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| Deriver to | Coverage Merge Tool(CMT) CI Ver.1.0.0  Guideline | - | | |
| - | 06-Jul-2022 | | |
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| Approved | Checked | Issued |
| - | - | DucNguyen |

目次

[1 Introduction 3](#_Toc108014182)

[1.1 License Information 3](#_Toc108014183)

[1.2 Notice 3](#_Toc108014184)

[2 Terminology 4](#_Toc108014185)

[3 Environment 5](#_Toc108014186)

[3.1 Hardware 5](#_Toc108014187)

[3.2 Software 5](#_Toc108014188)

[4 CMT’s operating method 6](#_Toc108014189)

[4.1 CMT Overview 6](#_Toc108014190)

[4.2 Folder structure 8](#_Toc108014191)

[4.3 CMT execution preparation 9](#_Toc108014192)

[4.4 CMT execution procedure 10](#_Toc108014193)

[5 Limitation 11](#_Toc108014194)

[6 Change log 12](#_Toc108014195)

# Introduction

This document describes about a Coverage Marge Tool’s (CMT) operating method.

## License Information

The source files of CMT uses the following library.

|  |  |
| --- | --- |
| Source file | Python library |
| Doc2Text.py | sys, docx |
| Text2Doc.py | sys, docx |

Please refer to the following sites about license in detail.

<https://www.python.org/download/releases/2.7/license/>

<https://github.com/mikemaccana/python-docx/blob/master/LICENSE>

## Notice

Don't change the following file of the CMT. When changing it, operation is not guaranteed.

*CMT\_CI*

+----- *exec* : CMT executable files.

| +----- CompileCheck.py : Tool to analyze ..cpl cpr file to get the un-compile line of code.

| +----- ctr\_analysis.exe : Tool to analyze coverage result data.

# Terminology

|  |  |
| --- | --- |
| Word | Description |
| CMT | Coverage Merge Tool |
| Cantata | C / C++ compatible dynamic test tool |
| Cantata Project(on PC) | Cantata Project for Coverage measurement on PC |
| Cantata Project(on Board) | Cantata Project for Coverage measurement on Board |
| Auto Test Program | Test program for coverage measurement that Cantata generates automatically |
| Coverage result files (on PC) | MS-Word file which copied coverage result of a measurement on PC displayed by Viewer of Cantata(\*.doc) |
| Coverage result files (on Board) | MS-Word file which copied coverage result of a measurement on Board displayed by Viewer of Cantata(\*.doc) |
| Coverage result files (After merge) | MS-Word file which merged Coverage result files by CMT |
| Coverage result data (on PC) | Coverage result on PC of the text file output by Cantata(\*.ctr) |
| Coverage result data (on Board) | Coverage result on Board of the text file output by Cantata(\*.ctr) |
| Executable File (.out) | Executable File generated by Cantata |
| multiplexOutput | Coverage result raw data for Cantata |
| Coverage result data analysis files | File of analysis result of Coverage result data |
| Create\_ctr.exe | A tool for generating Coverage result data for on Board |
| Coverage report file | Coverage report of the MS-Excel file (\*.xlsm) |

# Environment

Following environments are required to use the CMT.

## Hardware

* Windows PC (Windows 7/10) .

With a sufficient specification to operate the following software.

## Software

* Cygwin installed dos2unix and python3.8.x or later
* MS-Office Word 2013 or later
* Cantata Version 9.0

# CMT’s operating method

This chapter describes the CMT execution preparation and procedure.

## CMT Overview

CMT is a tool aimed at:

* Merge more than one coverage result files.
* Merge more than one coverage result data.
* The merged file becomes the input of the Covrage report file.

CMT has the following functions.

* Coverage result files merge function：

Merging Coverage result files measured with Cantata.

* Coverage result analysis function：

Analyzes the Coverage result data, and outputs Coverage result data analysis files.

A schematic diagram of each function is described below.

(1)

DUT Test specification

CMT

1. Generate “Test Program”
2. Generate “Compile Coverage result files (on PC)”
3. Generate “Coverage result data (on PC)”
4. "Coverage result files (on PC)" and "Coverage result files (on Board)" are merged by CMT and "Coverage result files (After merge)" is generated.
5. "Coverage result data (on PC)" and "Coverage result data (on Board)" are merged by CMT and "Coverage result data analysis files" is generated.

TableDriven Generate test case

(2)

(1)

Cantata Project

(on PC)

Compile Coverage

Result files (.cpl)

Cantata

Un-compile data (After merge)

Coverage result files merge function

MCAL Driver

(.c/.h)

d

Coverage report file

(3)

Coverage result analysis function

Coverage result

data (.ctr)

CMT

(2)

Coverage result data

analysis files

on PC

Cantata Project

Generate

on Board

Input

CMT function

Figure . schematic diagram of tool to use in DUT

Note:

* In case of “on PC”, "Coverage result data" is output to "[Cantata project folder]/Cantata/tests/[Test Program]/".

## Folder structure

This chapter describes the folder structure of "Ver.1.0.0\_Official.zip" (CMT executable files and CMT execution environment) in <https://172.29.44.209/automotive/autosar/svnASG_D008633/project/external/RVC/Tools/CMT/CMT_Ver.1.0.0_Official>

In following folders structure, *italic characters* represent folders.

**[CMT\_CI]**

*Ver.1.0.0\_Official*

+----- *CMT* : CMT’s folder.

| +----- *docs* : Document folder.

| | +----- CMT\_Guideline.docx : This document.

| +----- *exec* : CMT executable files.

| | +----- CompileCheck.py : Tool to analyze ..cpl cpr file to get the un-compile line of code.

| | +----- ctr\_analysis.exe : Tool to analyze coverage result data.

| \----- ReleaseNote.txt : CMT’s release note.

\----- *Env* : CMT execution environment folder.

+----- *msn* (**[Execution folder]**) : Template of an execution folder.

| +----- CMT\_execute.sh : CMT execution script

| +----- *ctr\_log* : Output destination of Coverage result data

| +----- *input* : Input destination of coverage result files and

| | coverage result data of a merging target

| +----- *log* : Output destination of CMT logs

| +----- *report* : Coverage report files location

| | + Coverage\_Report\_Template.xlsx : Template for Coveraga report

| | + Coverage\_Template\_Changelog.txt: History for the change in Coverage\_Report\_Template.xlsx

| +----- *result* : Output destination of coverage result files

| \----- target.txt : merging target file (Without extensions) list

| (e.g. Adc\_LLDriver)

\----- stmnt\_print.exe : Tool to extract non-compilation code.

## CMT execution preparation

1. Construct CMT environment. (refer to chapter 3.2)
2. Copy “*/Env/msn*” to “*/Env*”, rename “[Execution folder]” to module name. (e.g. adc)
3. Describe merging target file name without extension in “/Env/[Execution folder]/target.txt". (e.g. If the target file name is “Adc\_LLDriver.c”, describe “Adc\_LLDriver”)

If there are multiple target files, they are separated by line feed code as shown below.

Adc\n

Adc\_Irq\n

Adc\_LLDriver\n

Note : The line feed code of “target.txt" must be "LF" (\n). When the line feed code is “CRLF” (\r\n), CMT does not operate normally.

1. Save coverage result files and coverage result data of a merging target files to " *Env/[Execution folder]/input*".

e.g.

adc ([Execution folder])

\----- input

+----- Adc\_Cfg01\_F1M

| +----- Adc\_c.doc

| +----- Adc\_Irq\_c.doc

| +----- atest\_Adc.ctr

| +----- atest\_Adc\_Irq.ctr

| +----- atest\_Adc.cpl

| +----- atest\_Adc\_Irq.cpl

+----- Adc\_Cfg02\_F1M

| +----- Adc\_c.doc

| +----- atest\_Adc.ctr

| +----- atest\_Adc.cpl

\----- log

+----- Adc\_c\_code.txt (Copy original Adc.c and rename)

+----- Adc\_Irq\_c\_code.txt (Copy original Adc\_Irq.c and rename)

## CMT execution procedure

1. Execute “/Env/[Execution folder]/CMT\_execute.sh”.

-> The following files are output after CMT execution completion.

* + coverage merge result files(\*.doc) are output to " */Env/[Execution folder]/result*".
  + \*\_log.txt are output to " */Env/[Execution folder]/ctr\_log*".

# Limitation

* When coverage result data and coverage result files aren't the format Cantata output, a CMT doesn't normally execute.
* Coverage result files of a merging target files be the same source code (Version). In case of different source code, the following message is indicated.

ERROR: Two source codes are different.

* The need to create source code .docx and .txt before run. Copy exactly .c content to MS Word and text editor then save to location desubcribe in 4.3 CMTexecution preparation

# Change log

|  |  |  |  |
| --- | --- | --- | --- |
| Revision | date | content | Author |
| 1.0 | 06-Jul-2022 | Initial for CI | DucNguyen |
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