



# Setting up GT Ref Clock and Boardfarm Setups

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# Agenda



## OPTIONS TO PROGRAM THE ONBOARD OSCILLATOR FOR THE REQUIRED FREQUENCY

1. BEAM Tool
2. System Controller App (sc\_app)
3. IDTCM Driver



## AVAILABLE BOARDFARM SETUPS

1. Board-to-Board Setup
2. Board to Mellanox CX5



## DEMO

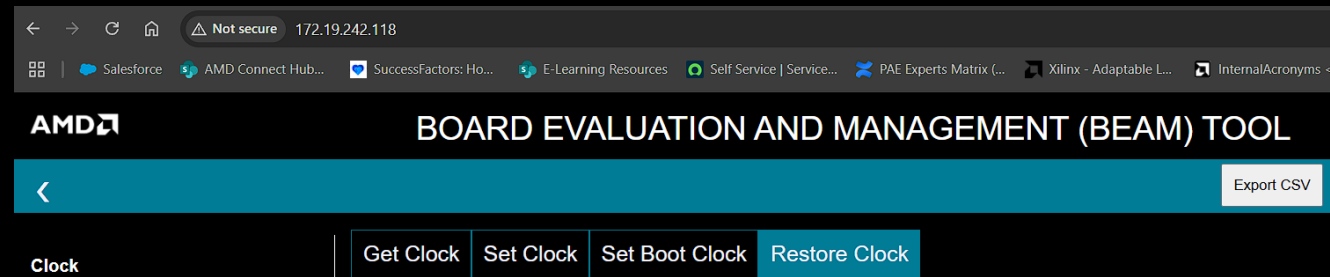
1. Programming via BEAM Tool
2. Programming via sc\_app
3. Programming via IDTCM Driver

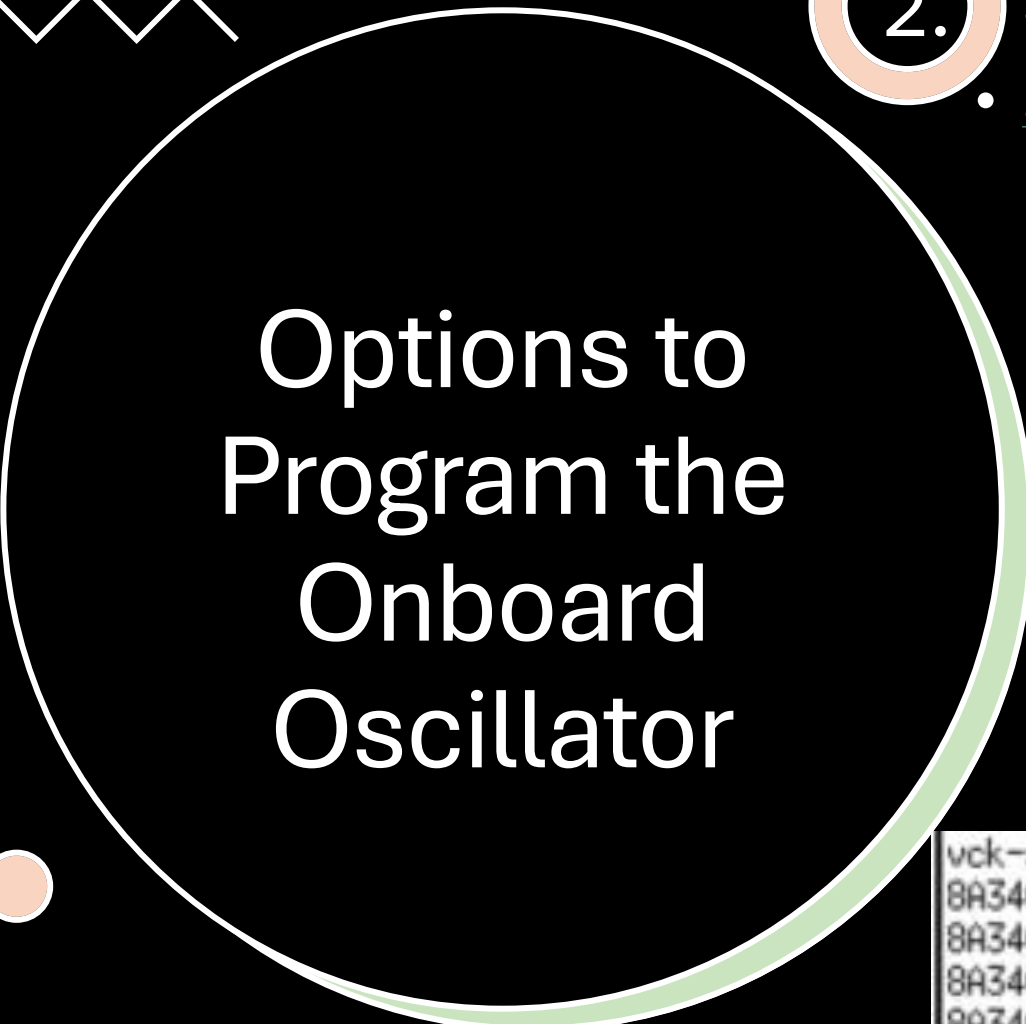



# Options to Program the Onboard Oscillator

## 1. BEAM Tool in BF Boards

- Port forwarding from systest
  - *connect com2*, get the *ipaddr* of the board
  - In systest terminal, *tcpforward 80 'ipaddr:80'*
  - Gives you an IP address, which you can use as a URL to load the BEAM tool for that board
  - Has GUI, easy to upload new clock files





# Options to Program the Onboard Oscillator

2.

## System Controller App

- [sc\\_app](#) for VCK190/VCK180/VPK120, etc.
  - Equivalent to the Boards teams' [Board UI](#)
  - *connect com2*
  - System controller 2024 comes with 1 clock file (156.25MHz)
  - If a different clock file is needed, it can be generated using a Renesas tool called Timing Commander and scp into SC:
    - <https://www.renesas.com/en/software-tool/timing-commander>

```
vck-sc-zynqmp:/usr/share/system-controller-app/BIT/clock_files$ ls
8A34001_2020-0318_156MHz.bin          README.md
8A34001_2020-0318_156MHz.tcs        VPK180-112_8A34001_156MHz_312MHz.bin
8A34001_2020-0318_156MHz.txt        VPK180-112_8A34001_156MHz_312MHz.tcs
8A34001_20200319_322M2656256.tcs    VPK180-112_8A34001_156MHz_312MHz.txt
8A34001_20200319_322M2656256.txt    blank_image
```

## 2. System Controller App Cont'd

### sc\_app useful commands

Clock file directory:

- `cd /usr/share/system-controller-app/BIT/clock_files`
- `sc_app -c listclocks`
- `sc_app -c getclock -t '8A34001 FMC2'`
- `sc_app -c setclock -t '8A34001 FMC2' -v '8A34001_20200319_322M2656256.tcs 8A34001_20200319_322M2656256.txt'`
- `sc_app -c getclock -t '8A34001 FMC2'`

```
root@xilinx-system-controller-2022:/usr/share/system-controller-app/BIT/clock_files# sc_app -c listclocks
zSFP Si570 - (10,000 MHz - 810,000 MHz)
User1 FMC2 Si570 - (10,000 MHz - 1250,000 MHz)
8A34001 FMC2
Versal Sys Clk Si570 - (10,000 MHz - 160,000 MHz)
Dimm1 Si570 - (10,000 MHz - 810,000 MHz)
LPDDR4 CLK1 Si570 - (10,000 MHz - 810,000 MHz)
LPDDR4 CLK2 Si570 - (10,000 MHz - 810,000 MHz)
HSPD Si570 - (10,000 MHz - 810,000 MHz)
```

```
root@xilinx-system-controller-2022:/usr/share/system-controller-app/BIT/clock_files# sc_app -c getclock -t '8A34001 FMC2'
.CIN 1 From Bank 200 GTY_REF: 322.265625MHz
CIN 2 From Bank 706:
Q0 to CIN 0:
Q10 to NC:
Q11 to NC:
Q1 to Bank 200 GTY_REF: 322.265625MHz
Q2 to Bank 201, 204-206 GTY_REF:
Q3 to FMC2 REFCLK: 245MHz
Q4 to FMC2 SYNC: 1PPS
Q5 to J328: 250MHz
Q6 to NC:
Q7 to NC:
Q8 to NC:
Q9 to NC:
```

ERROR: clock operation is not supported – Needs a CR to reflash the EEPROM  
EEPROMs in older boards are not write-protected, hence regression tests sometimes wipe them  
Share logs in the CR: `sc_app -c version`

3.

## IDTCM Driver

# Options to Program the Onboard Oscillator Cont'd

- Renesas has provided a Linux driver to program the oscillator
- In Petalinux, we can bake the image with the clock file that gets loaded during boot
- But first, the .tcs file needs to be converted into .bin file
- And a custom app can be created in the petalinux build (<\$PROJ\_DIR>/project-spec/meta-user/recipes-apps/)

```
xilinx-vck190-20242:/home/petalinux# dmesg | grep idt  
[ 3.864659] 8a3400x-phc 8a3400x-phc.2.auto: requesting firmware 'idtcn.bin'
```



## 3.

## IDTCM Driver Cont'd



## Adding Custom App in Petalinux

- The easiest way is to copy the provided app directory to your project(inside `<$PROJ_DIR>/project-spec/meta-user/recipes-apps/`) and enable it from the `user-rootfsconfig` file by adding `CONFIG_idtcm`
- Or a custom app can be manually created by using `Petalinux-create -t app` command. More info on UG1144.



# Reference Petalinux Project & Setup details

- [/public/cases/gt\\_refclk\\_program/xilinx-vck190-2024.2](/public/cases/gt_refclk_program/xilinx-vck190-2024.2)
- [https://amd.atlassian.net/wiki/spaces/~ajayad/pages/500927983/XSJ+Boardfarm+-+WTS-WWG+-+Ethernet+Testing+Setup?atl\\_f=PAGETREE](https://amd.atlassian.net/wiki/spaces/~ajayad/pages/500927983/XSJ+Boardfarm+-+WTS-WWG+-+Ethernet+Testing+Setup?atl_f=PAGETREE)

# Boardfarm Setups

## Board-to-Board setup

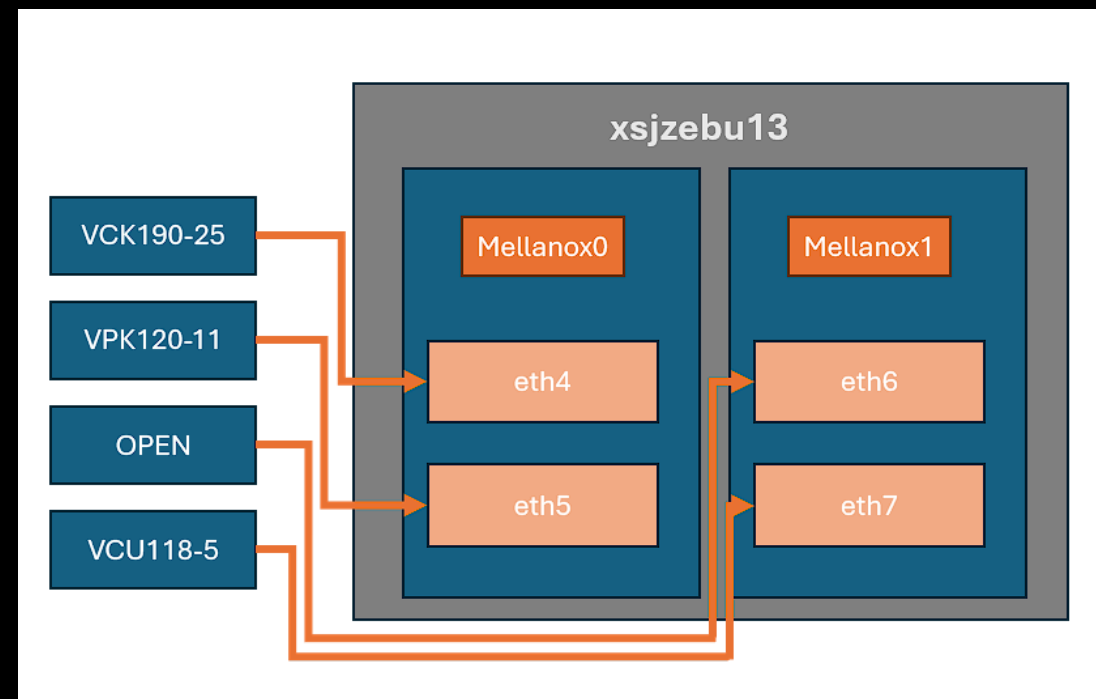
Board	Connection Type	Port	CR
VCK190-13 & VCK190-14	QSFP	QSFP0	<a href="#">CR-1199548 - WTS-WWG-Ethernet-Testing - Need a VCK190 to VCK190 connection via QSFP</a> <small>CLOSED</small>
VPK120-5 & VPK120-6	QSFP	QSFP2	<a href="#">CR-1204096 - WTS-WWG-Ethernet-Testing - VPK120 to VPK120 QSFP connection</a> <small>CLOSED</small>
VPK180-5 & VPK180-6	QSFP	QSFP4	<a href="#">CR-1226912 - WTS-WWG-Ethernet-Testing - VPK180 to VPK180 connection via QSFP</a> <small>CLOSED</small>
VCK190-13 & VCK190-14	SFP	SFP0	<a href="#">CR-1184041 - WTS-WWG-Ethernet-Testing - VCK190 board to board setup</a> <small>CLOSED</small>
VCK190-9 & VCK190-10 (VMK180)	SFP	SFP0	<a href="#">CR-1212175 - WTS-WWG-Ethernet-Testing - Need a VMK180 to VMK180 connection via SFP</a> <small>CLOSED</small>
VEK280-10 & VEK280-11	SFP	SFP0	<a href="#">CR-1232780 - WTS-WWG-Ethernet-Testing - VEK280 board to board setup</a> <small>CLOSED</small>
ZCU102-5 & ZCU102-6	SFP	SFP0	<a href="#">CR-1202007 - WTS-WWG-Ethernet-Testing - Need ZCU102 SFP connection for 10G ethernet testing</a> <small>CLOSED</small>
ZCU111-3 & ZCU111-4	SFP	SFP2	<a href="#">CR-1242683 - WTS-WWG-Ethernet-Testing - Need ZCU111 SFP connection for 25G ethernet testing</a> <small>NEW</small>
XHD-ZCU670-5 & XHD-ZCU670-6	SFP	SFP0	<a href="#">CR-1241140 - WTS-WWG-Ethernet-Testing - Need ZCU670 SFP connection for 1G/10G ethernet testing</a> <small>CLOSED</small>

(See [XSJ Boardfarm - WTS-WWG - Ethernet Testing Setup | XHD boards in XSJ Machine](#) to use this setup in the XSJ machine)

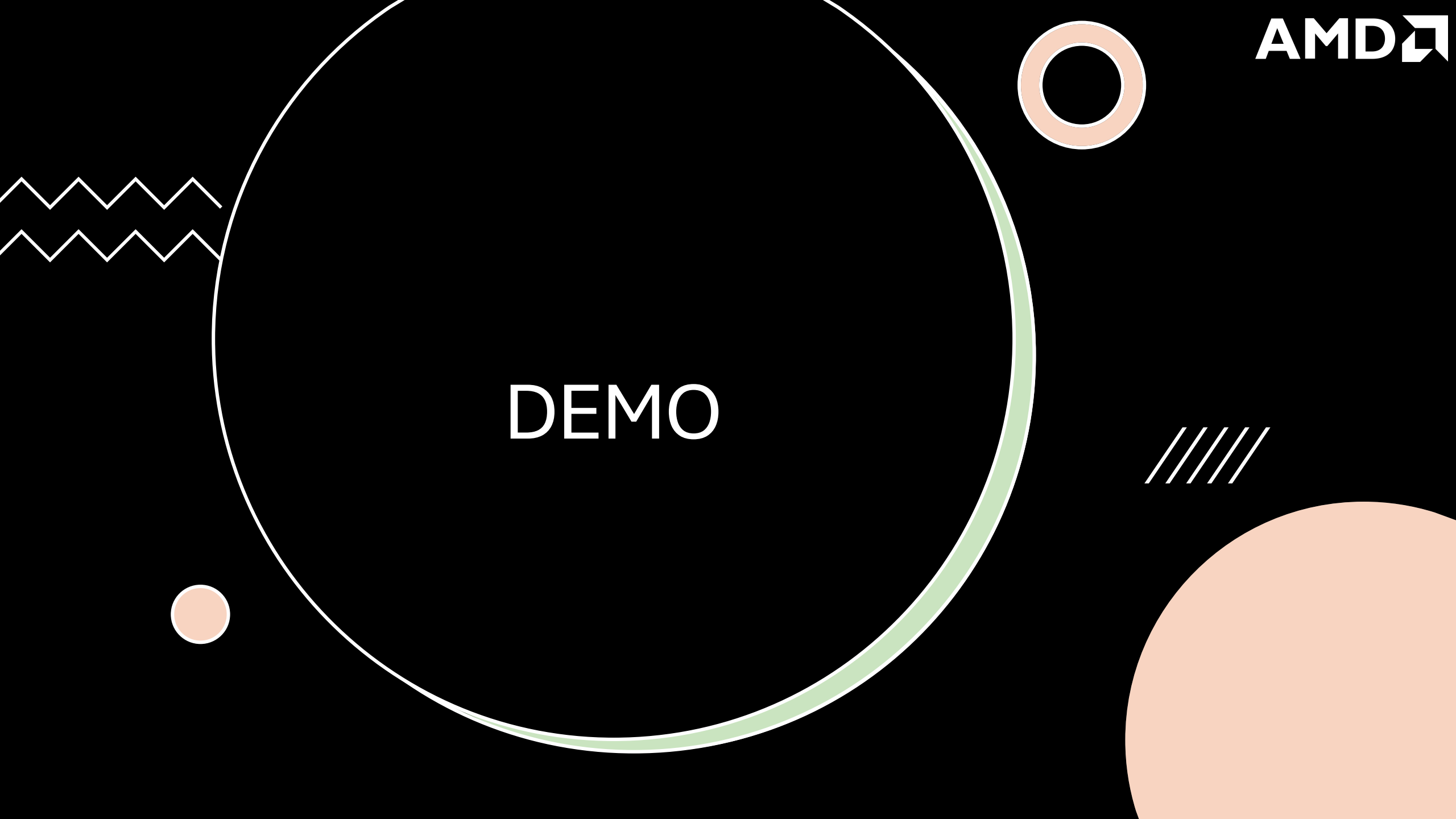


# Boardfarm Setups Cont'd

Board to Mellanox CX5



DEMO





**AMD** 

**AMD**   
together we advance\_