

Simics* Model Library for Eagle Stream Simulation Environment

Release Notes

May 2020

Revision V0.6.00

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Simics® Software Transition Overview

Simics Software, Version 6 Transition Sept. 27, 2019 – Dec. 31, 2019

- Transition period of 3 months during Q4'19; during this period, Simics software, version 5 (Python* 2.7) will continue to be supported with bug fixes, but will not include the latest functional and security updates. Users should update to Simics software, version 6 (Python 3.7).
- Simics software, version 5 (Python 2.7) will no longer be supported or available after December 31, 2019.
- No new Simics software, version 5 Base and Eclipse packages will be released after Q3'19.
- We recommend users upgrade their Python scripts to version 3.7 to align with the Simics software, version 6 update.

Simics Software, Version 6 Security Updates

- Simics software, version 6 has been updated to include functional and security updates and is targeted for release on Sept. 27, 2019.
- Simics software, version 5 does not include the latest functional and security updates. Customers should update to Simics software, version 6 as it becomes available.
- Simics software, version 5: all versions are provided as-is and will no longer be available after Dec. 31, 2019. This version will not be supported with any additional functional, security or other updates. Intel recommends that users of Simics software, version 5 uninstall and discontinue use as soon as possible and upgrade to the latest version of Simics software version 6 or later.

Simics software, version 5 does not include the latest functional and security updates. **Simics software, Version 6** is targeted to be released on **Sept 27th, 2019** and will include additional functional and security updates. Customers should update to the latest version as it becomes available.

Simics software, version 6 has been updated to include functional and security updates. Users should update to the latest version.



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Revision History

Revision Number	Description	Date
V0.3.00	<ul style="list-style-type: none">Initial release of the document.	June 2019
V0.3.01	<ul style="list-style-type: none">Edited sections 1.4, 2.2 and 3.4Removed section "2.3 Sample Operating System Images" as it is not applicable anymore.	July 2019
V0.3.02	<ul style="list-style-type: none">Edited sections 1.4, 1.5, 1.7, 2.2 and 3.4	August 2019
V0.3.03	<ul style="list-style-type: none">Edited sections 1.4, 2.2 and 3.4	September 2019
V0.3.04	<ul style="list-style-type: none">Edited sections 1.4, 1.5, 1.7, 2.2, 3.4 and 3.5	September 2019
V0.5.00	<ul style="list-style-type: none">Edited sections 1.5, 2.2 and 3.4	November 2019
V0.5.01	<ul style="list-style-type: none">Edited sections 1.4, 1.5, 1.7, 2.2, 3.4 and 3.5	December 2019
V0.5.02	<ul style="list-style-type: none">Edited sections 1.4, 1.7, 2.2. and 3.4	February 2020
V0.5.03	<ul style="list-style-type: none">Edited sections 1.4, 2.2, 3.4 and 3.5	March 2020
V0.6.00	<ul style="list-style-type: none">	May 2020

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1.0 Simics* Model Library for Eagle Stream Features

1.1 General Feature Summary

Simics* is a commercial full system simulation tool suite available from Wind River Systems, Inc*. The Simics Model Library for Eagle Stream is intended to provide critical pre-silicon and post-silicon simulation BIOS support for the Eagle Stream platform. This Simics release is intended to aid in early BIOS development on platforms and components which may continue to be in a design phase of development. This platform utilizes Sapphire Rapids processors and Emmitsburg chipset modeled on Intel’s Customer Reference Board (CRB).

1.2 Hardware and Software Requirements

Simics can be installed on both Linux* and Windows* operating systems (OS). However, note that Microsoft* Windows compatible packages and Linux 64-bit packages are provided with this release and other platform packages will be provided upon request.

Table 1. Requirements

	Linux* 64-Bit	Microsoft* Windows* 64-Bit
Host Architecture	x86-64	x86-64
OS	SLES10/11	Windows 7 ,Windows Server 2008
Memory	2GB ¹	
Hard Disk	Several GB ²	

NOTES:

1. In general about 2 GB and at least as much memory as the working set in the simulate machine, in order to avoid swapping.
2. Highly dependent on the amount of storage space used in the simulated machine. Simics itself requires a few hundred MB.



1.3 Pre-Requisites

As Simics is a commercial product from Wind River, the use of Simics is subject to the terms of the license agreements. Simics is license controlled using Flexnet* floating licenses. To set up a license server, Wind River will guide you through the license installation process and provide you with the choice of installing your license file either on a local license server or on an existing corporate license server. The process is fully documented in the file C:\Program Files\Simics\Simics 6\Simics 6.0.XX\doc\installation-guide-windows.pdf (Chapter 6).

1.4 Simics Download Instructions

This Simics release includes Model library for Eagle Stream, ITPii scripting packages and base packages 1000 and 1001.

Table 2 Decryption Keys for Package 1000 and 7921

Name	Number	Version	Decryption Key
Simics Base	1000	6.0.35	dadf16a4850e0d09fa5587cc8658de25287ac4a67b7fef03e460f9f9c5e51551
Simics Eclipse	1001	6.0.17	01bfe4499a924e00e5d00b3f46091e31e94fbfa784f2aafe2945dde9fecab2f1
Model Library: Eagle Stream External	7921	6.0.pr162	b84dd5a412e134e45f68fc572f7bb041db68fdb7db31e606b525db8f947f45ac
Simics ITP II Scripting	7033	6.0.pre170	16cdb924a1e9cf83c3577b6cc784ad8a3e6fa3750310cecd7641abbe3e6b3da6

Note: Decryption process of Simics packages has been updated requiring new keys for new model versions.

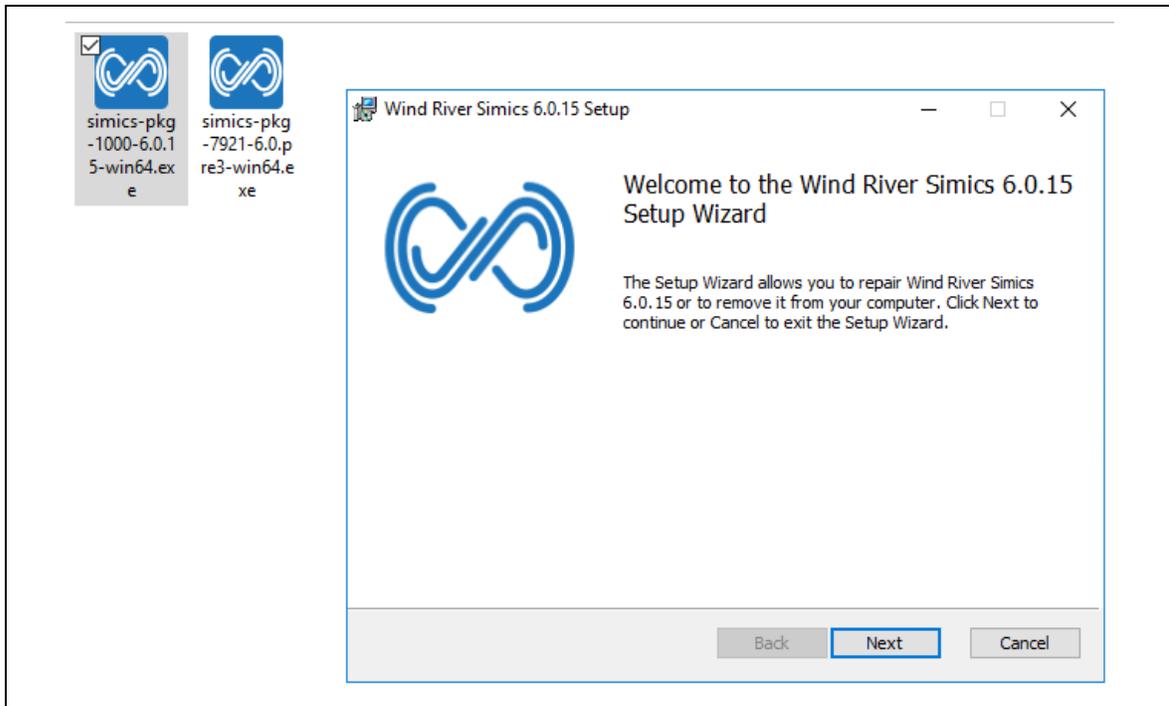
1.5 Windows Installation Instructions

This release includes individual installers for the packages mentioned in [section 1.4](#). To install them, unzip the SimicsEagleStream_V0.5.XX_win64.zip and execute each .exe file included in it in numerical order.



Installation wizard will request decryption key which can be found on [section 1.4](#) or in the pkg_keyfile.txt included on the zip.

Figure 1. Windows Installers



1.6 DBGHelp Installation for Windows

The Simics Debugger supports the debugging of PE files. The implementation depends on the file dbghelp.dll which is not packaged with Wind River Simics for licensing reasons.

To enable the support of PE files, install this file manually. Refer to the *Simics Analyzer User Guide* under C:\Program Files\Simics\Simics 6\Simics 6.0.XX\doc\analyzer-user-guide.pdf Appendix A.

1.7 Linux Installation Instructions

Attention: There is an additional encrypted unzip required for Linux package from VIP. Password – intel123.

Zip file Simics6_EagleStream_V0.3.XX_linux64.tar contains a txt file the decryption keys for installation.



Once unzipped decompress the .tar file that comes with the VIP package using command:

> tar -xvf Simics6_EagleStream_V0.3.XX_linux64.tar

Resulting directory will have below content.

SimicsModelLibraries directory which contains Simics packages installation files.

Keys directory which contains a txt file the decryption keys for installation.

simics-eclipse-6.0.7-plugins-linux64.tar with needed Files to use Simics Eclipse GUI.

1. Untar the .tar files with Linux tar command:

tar xf simics-pkg-YYYY-6.0.xx-linux64.tar

2. Copy the .txt file with decryption keys included in the folder:
SimicsEagleStream_V0.3.XX_linux64/Keys to your */simics-6-install* directory.

3. Install the Simics base package by running the installation script using the keyfile as argument:

cd simics-6-install

./install-simics.pl pkg_keyfile_2019XXXX-YYYYYY.txt

Decryption keys will be automatically taken from the key file.

4. Provide installation location. Press Enter.

5. The installer should now summarize the installation and report that everything was successful.



2.0 Configuration and Simulation with Simics

2.1 Set Up Simics Workspace

Simics uses a workspace area to access user specific data. The workspace file structure is automatically created with the workspace setup script from the installation folder. Upon running Simics after installing the first time or on installing a new/updated package, Simics asks the user to establish their "workspace". The default is "c:\users\\Simics-workspace". Click "OK" and "Yes" to create the directory.

2.2 Sample Validation BIOS

The sample Eagle Stream platform BIOS is not included in this package. This Eagle Stream Simics is validated with the respective BIOS collateral mentioned in the table below.

Table 3 Simics Releases vs BIOS BKC's

Simics Release version	Bios BKC version
V0.3.00	Collateral ID:1022843 Eagle Stream – SPR 4S Server BIOS binary (10.d.07)
V0.3.01	Collateral ID:1023036 Eagle Stream - SPR 4S Server BIOS binary (11.d.13)
V0.3.02	Collateral ID:1023036 Eagle Stream - SPR 4S Server BIOS binary (11.d.13)
V0.3.03	Collateral ID: 1023553 Eagle Stream - SPR 4S Server BIOS binary (17.d.06)
V0.3.04	Collateral ID: 1023553 Eagle Stream - SPR 4S Server BIOS binary (17.d.06)
V0.5.00	Collateral ID: 1023553 Eagle Stream - SPR 4S Server BIOS binary (17.d.06)
V0.5.01	Eagle Stream - Sapphire Rapids Pre-Silicon BKC 2019 WW46 – KIT: 134318



V0.5.02	Eagle Stream - Sapphire Rapids Pre-Silicon BKC 2020 WW07, Kit: 135130
V0.5.03	Eagle Stream - Sapphire Rapids Pre-Silicon BKC 2020 WW10, Kit: 135418
V0.6.00	Eagle Stream - Sapphire Rapids Pre-Silicon BKC 2020 WW18, Kit: 135945 Eagle Stream - Sapphire Rapids Pre-Silicon BKC 2020 WW10, Kit: 135418 – supports ME WB

ME white box model was tested in conjunction with the binary included in KIT: 133761 "Intel® Server Platform Services for Eagle Stream Server Platforms Pre-Alpha Simics WB 1.0".

2.3 Simulating with Simics

In order to run a software simulation with Simics, runtime scripts which are referred to as session scripts need to be created. The session scripts can be created manually.

1. The default location for a session-script to find any file is the workspace ("c:\users\\Simics-workspace"), hereafter referred to as "%workspace%".
2. Create a session script (<filename>.simics) in <workspace>/targets/eaglestream to include pointers to the BIOS build image that will be simulated. Below is an example of a session script:

```
# Set what BIOS you want to use
$bios= "<PATH_TO_BIOS_BINARY>"

run-command-file "C:\\Program Files\\Simics\\Simics 6.0\\Simics
6.0.XXX\\..\\eaglestream external
6.0.preXX\\targets\\eaglestream\\eaglestream.simics"

eaglestream.serconsole.con.capture-start EGS_uart.log -overwrite
```

2.3.1 Windows

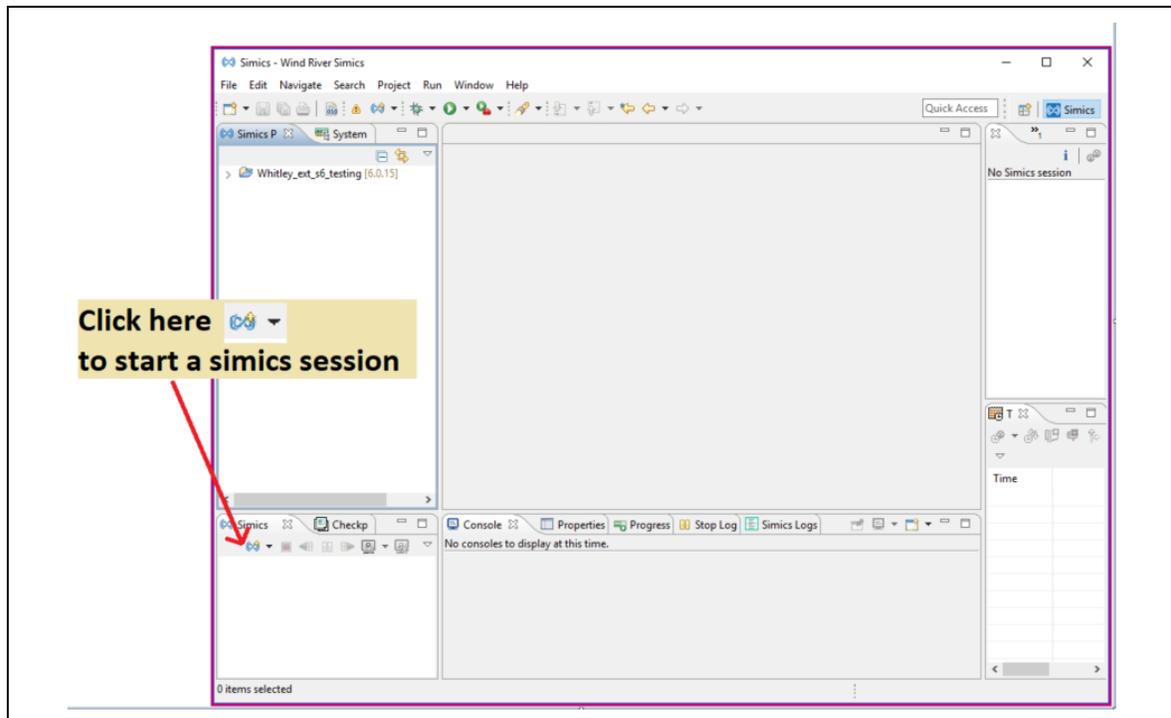
To start Simics:

1. Start Simics Classic UI from "C:\Program Files\Simics\Simics 6\Simics 6.0.XX\win64\bin\simics.exe"
2. Select "File->New Session from Script" from the Simics control window.
3. Select the session script created to run Simics, for example, "<workspace>/targets/eaglestream/eaglestream.simics".

To start Simics Eclipse:

4. Start Simics Eclipse from "C:\Program Files\Simics\Simics 6\Simics Eclipse 6.0.7-plugins-win64\win64\bin\simics-eclipse\eclipse.exe"
5. If this is the first time using Simics Eclipse, create a project by clicking File->Simics Project.
6. Specify a Project name. The default is Simics Project.
7. Click Finish.
8. You will see a directory with c:\eclipse\SimicsProject with targets\eaglestream created.
9. Place your script .simics as created in Section 2.4 here.
10. Start to load Simics by clicking the following icon shown below.

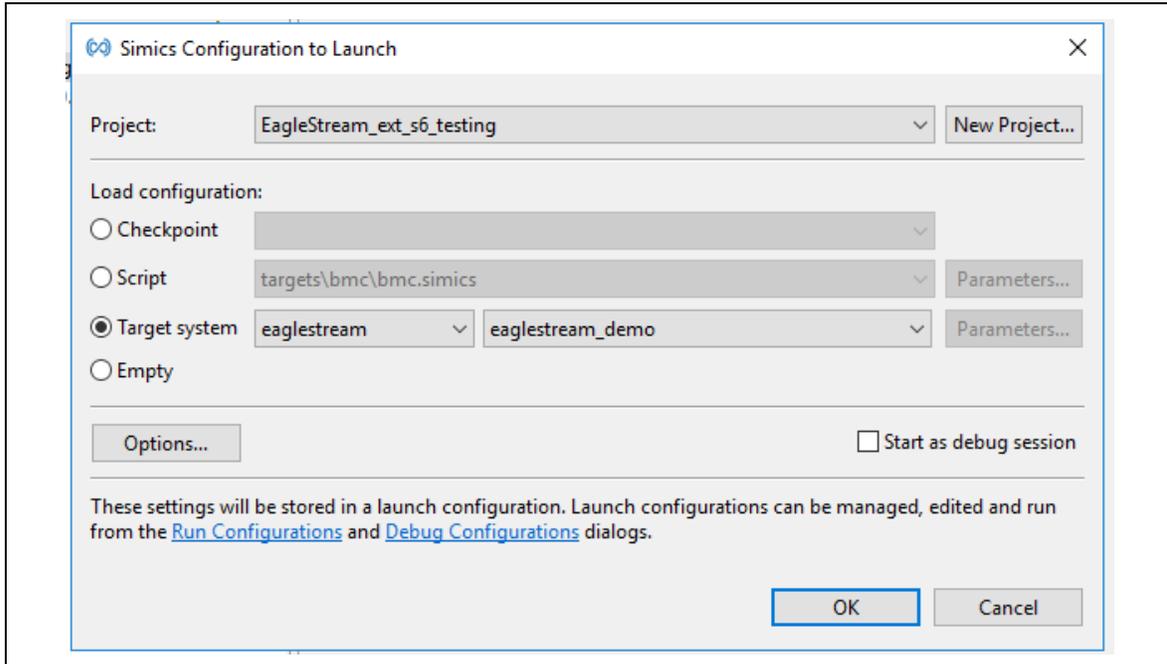
Figure 2. Starting Simics Simulation



11. Choose the Simics script to load.

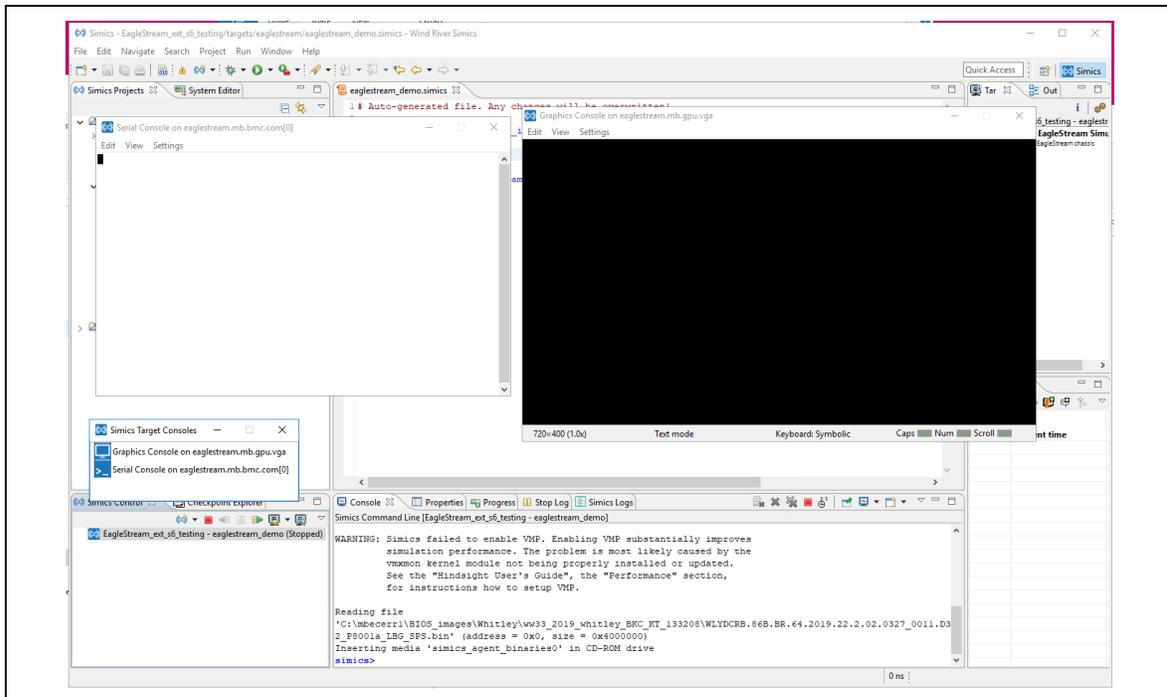


Figure 3. Choosing Script



12. Three windows appear. Click on Run->Run to run the project.

Figure 4. Simics Windows Once Script Loads





2.3.2 Linux

To start Simics Eclipse:

1. Start Simics Eclipse from <install_area>/simics-eclipse-6.0.7-plugins-linux64/linux64/bin/simics-eclipse/eclipse
2. Once in eclipse interface the rest of the process is the same as described in section [2.4.1](#)

2.4 Simics target Scripts

Eagle Stream Simics model includes a target script called eaglestream.simics, all customized configurations should be set on top of it, as the example described on [section 2.4](#).

2.5 OS Boot Times

Below table shows boot time reference for several operative systems.

Table 4 OS boot times

Workload & Scenario	Socket/Core/Thread	Boot time (sec)*
Busybox boot	2/2/2	113
Fedora 29 boot	1/2/1	132
CentOS 7.3 boot	1/2/1	104
Ubuntu 16 boot	1/2/1	97



3.0 Support and Issue Management and Documentation

3.1 Help

Simics contains an extensive online help system. To get help on Simics related features type "help" or type "help <utility-name>" in the command line window. Additionally, you can select "Help" in the contents on the Simics control window.

3.2 Issue support

Intel® Premier Support (IPS) is the issue management system for support on Simics. See Figure 5

1. Select Case Product "Eagle Stream".
2. Select Case Category: "Firmware/BIOS".
3. Select Case Subcategory: "Pre-Silicon BIOS Simulation"



Figure 5. Submitting Simics IPS Case

Cancel Submit

▼ Case Information

Project:

Product: Eagle Stream

*Note: If Project is blank or set to 'Not Applicable', all the [Contacts](#) in your account will have access to the case.

▼ Case Details

Subject

0 Out of 255 entered

Case Description

← → B I U S [Link] [Image] [List] [List] [List] [List] [List] [List]

Case Type: --Select--

Severity: Low

Customer Reference ID

End Customer

▼ Product/Project Info

Case Category: Firmware/BIOS

Case Subcategory: Pre-Silicon BIOS Simulation

▼ Environment Details

- BIOS
- Innovation Engine (IE)
- Intel® Management Engine Firmware (Intel® ME FW)
- Intel® Server Platform Services
- Pre-Silicon BIOS Simulation

3.3 Documentation

For the Simics base package reference guides, find it in C:\Program Files\Simics\Simics 6\Simics 6.0.XX\doc.

For the Whitley reference guide, find it in C:\Program Files\Simics\Simics 6\EagleStream External 6.0.pre3\doc



3.4 New Features and Bugs Fixed

Simics Release version v0.6.00

- Support for DDRT2 black box model dims configuration has been included. In order to enable DDRT2 dims set the flag \$ext_memory_spec to TRUE and use the dims [] array to insert the dim at the desired socket, channel and slot.

Example: setting 128GB DDRT2 dimm at socket 0, channel 0, slot 1

```
# dimms parameter list format:
# [sockets, channels, slots, iface, dimm-type, capacity-GB]

$ext_memory_spec = TRUE

$dimms           = [[0, 0, 0, "DDR5", "RDIMM", 4],
                    [0, 0, 1, "DDRT2", "NVM-LR", 128]]
```

Note: Make sure to add these configuration before the run-command-file on your .simcis script.

Simics Release version v0.5.03

- Included ITPii scripting package 7033 for the first time since Simics 6 happened.

Simics Release version v0.5.02

- Eagle Stream model was recompiled to align with latest Simics base model version. For details on Simics base changes please refer to "<INSTALL_AREA>\Simics 5.0.XXX\doc\RELEASENOTES.pdf"

Simics Release version v0.5.01

- Simics Eclipse package is included for the first time on Simics 6 version.

Simics Release version v0.5.00

- ME white box support added, binary used to test ME model is included in [section 2.2](#).

Simics Release version v0.3.04

- Simics Packages Official Migration from version 5.0 to version 6.0.

Simics Release version v0.3.03



- Last Simics version 5.0 release. Transition to version 6.0 to be done in next release.

Simics Release version v0.3.02

- Simics Package Utility was removed from release package. Refer to [section 1.5](#) for updated Windows Installation Instructions.

Simics Release version v0.3.01

- Fixed installation issue in Linux environment. New installation method described in [section 1.7](#).

Simics Release version v0.3.00

- Initial model release.

3.5 Limitations and Known Issues

Known issues:

- ITPii python console is not supported by eclipse version 1001.0.6.17, in order to use ITPii feature please revert eclipse package version only to 1001.0.6.16 delivered on EGS release version v0.5.03 KIT:135561.
- When running ITPii python console you'll get below error on eclipse python command prompt.

File

```
"C:/Users/<your_own_path>/configuration/org.eclipse.osgi/16/0/.cp/res/v20131224.py",  
line 35, in __init__
```

```
sys.stdout = os.fdopen(fileno, "w", 0)
```

To work around the error edit line 35 of the file pointed by error signature like below.

Original: `sys.stdout = os.fdopen(fileno, "w", 0)`

Edited: `sys.stdout = os.fdopen(fileno, "w", 1)`

- ME WB model does not work with ww18 Bios BKC. For ME WB simulations please use ww14 BKC bios binary. Bios collateral ID's are documented in [section 2.2](#).



- In order to use Simics Eclipse on Linux hosts GTK3 needs to be installed as pre-requisite.
- Busybox craft file is not included as part of the Eagle Stream Simics model. Use your own OS craft file to boot to OS or set disk_image variable to an empty string to boot to EFI shell directly.
`disk_image = ""`

Limitations:

- Only 1 and 2 socket configurations are supported
- Host system needs to support SSE4.2 instruction set.