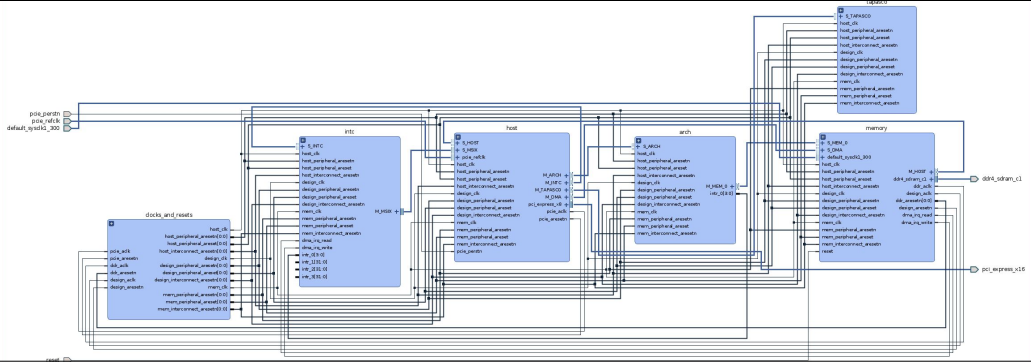
Architekturen und Entwurf von Rechnersystemen
Besprechung Theorieblatt 4

Wintersemester 2022/2023

Johannes Wirth
Fachgebiet Eingebettete Systeme und ihre Anwendungen

TECHNISCHE UNIVERSITÄT DARMSTADT



Dies und das

TECHNISCHE UNIVERSITÄT DARMSTADT

- Klausur am 27.02.2023 um 13 Uhr
- Zur Klausurvorbereitung:
  - Bluespec und SoC Wrapup-Blätter mit klausurähnlichen Fragen
  - Sprechstunden
    - Mögliche Änderungen werden in Moodle bekanntgegeben
  - Moodle Forum für Fragen

Dies und das

TECHNISCHE UNIVERSITÄT DARMSTADT

- Klausur am 27.02.2023 um 13 Uhr
- Zur Klausurvorbereitung:
  - Bluespec und SoC Wrapup-Blätter mit klausurähnlichen Fragen
  - Sprechstunden
    - Mögliche Änderungen werden in Moodle bekanntgegeben
  - Moodle Forum für Fragen
- Heute:
  - Theorieübungsblatt 4
  - BSV-Übung 6
  - Beispielaufgaben
  - Weiterführende Veranstaltungen

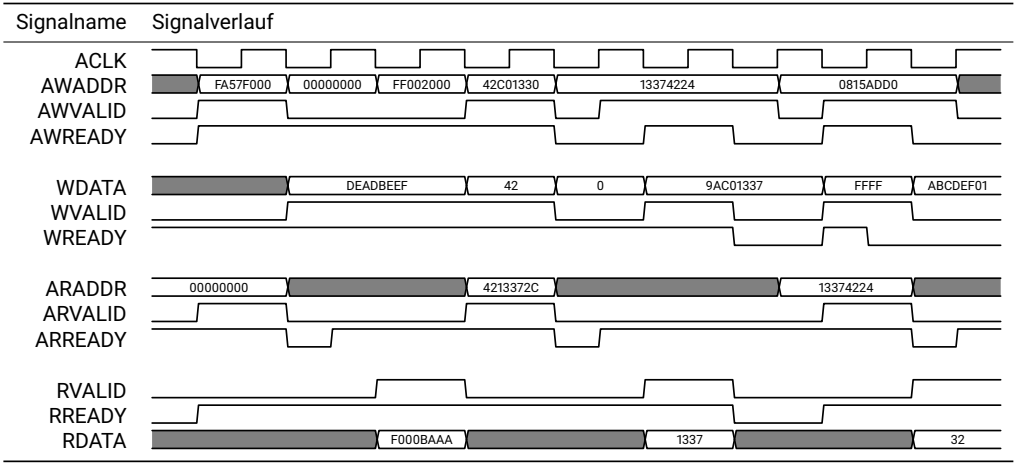
TECHNISCHE
UNIVERSITÄT
DARMSTADT

Theorieübungsblatt 4

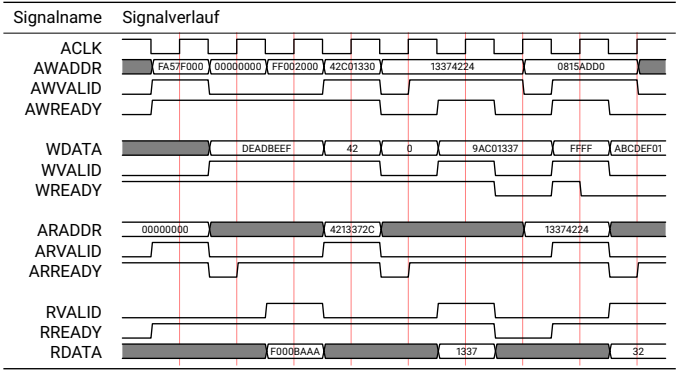
AXI 4

Aufgabe 4.1.3a - AXI4-Lite Transfers

TECHNISCHE UNIVERSITÄT DARMSTADT

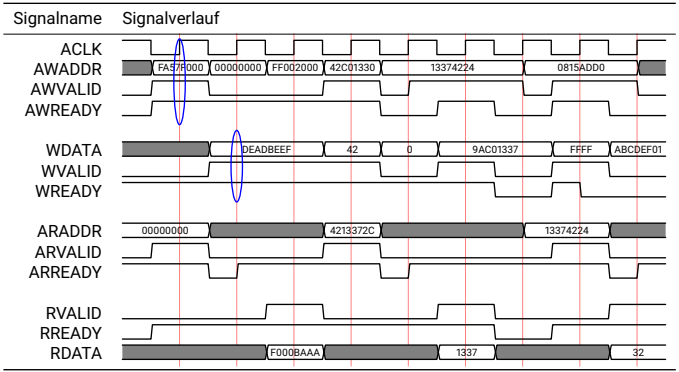


Aufgabe 4.1.3a - AXI4-Lite Transfers



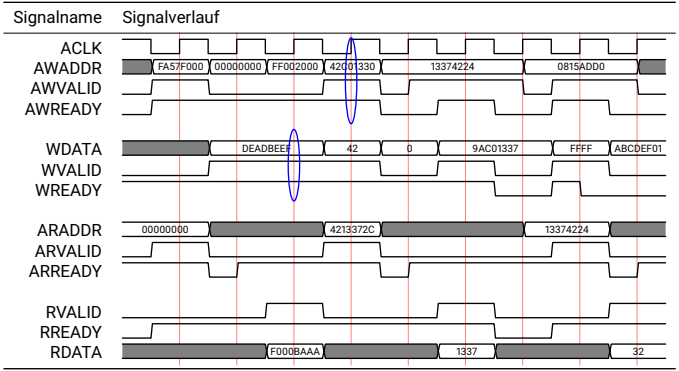
Adresse	Daten
0x00000000	
0x0815ADD0	
0x13374224	
0x4213372C	
0x42C01330	
0xFA57F000	

Aufgabe 4.1.3a - AXI4-Lite Transfers



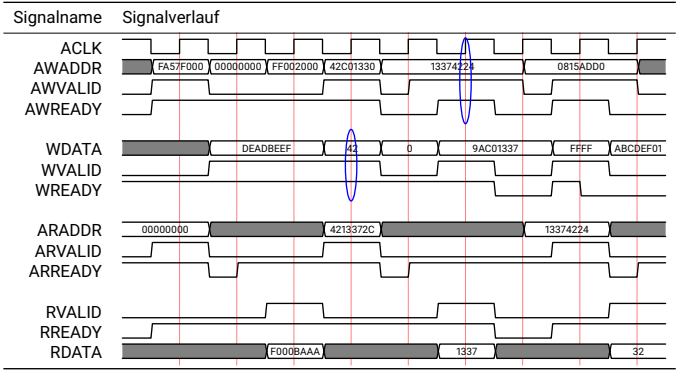
Adresse	Daten
0x00000000	
0x0815ADD0	
0x13374224	
0x4213372C	
0x42C01330	
0xFA57F000	0xDEADBEEF

Aufgabe 4.1.3a - AXI4-Lite Transfers



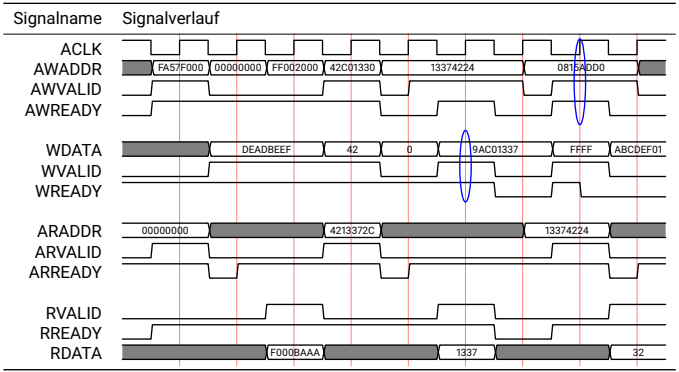
Adresse	Daten
0x00000000	
0x0815ADD0	
0x13374224	
0x4213372C	
0x42C01330	0xDEADBEEF
0xFA57F000	0xDEADBEEF

Aufgabe 4.1.3a - AXI4-Lite Transfers



Adresse	Daten
0x00000000	
0x0815ADD0	
0x13374224	0x00000042
0x4213372C	
0x42C01330	0xDEADBEEF
0xFA57F000	0xDEADBEEF

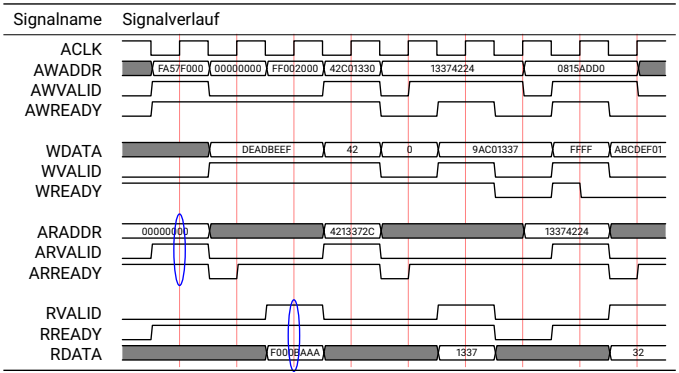
Aufgabe 4.1.3a - AXI4-Lite Transfers



Adresse	Daten
0x00000000	
0x0815ADD0	0x9AC01337
0x13374224	0x00000042
0x4213372C	
0x42C01330	0xDEADBEEF
0xFA57F000	0xDEADBEEF

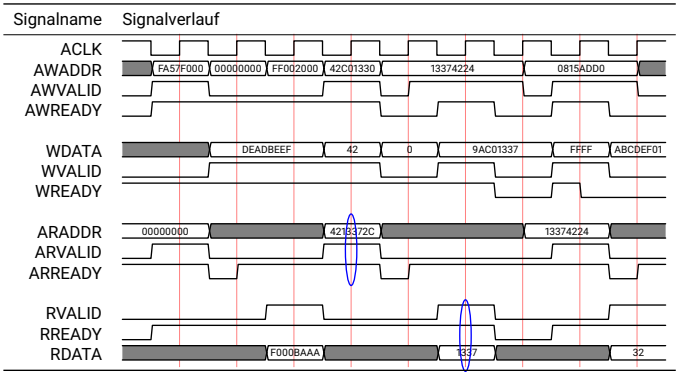
Aufgabe 4.1.3a - AXI4-Lite Transfers

TECHNISCHE UNIVERSITÄT DARMSTADT



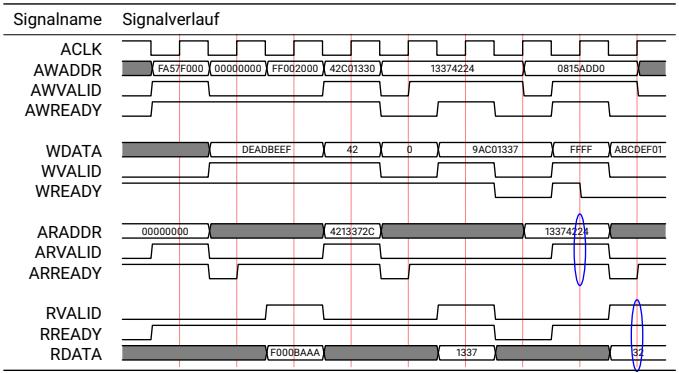
Adresse	Daten
0x00000000	0xF000BAAA
0x0815ADD0	0x9AC01337
0x13374224	0x00000042
0x4213372C	
0x42C01330	0xDEADBEEF
0xFA57F000	0xDEADBEEF

Aufgabe 4.1.3a - AXI4-Lite Transfers



Adresse	Daten
0x00000000	0xF000BAAA
0x0815ADD0	0x9AC01337
0x13374224	0x00000042
0x4213372C	0x00001337
0x42C01330	0xDEADBEEF
0xFA57F000	0xDEADBEEF

Aufgabe 4.1.3a - AXI4-Lite Transfers

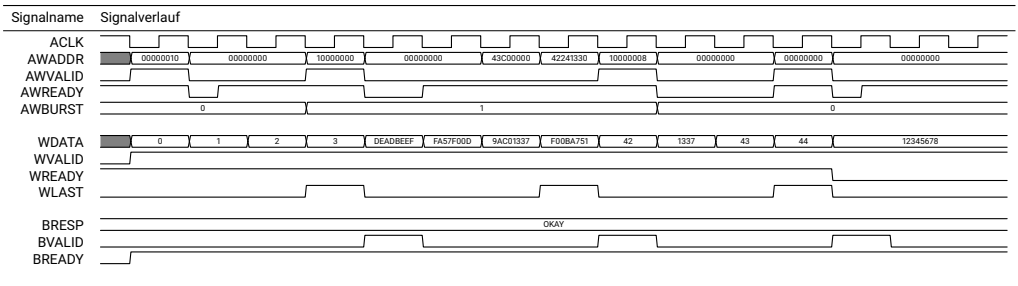


Adresse	Daten
0x00000000	0xF000BAAA
0x0815ADD0	0x9AC01337
0x13374224	0x00000032
0x4213372C	0x00001337
0x42C01330	0xDEADBEEF
0xFA57F000	0xDEADBEEF

Aufgabe 4.1.3a - AXI4-Lite Transfers

TECHNISCHE UNIVERSITÄT DARMSTADT

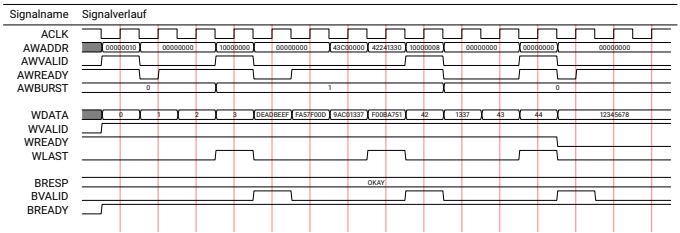
AxLEN=3, AxSIZE=2
AxBURST == 0 => FIXED
AxBURST == 1 => INCREMENT



Aufgabe 4.1.3b - AXI4-Full Transfers

TECHNISCHE UNIVERSITÄT DARMSTADT

AxLEN=3, AxSIZE=2
AxBURST == 0 => FIXED
AxBURST == 1 => INCREMENT

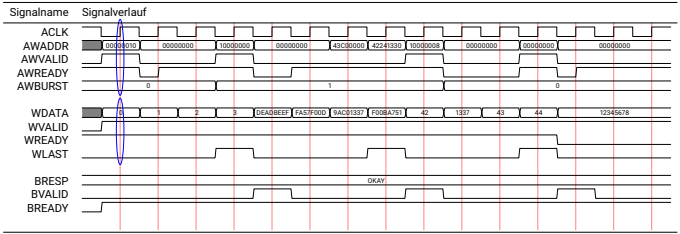


Adresse	Daten

Aufgabe 4.1.3b - AXI4-Full Transfers

TECHNISCHE UNIVERSITÄT DARMSTADT

AxLEN=3, AxSIZE=2
AxBURST == 0 => FIXED
AxBURST == 1 => INCREMENT

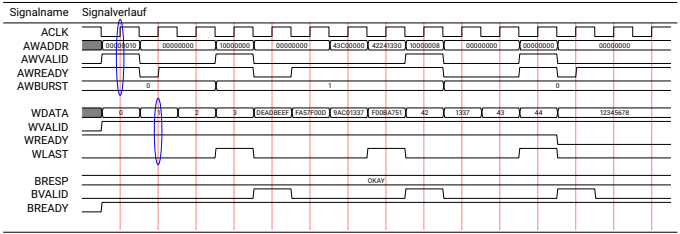


Adresse	Daten
0x00000010	0x00000000

Aufgabe 4.1.3b - AXI4-Full Transfers

TECHNISCHE UNIVERSITÄT DARMSTADT

AxLEN=3, AxSIZE=2
AxBURST == 0 => FIXED
AxBURST == 1 => INCREMENT

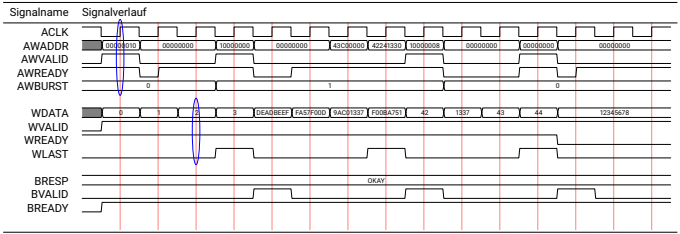


Adresse	Daten
0x00000010	0x00000001

Aufgabe 4.1.3b - AXI4-Full Transfers

TECHNISCHE UNIVERSITÄT DARMSTADT

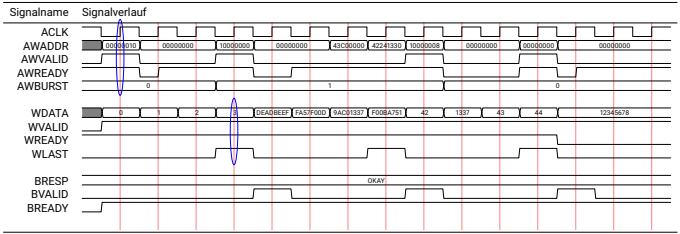
AxLEN=3, AxSIZE=2
AxBURST == 0 => FIXED
AxBURST == 1 => INCREMENT



Adresse	Daten
0x00000010	0x00000002

Aufgabe 4.1.3b - AXI4-Full Transfers

AxLEN=3, AxSIZE=2
AxBURST == 0 => FIXED
AxBURST == 1 => INCREMENT

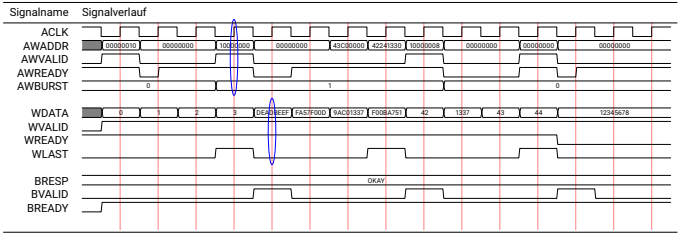


Adresse	Daten
0x00000010	0x00000003

Aufgabe 4.1.3b - AXI4-Full Transfers

TECHNISCHE UNIVERSITÄT DARMSTADT

AxLEN=3, AxSIZE=2
AxBURST == 0 => FIXED
AxBURST == 1 => INCREMENT

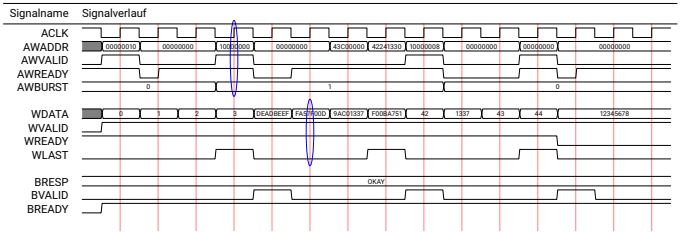


Adresse	Daten
0x00000010	0x00000003
0x10000000	0xDEADBEEF

Aufgabe 4.1.3b - AXI4-Full Transfers

TECHNISCHE UNIVERSITÄT DARMSTADT

AxLEN=3, AxSIZE=2
AxBURST == 0 => FIXED
AxBURST == 1 => INCREMENT

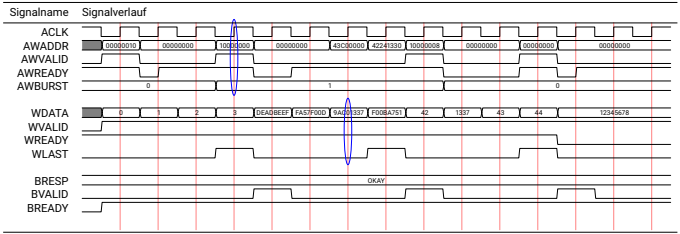


Adresse	Daten
0x00000010	0x00000003
0x10000000	0xDEADBEEF
0x10000004	0xFA57F00D

Aufgabe 4.1.3b - AXI4-Full Transfers

TECHNISCHE UNIVERSITÄT DARMSTADT

AxLEN=3, AxSIZE=2
AxBURST == 0 => FIXED
AxBURST == 1 => INCREMENT

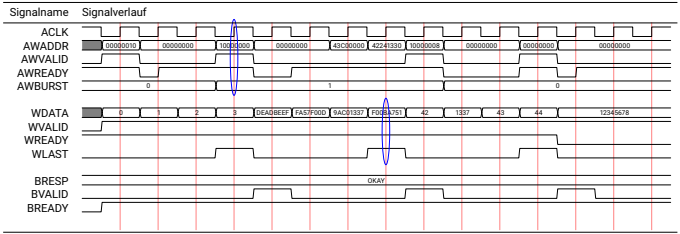


Adresse	Daten
0x00000010	0x00000003
0x10000000	0xDEADBEEF
0x10000004	0xFA57F00D
0x10000008	0x9AC01337

Aufgabe 4.1.3b - AXI4-Full Transfers

TECHNISCHE UNIVERSITÄT DARMSTADT

AxLEN=3, AxSIZE=2
AxBURST == 0 => FIXED
AxBURST == 1 => INCREMENT

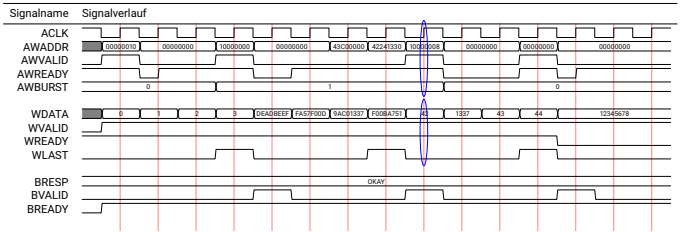


Adresse	Daten
0x00000010	0x00000003
0x10000000	0xDEADBEEF
0x10000004	0xFA57F00D
0x10000008	0x9AC01337
0x1000000C	0xF00BA751

Aufgabe 4.1.3b - AXI4-Full Transfers

TECHNISCHE UNIVERSITÄT DARMSTADT

AxLEN=3, AxSIZE=2
AxBURST == 0 => FIXED
AxBURST == 1 => INCREMENT

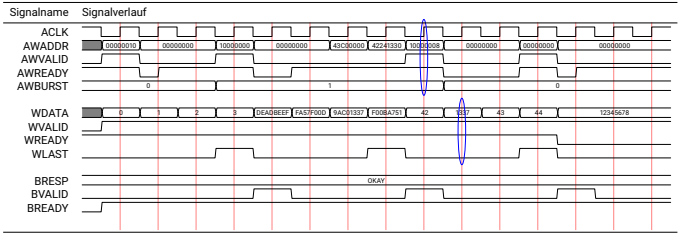


Adresse	Daten
0x00000010	0x00000003
0x10000000	0xDEADBEEF
0x10000004	0xFA57F00D
0x10000008	0x00000042
0x1000000C	0xF00BA751

Aufgabe 4.1.3b - AXI4-Full Transfers

TECHNISCHE UNIVERSITÄT DARMSTADT

AxLEN=3, AxSIZE=2
AxBURST == 0 => FIXED
AxBURST == 1 => INCREMENT

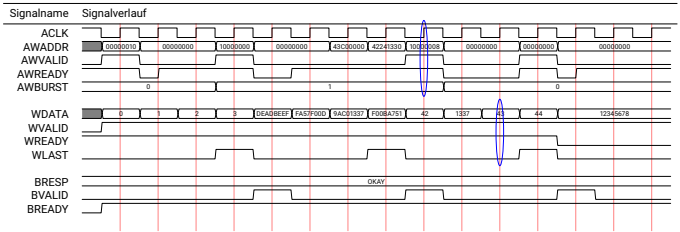


Adresse	Daten
0x00000010	0x00000003
0x10000000	0xDEADBEEF
0x10000004	0xFA57F00D
0x10000008	0x00000042
0x1000000C	0x00001337

Aufgabe 4.1.3b - AXI4-Full Transfers

TECHNISCHE UNIVERSITÄT DARMSTADT

AxLEN=3, AxSIZE=2
AxBURST == 0 => FIXED
AxBURST == 1 => INCREMENT

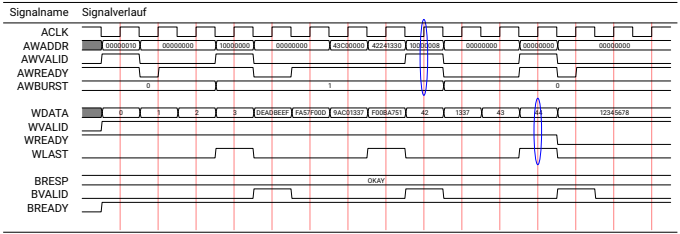


Adresse	Daten
0x00000010	0x00000003
0x10000000	0xDEADBEEF
0x10000004	0xFA57F00D
0x10000008	0x00000042
0x1000000C	0x00001337
0x10000010	0x00000043

Aufgabe 4.1.3b - AXI4-Full Transfers

TECHNISCHE UNIVERSITÄT DARMSTADT

AxLEN=3, AxSIZE=2
AxBURST == 0 => FIXED
AxBURST == 1 => INCREMENT



Adresse	Daten
0x00000010	0x00000003
0x10000000	0xDEADBEEF
0x10000004	0xFA57F00D
0x10000008	0x00000042
0x1000000C	0x00001337
0x10000010	0x00000043
0x10000014	0x00000044

TaPaSCo

TaPaSCo Addressmap: Argument Register 1 schreiben von target_ip_00_011

TECHNISCHE UNIVERSITÄT DARMSTADT

Host/ps7

Data (32 address bits : 0x40000000 [1G],0x80000000 [1G])

InterruptControl/axi_intc_00	s_axi	Reg	0x8180_0000	64K	0x8180_FFFF
Threadpool/target_ip_00_000	s_axi_AXILiteS	Reg	0x43C0_0000	64K	0x43C0_FFFF
Threadpool/target_ip_00_001	s_axi_AXILiteS	Reg	0x43C1_0000	64K	0x43C1_FFFF
Threadpool/target_ip_00_002	s_axi_AXILiteS	Reg	0x43C2_0000	64K	0x43C2_FFFF
Threadpool/target_ip_00_003	s_axi_AXILiteS	Reg	0x43C3_0000	64K	0x43C3_FFFF
Threadpool/target_ip_00_004	s_axi_AXILiteS	Reg	0x43C4_0000	64K	0x43C4_FFFF
Threadpool/target_ip_00_005	s_axi_AXILiteS	Reg	0x43C5_0000	64K	0x43C5_FFFF
Threadpool/target_ip_00_006	s_axi_AXILiteS	Reg	0x43C6_0000	64K	0x43C6_FFFF
Threadpool/target_ip_00_007	s_axi_AXILiteS	Reg	0x43C7_0000	64K	0x43C7_FFFF
Threadpool/target_ip_00_008	s_axi_AXILiteS	Reg	0x43C8_0000	64K	0x43C8_FFFF
Threadpool/target_ip_00_009	s_axi_AXILiteS	Reg	0x43C9_0000	64K	0x43C9_FFFF
Threadpool/target_ip_00_010	s_axi_AXILiteS	Reg	0x43CA_0000	64K	0x43CA_FFFF
Threadpool/target_ip_00_011	s_axi_AXILiteS	Reg	0x43CB_0000	64K	0x43CB_FFFF
Threadpool/target_ip_00_012	s_axi_AXILiteS	Reg	0x43CC_0000	64K	0x43CC_FFFF
Threadpool/target_ip_00_013	s_axi_AXILiteS	Reg	0x43CD_0000	64K	0x43CD_FFFF
Threadpool/target_ip_00_014	s_axi_AXILiteS	Reg	0x43CE_0000	64K	0x43CE_FFFF
Threadpool/target_ip_00_015	s_axi_AXILiteS	Reg	0x43CF_0000	64K	0x43CF_FFFF
tpc_status	S00_AXI	S00_AXI_reg	0x7777_0000	64K	0x7777_FFFF

TaPaSCo Addressmap: Argument Register 1 schreiben von target_ip_00_011

TECHNISCHE UNIVERSITÄT DARMSTADT

Host/ps7

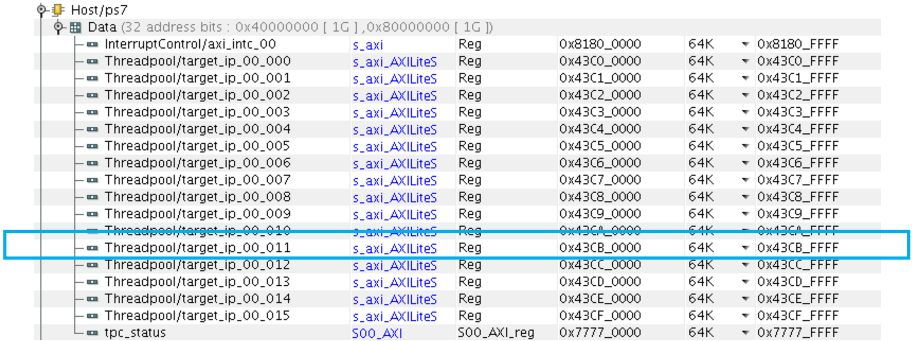
Data (32 address bits : 0x40000000 [1G],0x80000000 [1G])

InterruptControl/axi_intc_00	s_axi	Reg	0x8180_0000	64K	0x8180_FFFF
Threadpool/target_ip_00_000	s_axi_AXILiteS	Reg	0x43C0_0000	64K	0x43C0_FFFF
Threadpool/target_ip_00_001	s_axi_AXILiteS	Reg	0x43C1_0000	64K	0x43C1_FFFF
Threadpool/target_ip_00_002	s_axi_AXILiteS	Reg	0x43C2_0000	64K	0x43C2_FFFF
Threadpool/target_ip_00_003	s_axi_AXILiteS	Reg	0x43C3_0000	64K	0x43C3_FFFF
Threadpool/target_ip_00_004	s_axi_AXILiteS	Reg	0x43C4_0000	64K	0x43C4_FFFF
Threadpool/target_ip_00_005	s_axi_AXILiteS	Reg	0x43C5_0000	64K	0x43C5_FFFF
Threadpool/target_ip_00_006	s_axi_AXILiteS	Reg	0x43C6_0000	64K	0x43C6_FFFF
Threadpool/target_ip_00_007	s_axi_AXILiteS	Reg	0x43C7_0000	64K	0x43C7_FFFF
Threadpool/target_ip_00_008	s_axi_AXILiteS	Reg	0x43C8_0000	64K	0x43C8_FFFF
Threadpool/target_ip_00_009	s_axi_AXILiteS	Reg	0x43C9_0000	64K	0x43C9_FFFF
Threadpool/target_ip_00_010	s_axi_AXILiteS	Reg	0x43CA_0000	64K	0x43CA_FFFF
Threadpool/target_ip_00_011	s_axi_AXILiteS	Reg	0x43CB_0000	64K	0x43CB_FFFF
Threadpool/target_ip_00_012	s_axi_AXILiteS	Reg	0x43CC_0000	64K	0x43CC_FFFF
Threadpool/target_ip_00_013	s_axi_AXILiteS	Reg	0x43CD_0000	64K	0x43CD_FFFF
Threadpool/target_ip_00_014	s_axi_AXILiteS	Reg	0x43CE_0000	64K	0x43CE_FFFF
Threadpool/target_ip_00_015	s_axi_AXILiteS	Reg	0x43CF_0000	64K	0x43CF_FFFF
tpc_status	S00_AXI	S00_AXI_reg	0x7777_0000	64K	0x7777_FFFF

- Argument Register 1 an Stelle `'h20` der PE

TaPaSCo Addressmap: Argument Register 1 schreiben von target_ip_00_011

TECHNISCHE UNIVERSITÄT DARMSTADT



Host/ps7

Data (32 address bits : 0x40000000 [1G],0x80000000 [1G])

InterruptControl/axi_intc_00	s_axi	Reg	0x8180_0000	64K	0x8180_FFFF
Threadpool/target_ip_00_000	s_axi_AXILiteS	Reg	0x43C0_0000	64K	0x43C0_FFFF
Threadpool/target_ip_00_001	s_axi_AXILiteS	Reg	0x43C1_0000	64K	0x43C1_FFFF
Threadpool/target_ip_00_002	s_axi_AXILiteS	Reg	0x43C2_0000	64K	0x43C2_FFFF
Threadpool/target_ip_00_003	s_axi_AXILiteS	Reg	0x43C3_0000	64K	0x43C3_FFFF
Threadpool/target_ip_00_004	s_axi_AXILiteS	Reg	0x43C4_0000	64K	0x43C4_FFFF
Threadpool/target_ip_00_005	s_axi_AXILiteS	Reg	0x43C5_0000	64K	0x43C5_FFFF
Threadpool/target_ip_00_006	s_axi_AXILiteS	Reg	0x43C6_0000	64K	0x43C6_FFFF
Threadpool/target_ip_00_007	s_axi_AXILiteS	Reg	0x43C7_0000	64K	0x43C7_FFFF
Threadpool/target_ip_00_008	s_axi_AXILiteS	Reg	0x43C8_0000	64K	0x43C8_FFFF
Threadpool/target_ip_00_009	s_axi_AXILiteS	Reg	0x43C9_0000	64K	0x43C9_FFFF
Threadpool/target_ip_00_010	s_axi_AXILiteS	Reg	0x43CA_0000	64K	0x43CA_FFFF
Threadpool/target_ip_00_011	s_axi_AXILiteS	Reg	0x43CB_0000	64K	0x43CB_FFFF
Threadpool/target_ip_00_012	s_axi_AXILiteS	Reg	0x43CC_0000	64K	0x43CC_FFFF
Threadpool/target_ip_00_013	s_axi_AXILiteS	Reg	0x43CD_0000	64K	0x43CD_FFFF
Threadpool/target_ip_00_014	s_axi_AXILiteS	Reg	0x43CE_0000	64K	0x43CE_FFFF
Threadpool/target_ip_00_015	s_axi_AXILiteS	Reg	0x43CF_0000	64K	0x43CF_FFFF
tpc_status	S00_AXI	S00_AXI_reg	0x7777_0000	64K	0x7777_FFFF

- Argument Register 1 an Stelle **'h20** der PE
- **target_ip_00_011** an Adresse **'h43CB0000**

TaPaSCo Addressmap: Argument Register 1 schreiben von target_ip_00_011

TECHNISCHE UNIVERSITÄT DARMSTADT

Host/ps7

Data (32 address bits : 0x40000000 [1G],0x80000000 [1G])

InterruptControl/axi_intc_00	s_axi	Reg	0x8180_0000	64K	0x8180_FFFF
Threadpool/target_ip_00_000	s_axi_AXILiteS	Reg	0x43C0_0000	64K	0x43C0_FFFF
Threadpool/target_ip_00_001	s_axi_AXILiteS	Reg	0x43C1_0000	64K	0x43C1_FFFF
Threadpool/target_ip_00_002	s_axi_AXILiteS	Reg	0x43C2_0000	64K	0x43C2_FFFF
Threadpool/target_ip_00_003	s_axi_AXILiteS	Reg	0x43C3_0000	64K	0x43C3_FFFF
Threadpool/target_ip_00_004	s_axi_AXILiteS	Reg	0x43C4_0000	64K	0x43C4_FFFF
Threadpool/target_ip_00_005	s_axi_AXILiteS	Reg	0x43C5_0000	64K	0x43C5_FFFF
Threadpool/target_ip_00_006	s_axi_AXILiteS	Reg	0x43C6_0000	64K	0x43C6_FFFF
Threadpool/target_ip_00_007	s_axi_AXILiteS	Reg	0x43C7_0000	64K	0x43C7_FFFF
Threadpool/target_ip_00_008	s_axi_AXILiteS	Reg	0x43C8_0000	64K	0x43C8_FFFF
Threadpool/target_ip_00_009	s_axi_AXILiteS	Reg	0x43C9_0000	64K	0x43C9_FFFF
Threadpool/target_ip_00_010	s_axi_AXILiteS	Reg	0x43CA_0000	64K	0x43CA_FFFF
Threadpool/target_ip_00_011	s_axi_AXILiteS	Reg	0x43CB_0000	64K	0x43CB_FFFF
Threadpool/target_ip_00_012	s_axi_AXILiteS	Reg	0x43CC_0000	64K	0x43CC_FFFF
Threadpool/target_ip_00_013	s_axi_AXILiteS	Reg	0x43CD_0000	64K	0x43CD_FFFF
Threadpool/target_ip_00_014	s_axi_AXILiteS	Reg	0x43CE_0000	64K	0x43CE_FFFF
Threadpool/target_ip_00_015	s_axi_AXILiteS	Reg	0x43CF_0000	64K	0x43CF_FFFF
tpc_status	S00_AXI	S00_AXI_reg	0x7777_0000	64K	0x7777_FFFF

- Argument Register 1 an Stelle **'h20** der PE
- **target_ip_00_011** an Adresse **'h43CB0000**
- Argument Register 1 von **target_ip_00_011** an Adresse **'h43CB0020**

TaPaSCo Addressmap: Ergebnis und Interrupt bestätigen

TECHNISCHE UNIVERSITÄT DARMSTADT

Host/ps7

Data (32 address bits : 0x40000000 [1G],0x80000000 [1G])

InterruptControl/axi_intc_00	s_axi	Reg	0x8180_0000	64K	0x8180_FFFF
Threadpool/target_ip_00_000	s_axi_AXILiteS	Reg	0x43C0_0000	64K	0x43C0_FFFF
Threadpool/target_ip_00_001	s_axi_AXILiteS	Reg	0x43C1_0000	64K	0x43C1_FFFF
Threadpool/target_ip_00_002	s_axi_AXILiteS	Reg	0x43C2_0000	64K	0x43C2_FFFF
Threadpool/target_ip_00_003	s_axi_AXILiteS	Reg	0x43C3_0000	64K	0x43C3_FFFF
Threadpool/target_ip_00_004	s_axi_AXILiteS	Reg	0x43C4_0000	64K	0x43C4_FFFF
Threadpool/target_ip_00_005	s_axi_AXILiteS	Reg	0x43C5_0000	64K	0x43C5_FFFF
Threadpool/target_ip_00_006	s_axi_AXILiteS	Reg	0x43C6_0000	64K	0x43C6_FFFF
Threadpool/target_ip_00_007	s_axi_AXILiteS	Reg	0x43C7_0000	64K	0x43C7_FFFF
Threadpool/target_ip_00_008	s_axi_AXILiteS	Reg	0x43C8_0000	64K	0x43C8_FFFF
Threadpool/target_ip_00_009	s_axi_AXILiteS	Reg	0x43C9_0000	64K	0x43C9_FFFF
Threadpool/target_ip_00_010	s_axi_AXILiteS	Reg	0x43CA_0000	64K	0x43CA_FFFF
Threadpool/target_ip_00_011	s_axi_AXILiteS	Reg	0x43CB_0000	64K	0x43CB_FFFF
Threadpool/target_ip_00_012	s_axi_AXILiteS	Reg	0x43CC_0000	64K	0x43CC_FFFF
Threadpool/target_ip_00_013	s_axi_AXILiteS	Reg	0x43CD_0000	64K	0x43CD_FFFF
Threadpool/target_ip_00_014	s_axi_AXILiteS	Reg	0x43CE_0000	64K	0x43CE_FFFF
Threadpool/target_ip_00_015	s_axi_AXILiteS	Reg	0x43CF_0000	64K	0x43CF_FFFF
tpc_status	S00_AXI	S00_AXI_reg	0x7777_0000	64K	0x7777_FFFF

TaPaSCo Addressmap: Ergebnis und Interrupt bestätigen

TECHNISCHE UNIVERSITÄT DARMSTADT

Host/ps7

Data (32 address bits : 0x40000000 [1G],0x80000000 [1G])

InterruptControl/axi_intc_00	s_axi	Reg	0x8180_0000	64K	0x8180_FFFF
Threadpool/target_ip_00_000	s_axi_AXILiteS	Reg	0x43C0_0000	64K	0x43C0_FFFF
Threadpool/target_ip_00_001	s_axi_AXILiteS	Reg	0x43C1_0000	64K	0x43C1_FFFF
Threadpool/target_ip_00_002	s_axi_AXILiteS	Reg	0x43C2_0000	64K	0x43C2_FFFF
Threadpool/target_ip_00_003	s_axi_AXILiteS	Reg	0x43C3_0000	64K	0x43C3_FFFF
Threadpool/target_ip_00_004	s_axi_AXILiteS	Reg	0x43C4_0000	64K	0x43C4_FFFF
Threadpool/target_ip_00_005	s_axi_AXILiteS	Reg	0x43C5_0000	64K	0x43C5_FFFF
Threadpool/target_ip_00_006	s_axi_AXILiteS	Reg	0x43C6_0000	64K	0x43C6_FFFF
Threadpool/target_ip_00_007	s_axi_AXILiteS	Reg	0x43C7_0000	64K	0x43C7_FFFF
Threadpool/target_ip_00_008	s_axi_AXILiteS	Reg	0x43C8_0000	64K	0x43C8_FFFF
Threadpool/target_ip_00_009	s_axi_AXILiteS	Reg	0x43C9_0000	64K	0x43C9_FFFF
Threadpool/target_ip_00_010	s_axi_AXILiteS	Reg	0x43CA_0000	64K	0x43CA_FFFF
Threadpool/target_ip_00_011	s_axi_AXILiteS	Reg	0x43CB_0000	64K	0x43CB_FFFF
Threadpool/target_ip_00_012	s_axi_AXILiteS	Reg	0x43CC_0000	64K	0x43CC_FFFF
Threadpool/target_ip_00_013	s_axi_AXILiteS	Reg	0x43CD_0000	64K	0x43CD_FFFF
Threadpool/target_ip_00_014	s_axi_AXILiteS	Reg	0x43CE_0000	64K	0x43CE_FFFF
Threadpool/target_ip_00_015	s_axi_AXILiteS	Reg	0x43CF_0000	64K	0x43CF_FFFF
tpc_status	S00_AXI	S00_AXI_reg	0x7777_0000	64K	0x7777_FFFF

- Return Value Register an Stelle `'h10` der PE => `'h43CB0010`

TaPaSCo Addressmap: Ergebnis und Interrupt bestätigen

TECHNISCHE UNIVERSITÄT DARMSTADT

Host/ps7

Data (32 address bits : 0x40000000 [1G],0x80000000 [1G])

InterruptControl/axi_intc_00	s_axi	Reg	0x8180_0000	64K	0x8180_FFFF
Threadpool/target_ip_00_000	s_axi_AXILiteS	Reg	0x43C0_0000	64K	0x43C0_FFFF
Threadpool/target_ip_00_001	s_axi_AXILiteS	Reg	0x43C1_0000	64K	0x43C1_FFFF
Threadpool/target_ip_00_002	s_axi_AXILiteS	Reg	0x43C2_0000	64K	0x43C2_FFFF
Threadpool/target_ip_00_003	s_axi_AXILiteS	Reg	0x43C3_0000	64K	0x43C3_FFFF
Threadpool/target_ip_00_004	s_axi_AXILiteS	Reg	0x43C4_0000	64K	0x43C4_FFFF
Threadpool/target_ip_00_005	s_axi_AXILiteS	Reg	0x43C5_0000	64K	0x43C5_FFFF
Threadpool/target_ip_00_006	s_axi_AXILiteS	Reg	0x43C6_0000	64K	0x43C6_FFFF
Threadpool/target_ip_00_007	s_axi_AXILiteS	Reg	0x43C7_0000	64K	0x43C7_FFFF
Threadpool/target_ip_00_008	s_axi_AXILiteS	Reg	0x43C8_0000	64K	0x43C8_FFFF
Threadpool/target_ip_00_009	s_axi_AXILiteS	Reg	0x43C9_0000	64K	0x43C9_FFFF
Threadpool/target_ip_00_010	s_axi_AXILiteS	Reg	0x43CA_0000	64K	0x43CA_FFFF
Threadpool/target_ip_00_011	s_axi_AXILiteS	Reg	0x43CB_0000	64K	0x43CB_FFFF
Threadpool/target_ip_00_012	s_axi_AXILiteS	Reg	0x43CC_0000	64K	0x43CC_FFFF
Threadpool/target_ip_00_013	s_axi_AXILiteS	Reg	0x43CD_0000	64K	0x43CD_FFFF
Threadpool/target_ip_00_014	s_axi_AXILiteS	Reg	0x43CE_0000	64K	0x43CE_FFFF
Threadpool/target_ip_00_015	s_axi_AXILiteS	Reg	0x43CF_0000	64K	0x43CF_FFFF
tpc_status	S00_AXI	S00_AXI_reg	0x7777_0000	64K	0x7777_FFFF

- Return Value Register an Stelle **`'h10`** der PE => **`'h43CB0010`**
- Interrupt Acknowledge Register an Stelle **`'h0C`** der PE => **`'h43CB000C`**

Weiterführende Veranstaltungen

Weiterführende Veranstaltungen

TECHNISCHE UNIVERSITÄT DARMSTADT

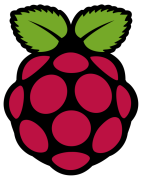
- Sommersemester
  - Embedded Systems Hands-On 1
  - Praktische FPGA-Programmierung mit Hochsprachen
- Wintersemester
  - Embedded Systems Hands-On 2
  - Algorithmen für Chip-Entwurfswerkzeuge

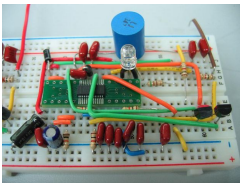
Embedded Systems Hands-On 1 - Entwurf und Realisierung von Hardware/Software-Systemen

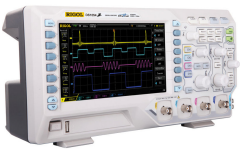
TECHNISCHE UNIVERSITÄT DARMSTADT

- Themen:
  - Embedded Linux auf Raspberry Pi
  - Programmierung von Mikrocontrollern
  - Einfache elektronische Schaltungen

→ 6 Aufgaben + Projekt in Gruppenarbeit



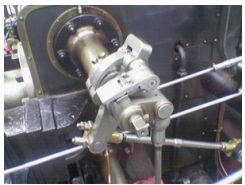


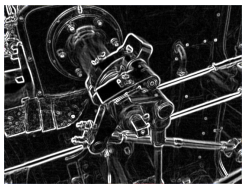


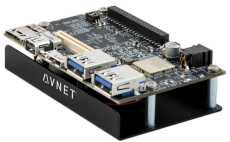
Embedded Systems Hands-On 2 - Entwurf von Hardware-Beschleunigern für Systems-on-Chip

TECHNISCHE UNIVERSITÄT DARMSTADT

- Ziel: Hardwarebeschleunigung eines Sobel-Bildfilters
- Themen:
  - Einführung in TaPaSCo-RISCV
  - Embedded Linux auf Xilinx ZynqMP
  - Linux Treiber
  - Hardware-Modul in Bluespec
  - Genaue Analyse der FPGA Implementierung: Resourcenverbrauch, Taktfrequenz



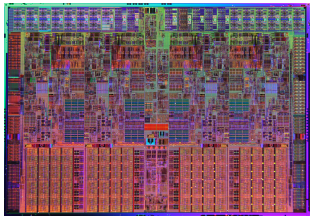




Algorithmen für Chip-Entwurfswerkzeuge

TECHNISCHE UNIVERSITÄT DARMSTADT

- Ziel: Physikalischer Schaltkreis
- Algorithmische Graphentheorie und mathematische Optimierungsverfahren im VLSI Entwurf
- Themen:
  - Partitionierung
  - Floorplanning
  - Platzierung
  - Verdrahtung
  - Kompaktierung
- 3 CP Vorlesung + 6 CP Praktikum



Quelle: Intel (Nehalem)

Fragerunde

TECHNISCHE UNIVERSITÄT DARMSTADT

Fragen zur Vorlesung oder zur Übung?