   ├── kubectl
│   ├── mvn
│   ├── ng
│   ├── node
│   ├── npm
│   ├── project
│   ├── release
│   ├── sonar
│   ├── vscode
│   └── yarn
├── devon
├── devon.bat
├── environment-project
├── environment-project.bat
├── functions
└── devon.properties
```

The `command` folder contains the `commandlets`. The `devon` script is the key `command line interface` for `devonfw-ide`. There is also `devon.bat` that can be used in CMD or PowerShell. As the `devon CLI` can be used as a global command on your computer from any directory and gets `installed` centrally, it aims to be stable, minimal, and lightweight. The key logic to set up the environment variables is therefore in a separate script `environment-project` and its Windows variant `environment-project.bat` inside this `scripts` folder. The file `functions` contains a collection of reusable bash functions. These are sourced and used by the `commandlets`. Finally the `devon.properties` file contains defaults for the general `configuration` of `devonfw-ide`.

1.6.4. settings

The `devonfw-ide` requires `settings` with configuration templates for the arbitrary tools.

To get an initial set of these settings we provide the default `ide-settings` as an initial package. These are also released so you can download the latest stable or any history version at `maven central`.

To test `devonfw-ide` or for very small projects you can also use these the latest default settings (just hit return when `setup` is asking for the `Settings URL`). However, for collaborative projects we strongly encourage you to distribute and maintain the settings via a dedicated and project specific `git` repository. This gives you the freedom to control and manage the tools with their versions and configurations during the project lifecycle. Therefore simply follow the `admin usage guide`.

Structure

The settings folder (see `SETTINGS_PATH`) has to follow this file structure:

Listing 4. File structure of settings

```

/settings
├── / devon
│   ├── / conf
│   │   ├── / .m2
│   │   │   └── settings.xml
│   │   ├── / npm
│   │   │   └── .npmrc
│   │   └── devon.properties
│   ├── / eclipse
│   │   ├── / workspace
│   │   │   ├── / setup
│   │   │   └── / update
│   │   ├── lifecycle-mapping-metadata.xml
│   │   └── project.dictionary
│   ├── / ...
│   ├── / sonarqube
│   │   └── / profiles
│   │       ├── Devon-C#.xml
│   │       ├── ...
│   │       └── Devon-XML.xml
│   ├── / vscode
│   │   ├── / workspace
│   │   │   ├── / setup
│   │   │   └── / update
│   └── devon.properties

```

As you can see, the `settings` folder contains sub-folders for tools of the IDE. So the `devon` folder contains `devon.properties` files for the `configuration` of your environment. Further, for the IDEs such as `eclipse` or `vscode`, the according folders contain the templates to manage the workspace via our `configurator`.

Configuration Philosophy

Different tools and configuration files require a different handling:

- Where suitable, we directly use these configurations from your `settings` (e.g. for `eclipse/lifecycle-mapping-metadata.xml`, or `eclipse/project.dictionary`).
- The `devon` folder in `settings` contains templates for configuration files. There are copied to the `devonfw-ide` installation during `setup` (if no such file already exists). In this way the `settings` repository can provide reasonable defaults but allows the user to take over control and customize to his personal needs (e.g. `.m2/settings.xml`).
- Other configurations need to be imported manually. To avoid manual steps and simplify use we try to automate as much as possible. This currently applies to `sonarqube` profiles but will be automated with `sonar-devon4j-plugin` in the future.
- For tools with complex configuration structures like `eclipse`, `intellij`, or `vscode` we provide a smart mechanism via our `configurator`.

Customize Settings

You can easily customize these settings for the requirements of your project. We suggest that one team member is responsible to ensure that everything stays consistent and works.

You may also create new sub-folders in `settings` and put individual items according to your needs. E.g. you could add scripts for `greasemonkey` or `tampermonkey`, as well as scripts for your database or whatever may be useful and worth to share in your team. However, to share and maintain knowledge we recommend to use a wiki.

1.6.5. software

The `software` folder contains the third party tools for your IDE such as `maven`, `npm`, `java`, etc. With respect to the `licensing terms` you may create a custom archive containing a `devonfw-ide` together with the required software. However, to be platform independent and allow lightweight updates, the `devonfw-ide` is capable to download and `install` the software automatically for you.

Repository

By default, software is downloaded via the internet from public download URLs of the according tools. However, some projects may need specific tools or tool versions that are not publicly available. In such case, they can create their own software repository (e.g. in a VPN) and `configure` the base URL of it via `DEVON_SOFTWARE_REPOSITORY` variable. Then, `devonfw-ide` will download all software from this repository only instead of the default public download URLs. This repository (URL) should be accessible within your network via HTTPS (or HTTP) and without any authentication. The repository needs to have the following structure:

```
${DEVON_SOFTWARE_REPOSITORY}/<tool>/<version>/<tool>-<version>[-<os>].tgz
```

So for every tool `<tool>` (`java`, `maven`, `vscode`, `eclipse`, etc.) you need to provide a folder in your repository. Within this folder for every supported version `<version>` you need a subfolder. This subfolder needs to contain the tool in that version for every operating system `<os>` (`windows`, `linux`, or `mac` - omitted if platform independent, e.g. for `maven`).

Shared

By default, each installation of `devonfw-ide` has its own physical installations of the required tools in the desired versions stored in its local `software` folder. While this is great for isolation of `devonfw-ide` installations and to prevent side-effects, it can cause a huge waste of disc resources in case you are having many installations of `devonfw-ide`. If you are a power-user of `devonfw-ide` with more than ten or even up to hundreds of installations on your machine, you might love to share installations of a software tool in a particular version between multiple `devonfw-ide` installations.



If you use this power-feature you are taking responsibility for side-effects and should not expect support. Also if you are using Windows please read [Symlinks in Windows](#) and make your mind if you really want to do so. You might also use this [hint](#) and maintain it manually without enabling the following feature.

In order to do so, you only need to [configure](#) the variable `DEVON_SOFTWARE_PATH` in your `~/devon.properties` pointing to an existing directory on your disc (e.g. `/projects/software` or `C:\projects\software`). Then `devonfw-ide` will install required software into `${DEVON_SOFTWARE_PATH}/${software_name}/${software_version}` as needed and create a symbolic link to it in `${DEVON_IDE_HOME}/software/${software_name}`.

As a benefit, another `devonfw-ide` installation will use the same software with the same version can re-use the existing installation and only needs to create the symbolic link. No more waste of having many identical JDK installations on your disc.

As a drawback, you need to be aware that specific tools may be "manipulated" after installation. The most common case is that a tool allows to install plugins or extensions such as all IDEs do. Such "manipulations" will cause side-effects between the different `devonfw-ide` installations sharing the same version of that tool. While this can also be a benefit it may also cause trouble. If you have a sensitive project that should not be affected by such side-effects, you may again override the `DEVON_SOFTWARE_PATH` variable to the empty value in your `${DEVON_IDE_HOME}/conf/devon.properties` of that sensitive installation:

```
DEVON_SOFTWARE_PATH=
```

This will disable this feature particularly for that specific sensitive `devonfw-ide` installation but let you use it for all other ones.

Custom

In some cases, a project might need a (proprietary) tool(s) that (are) not supported by `devonfw-ide`. A very simple solution is to get a release of `devonfw-ide` and add the tool(s) to the software folder and then distribute this modified release to your team. However, this has several drawbacks as you then have a fork of `devonfw-ide` all will lose your tool(s) when updating to a new release.

As a solution for this need, `devonfw-ide` lets you configure custom tools via the `DEVON_IDE_CUSTOM_TOOLS` [variable](#). It can be defined in `devon.properties` of your [settings](#) git repository as an array of the custom tools you need to add. Each entry applies:

- It needs to have the form `<<tool>>:<<version>>[:all][:<<repository-url>>]`
- The first entry must have the `<<repository-url>>` included which is used as default
- Further entries will inherit this default if omitted
- This URL is used in the same way as described above for a software [repository](#).
- The `DEVON_SOFTWARE_REPOSITORY` variable is ignored by this feature.
- The optional infix `:all` is used to indicate that the tool is platform independent. Otherwise, an OS specific infix is appended to the URL file to download for your platform (`windows`, `linux`, or `mac`).

As an example, we define it in `${DEVON_IDE_HOME}/settings/devon.properties`:

```
DEVON_IDE_CUSTOM_TOOLS=(jboss-eap:7.1.4.GA:all:https://host.tld/projects/my-project  
firefox:70.0.1)
```

This will download and extract the following content to your **software** folder:

- <https://host.tld/projects/my-project/jboss-eap/7.1.4.GA/jboss-eap-7.1.4.GA.tgz>
- <https://host.tld/projects/my-project/firefox/70.0.1/firefox-70.0.1-windows.tgz>

Please note that if you are not using windows, the **-windows** suffix will be **-mac** or **-linux**.

1.6.6. system

The **system** folder contains documentation and solutions for operation system specific **integration**. Please have a look to get the maximum out of **devonfw-ide** and become a very efficient power user.

1.6.7. updates

The **updates** folder is used for temporary data. This includes:

- extracted archives for installation and updates
- backups of old content on updates to prevent data loss

If all works fine you may clean this folder to save some kilo- or mega-bytes. Otherwise, you can ignore it unless you are looking for a backup after a failed or unplanned upgrade.

1.6.8. workspaces

The **workspaces** folder contains folders for your active work. There is a workspace folder **main** dedicated for your primary work. You may do all your work inside the **main** workspace. Also, you are free to create any number of additional workspace folders named as you like (e.g. **test**, **release**, **testing**, **my-sub-project**, etc.). Using multiple workspaces is especially relevant for Eclipse as each workspace has its own Eclipse runtime instance and configuration.

Within the workspace folder (e.g. **workspaces/main**) you are again free to create sub-folders for (sub-)projects according to your needs. We assume that in most cases you clone git repositories here. The following structure shows an example layout for devonfw:

Listing 5. File structure of workspaces

```

/ workspaces
├── / main
│   ├── / .metadata
│   ├── / ide
│   ├── / devon4j
│   └── / my-thai-star
└── / stable
    ├── / .metadata
    ├── / ide
    └── / devon4j

```

In the **main** workspace you may find the cloned forks for regular work (in the example e.g. **devon4j**) as a base to create pull-requests while in the **stable** workspace there is a clone of **devon4j** from the official **devon4j**. However, this is just an example. Some people like to create separate workspaces for development and maintenance branches with git. Other people just switch between those via **git checkout**.

1.6.9. Project import

The **devonfw-ide** supports to automatically check out and import required projects into your IDE during **setup**. To configure this you put a **.properties** file for each desired project into the **projects** sub-folder in your **settings**. Each **.properties** file describes one "project" which you would like to check out and (potentially) import:

```

path=myproject
workingsets=Set1,Set2
workspace=example
git.url=http://github.com/someorg/someproject
git.branch=develop
build.path=.
build.cmd=mvn -DskipTests=true -Darchetype.test.skip=true clean install
eclipse=import
active=true

```

Table 24. Variables of project import

Variable	Value	Meaning
path	e.g. myproject , will clone into \${WORKSPACE_PATH}/myproject	(required) Path into which the projects is cloned. This path is relative to the workspace.

Variable	Value	Meaning
<code>working sets</code>	e.g. <code>ws1,ws2</code>	(optional) This will create working sets (in eclipse). Each module (eclipse project) of this project will be part of all these working sets. Working sets will be automatically created if necessary.
<code>workspace</code>	<code>main</code>	Workspace to use for checkout and import. Default is <code>main</code> .
<code>git.url</code>	e.g. <code>http://github.com/someorg/someproject</code>	(required) Git URL to use for cloning the project.
<code>git.branch</code>	e.g. <code>develop</code>	(optional) Git branch to checkout. Git default branch is default.
<code>build.path</code>	e.g. <code>.</code> (default)	(optional) The directory inside <code>path</code> where to trigger an initial build after clone or pull (if <code>build.cmd</code> is set). For a regular project use <code>.</code> to build top-level project.
<code>build.cmd</code>	e.g. <code>build</code> or <code>mvn -DskipTests=true -Darchetype.test.skip=true clean install</code>	(optional) The <i>devonfw</i> command to invoke to build the project after clone or pull. If omitted no build is triggered.
<code>eclipse</code>	e.g. <code>import</code>	(optional) Desired action for eclipse IDE. If you put <code>import</code> here all modules (eclipse projects) in the current project will be imported into eclipse. If you leave this out or put any other value for this parameter, no change in eclipse is done.
<code>active</code>	<code>true</code>	(optional) If set to <code>false</code> the project is skipped during the <code>setup</code> .

Please note that the `.properties` file is parsed via shell and not via java. So be careful with "advanced" features `.properties` files normally support.

2. Advanced Features

2.1. Cross-Plattform Tooling

2.1.1. Git Client

If you are looking for a git client that works cross-platform we recommend to use [Fork](#).

2.1.2. Draw Diagrams

To draw diagrams for your project or for blueprints in devonfw, we recommend the following cross-plattform tools:

- [draw.io](#) is a powerful generic vector painting program (similar to visio). You can get a free open-source edition for your desktop from [here](#).
- [ObjectAid](#) is a nice and easy to use eclipse plugin that you can use to quickly create UML diagrams from existing code. While class-diagrams are supported for free, you need to buy a license if you want to use the other diagram types.
- [PlantUML](#) is a great tool that can render UML diagrams from simple markup that can be easily managed in [git](#) or other version-control systems together with your code. Its simplicity allows branching and merging unlike other greedy binary UML data-formats.

2.1.3. Browser Plugins

There are tons of helpful browser plugins out there and it might be a matter of personal taste what you like to have installed. However, as we are heavily using github we want to promote [octotree](#). In case you also work with ZenHub you might want to install the [Zenhub Browser Extension](#).

2.2. Windows Tooling

2.2.1. Installing software

The devon IDE already contains a lot of software. But if you need more, here are some ways to get it easily:

Chocolatey

[Chocolatey](#) is a repository for free and open source software similiar to the repositories know from the Linux like apt, apk, pacman, ...

Winget

Microsoft is also working on a repository for Windows called [winget](#). It is currently in alpha state, but is expected to be integreated in the upcoming Windows 11.

2.2.2. Integration into Windows-Explorer

After you have [set up](#) your [devonfw-ide](#) on a windows machine, you already have windows-explorer integration out-of-the-box. Just right-click on the folder you would like to open in a terminal and choose from the context menu:

- [Git Bash](#)
- [Open devonfw CMD shell here](#)
- [Open devonfw PowerShell here](#)
- [Open devonfw Cygwin Bash Here](#) (only if cygwin was installed during setup)

2.2.3. Tabs everywhere

Many people got used to *tabs* that have been introduced by all major browsers:

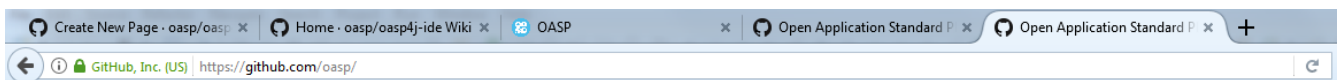


Figure 1. Tabs in Firefox

This nice feature can be added to many other tools.

Tabs for Windows Explorer

If you want to have tabs for windows explorer simply install [Clover](#)

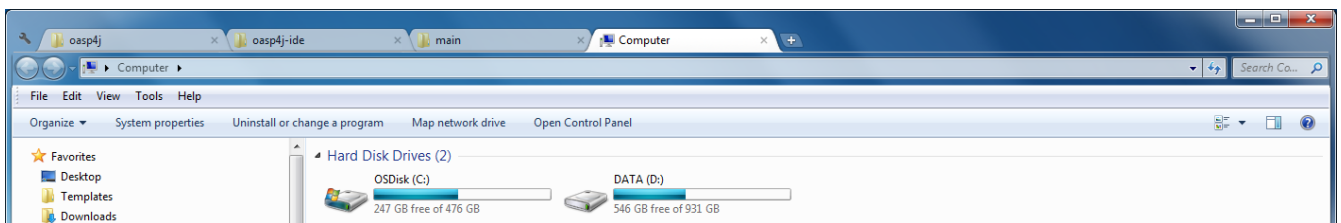


Figure 2. Tabs in Windows Explorer

Tabs for SSH

If you want to have tabs for your SSH client [Putty](#) (or even better [Kitty](#) that comes with [WinSCP](#) integration) you simply install [SuperPutty](#) BTW: Windows 10 has already an SSH client included.

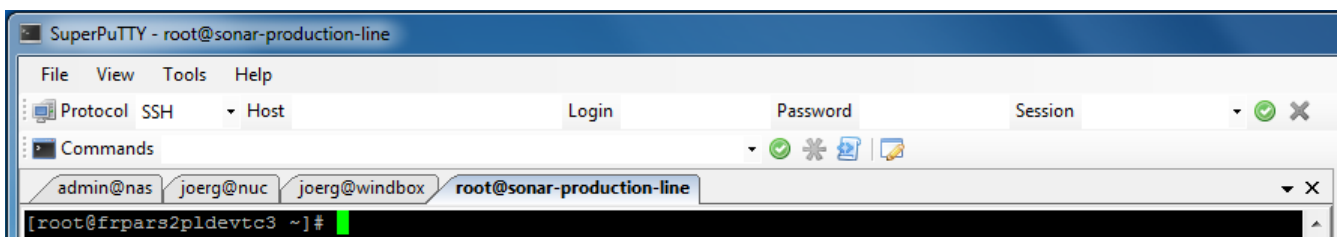


Figure 3. Tabs for SSH

Tabs for CMD

If you want to have tabs for your windows command-line you simply install [ConEmu](#). Here you can also add other shells like Putty. Also you should have a look at the new [Windows Terminal](#) which also supports tabs.

```

[INFO] Reactor Summary:
[INFO] mmm-util ..... SUCCESS [ 0.880 s]
[INFO] mmm-util-bom ..... SUCCESS [ 0.050 s]
[INFO] mmm-util-modules ..... SUCCESS [ 0.033 s]
[INFO] mmm-util-test ..... SUCCESS [ 5.319 s]
[INFO] mmm-util-core ..... SUCCESS [ 19.194 s]
[INFO] mmm-util-pojo ..... SUCCESS [ 8.262 s]
[INFO] mmm-util-entity ..... SUCCESS [ 3.506 s]
[INFO] mmm-util-validation ..... SUCCESS [ 5.722 s]
[INFO] mmm-util-io ..... SUCCESS [ 19.249 s]
[INFO] mmm-util-cli ..... SUCCESS [ 5.017 s]
[INFO] mmm-util-context ..... SUCCESS [ 4.570 s]
[INFO] mmm-util-event ..... SUCCESS [ 2.844 s]
[INFO] mmm-util-search ..... SUCCESS [ 1.421 s]
[INFO] mmm-util-version ..... SUCCESS [ 4.263 s]
[INFO] mmm-util-json ..... SUCCESS [ 2.369 s]
[INFO] mmm-util-data ..... SUCCESS [ 0.210 s]
[INFO] mmm-util-gwt ..... SUCCESS [ 13.438 s]
[INFO] mmm-util-http ..... SUCCESS [ 3.912 s]
[INFO] -----
[INFO] BUILD SUCCESS
[INFO] -----
[INFO] Total time: 01:40 min
[INFO] Finished at: 2017-11-16T17:11:15+01:00
[INFO] Final Memory: 31M/243M
[INFO] -----
D:\Projekte\mmm\workspaces\main\util>
cmd.exe* [64]:9444

```

Figure 4. Tabs for CMD

See [integration](#) to make ConEmu work flawless with `devonfw-ide`.

2.2.4. Windows Helpers

Handle passwords

Do you want complex passwords that differ for each account for security? Do you only want to remember a single password for simplicity? Do you want to have both? Then, you need to install [KeePass](#) right now.

Real text editor

A real developer needs a real text editor and not windows build in `notepad`. The most common choice is [Notepad++](#).

Real compression tool

Do you need to deal with ZIP files, TGZ, dpkg, etc.? Just install [7zip](#) and forget about windows build-in ZIP support (that is buggy with long file paths, etc.).

Smarter clipboard

Do you want to paste something from the clipboard but meanwhile you had to copy something else? Just, one of the many things you can easily do with [ditto](#).

PowerToys

Microsoft provides some extensions to improve the workflow in windows called [PowerToys](#). The include tools like a file renamer, a way to order your windows on the screen, a color picker and more.

Sysinternals Tools

A real developer will quickly notice that windows build in tools to analyze processes, network connections, autostarts, etc. are quite poor. So, what you really would like is the [Sysinternals-Suite](#). You can make process-explorer your [default task manager](#). Use autoruns to prevent nasty background things to be started automatically. Use tcpview to figure out which process is blocking port 8080, etc.

Cope with file locks

Did you ever fail to delete a file or directory that was locked by some process and you did not even know which one it was? Then you might love [IoBit Unlocker](#). See also [this article](#).

Create symbolic links

Are you are used to symbolic and hard links in Linux? Do you have to work with Windows? Would you also like to have such links in Windows? Why not? Windows [supports real links](#) (not shortcuts like in other cases). If you even want to have it integrated in windows explorer you might want to install [linkshellextension](#). However, you might want to disable [SmartMove](#) in the [configuration](#) if you face strange performance issues when moving folders.

Linux

Install [Cygwin](#) and get your bash in windows with ssh-agent, awk, sed, tar, and all the tools you love (or hate). Windows 10 has already a Linux as an installable feature included: WSL and from Version 2004 on WSL2, which is a native Linux Kernel running on Windows (an a light weight VM).

X11

Do you want to connect via SSH and need to open an X11 app from the server? Do you want to see the GUI on your windows desktop? No problem: Install [VcXsrv](#).

Keyboard Freak

Are you a keyboard shortcut person? Do you want to have shortcuts for things like « and » ? Then you should try [AutoHotKey](#). For the example (« and ») you can simply use this script to get started:

```
^<::Send {U+00AB}
^+<::Send {U+00BB}
```

First, just press [\[ctrl\]\[<\]](#) and [\[ctrl\]\[>\]](#) ([\[ctrl\]\[shift\]\[<\]](#)). Next, create shortcuts to launch your IDE, to open your favorite tool, etc. If you like a GUI to easily configure the scrips, that comes with a lot of extensions preinstalled, you should have a look at [Ac'tive Aid](#).

Paint anywhere on your desktop

Do you collaborate sharing your screen, and want to mark a spot on top of what you see? Use [Epic Pen](#) to do just that.

Analyze graphs

Do you need to visualise complex graph structures? Convert them to [Trivial Graph Format](#) (.tgf), a run [yEd](#) to get an interactive visualization of your graph.

Up your screen capture game

Capture any part of your screen with a single click, directly upload to dropbox, or run a svn commit all in one go with [Greenshot](#). Another screen capture tool where you can easily manage and edit your screenshots and also do screen recordings with is [Screenpresso](#).

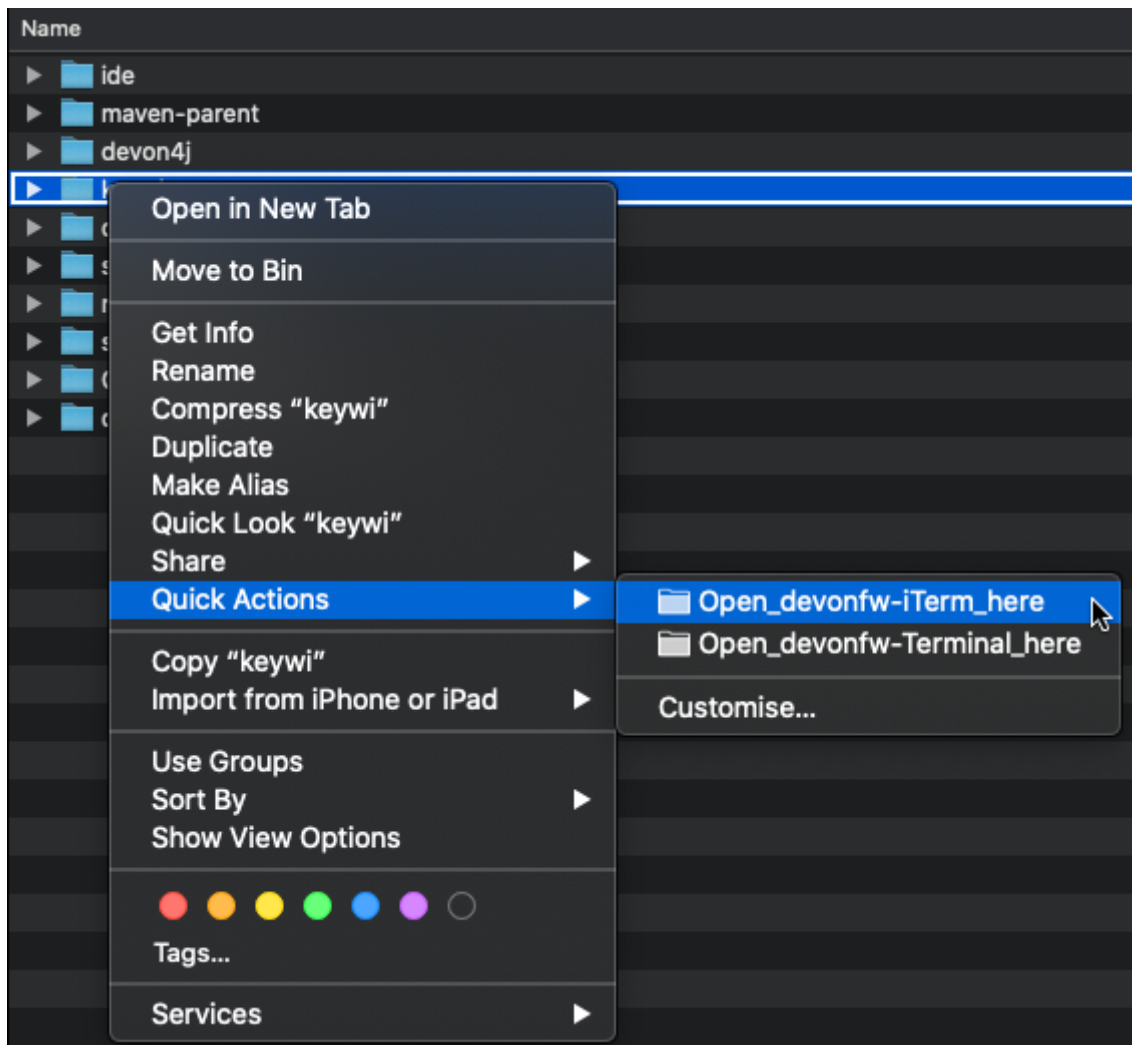
Fast Search in Windows

[Everything](#) is a desktop search utility for Windows that can rapidly find files and folders by name.

2.3. MacOS Tooling

2.3.1. Finder

If you want to open a terminal from a folder in [Finder](#) and automatically get your environment set properly for `devonfw-ide` you will find the perfect solution here.



So after installing (see below) the integration(s) provided here, you can easily open a terminal

ready for your `devonfw-ide`:

- right click (`[control]` + click) on file or folder in `Finder`
- Expand the `Quick-Actions` sub-menu
- Click on the desired action (e.g. `Open devonfw-Terminal here`)
- Verify that you environment is properly initialized by invoking:

```
mvn -v
```

To get this feature for MacOS `Terminal.app` open `Finder` and run the workflow `system/mac/terminal/Open_devonfw-Terminal_here.workflow` (in `${DEVON_IDE_HOME}`). For `iTerm2.app` (that can be installed from `App Store`) do the same with `system/mac/iterm/Open_devonfw-iTerm_here.workflow`.

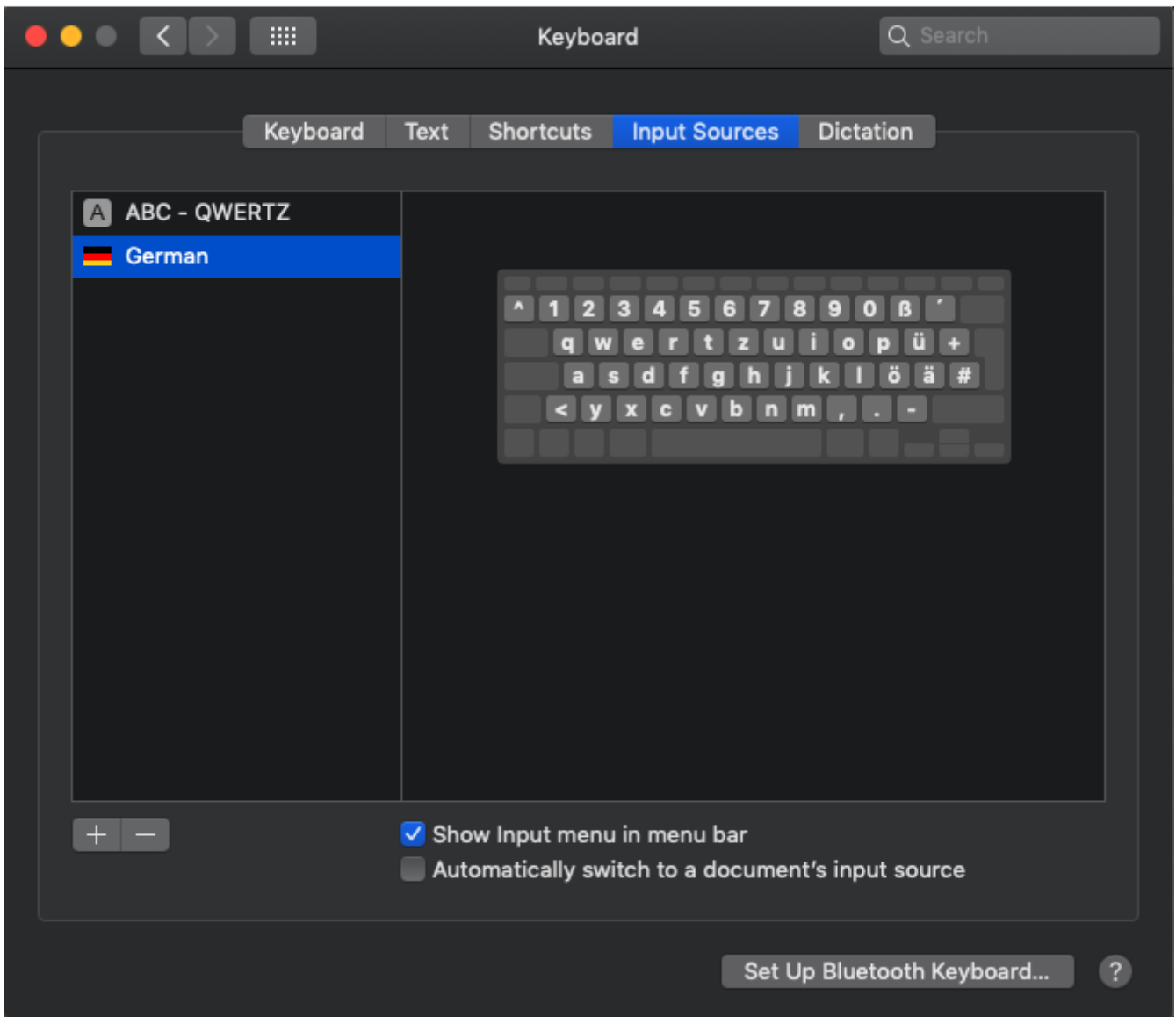
2.3.2. Keyboard

Keyboard support is not an integration however, some users coming from other platforms may struggle with the way MacOS deals with (external non-apple) keyboards. So to make it short: if you are happy with your keyboard and shortcuts, you can skip all the following. Otherwise, if you think that pressing keys like `Home`, `End`, etc. should just work as expected or pressing `Alt Gr` should allow you to type the special characters as printed on your German keyboard then here you will find a solution to your problems! To get all automated you can just run the script `system/mac/keyboard/install-mac-keyboard-support.sh` (in `${DEVON_IDE_HOME}`). If you would like to understand what is going on, you want to customize the keyboard settings to your needs, or you want a keyboard layout other than German ISO, please read on.

Keyboard Layouts

Keyboard layouts allow a find-grained mapping of each key on your keyboard to its resulting input character or behaviour. They are MacOS native features and do not need to have software running as a background service to make the keyboard mapping work (see `Karabiner` section below as an alternative). They are provided as so called `bundle` (white lego brick icon). Like a MacOS app this is a folder containing a `Contents` folder with a specific sub-folder structure. In the `Resources` subfolder `*.keylayout` files are placed and define the exact mapping for the keyboard. As an example we provide a `Keyboard Layouts` folder containing a `bundle` for a German keyboard mapping.

To install keyboard layouts simply doubleclick the `bundle` or copy it to `~/Library/Keyboard Layouts`. To actually use them go to `System Preferences` and select `Keyboard`. Then, select the tab `Input Sources`. With the `+` button you can add a keyboard layout for your daily usage with your mac. Please note that the keyboard layout shipped with `devonfw-ide` is called `German-ISO` and can be found in the `Others` section at the end of the list. It can be used as an example or template, if you want to create your own layout.



When you have multiple mappings in place, on the top menu bar you will find a little icon next to the current time that allows you to switch between the keyboard layouts, which is very handy when you switch from your native MacBook keyboard to an external USB keyboard or vice versa. Even for a pure MacOS geek this can be helpful in case a friend coming from Windows/Linux is supposed to type something on the Mac in a pair-programming session.

In our German keyboard mapping example you can use the keys like **Alt Gr**, etc. to type special characters as you would expect and as printed on your keyboard. To make **Pos1**, **End**, etc. work properly accross all apps please read on to the next section(s).

In case you would like to create your own keyboard layout you can of course edit the `*.keylayout` files in a text editor. However, to make this much more comfortable, you can use the graphical editor tool [Ukelele](#). Besides, the app itself, the Ukelele `dmg` file, also contains a **Documentation** and a **Resources** folder. The latter contains many keyboard layouts that you can use as a starting point.

Key Bindings

Still, various keyboard shortcuts might not work as expected for you. Therefore, we provide you with an advanced configuration in the folder `system/mac/keyboard/KeyBindings` that you can copy to your `~/Library` folder:

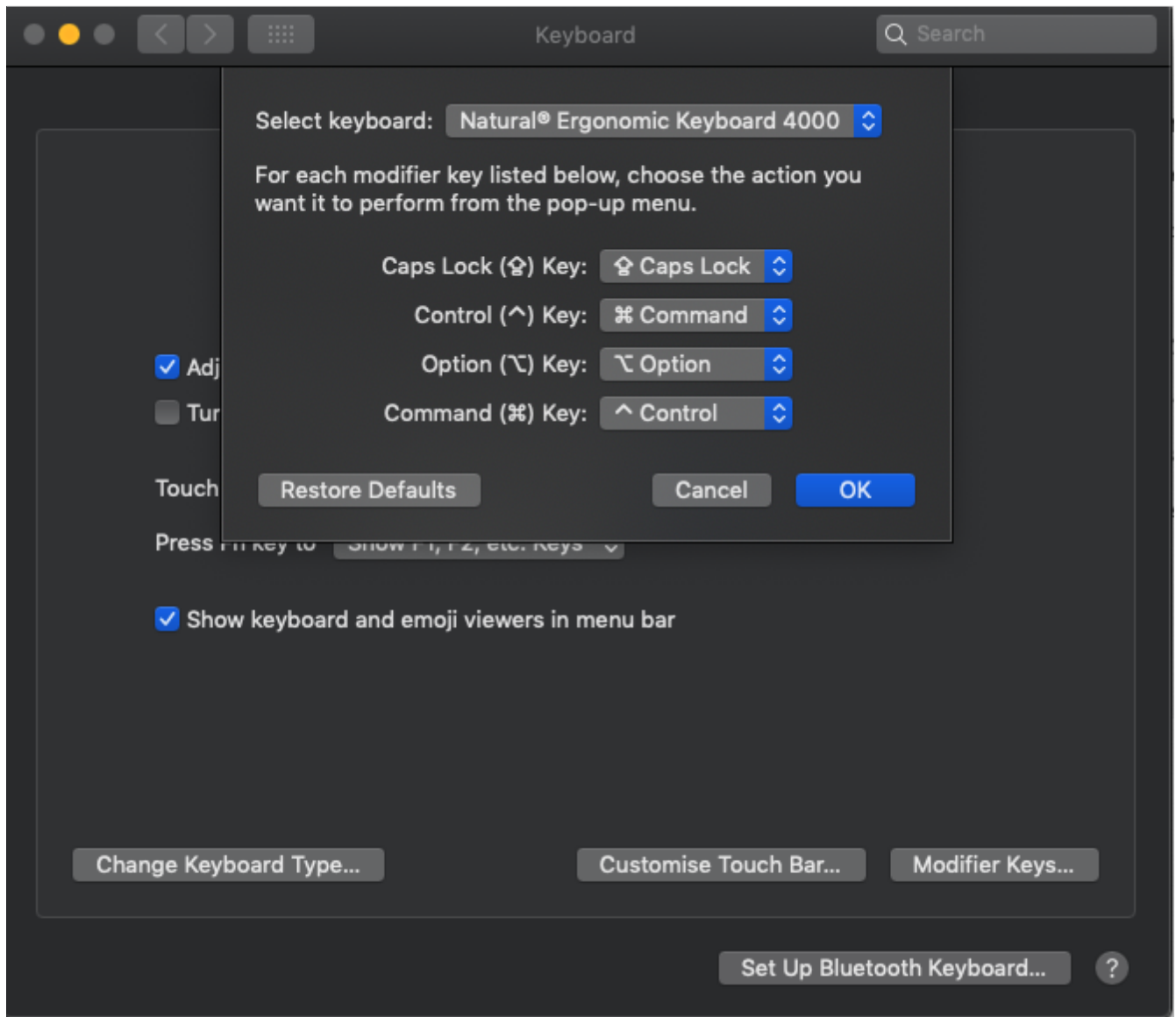
```
cd system/mac/keyboard/  
cp -r KeyBindings ~/Library
```

To make the changes work you need to log out and log in again or you can reboot. After that, your **Home** (**Pos1**) and **End** buttons should work as expected including with selection via **Shift** and/or **Command**. Also, you can use **Command** together with the left or right arrow key to move between words and combined it with **Shift** for selection. As an example, for further customization you can press **Command** + **<** to type the unicode character **<<**.

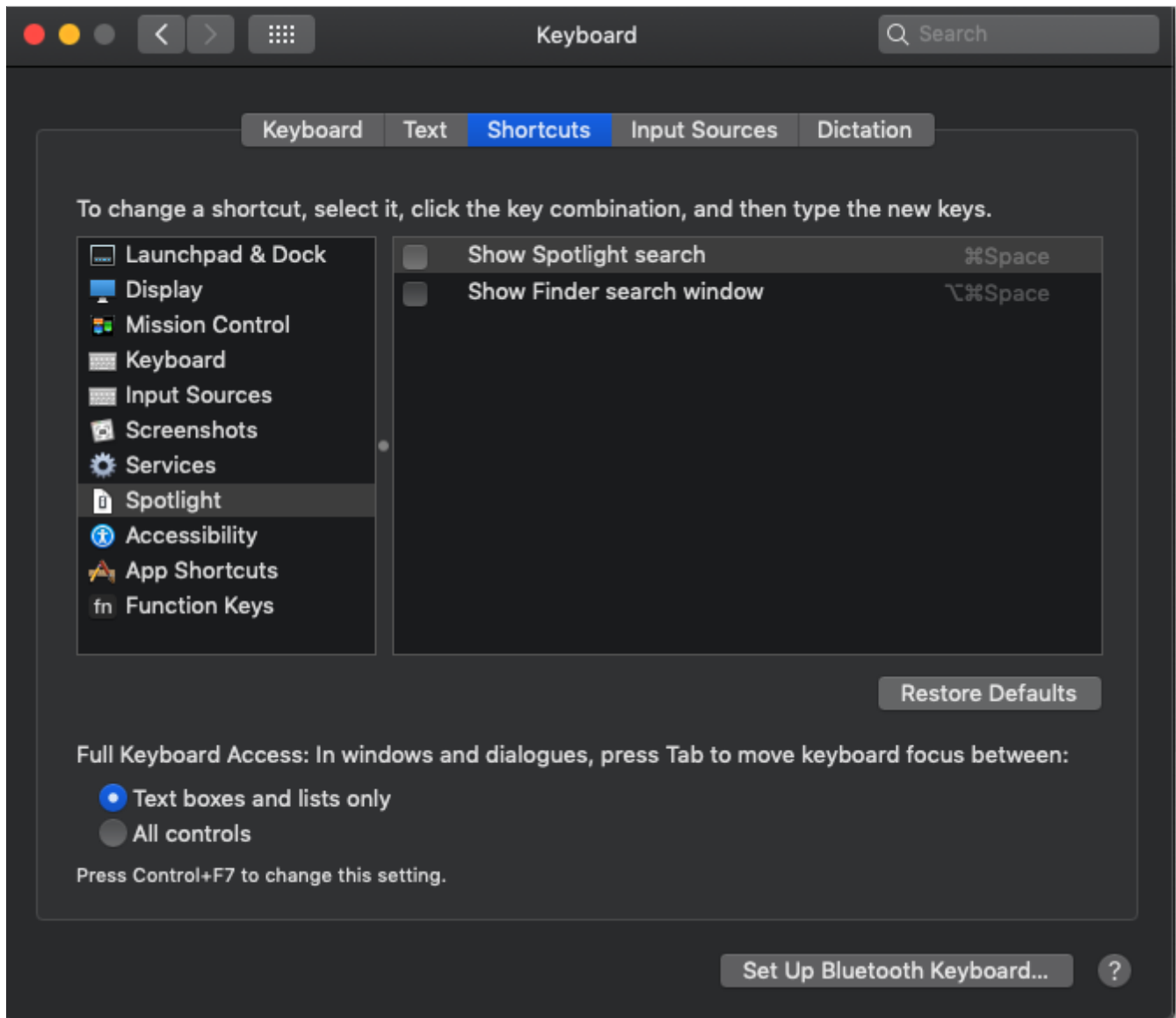
However, still some apps listen to keyboard events on a lower level and come with their own keyboard mappings. In these apps you might still experience unexpected behaviour. Solutions can be found in the following sub-sections.

Switch Control and Command

If you are used to windows or linux and get easily confused by the apple keyboard behaviour you might want to switch the **Control** and the **Option** key. Open **System Preferences** and select **Keyboard**. Then, in the first tab, click on the button **Modifier Keys...**. For every keyboard you can customize the behaviour of your modifier keys and therefore switch **Control** and **Option** as illustrated in the screenshot:



Programmers now should also disable that **Control** + **Space** is opening **Spotlight Search** as otherwise this shortcut can not be redefined in other apps like common IDEs.



Eclipse

In Eclipse, move and select by word as described above does not work. Even worse, the most important shortcut does not work: **Control + Space** for code completion (content assist). You can manually redefine the key bindings in **Preferences** under **General > Keys**. However, with multiple IDE installations and workspaces this will quickly get tedious. Therefore, you can **Export** and **Import** specific **Preferences** such as **Keys Preferences** to/from a ***.epf** (Eclipse PreFerences) file. We have done all this for you so you can just import the file located in **system/mac/keyboard/Eclipse/eclipse-mac-keybindings.epf** into your Eclipse. Happy coding.

Karabiner

If you want more dynamics and do not worry about an app that has to run in the background to make your keyboard work as you like (no relevant performance overhead), you can try [Karabiner Elements](#). This is a powerful tool to remap your keyboard shortcuts. In the UI you can only directly create and edit **Simple Modifications** that are too limited for most use-cases. However, using **Complex Modifications** you can do a lot of magic to customize the keyboard behaviour to your personal needs. A key with any combination of modifiers can be mapped to any key with arbitrary modifiers. This can also be bound to conditions based on the frontmost application or the keyboard model. These complex modifications are configured as ***.json** files. We have included a set with useful

rules for external keyboards, programmer shortcuts, etc. If you have Karabiner installed, you only need to copy the contents of the `karabiner` folder located in this directory to your `~/.config` folder:

```
cd system/mac/keyboard/  
cp karabiner/assets/complex_modifications/*.json  
~/.config/karabiner/assets/complex_modifications/
```

Now, if you open the `Complex Modifications` in the `Karabiner` app, you can click on the `+ Add rule` button and will see these mappings in the pop up. Select the rules you want to add (e.g. add all) and you are done. Unlike other solutions, you can quickly tweak your keyboard without the need to log out and restart apps, which gives faster trial and error turnarounds. Further, if you want to tweak your own configs, Karabiner comes with a secondary app called `Karabiner-EventViewer` that shows you the names of the keys, modifiers, and apps for the events you are triggering. This is very helpful to get the config right.

2.4. Linux Tooling

There is nothing in this section so far. If you are a Linux user, please share your experience and provide your valuable hints.

2.5. Lombok

Even though not officially recommended by `devon4j` some projects want to use `lombok` in their project. As this requires some tweaks for IDEs we do support you with this guide in case you want to use it.

2.5.1. Lombok in Eclipse

For eclipse there is a plugin to activate `lombok support in eclipse`. We have this already preconfigured for you in our default `settings`. So for manual installation after `setup`, you can get it via this command:

```
devon eclipse add-plugin lombok
```

However, to avoid manual extra effort for lombok based projects you only need to activate this plugin in your project specific `settings` in `lombok.properties for eclipse` (replace `false` with `true` for `plugin_active`).

2.5.2. Lombok for VS-Code

For VisualStudio Code there is an extension to activate `lombok support in VS-Code`. We have this already preconfigured for you in our default `settings`. So for manual installation after `setup`, you can get it via this command:

```
devon vscode add-plugin lombok
```

However, to avoid manual extra effort for lombok based projects you only need to activate this plugin in your project specific [settings](#) in [lombok.properties](#) for [vscode](#) (replace `false` with `true` for `plugin_active`).

2.5.3. Lombok for IntelliJ

For IntelliJ there is a plugin to activate [lombok support in IntelliJ](#). Currently we have not yet configured or automated this in `devonfw-ide`. Please contribute to change this. See issues [#453](#) and [#491](#).

3. Support

3.1. Migration from oasp4j-ide

The `devonfw-ide` is a completely new and innovative solution for managing the local development environment that has been created from scratch. Releases of `OASP` as well as releases of `devonfw` until version 3.1.x are based on the old `oasp4j-ide` that is now considered deprecated. As `devonfw-ide` is a complete redesign this will have some impact for the users. This section should help and assist so you do not get lost.

3.1.1. Get familiar with devonfw-ide

First of all you should roughly get familiar with the new `devonfw-ide`. The key features and changes are:

- platform-agnostic (supports Windows, Mac, and Linux in a single distribution)
- small core (reduced the download package from ~2 gigabyte to ~2 megabyte)
- fast and easy updates (built in update support)
- minimum number of scripts (removed tons of end-user scripts making things much simpler)
- fully automated setup (run `setup` script and you are ready - even for advanced features that had to be configured manually before)
- single command for everything (entire CLI available via new `devon` command)

For all the details you should study the documentation starting from the [beginning](#).

3.1.2. Migration of existing oasp4j-ide installation

- extract new `devonfw-ide-scripts` on top of your existing installation
- run `setup`
- done

If you get errors:

- ask your technical lead to fix the `settings` git repo for `devonfw-ide` or offer him to do it for you.
- you need to merge the `devon` folder into your settings
- you need to merge the `devon.properties` into your settings
- you should check your `variables[-customized][.bat]` and merge required customizations into the proper `configuration`

3.1.3. Hints for users after migration

Getting used to all the new commands might be tedious when starting after a migration.

Table 25. Comparison of commands

oasp4j-ide command	devonfw-ide command	Comment
create-or-update-workspace	devon eclipse ws-update	actually not needed anymore as workspace is updated automatically when IDE is launched. To launch your IDE simply run <code>devon eclipse</code> , <code>devon intellij</code> , or <code>devon vscode</code> . If you like to get launch scripts for your IDE e.g. Eclipse just call <code>devon eclipse --all create-script</code> .
create-or-update-workspace <<workspace>>	cd <<workspace>> && devon eclipse ws-update	
update-all-workspaces	devon eclipse --all ws-update	
create-or-update-workspace-vs	devon vscode ws-update	
devcon workspace create <<workspace>>	Simply create the <<workspace>> directory (e.g. <code>cd workspaces && mkdir examples</code>)	
scripts/update-eclipse-workspace-settings	devon eclipse ws-reverse	To add new properties (old option <code>--new</code>) use <code>devon eclipse ws-reverse-add</code>
devcon project build devcon devon4j build devcon devon4ng build	devon build	
devcon devon4j create	devon java create	
devcon devon4ng create	devon ng create	
devcon system * devcon dist *	setup or devon ide setup	
console.bat	-	Simply open terminal in selected folder. On Windows right-click folder in windows-explorer and select <code>open devonfw CMD here</code> .
devcon help	devon help	
devcon doc	Read the documentation from devonfw.com	

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The following table shows the components that may be used. The column `inclusion` indicates the way the component is included:

- `directly included` means the component is directly contained in the download package of `devonfw-ide` we provide
- `default setup` means the component is not initially included but will be downloaded during the `setup` by default
- `optional` means the component is neither initially included nor downloaded by default, but only gets downloaded and installed if explicitly triggered by you when invoking additional commands or if explicitly configured by your project.

Table 26. Third party components

Component	Inclusion	License
devonfw-ide	Directly included	ASL 2.0
JSON-P API	Directly included	EPL 2.0
JSON-P Implementation	Directly included	EPL 2.0
OpenJDK / AdoptOpenJDK (Java)	Default Setup	GPLv2
Maven	Default Setup	ASL 2.0
VS Code	Optional	MIT (Terms)
extension-pack-vscode	Optional	ASL 2.0
Eclipse	Optional	EPL 2.0
CobiGen	Optional	ASL 2.0
TM Terminal	Optional	EPL 2.0 (see here)
AnyEdit	Optional	EPL 1.0

Component	Inclusion	License
EclipseCS	Optional	LGPL 2.1
SpotBugs Eclipse plugin	Optional	LGPL 2.1
EclEmma	Optional	EPL 1.0
StartExplorer	Optional	WTFPL 2
regex tester	Optional	GPL 2.0 (see here)
eclipse-templatevariables	Optional	ASL 2.0
Node.js	Default Setup	License
NPM	Default Setup	Artistic License 2.0 (Terms)
Angular CLI (ng)	Optional	MIT
Groovy	Optional	ASL 2.0
Apache Ant	Optional	ASL 2.0
Gradle	Optional	ASL 2.0
Jenkins	Optional	MIT
SonarQube (CommunityEdition)	Optional	LGPL 3.0
SonarLint	Optional	LGPL 3+
cicdgen	Optional	ASL 2.0
devon4j	Optional	ASL 2.0
devon4ng	Optional	ASL 2.0
devon4node	Optional	ASL 2.0
IntelliJ IDEA	Optional	ASL 2.0
jasypt	Optional	ASL 2.0
docker	Optional	ASL 2.0 and EULA
kubernetes	Optional	ASL 2.0

3.2.1. Apache Software License - Version 2.0

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Version 3, 29 June 2007

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=== src/compat.h src/compat-inl.h ===
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