[CHESS D2.4] The 42 Analyzer tool tutorial

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Version	Author	Modifications
08/09/2011	Daniela Cancila (Atego)	All : idea, structure, contents and first draft
13/09/2011	Daniela Cancila (Atego)	Minor modifications
14/09/2011	Daniela Cancila (Atego)	Minor modifications

ABSTRACT

This note introduces and supports the 42 Analyzer tool, developed by Atego during the Chess Artemis project. The note includes a questionnaire and the Thales feedback.

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THE BEGINNINGS

42 analyzer answers to a question firstly introduced by Thales :

how many tasks will be automatically generated in the PSM space ?

A designer of high-integrity critical systems ought to keep under control the number of tasks. The underlying idea is to minimize the number of tasks of the system. In order to accomplish this objective, a designer would access to the information (of the number of tasks) in *a direct way*, as soon as possible [1].

42 analyzer is able to answer to the question already at PIM level, that is, before the PSM automatic generation.

Figure 1 shows the 42 analyzer role with respect to the Chess tool chain.

Figure 2 shows a model at PIM level, which is the input for 42 analyzer. Figure 3 shows its output.

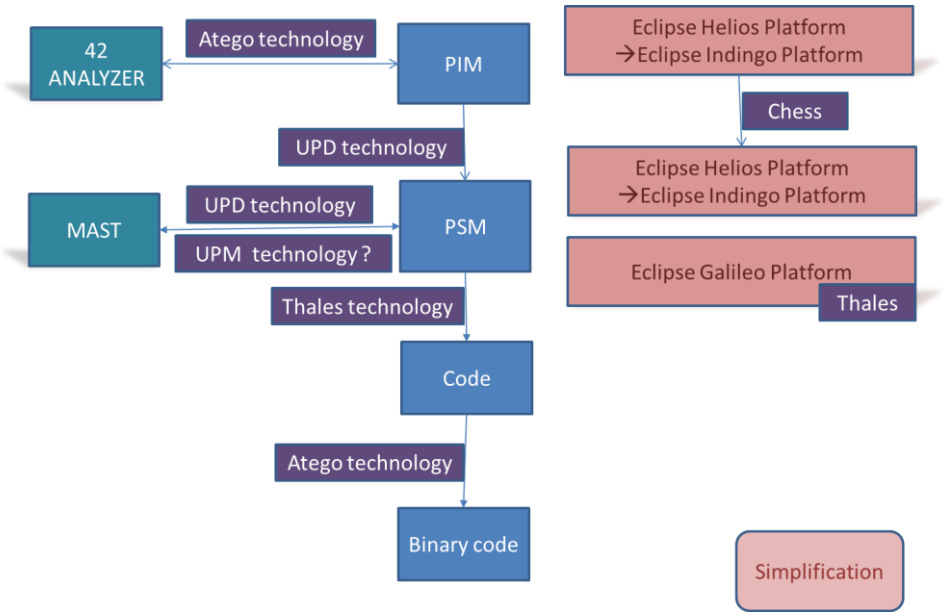

Figure 1 : Integrating 42 Analyzer in the Chess tool chain

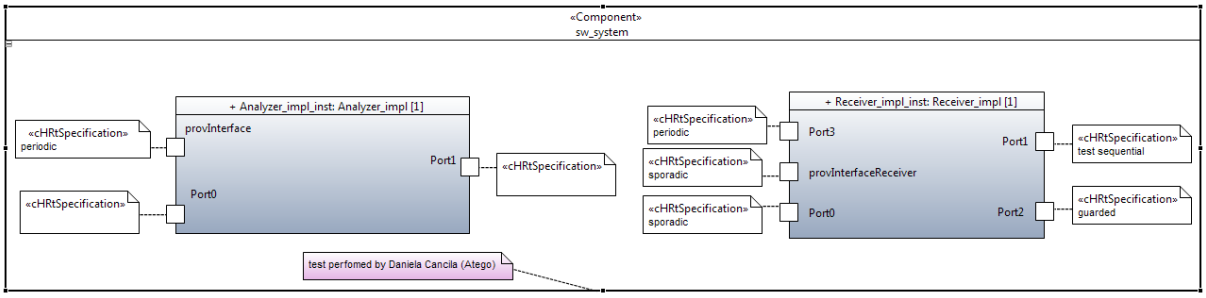

Figure 2 : An example of a Chess model at PIM level. It is the input for 42 analyzer.

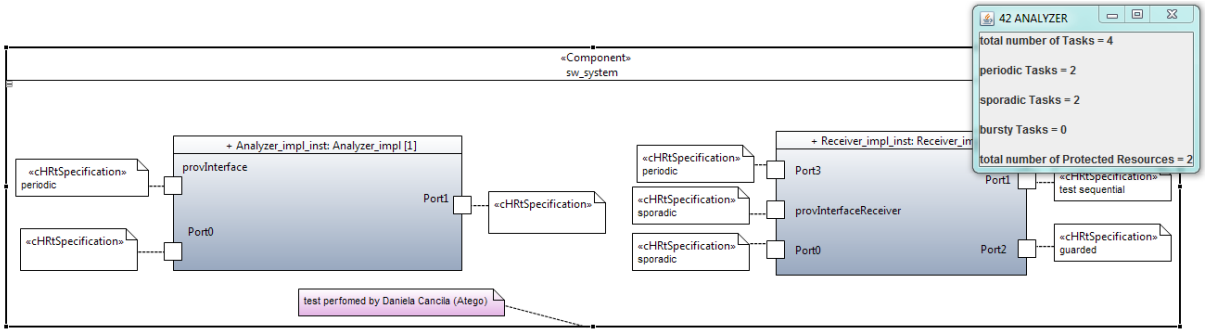

Figure 3 : The 42 analyzer window is automatically generated. The window contains the output for 42 Analyzer.

HOW TO INSTALL 42 ANALYZER

Copy file fr.atego.chess.fortytwo_1.0.0.201109121512.jar in the folder Eclipse/plugins

HOW TO USE 42 ANALYZER

1. Specify a model by applying the Chess profile

2. Specify the task and the protected resources by following the Chess methodology and the Chess profile, i.e. by applying the CHRtSpecification stereotype on ports. For the sake of auto-contented note, we introduce the main steps :

    - Specify attribute occKind with one of the following values
        - Periodic
        - Sporadic
        - Bursty

    - Specify attribute protection with guarded. Attribute occKind must have the default value (that is null)

    - Link the CHRtSpecification stereotype to the port you want specify by using the link in the Chess palette

    Figure 4 shows Stereotype CHRtSpecification for a protected resource. Figure 5 shows Stereotype CHRtSpefication for a Periodic task.

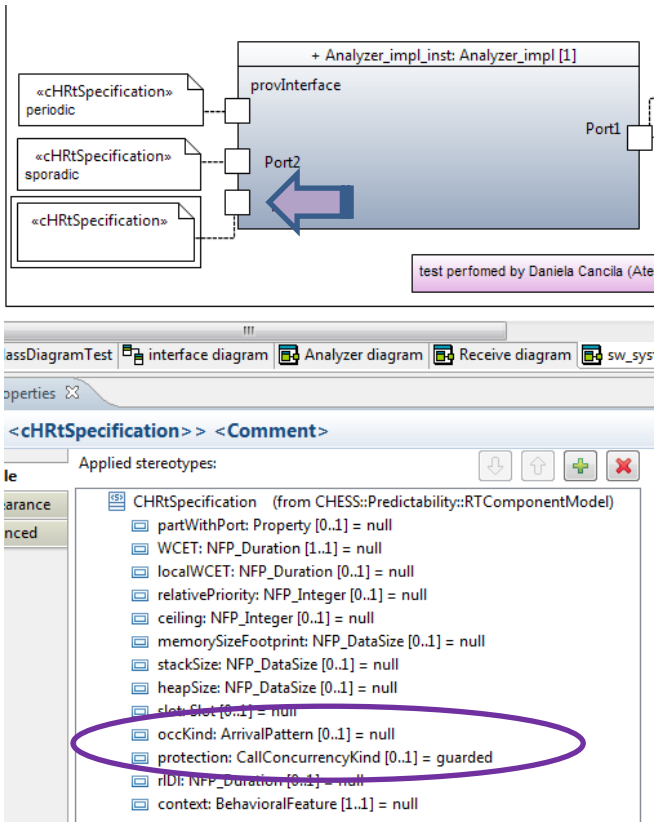

Figure 4 : CHRtSpefication for a protected resource

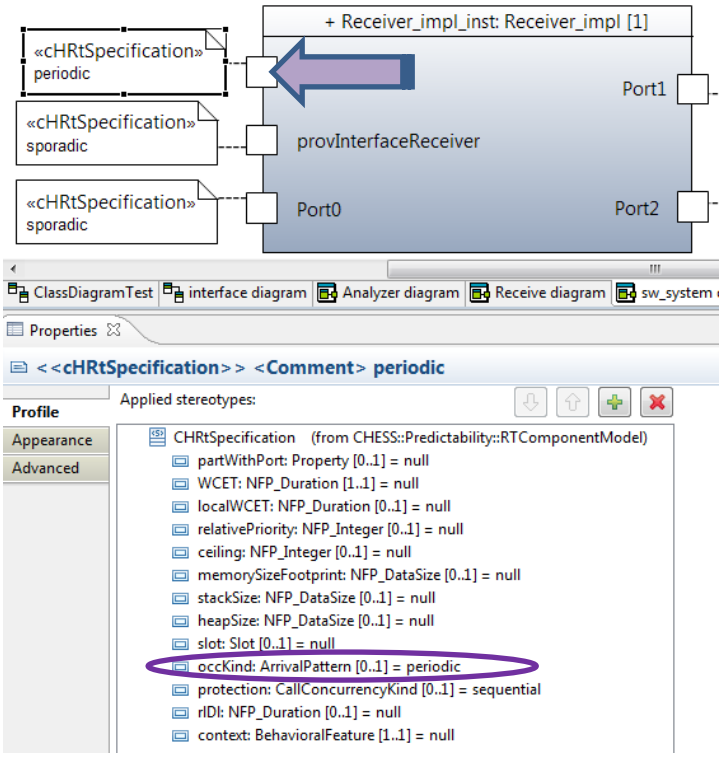

Figure 5 : CHRtSpecification for a Periodic task

3. Click on the main component (sw_system in the example) and open the pop-up menu. Go on 42 analyzer. A submenu is automatically opened. Double click on the opened menu. (see Figure 6)

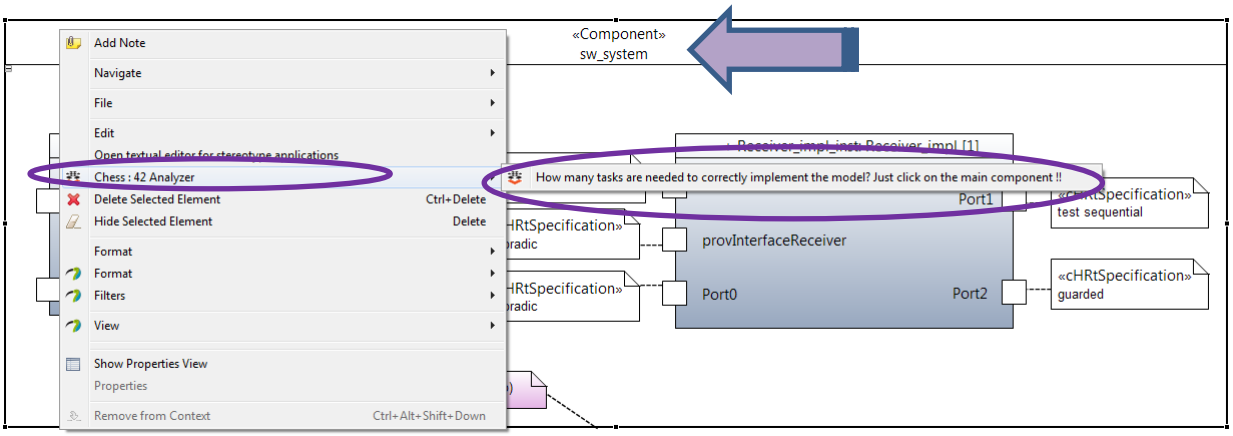

Figure 6 : 42 Analyzer menu

4. 42 Analyzer runs. It is the time for a smile and, perhaps, for a cup coffee or tea. Figure 7 shows the result.
5. Close the 42 Analyzer window by clicking on the

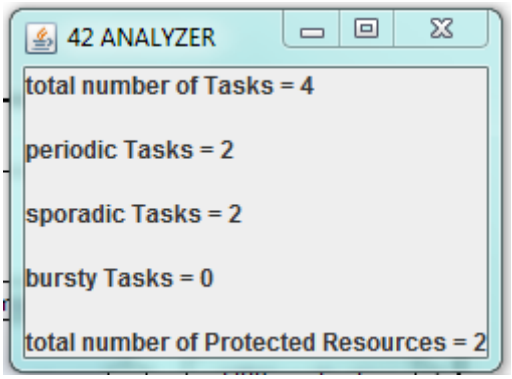

Figure 7 : The 42 Analyzer output

42 Analyzer is compliant with Ravenscar Computational Model (RCM) [2].

IMPORTANT REMARK

The way the Chess language is designed introduces a limitation in its use. Indeed, stereotype CHRtSpecification is an extension of a UML comment. As a result, it cannot be specified anywhere in the model; it can be taken be into account only if they are specified outside UML properties. On Figure 8, the right part is correct, while the left part will be ignored (see the result of the analysis on Figure 9).

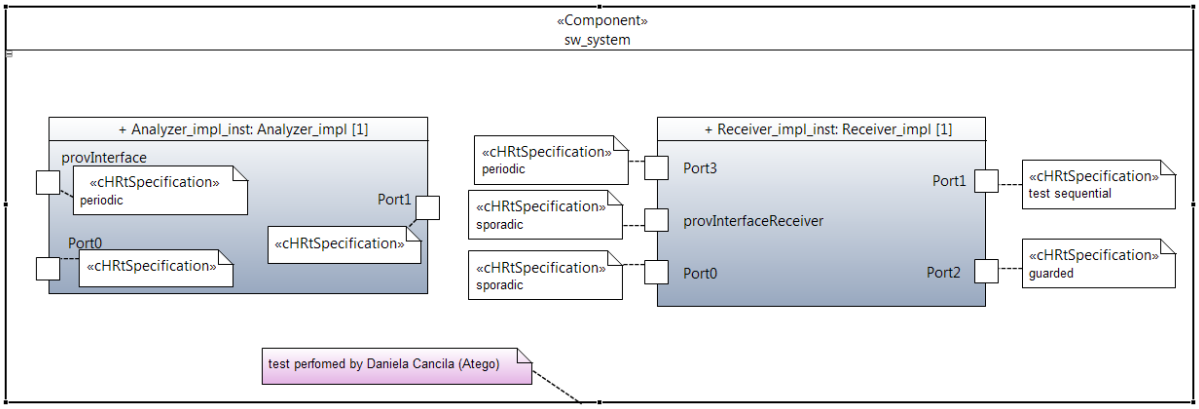

Figure 8 : the input

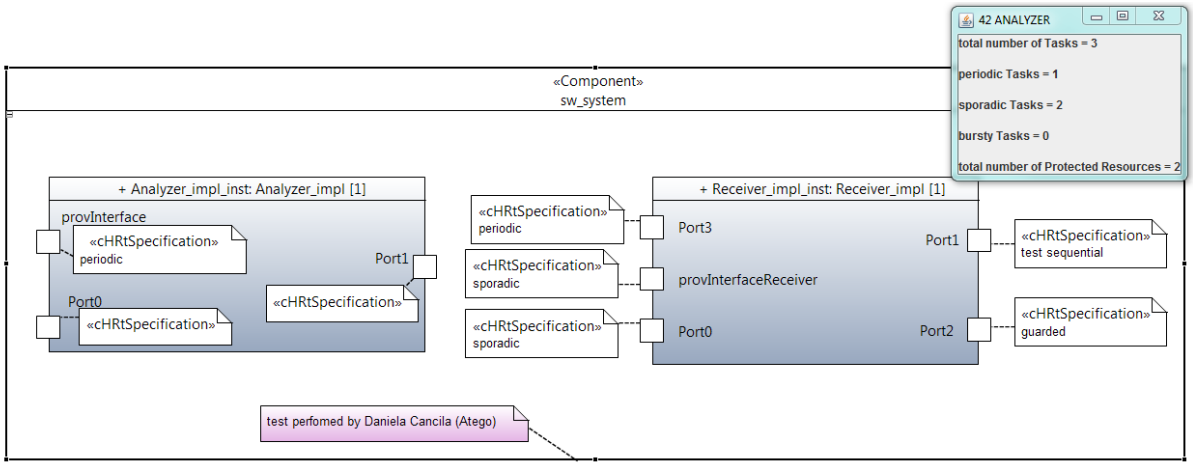

Figure 9 : the output

REFERENCES

[1] Chess_D2-4_PriseEnChargeDesExigencesDeThales _I_FIN, Internal technical note.

[2] T. Vardanega, *A property-preserving reuse-geared approach to model-driven development*, in Proc. 12th IEEE Int. Conf. Embedded and Real-Time Comput. Syst. Appl., Aug. 2006, pp. 223–230.

End Of Note