



Zebra[®]

VMAccel[™] FPGA Cloud

AMD/Xilinx[®] Versal VCK5000

User Guide

Zebra Version: V2022.versal.resnet50_2





TABLE OF CONTENTS

1 INTRODUCTION & SCOPE 3

2 LICENSE 3

3 CONTACT & SUPPORT 3

4 REQUIREMENTS..... 3

5 VMACCEL CLOUD ACCESS 3

6 GETTING STARTED ON VMACCEL..... 4

6.1 LAUNCHING ZEBRA VM INSTANCE.....4

6.2 STARTING ZEBRA ON VM INSTANCE.....5

7 EXECUTING RESNET-50 6

8 HOW TO ACCESS EASE-OF-USE RELEASE 6

LEGAL NOTICE..... 7





1 Introduction & Scope

This document is a guide for running Mipsology® Zebra CNN inference acceleration software on AMD/Xilinx® VCK5000 PCIe Acceleration Card hosted at VMAccel® FPGA Cloud.

This is an Alpha-quality release with aim of showing performance preview with ResNet-50 (version 1.0 and 1.5) CNN inference.

For access to all supported ML Frameworks and CNNs, please access the Zebra Ease-of-Use (EoU) VM instances.

2 License

VMAccel Zebra virtual machines (VM) are pre-configured with software license. This license is **not** designed for production deployment. Any CNN inference running continuously for more than 15 minutes will experience significant slowdown in execution.

3 Contact & Support

Please email support@mipsology.com for questions, concerns, technical help or discuss your project's unique requirements.

4 Requirements

VMAccel Zebra instances are pre-configured with all required software and hardware. Only requirement on client side is a computer with internet connection and web browser.

5 VMAccel Cloud Access

To gain access to VMAccel cloud, please fill the form <https://www.vmaccel.com/zebrademo>

For any questions or concerns, please contact support@vmaccel.com





6 Getting Started on VMAccel

6.1 Launching Zebra VM Instance

Once you have the access credentials from VMAccel, please follow “Getting Started” section from <https://vmaccel.atlassian.net/wiki/spaces/docs/pages/59212022/Getting+Started>

Summary:

- In a web browser navigate to: <https://xilinx2.vmaccel.com/dashboard/project/>
- On left hand side: Click on “Instances”
- On right hand side: Click on “Launch Instance”
- Follow GUI instructions/options for configuration

IMP: Use following details when creating Zebra VM instance:

- Source : Secure Boot Image = “Mipsology Zebra VCK5000 ES1”
- Flavor = “Mipsology Zebra VCK5000-ES1.1 (16.32.128)”
- Network = “mipsology_local”

For advanced features like enabling external `ssh` access, follow instructions here :

<https://vmaccel.atlassian.net/wiki/spaces/docs/pages/38830174/Connect+to+Instance+via+SSH>

Once created, you should see the instance listed as a row on “Instances” web page/view. Example screenshot:

Instance Name	Image Name	IP Address	Flavor	Key Pair	Status	Availability Zone	Task	Power State	Age	Actions
zebra_eou_VckEs1	Mipsology Zebra VCK5000 ES1	172.16.1.149	Mipsology Zebra VCK5000-ES1.1 (16.32.128)	-	Active	nova	None	Running	1 minute	Create Snapshot

Newly Created Instance

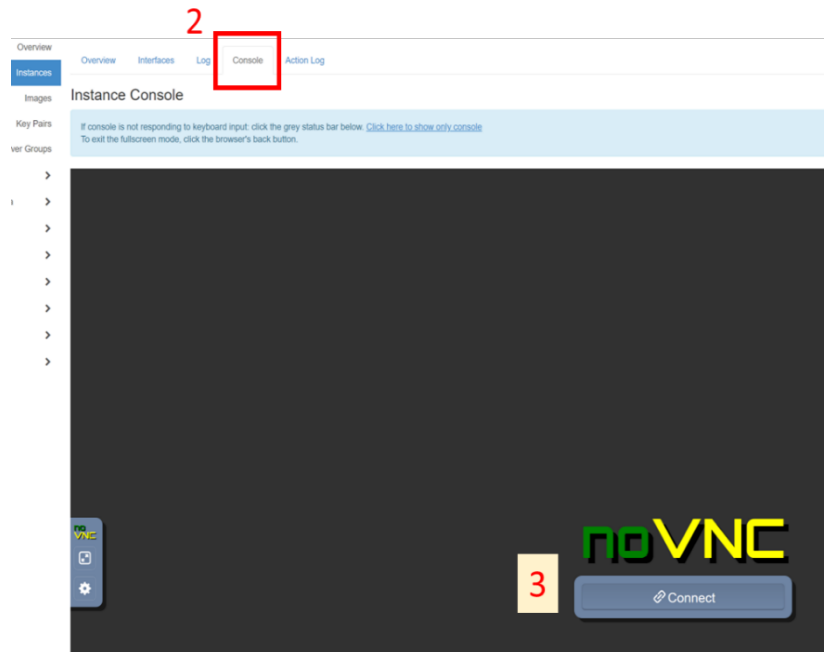




6.2 Starting Zebra on VM Instance

After the VM instance is created successfully:

1. Start the instance by clicking on the "Instance Name"
2. Click on "Console"
3. "Connect" to noVNC



Inside VNC session:

This User Guide is open by default.

Open "Terminal Emulator"
(Icon available on Desktop)

```
cd zebra
```

```
cd V2022.versal.resnet50_2
```

```
./examples/docker/run.bash  
(starts Zebra Docker)
```

```
cd zebra  
. settings.sh  
cd examples  
zebra_tools --checkCores
```

Zebra is ready IF above command shows status without any errors.

```
[ZEBRA] =====  
[ZEBRA] MIPSOLOGY SAS (c) 2022  
[ZEBRA] Zebra V2022.versal.07  
[ZEBRA] =====  
[ZEBRA] =====  
[ZEBRA] MIPSOLOGY SAS (c) 2022  
[ZEBRA] Zebra V2022.versal.07  
[ZEBRA] =====  
[ZEBRA] The command line is: "zebra_tools --checkCores".  
[ZEBRA] Detect XIL_VCK5000Prod_woAIE board 0 on PCIe slot 0000:02:00.  
[ZEBRA] Check if board 0 system 0 core 0 can be used ... OK.  
[ZEBRA] Check if board 0 system 0 core 1 can be used ... OK.  
[ZEBRA] Check if board 0 system 1 core 0 can be used ... OK.  
[ZEBRA] Check if board 0 system 1 core 1 can be used ... OK.  
[ZEBRA] Check if board 0 system 2 core 0 can be used ... OK.  
[ZEBRA] Check if board 0 system 2 core 1 can be used ... OK.  
[ZEBRA] Check if board 0 system 3 core 0 can be used ... OK.  
[ZEBRA] Check if board 0 system 3 core 1 can be used ... OK.  
[ZEBRA]
```

At this point, User is inside Zebra docker running on user-configured VM instance targeting VCK5000 board.





7 Executing ResNet-50

When inside Zebra docker

```
cd  
  
cd zebra  
  
. settings.sh  
  
cd examples  
  
./run_resnet50-v1.5  
(execute TF1 resnet50 v1.5)  
  
./run_resnet50  
(execute TF1 resnet50 v1.0)
```

At end of each execution / run, Zebra will print an execution summary table that displays the FPGA inference performance (FPS).

Expectations for Future

In future release, Zebra is expected to enable single release with this inference performance along with Ease-of-Use (EoU). Zebra is also expected to enable higher CNN inference performance for all support CNNs.

8 How To Access Ease-of-Use Release

Please refer to VMAccel in order to access Zebra Ease-of-Use (EoU) release.





Legal Notice

The information disclosed to you (the “User”) hereunder is provided solely for the selection and use of Mipsology products. The information, the applications, and the tools (together referred as the “Materials”) are made available “AS IS” and with all mistakes, errors, inconsistencies, or defects, without warranty of any kind. To the maximum extent permitted by applicable law:

(1) The Materials are provided "as is" and "as available", without warranty of any kind. Mipsology, its affiliates, its officers, its employees, or its suppliers and representatives, do not warrant in any way that the Materials is error free or satisfy licensee's specific requirements and disclaim any and all warranties of any kind or nature, whether express, implied, or statutory, relating to or arising with respect to the Materials, including but not limited to implied warranties of merchantability, warranty of fitness for a particular purpose, title, and noninfringement. Mipsology makes no warranty concerning the data, results or information resulting in using the Materials.

(2) To the maximum extent permitted by applicable law, in no event shall Mipsology, its affiliates, its officers, its employees, or its suppliers and representatives be liable for any special, exemplary, consequential, incidental, punitive, direct or indirect damages whatsoever including, but not limited, to loss of business profit, loss of use, loss of data, business interruption, loss of revenue, loss of orders, loss of business or profits, anticipated savings, loss of information and data, damage to brand image, or any other financial loss arising out of or in connection with the use of the Materials or the operation of the application or any other product or services, even if advised beforehand of the possibility of such damages. In no event will Mipsology total liability under or arising out of this agreement exceed the actual received payment from User, directly or through the cloud, in the last billing period or the duration of the incident, whichever is the lowest amount, reduced by any other amount Mipsology would have paid back to User. To the extent that the applicable jurisdiction limits licensee's ability to disclaim any implied warranties, this disclaimer shall be effective to the maximum extent permitted. Without limiting the foregoing, the User is responsible for determining and verifying that the Materials, its environment, and the hardware used to run the application are compatible. Mipsology further decline any warranties of any kind or nature on the hardware used in conjunction with the Materials. Mipsology shall not be liable to User nor any third parties (whether arising in contract, tort (including negligence), breach of statutory duty or otherwise) for failure of fitness or any of its or a third party's systems that results in the inability to process or use the Material, User's failure to meet any of its payment obligations, negligence, fraud or fraudulent misrepresentation of User or any other actions which result from misuse or inappropriate use of the Materials.

Without prior written agreement, User will not knowingly, or allow others, including internally, to copy, reproduce, modify, obliterate, distribute, or publicly display the Materials in any form, partially or fully, whatsoever except for the normal usage of the Materials.

Mipsology assumes no obligation to correct any errors contained in the Materials or to notify User of updates to the Materials. This document is subject to change without notice.

Please refer to Mipsology’s End User License Agreement (EULA.txt) and other legal notices available in the ‘doc’ directory of the provided release.

Copyright

© Copyright 2019–2022 Mipsology SAS. Mipsology and Zebra are registered trademarks of Mipsology SAS. All other trademarks are the property of their respective owners.

