# Tool-chain framework release

## D5.8

Signature Control

| Written | Checked | Approved Configuration Management | Approved Quality Assurance | Approved Project Management |
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D5.8 Tool-chain framework release

Changes Record

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| 1 | 2023-02-06 | F. Florczyk | All | Initial issue |
| 2 | 2023-04-28 | I. Jarek | All | Document update |
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# 1. Introduction

## 1.1. Purpose, scope and content

This document contains technical description of virtual machine constituting the D5.8 Tool-chain Framework Release deliverable. It holds all the necessary descriptions of system configuration and required binaries that were possible to install on the machine.

Purpose of this document is to provide user with detailed description of configuration and implementation of features prepared during the project development.

## 1.2. Availability

The AURORA Virtual Machine release (D5_8 TASTE-VM-10-64bit-Aurora-Release) is available for download upon request. Please contact us at info@aurora-software.eu.

## 1.3. Repositories status

There are multiple git repositories installed on the machine. All of them need to be checked out on specific commit hash for proper Aurora implementation demonstration. The following table describes needed repositories and its hashes.

| Repository | Location | Hash |
|---|---|---|
| tool-src | /home/taste | 724736005267f0065e2c912e2ec0224a37043612 |
| SpaceCreator | /home/taste/Repositories | d95a22773108ae7104d89f5e1dbca2fcc2d3c581 |
| AURORA-Validation | /home/taste/Repositories | 894373ceae6ce0bd2632279dc425a817eb974498 |

*Table  1 List of required repositories*

Other impacted repositories are located in tool-src repository as submodules. They are synchronized so it is not required to manually checkout them. The following list presents list of impacted submodules:

- DMT
- Kazoo
- SIS
- TASTE-LEON3-Runtime
- Leon3-BSP
- TASTE-LEON3-Drivers
- TASTE-Linux-Runtime
- TASTE-Runtime-Common

# 2. Configuration description

## 2.1. Tool-chain configuration

During tool-chain release preparations multiple subsystems and tools were installed on the presented virtual machine. The following description presents all the necessary tools.

### 2.1.1. Core TASTE systems

The AURORA tool-chain release is based on standard TASTE VM provided from https://taste.tools/. Standard Core TASTE systems are installed on the machine, including SpaceCreator, kazoo, dmt etc. (details described in chapter 1.2). There is no need to checkout them manually as they are synchronized with main tool-src repository, only main repository should be checked out on proper commit (see Table 1.).

### 2.1.2. RTEMS6

RTEMS in its version 6 is installed on the machine. Script from tool-src/add-ons was used for proper installation (install-rtems6_smp_qdp_gr712rc.sh).

### 2.1.3. SIS

SIS was installed on the machine. Script from tool-src/add-ons was used for proper installation (install-sis.sh).

### 2.1.4. TASTE-LEON3-Runtime

TASTE-LEON3-Runtime was installed on the machine. Script from tool-src/add-ons was used for proper installation (install-leon3-runtime.sh).

### 2.1.5. Matlab

MATLAB was not installed on the machine, however special binary is present in the machine in /home/taste/bin/matlabremote. It allows to connect to the remote machine with MATLAB installed. This binary needs a wrapper in the form of a script which provides API for all local binaries that need to use MATLAB locally.

For standard MATLAB usage, MATLAB needs to be installed manually by the user, see https://www.mathworks.com/products/matlab.html.

### 2.1.6. QGenC

QGenC was not installed on the machine. For proper QGenC usage, it needs to be installed manually by the user, see https://www.adacore.com/qgen.

### 2.1.7. AURORA-Validation

This repository contains validation models and tests which are not needed for proper AURORA implementation usage. This repository was provided in the machine for easy access to example projects and validation tests. For more information see chapter 6. Toolchain Demonstration of AUR-N7S-RP-0003 D5.9 Toolchain Demonstration Report.

# 3. Implementation impact

Various repositories and tools were impacted during the Aurora project development. The following list describes implementation impact in these tools and subsystems.

## 3.1. Kazoo

In Kazoo tool there were impacts on source code responsible for parsing input data from AADL files and providing templates with proper data (src directory). Moreover, there were various changes in templates connected with providing source code for specific targets described in AURORA project. The following list presents a high-level description of places in repository impacted during the project development.

- src/ (logic source code connected with serialization and deserialization of data)
- templates/concurrency_view/aadl_4_makefile
- all templates from catalogues templates/concurrency_view/generic_linux…
- all templates from catalogues templates/concurrency_view/generic_routing…
- all templates from catalogues templates/concurrency_view/generic_rtems6…
- all templates from catalogues templates/concurrency_view/generic_system_spec…
- all templates from catalogues templates/concurrency_view/leon3-rtems6…
- templates/glue/language_wrappers/invoke_ri-body
- templates/glue/language_wrappers/mini-cv
- templates/glue/language_wrappers/vm_if-body
- templates/glue/language_wrappers/vm_if-header
- all templates from catalogues templates/skeletons/simulink_…
- templates/skeletons/makefile.tmplt

Moreover, during project development Kazoo tests were prepared for easier impact handling. The following list presents tests developed during project implementation placed in test directory:

- linux-cpp-n-2-m-demo
- linux-cpp-n-2-m-with-routing-table-demo
- linux-cpp-one-2-n-demo
- linux-cpp-one-2-n-protected
- linux-cpp-one-2-n-sporadic
- linux-cpp-one-2-n-unprotected
- linux-cpp-startup-priority-demo
- linux-get-sender-demo
- linux-get-sender-with-broker-demo
- RTEMS6_SMP_QDP-get-sender-demo
- RTEMS6_SMP_QDP-multicast
- RTEMS6_SMP_QDP-n-2-m-demo
- RTEMS6_SMP_QDP-n-2-m-with-routing-table
- RTEMS6_SMP_QDP-perf-mon
- RTEMS6_SMP_QDP-uart-communication

## 3.2. DMT

The following list presents a high-level description of the impacted areas inside DMT repository :

- dmt/A_mappers/qgenc_A_mapper.py
- dmt/B_mappers/c_B_mapper.py
- dmt/B_mappers/qgenc_B_mapper.py

- dmt/B_mappers/synchronousTool.py
- dmt/commonPy/recursiveMapper.py
- dmt/commonPy/aadlAST.py
- dmt/commonPy2/AadlParser.py
- dmt/commonPy2/aadlAST.py
- dmt/aadl2glueC.py
- dmt/msgPrinter.py
- dmt/msgPrinterASN1.py
- tests-coverage/mini_cv.aadl
- tests-coverage/DataTypesSimulink.asn
- tests-coverage/robots.asn

## 3.3. TASTE-Runtime-Common

There are changes present in source code connected with Broker and Packetizer.

## 3.4. TASTE-Linux-Runtime

There are changes present in source code connected with Request, Queue and StartBarrier.

## 3.5. TASTE-Leon3-Runtime

Runtime specific files for the new TASTE Leon3 Runtime are provided in this repository.

## 3.6. TASTE-Leon3-Drivers

UART serial communication device implementation for the TASTE Leon3 Runtime is provided in this repository. It relies on TASTE-Runtime-Common and Leon3-BSP.

## 3.7. Leon3-BSP

Leon3 Board Support Package has been provided for low-level handling of Leon3 peripherals such as UART communication and Timers. Logic for these peripherals is placed in the corresponding files in the source code directory.

## 3.8. Configuration scripts

During project development there were created and impacted various installation scripts placed inside tool-src for easier tool-chain installation. The following list presents impacted scripts placed in tool-src repository:

- /install/88_spaceCreator.sh
- /add-ons/install-leon3-runtime.sh
- /add-ons/install-rtems6_smp_qdp_gr712rc.sh
- /add-ons/install-sis.sh

## 3.9. Configuration files

During project development various configuration files were impacted for proper implementation handling. The following list presents impacted scripts placed in tool-src repository :

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- misc/aadl-library/taste_properties.aadl
- misc/aadl-library/ocarina_components.aadl
- misc/space-creator/archetypes (files inside)
- misc/space-creator/xml2aadl (all files inside)
- misc/space-creator/default_attributes.xml
- misc/space-creator/Board1.xml
- misc/space-creator/function-tester/boards_config.txt

## 3.10.    SpaceCreator

During Aurora development there were multiple changes in SpaceCreator, Integrated Development Environment for Taste tool-chain. The following list presents a high-level description of the impacted areas inside SpaceCreator repository:

- src/qtcreator/functiontesterplugin (new plugin developed for Aurora)
- src/qtcreator/simulinkimporterplugin (new plugin developed for Aurora)
- src/libs/conversion/Simulink
- src/libs/ivcore
- src/libs/libiveditor
- src/libs/shared
- src/libs/testgenerator

Moreover, during SpaceCreator development, there were added or impacted tests. The following list presents high-level description of the impacted test areas inside SpaceCreator repository:

- tests/integrationtests/conversion/simulinktoiv
- tests/integrationtests/conversion/simulinktoasn1
- tests/integrationtests/testgenerator
- tests/manual/functiontester
- tests/manual/qgenc
- tests/manual/simulinkimporterplugin
- tests/unittests/conversion
- tests/unittests/ivcore
- tests/unittests/libiveditor
- tests/unittests/shared
- tests/unittests/simulink
- tests/unittests/testgenerator

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