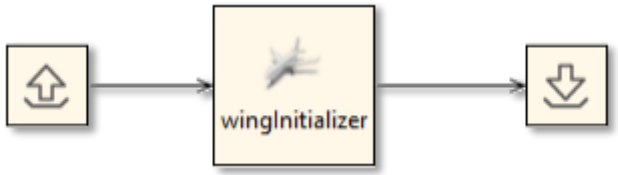
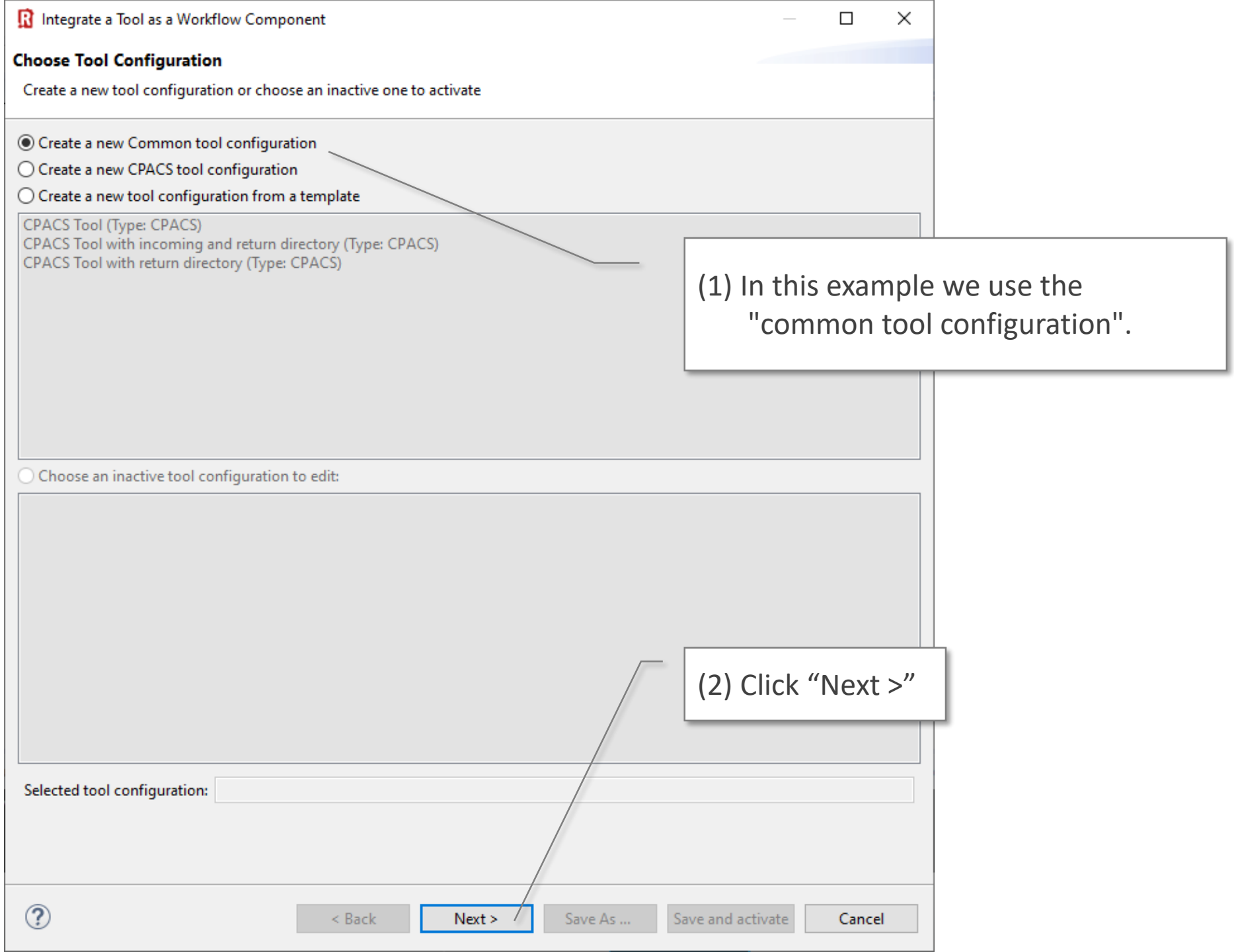
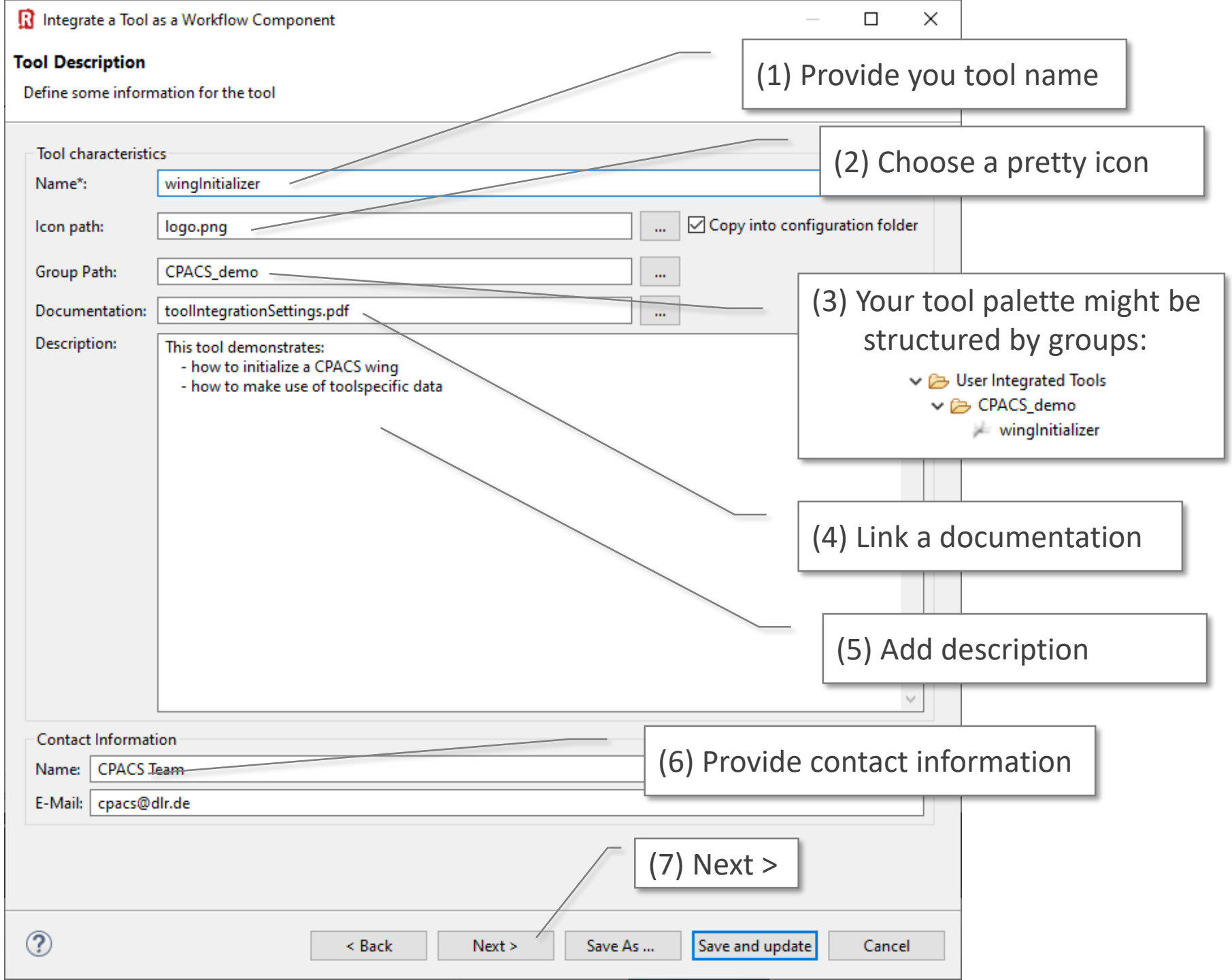
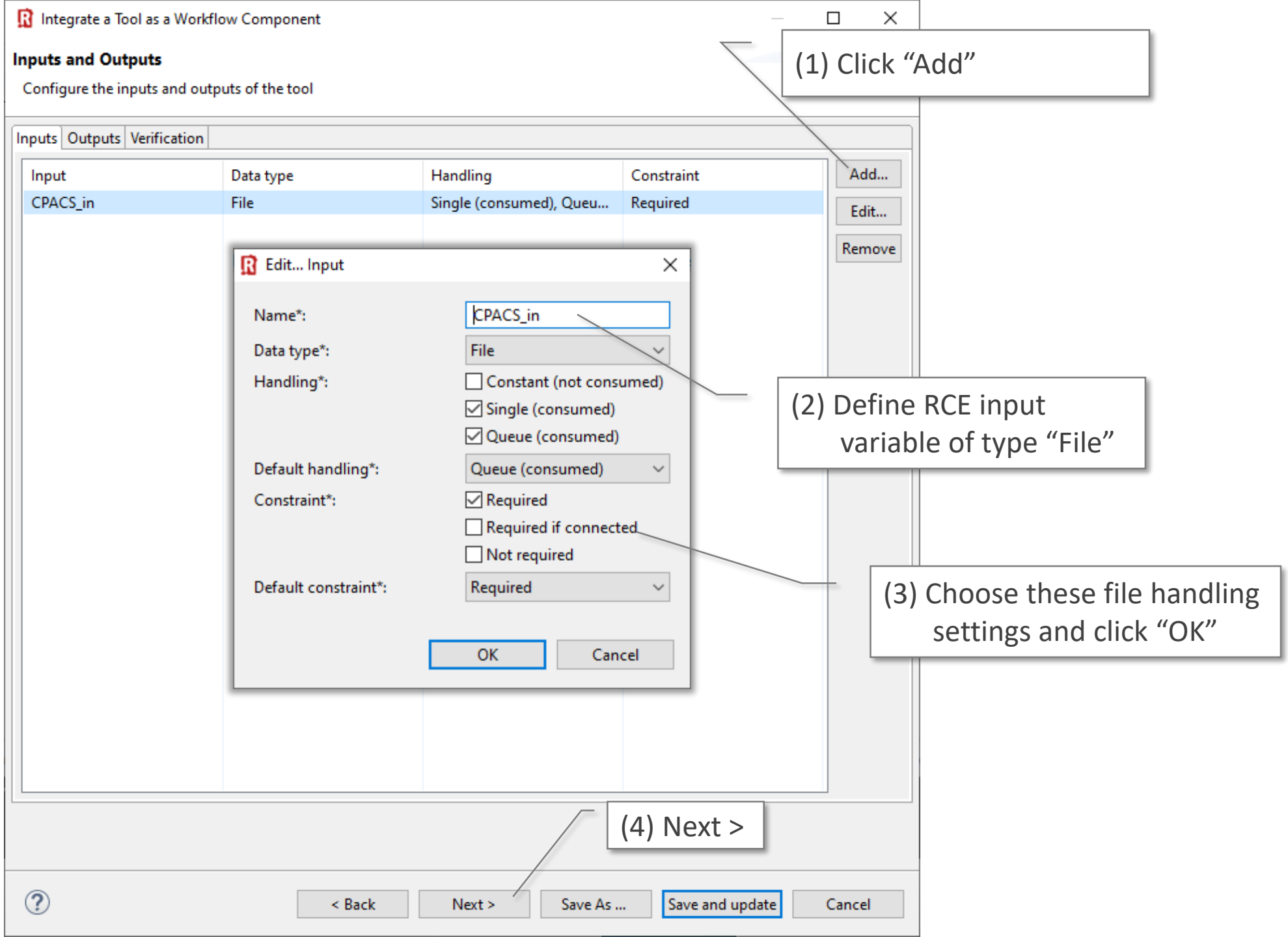
# RCE tool integration

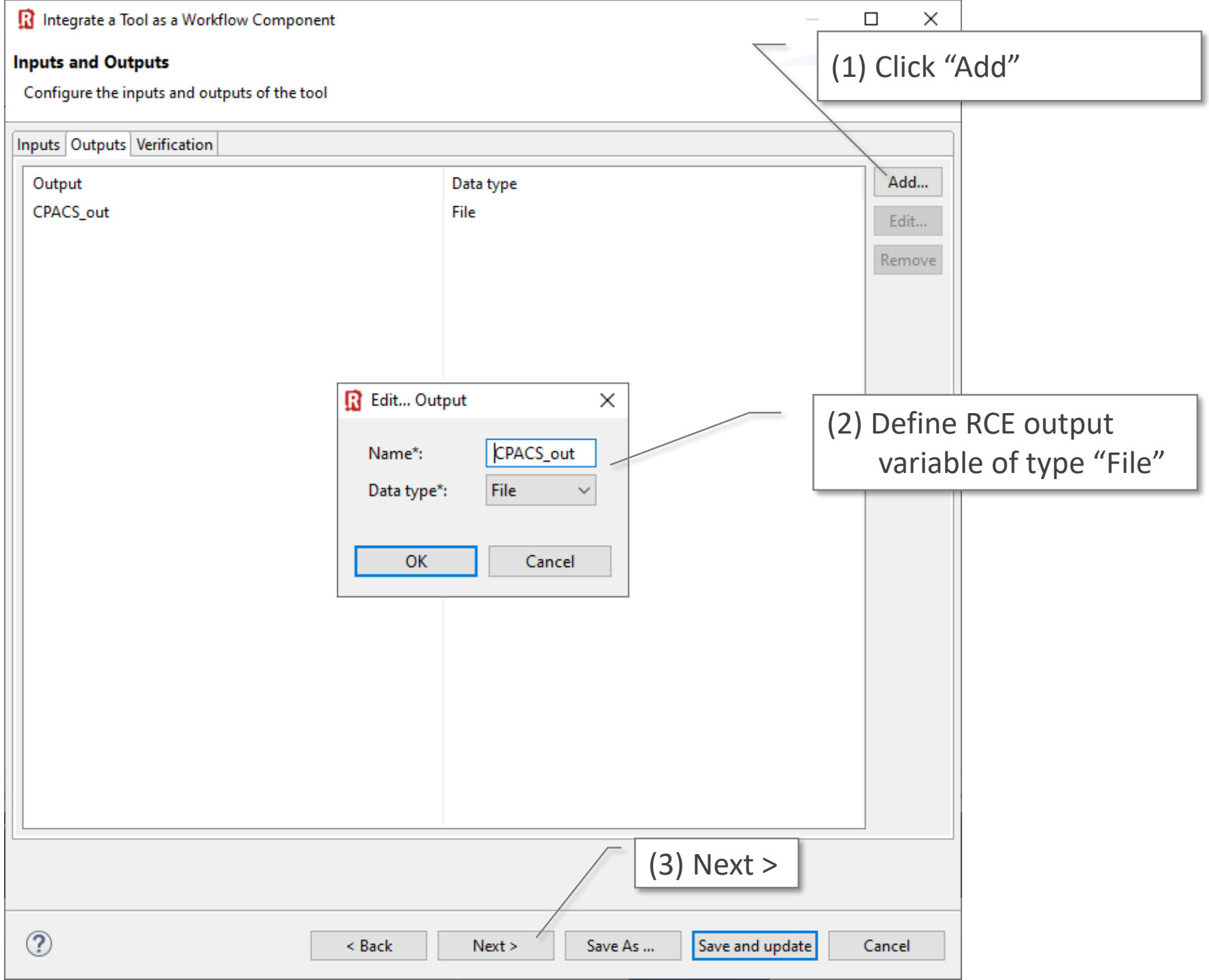
wingInitializer

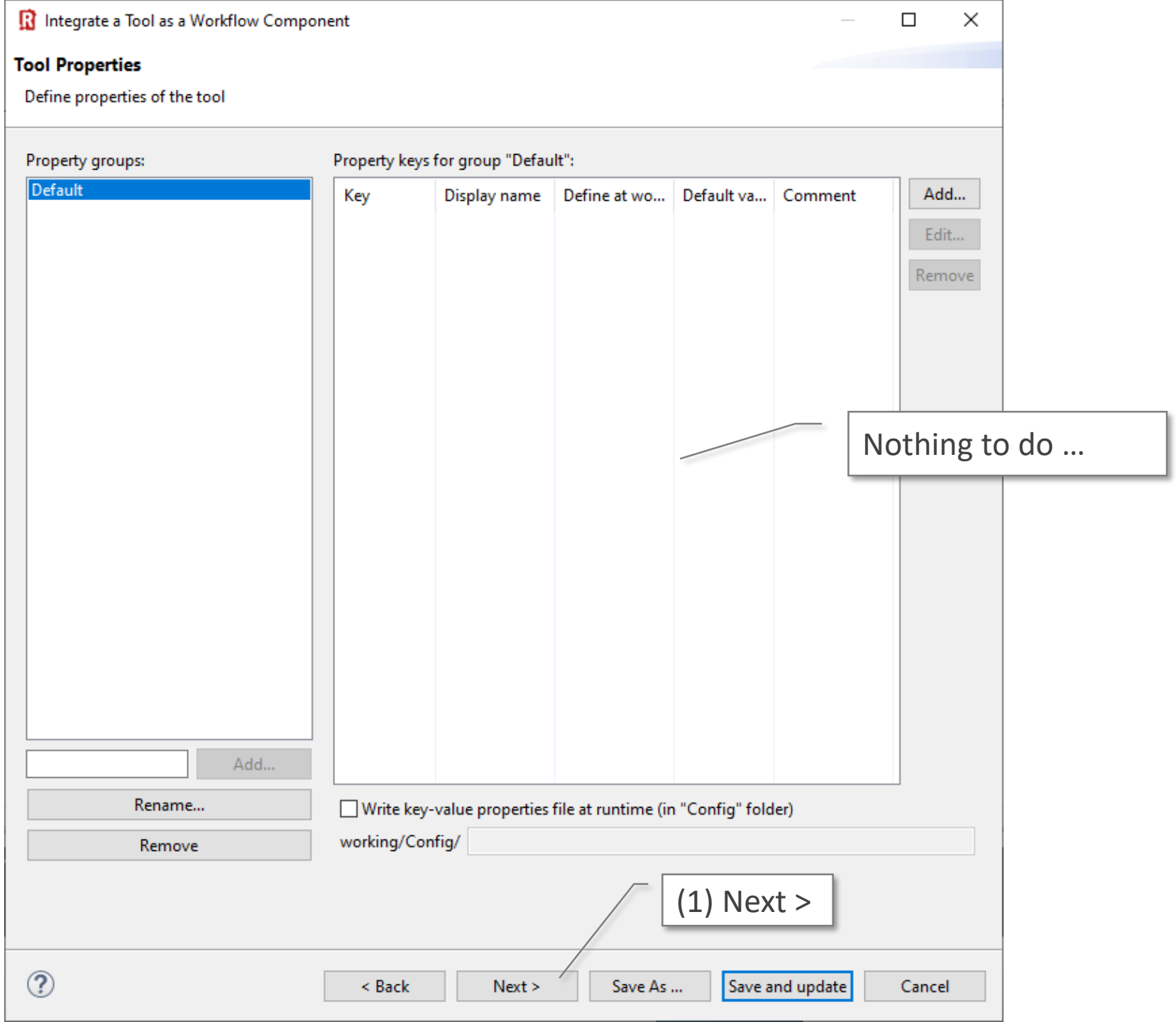


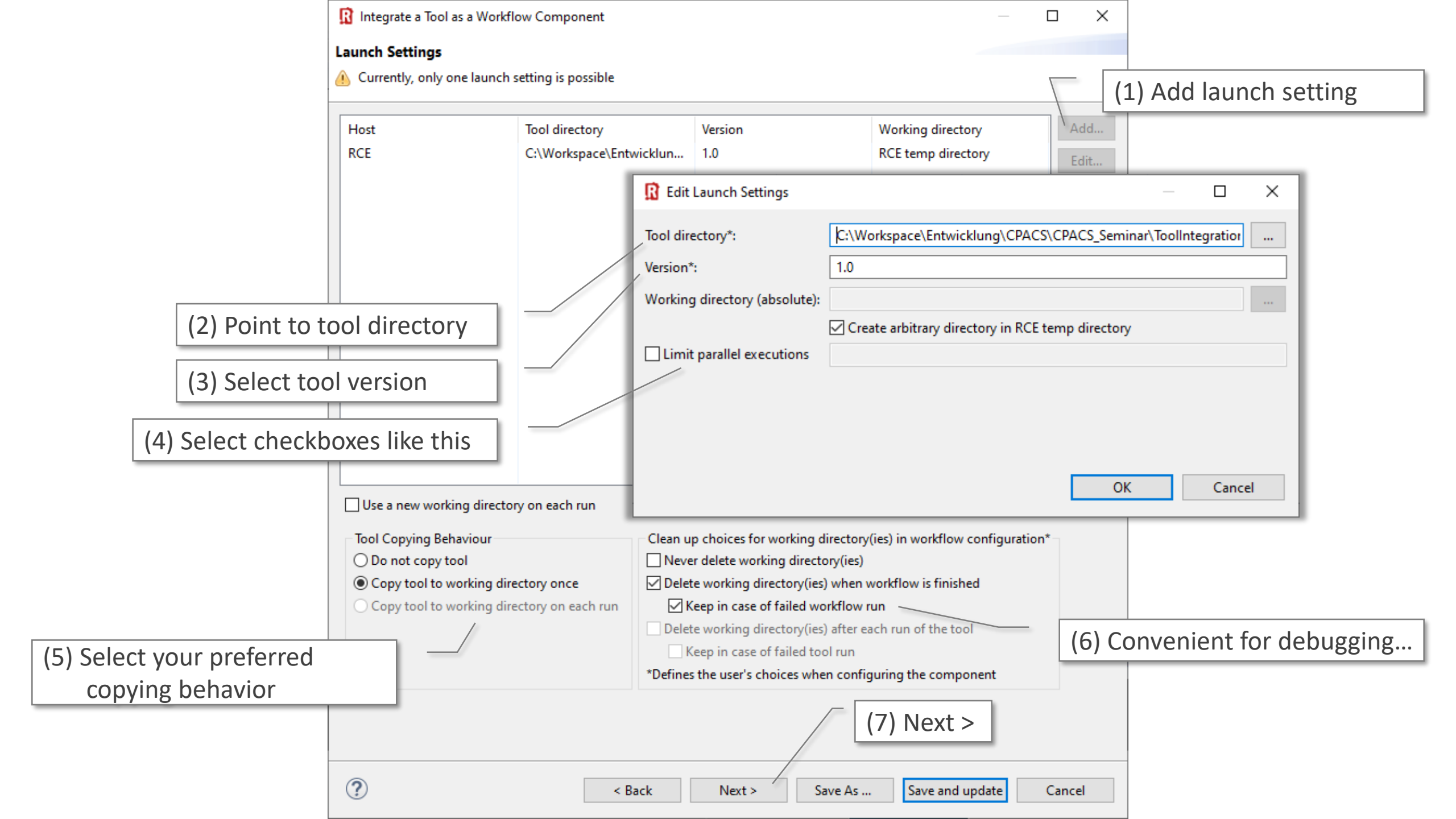

Integrate a Tool as a Workflow Component
Choose Tool Configuration
Create a new tool configuration or choose an inactive one to activate
Create a new Common tool configuration
Create a new CPACS tool configuration
Create a new tool configuration from a template
CPACS Tool (Type: CPACS)
CPACS Tool with incoming and return directory (Type: CPACS)
CPACS Tool with return directory (Type: CPACS)
Choose an inactive tool configuration to edit:
Selected tool configuration:
< Back
Next >
Save As ...
Save and activate
Cancel
(1) In this example we use the "common tool configuration".
(2) Click “Next >”


Integrate a Tool as a Workflow Component
Tool Description
Define some information for the tool
Tool characteristics
Name*:
wingInitializer
Icon path:
logo.png
Copy into configuration folder
Group Path:
CPACS_demo
Documentation:
toolIntegrationSettings.pdf
Description:
This tool demonstrates:
- how to initialize a CPACS wing
- how to make use of toolspecific data
Contact Information
Name:
CPACS Team
E-Mail:
cpacs@dlr.de
< Back
Next >
Save As ...
Save and update
Cancel
(1) Provide you tool name
(2) Choose a pretty icon
(3) Your tool palette might be structured by groups:
User Integrated Tools
CPACS_demo
wingInitializer
(4) Link a documentation
(5) Add description
(6) Provide contact information
(7) Next >


Integrate a Tool as a Workflow Component
Inputs and Outputs
Configure the inputs and outputs of the tool
Inputs
Outputs
Verification
Input
Data type
Handling
Constraint
CPACS_in
File
Single (consumed), Queu...
Required
Add...
Edit...
Remove
Edit... Input
Name*:
CPACS_in
Data type*:
File
Handling*:
Constant (not consumed)
Single (consumed)
Queue (consumed)
Default handling*:
Queue (consumed)
Constraint*:
Required
Required if connected
Not required
Default constraint*:
Required
OK
Cancel
(1) Click “Add”
(2) Define RCE input variable of type “File”
(3) Choose these file handling settings and click “OK”
(4) Next >
< Back
Next >
Save As ...
Save and update
Cancel


Integrate a Tool as a Workflow Component
Inputs and Outputs
Configure the inputs and outputs of the tool
Inputs
Outputs
Verification
Output
Data type
CPACS_out
File
Add...
Edit...
Remove
Edit... Output
Name*:
CPACS_out
Data type*:
File
OK
Cancel
(1) Click “Add”
(2) Define RCE output variable of type “File”
(3) Next >
< Back
Next >
Save As ...
Save and update
Cancel


Integrate a Tool as a Workflow Component
Tool Properties
Define properties of the tool
Property groups:
Default
Add...
Rename...
Remove
Property keys for group "Default":
Key
Display name
Define at wo...
Default va...
Comment
Add...
Edit...
Remove
Write key-value properties file at runtime (in "Config" folder)
working/Config/
Nothing to do ...
(1) Next >
< Back
Next >
Save As ...
Save and update
Cancel

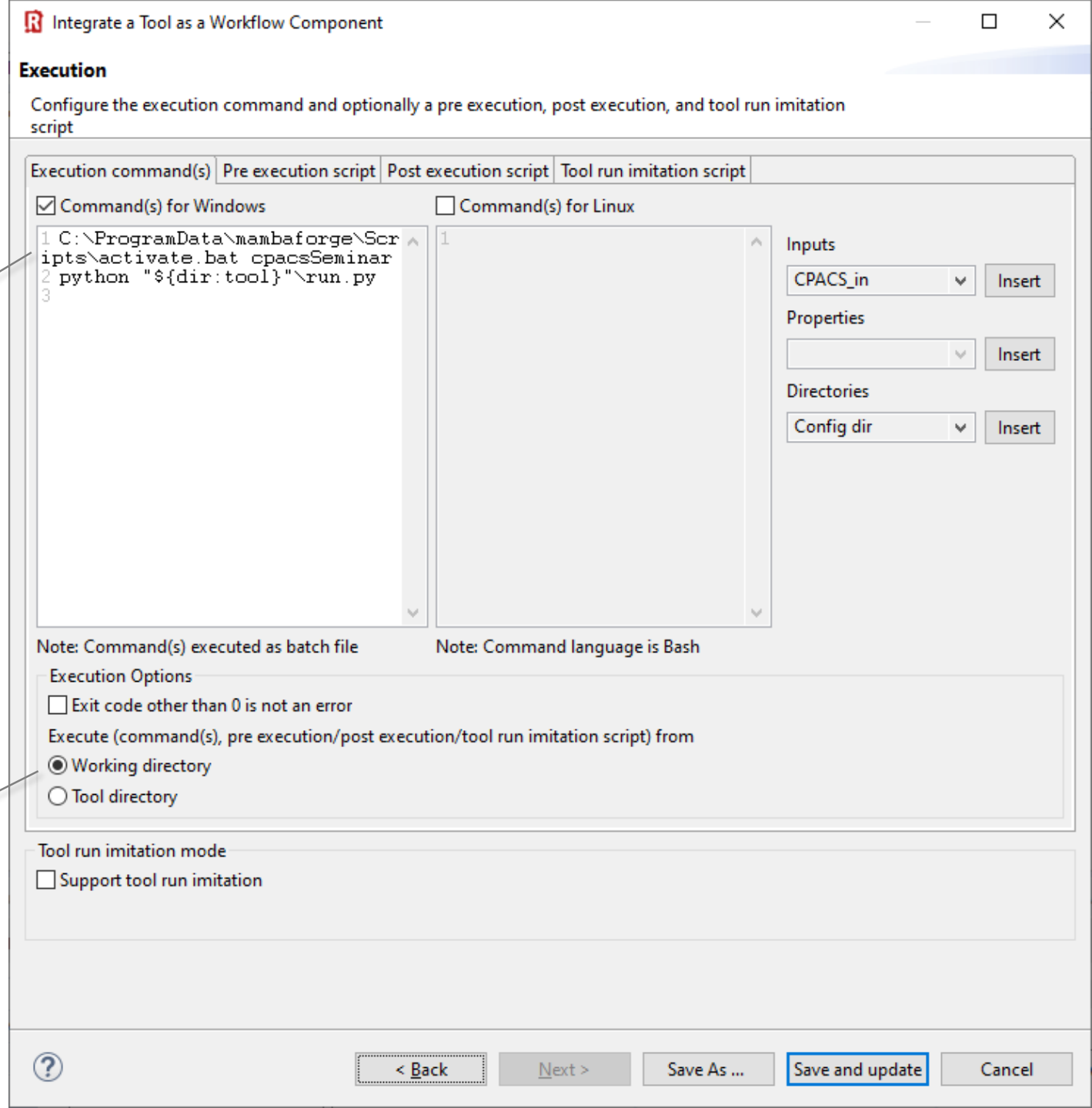

Integrate a Tool as a Workflow Component
Launch Settings
Currently, only one launch setting is possible
Host
Tool directory
Version
Working directory
RCE
C:\Workspace\Entwicklun...
1.0
RCE temp directory
Add...
Edit...
Edit Launch Settings
Tool directory*:
C:\Workspace\Entwicklung\CPACS\CPACS_Seminar\ToolIntegratior
Version*:
1.0
Working directory (absolute):
Create arbitrary directory in RCE temp directory
Limit parallel executions
OK
Cancel
Use a new working directory on each run
Tool Copying Behaviour
Do not copy tool
Copy tool to working directory once
Copy tool to working directory on each run
Clean up choices for working directory(ies) in workflow configuration*
Never delete working directory(ies)
Delete working directory(ies) when workflow is finished
Keep in case of failed workflow run
Delete working directory(ies) after each run of the tool
Keep in case of failed tool run
*Defines the user's choices when configuring the component
< Back
Next >
Save As ...
Save and update
Cancel
(1) Add launch setting
(2) Point to tool directory
(3) Select tool version
(4) Select checkboxes like this
(5) Select your preferred copying behavior
(6) Convenient for debugging...
(7) Next >

```
C:\ProgramData\mambaforge\Scripts\activate.bat
cpacsSeminar
python "${dir:tool}"\run.py
```

(1) Specify execution commands for Windows and/or Linux

ⓘ This example is written in Python, so we need to activate the correct interpreter first.

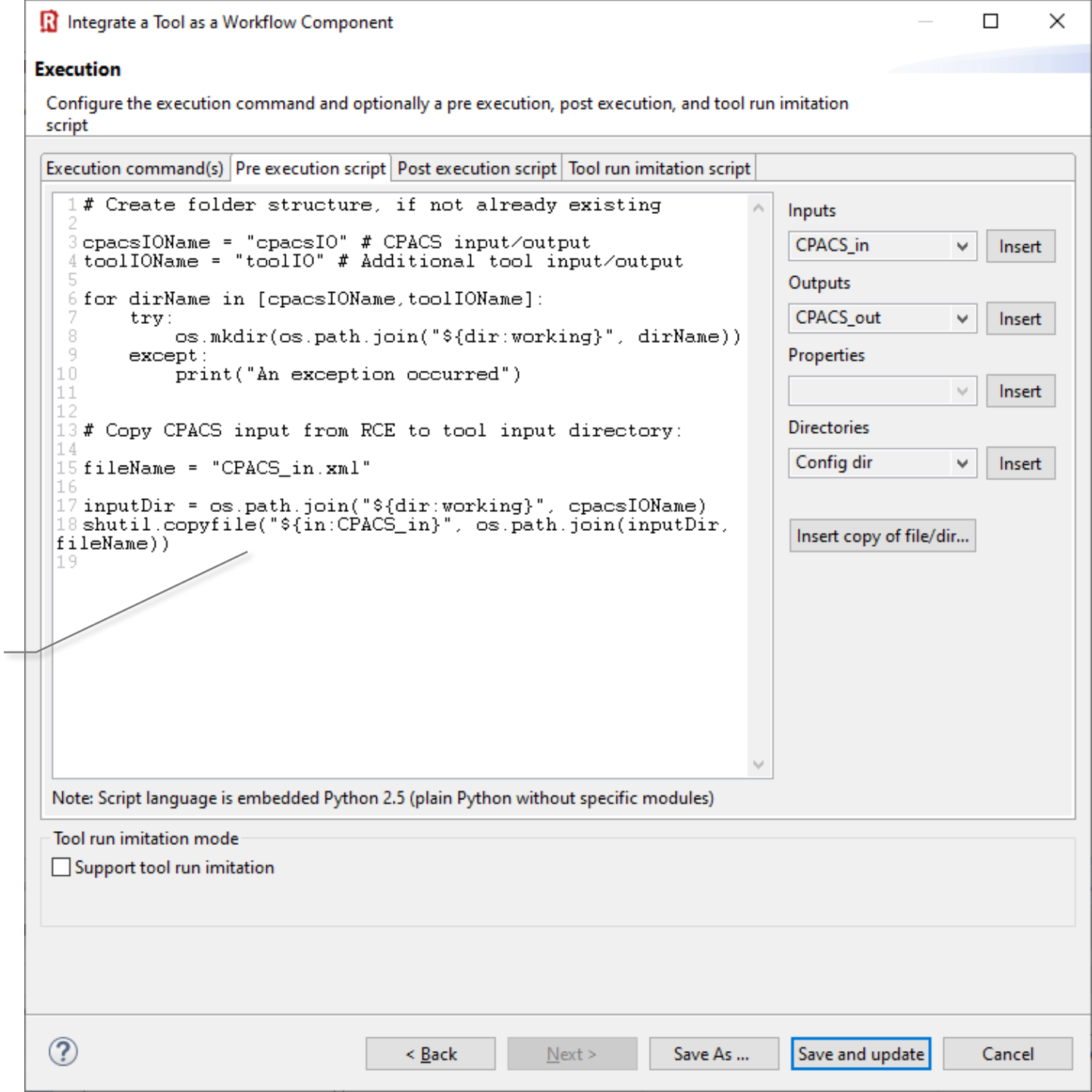
(2) Select “Working directory”



```
# Create folder structure, if not already existing

cpacsIOName = "cpacsIO" # CPACS input/output
toolIOName = "toolIO" # Additional tool input/output

for dirName in [cpacsIOName,toolIOName]:
    try:
        os.mkdir(os.path.join("${dir:working}", dirName))
    except:
        print("An exception occurred")


# Copy CPACS input from RCE to tool input directory:

fileName = "CPACS_in.xml"

inputDir = os.path.join("${dir:working}", cpacsIOName)
shutil.copyfile("${in:CPACS_in}", os.path.join(inputDir,
fileName))
```

(1) Insert pre-execution script in Python

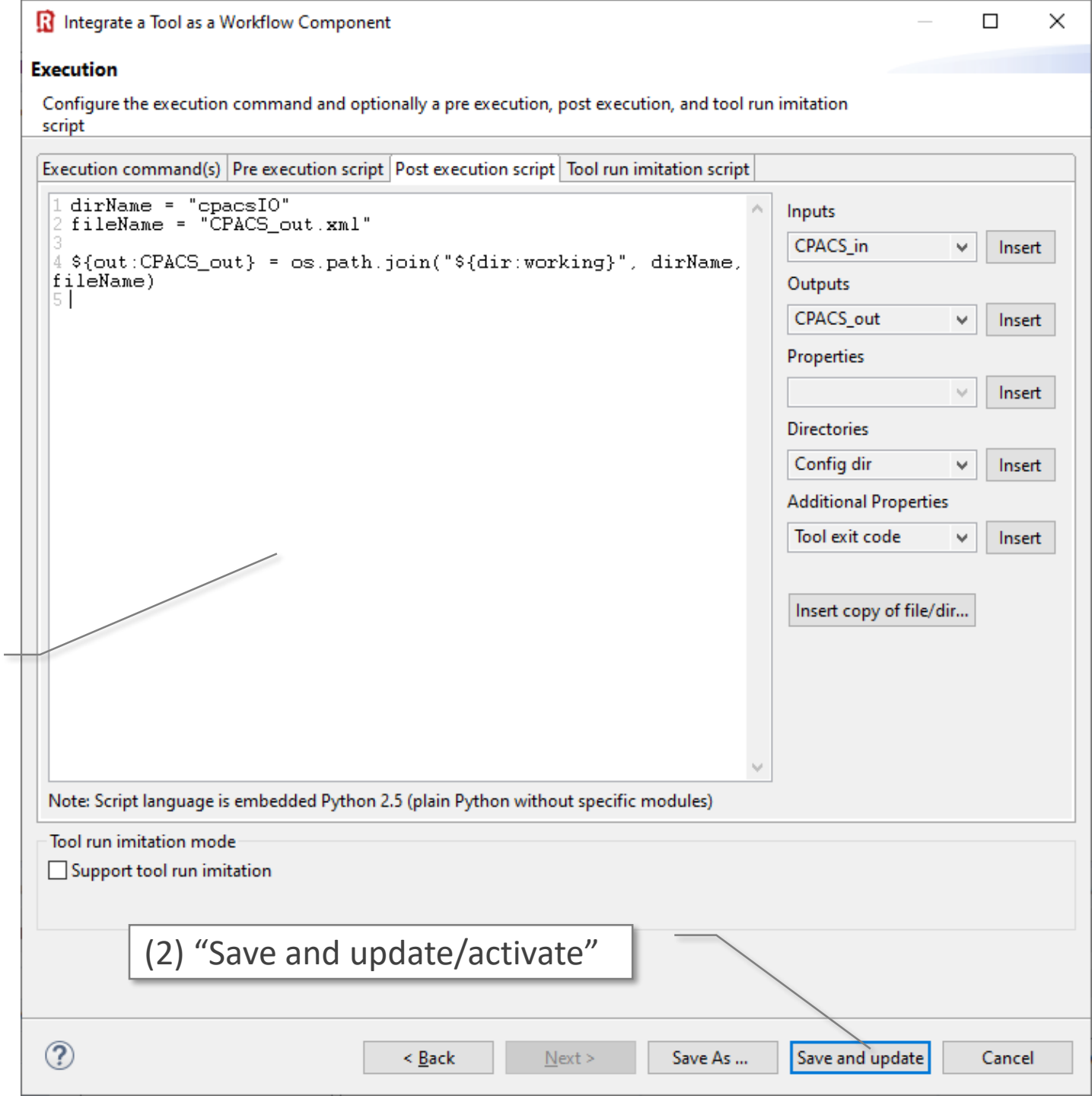
ⓘ Pre-execution: What happens before the actual tool is activated. Use this to create the required folder structure, if necessary, and copy the input file into it.

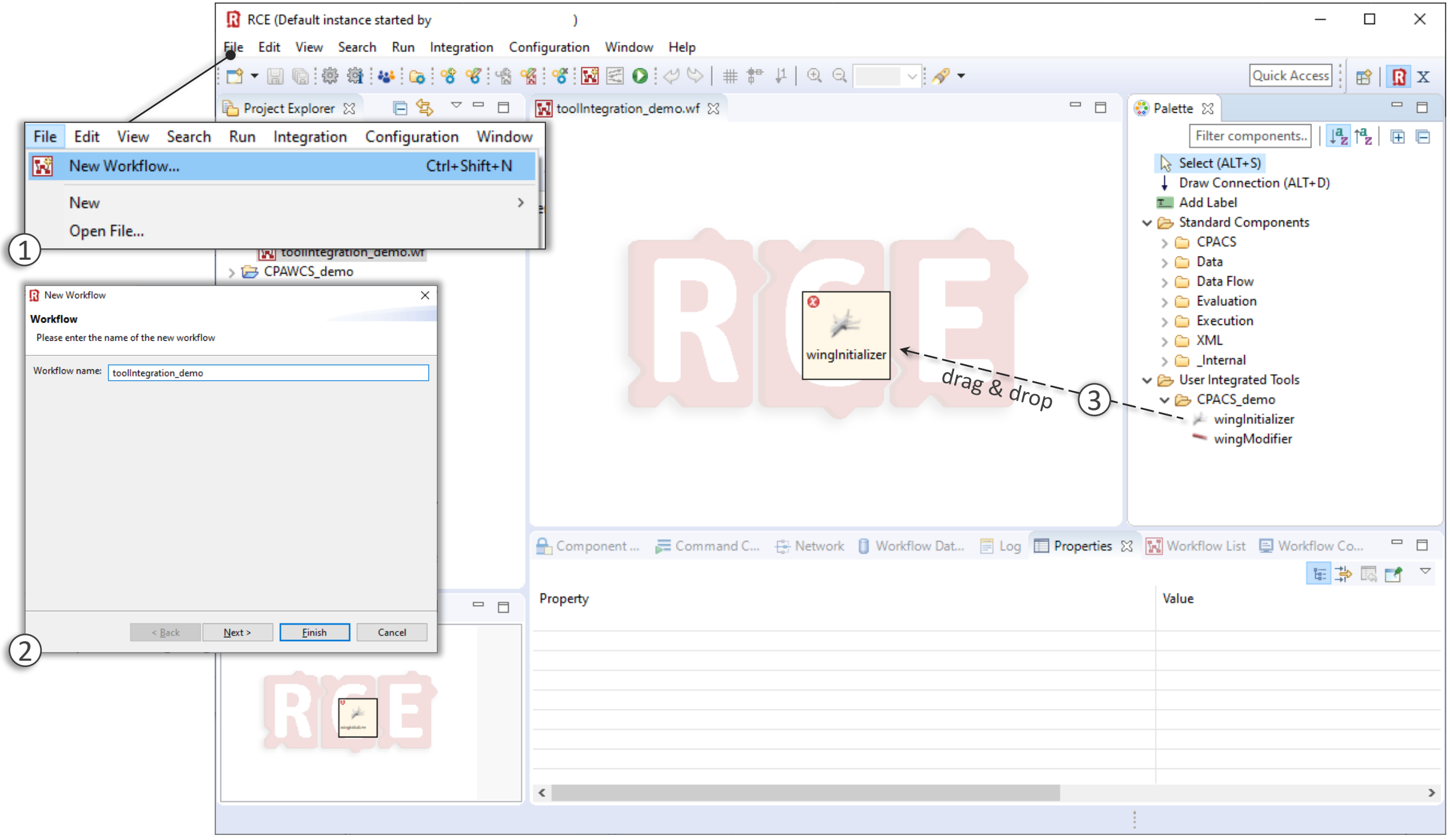


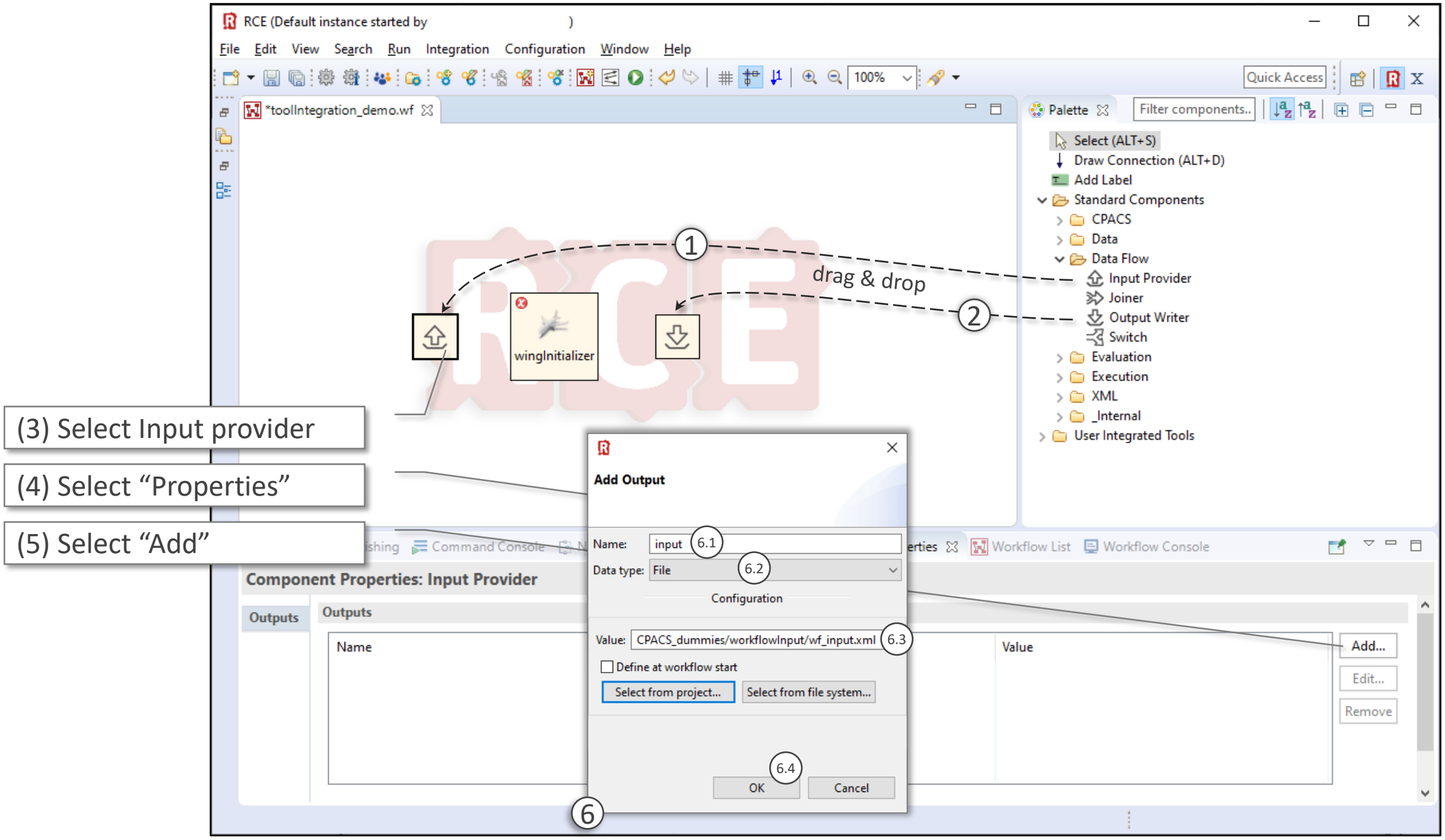
```
dirName = "cpacsIO"
fileName = "CPACS_out.xml"

${out:CPACS_out} = os.path.join("${dir:working}",
dirName, fileName)
```

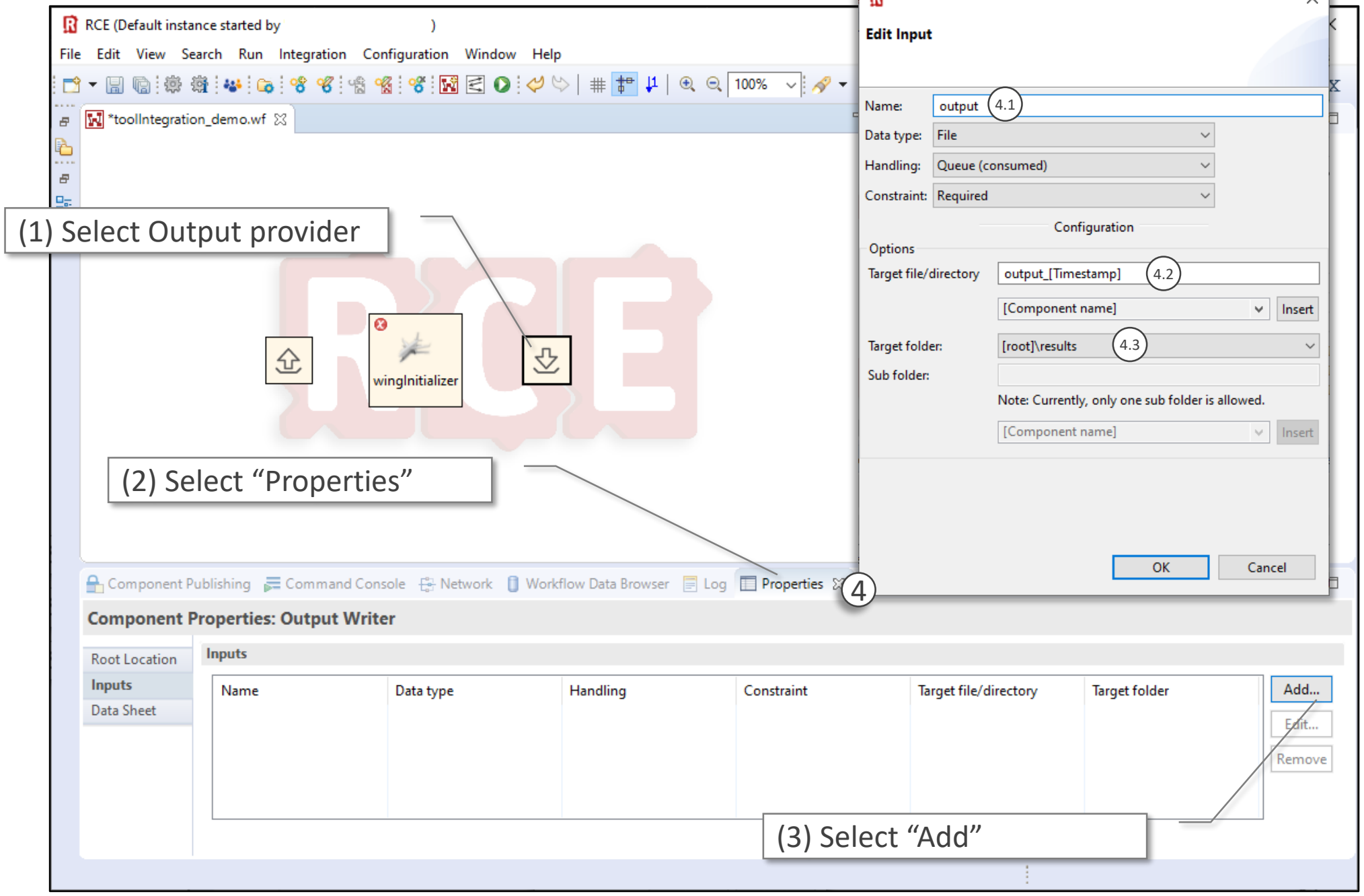
ⓘ Post-execution: What happens after the actual tool has finished. Here we're telling RCE where to find the output file.

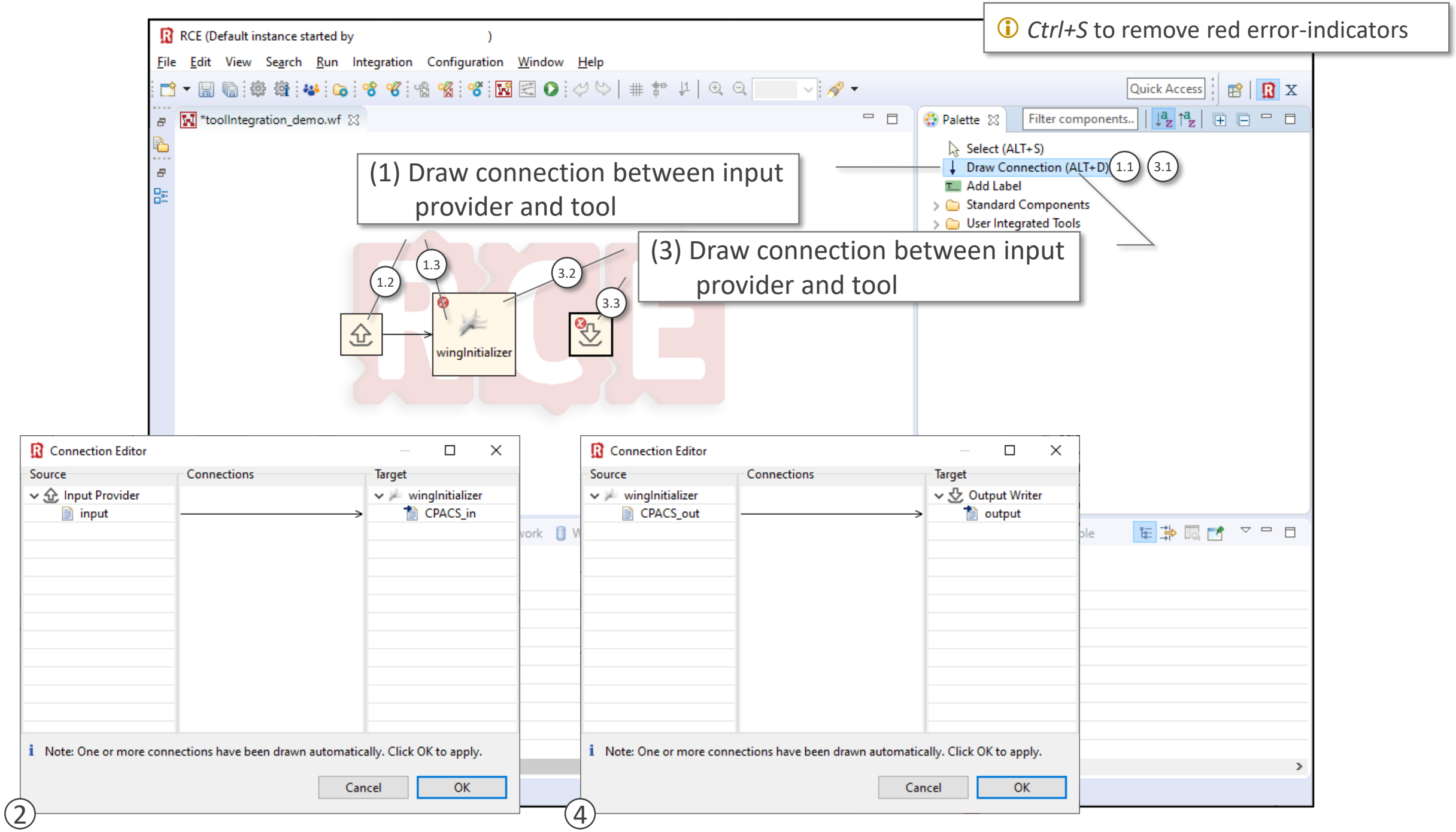
(1) Insert post-execution script in Python

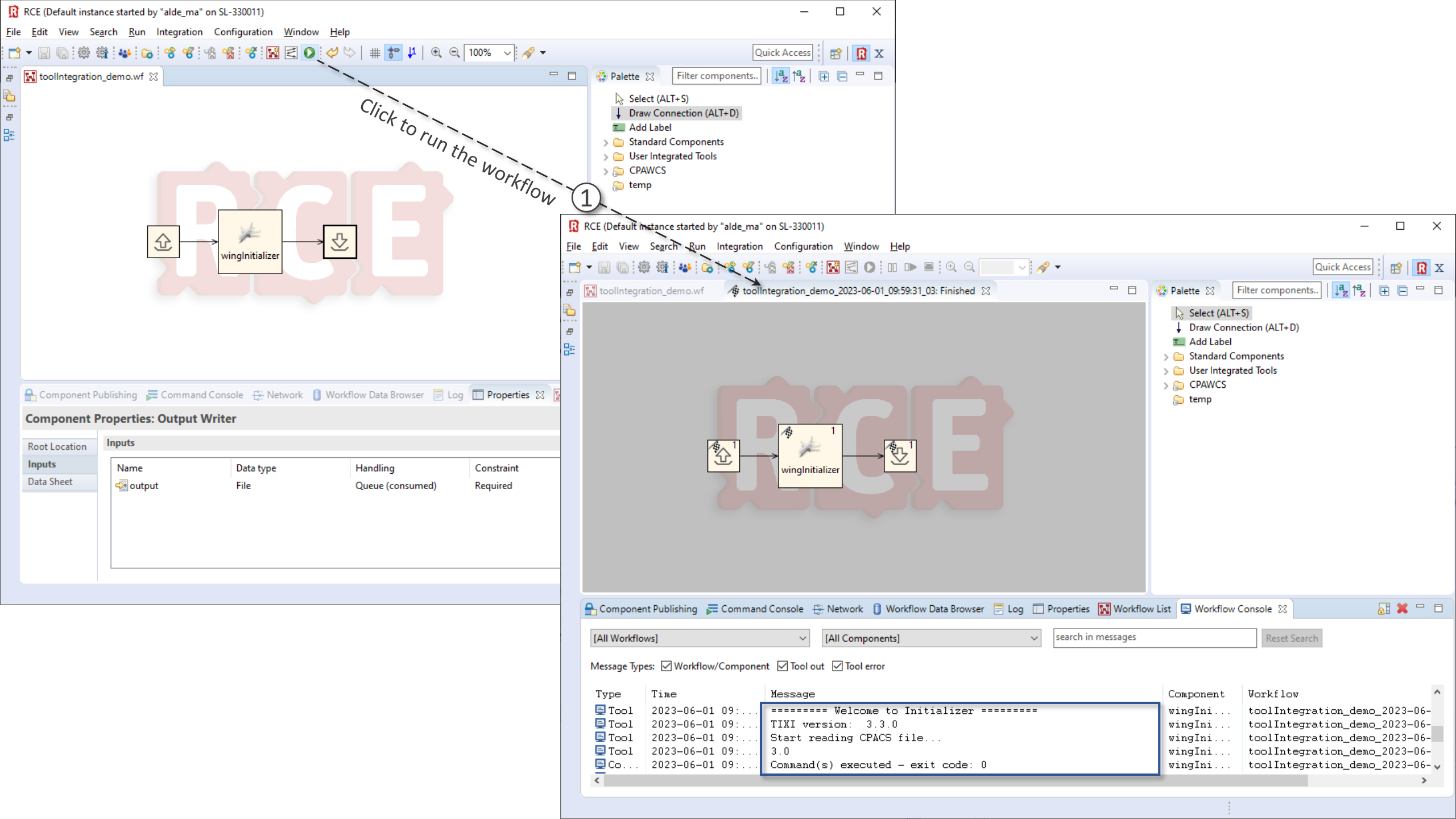


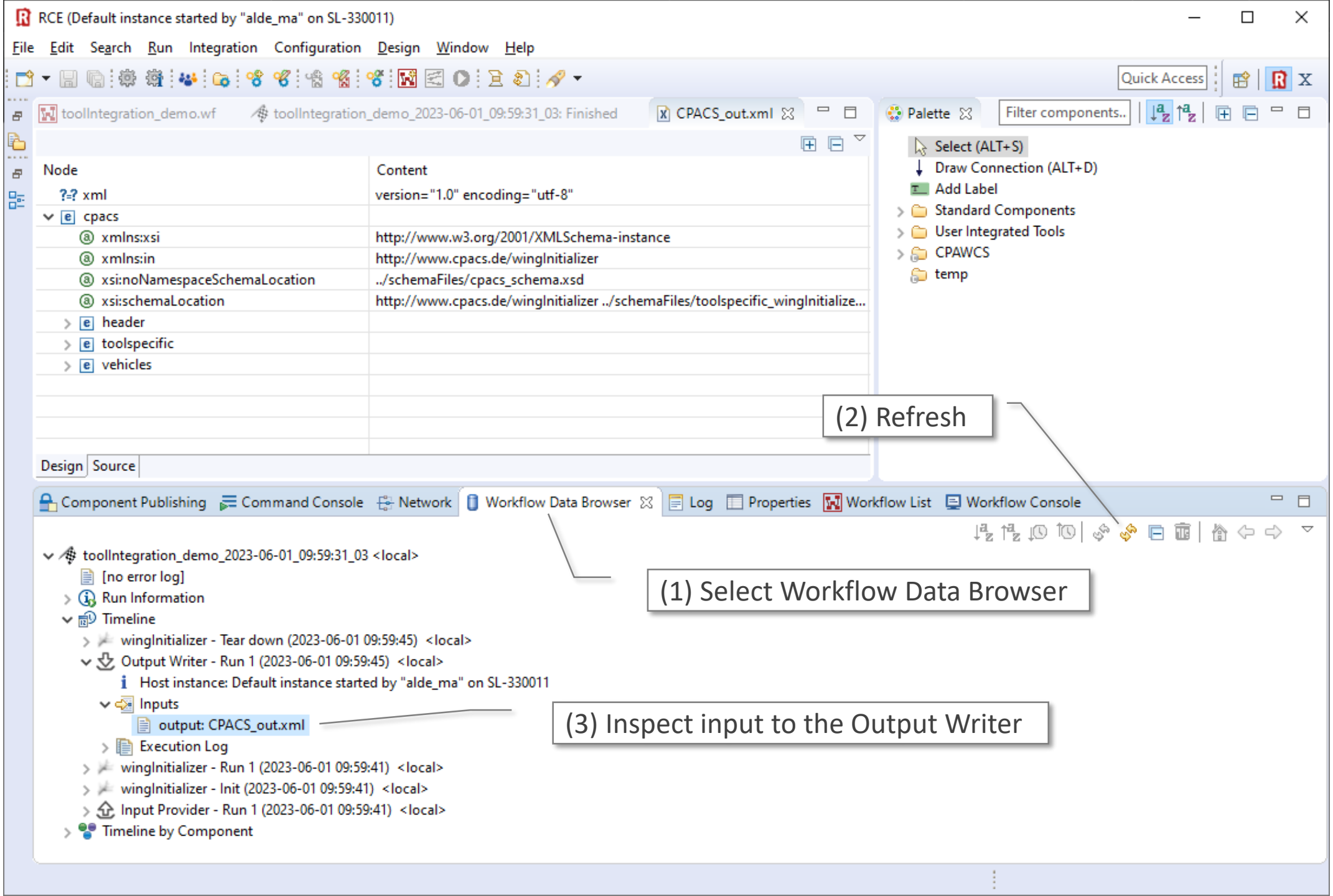

RCE (Default instance started by )
File Edit View Search Run Integration Configuration Window Help
Quick Access
Project Explorer
toolIntegration_demo.wf
CPAWCS_demo
Palette
Filter components..
Select (ALT+S)
Draw Connection (ALT+D)
Add Label
Standard Components
CPACS
Data
Data Flow
Evaluation
Execution
XML
_Internal
User Integrated Tools
CPACS_demo
wingInitializer
wingModifier
wingInitializer
drag & drop
3
Component ...
Command C...
Network
Workflow Dat...
Log
Properties
Workflow List
Workflow Co...
Property
Value
File Edit View Search Run Integration Configuration Window
New Workflow... Ctrl+Shift+N
New
Open File...
1
New Workflow
Workflow
Please enter the name of the new workflow
Workflow name: toolIntegration_demo
< Back
Next >
Finish
Cancel
2


RCE (Default instance started by )
File Edit View Search Run Integration Configuration Window Help
100%
Quick Access
*toolIntegration_demo.wf
wingInitializer
1
2
drag & drop
Palette
Filter components..
Select (ALT+S)
Draw Connection (ALT+D)
Add Label
Standard Components
CPACS
Data
Data Flow
Input Provider
Joiner
Output Writer
Switch
Evaluation
Execution
XML
_Internal
User Integrated Tools
(3) Select Input provider
(4) Select “Properties”
(5) Select “Add”
Command Console
Workflow List
Workflow Console
Component Properties: Input Provider
Outputs
Outputs
Name
Value
Add...
Edit...
Remove
Add Output
Name: input 6.1
Data type: File 6.2
Configuration
Value: CPACS_dummies/workflowInput/wf_input.xml 6.3
Define at workflow start
Select from project...
Select from file system...
6.4
OK
Cancel
6


RCE (Default instance started by )
File Edit View Search Run Integration Configuration Window Help
100%
*toolIntegration_demo.wf
(1) Select Output provider
wingInitializer
(2) Select “Properties”
Component Publishing
Command Console
Network
Workflow Data Browser
Log
Properties
4
Component Properties: Output Writer
Root Location
Inputs
Data Sheet
Inputs
Name
Data type
Handling
Constraint
Target file/directory
Target folder
Add...
Edit...
Remove
(3) Select “Add”
Edit Input
Name: output 4.1
Data type: File
Handling: Queue (consumed)
Constraint: Required
Configuration
Options
Target file/directory output_[Timestamp] 4.2
[Component name]
Insert
Target folder: [root]\results 4.3
Sub folder:
Note: Currently, only one sub folder is allowed.
[Component name]
Insert
OK
Cancel


Ctrl+S to remove red error-indicators
RCE (Default instance started by )
File Edit View Search Run Integration Configuration Window Help
Quick Access
*toolIntegration_demo.wf
Palette
Filter components..
Select (ALT+S)
Draw Connection (ALT+D)
Add Label
Standard Components
User Integrated Tools
1.1
3.1
(1) Draw connection between input provider and tool
(3) Draw connection between input provider and tool
1.2
1.3
3.2
3.3
wingInitializer
Connection Editor
Source
Connections
Target
Input Provider
input
wingInitializer
CPACS_in
Note: One or more connections have been drawn automatically. Click OK to apply.
Cancel
OK
2
Connection Editor
Source
Connections
Target
wingInitializer
CPACS_out
Output Writer
output
Note: One or more connections have been drawn automatically. Click OK to apply.
Cancel
OK
4


RCE (Default instance started by "alde_ma" on SL-330011)
File Edit View Search Run Integration Configuration Window Help
Quick Access
toolIntegration_demo.wf
Palette
Filter components..
Select (ALT+S)
Draw Connection (ALT+D)
Add Label
Standard Components
User Integrated Tools
CPAWCS
temp
Click to run the workflow
1
wingInitializer
Component Publishing
Command Console
Network
Workflow Data Browser
Log
Properties
Component Properties: Output Writer
Root Location
Inputs
Data Sheet
Inputs
Name
Data type
Handling
Constraint
output
File
Queue (consumed)
Required
RCE (Default instance started by "alde_ma" on SL-330011)
File Edit View Search Run Integration Configuration Window Help
Quick Access
toolIntegration_demo.wf
toolIntegration_demo_2023-06-01_09:59:31_03: Finished
Palette
Filter components..
Select (ALT+S)
Draw Connection (ALT+D)
Add Label
Standard Components
User Integrated Tools
CPAWCS
temp
wingInitializer
Component Publishing
Command Console
Network
Workflow Data Browser
Log
Properties
Workflow List
Workflow Console
[All Workflows]
[All Components]
search in messages
Reset Search
Message Types:
Workflow/Component
Tool out
Tool error
Type
Time
Message
Component
Workflow
Tool 2023-06-01 09:... ========= Welcome to Initializer ========= wingIni... toolIntegration_demo_2023-06-
Tool 2023-06-01 09:... TIXI version: 3.3.0 wingIni... toolIntegration_demo_2023-06-
Tool 2023-06-01 09:... Start reading CPACS file... wingIni... toolIntegration_demo_2023-06-
Tool 2023-06-01 09:... 3.0 wingIni... toolIntegration_demo_2023-06-
Co... 2023-06-01 09:... Command(s) executed - exit code: 0 wingIni... toolIntegration_demo_2023-06-


RCE (Default instance started by "alde_ma" on SL-330011)
File Edit Search Run Integration Configuration Design Window Help
Quick Access
toolIntegration_demo.wf
toolIntegration_demo_2023-06-01_09:59:31_03: Finished
CPACS_out.xml
Node
Content
xml
version="1.0" encoding="utf-8"
cpacs
xmlns:xsi
http://www.w3.org/2001/XMLSchema-instance
xmlns:in
http://www.cpacs.de/wingInitializer
xsi:noNamespaceSchemaLocation
../schemaFiles/cpacs_schema.xsd
xsi:schemaLocation
http://www.cpacs.de/wingInitializer ../schemaFiles/toolspecific_wingInitialize...
header
toolspecific
vehicles
Design
Source
Palette
Filter components..
Select (ALT+S)
Draw Connection (ALT+D)
Add Label
Standard Components
User Integrated Tools
CPAWCS
temp
(2) Refresh
Component Publishing
Command Console
Network
Workflow Data Browser
Log
Properties
Workflow List
Workflow Console
toolIntegration_demo_2023-06-01_09:59:31_03 <local>
[no error log]
Run Information
Timeline
wingInitializer - Tear down (2023-06-01 09:59:45) <local>
Output Writer - Run 1 (2023-06-01 09:59:45) <local>
Host instance: Default instance started by "alde_ma" on SL-330011
Inputs
output: CPACS_out.xml
Execution Log
wingInitializer - Run 1 (2023-06-01 09:59:41) <local>
wingInitializer - Init (2023-06-01 09:59:41) <local>
Input Provider - Run 1 (2023-06-01 09:59:41) <local>
Timeline by Component
(1) Select Workflow Data Browser
(3) Inspect input to the Output Writer