UDP/IP-Stack Datentypen

IPv4

Konstanten

ipv4_types.vhd – Z.13

IPv4 TX

Strukturen

ipv4_types.vhd – Z. 26	**ipv4_tx_header_type**
axi.vhd – Z	**axi_out_type**
ipv4_types.vhd – Z. 32	**ipv4_tx_type**

Konstanten

ipv4_types.vhd – Z. 21

IPv4 RX

Strukturen

ipv4_types.vhd – Z. 48	**ipv4_rx_header_type**

Tabelle1

axi.vhd – Z. 12	**axi_in_type**
ipv4_types.vhd – Z. 58	**ipv4_rx_type**
arp_types.vhd – Z. 37	**arp_control_type**
ipv4_types.vhd – Z. 63	**ip_control_type**
	Konstanten
	ipv4_types.vhd – Z

UDP TX	
	Strukturen
ipv4_types.vhd – Z. 77	**udp_tx_header_type**

Tabelle1

axi.vhd – Z. 19	**axi_out_type**
ipv4_types.vhd – Z. 86	**udp_tx_type**
	Konstanten
	ipv4_types.vhd – Z. 72

UDP RX	
	Strukturen
ipv4_types.vhd – Z. 48	**udp_rx_header_type**
	axi_in_type
ipv4_types.vhd – Z. 58	**udp_rx_type**

Tabelle1

arp_types.vhd – Z. 37	**arp_control_type**
ipv4_types.vhd – Z. 63	**ip_control_type**
ipv4_types.vhd – Z. 115	**udp_control_type**

ARP lookup types	
	Strukturen
arp_types.vhd – Z. 19	**arp_req_req_type**
arp_types.vhd – Z. 25	**arp_req_rslt_type**
arp_types.vhd – Z. 32	**arp_entry_t**
arp_types.vhd – Z. 37	**arp_control_type**

ARP store types	
	Strukturen
arp_types.vhd – Z. 44	**arp_store_rslt_t**
arp_types.vhd – Z. 32	**arp_entry_t**

Tabelle1

arp_types.vhd – Z. 46	**arp_store_rdrequest_t**
arp_types.vhd – Z. 52	**arp_store_wrrequest_t**
arp_types.vhd – Z. 58	**arp_store_result_t**

ARP network types

Strukturen

arp_types.vhd – Z. 66	**arp_nwk_rslt_t**
arp_types.vhd – Z. 32	**arp_entry_t**
arp_types.vhd – Z. 68	**arp_nwk_request_t**
arp_types.vhd – Z. 74	**arp_nwk_result_t**

IP_BC_ADDR	std_logic_vector (31 downto 0)	x"ffff_ffff"
MAC_BC_ADDR	std_logic_vector (47 downto 0)	x"ffff_ffff_ffff"

protocol	std_logic_vector (7 downto 0)
data_length	std_logic_vector (15 downto 0)
dst_ip_addr	std_logic_vector (31 downto 0)

data_out	std_logic_vector (7 downto 0)
data_out_valid	std_logic
data_out_last	std_logic

hdr	**ipv4_tx_header_type**	
		protocol data_length dst_ip_addr
data	**axi_out_type**	
		data_out data_out_valid data_out_last

werden im Modul IPv4_TX an dem Port ip_tx_result ausgegeben im IPv4 Modul wird der Port ip_tx_restult v

IPTX_RESULT_NONE	std_logic_vector (1 downto 0)	"00"
IPTX_RESULT_SENDING	std_logic_vector (1 downto 0)	"01"
IPTX_RESULT_ERR	std_logic_vector (1 downto 0)	"10"
IPTX_RESULT_SENT	std_logic_vector (1 downto 0)	"11"

protocol	std_logic_vector (7 downto 0)
data_length	std_logic_vector (15 downto 0)
src_ip_addr	std_logic_vector (31 downto 0)
is_valid	std_logic

is_broadcast	std_logic
num_frame_errors	std_logic_vector (7 downto 0)
last_error_code	std_logic_vector (3 downto 0)

data_in	std_logic_vector (7 downto 0)
data_in_valid	std_logic
data_in_last	std_logic

hdr	**ipv4_rx_header_type**	
		protocol
		data_length
		src_ip_addr
		is_valid
		is_broadcast
		num_frame_errors
		last_error_code
data	**axi_in_type**	
		data_in
		data_in_valid
		data_in_last

clear_cache	std_logic

arp_controls	**arp_control_type**	
		clear_cache

RX_EC_NONE	std_logic_vector (3 downto 0)	X"0"
RX_EC_ET_ETH	std_logic_vector (3 downto 0)	X"1"
RX_EC_ET_IP	std_logic_vector (3 downto 0)	X"2"
RX_EC_ET_USER	std_logic_vector (3 downto 0)	X"3"

data_length	std_logic_vector (15 downto 0)
dst_ip_addr	std_logic_vector (31 downto 0)
dst_port	std_logic_vector (15 downto 0)
src_port	std_logic_vector (15 downto 0)
checksum	std_logic_vector (15 downto 0)

data_out	std_logic_vector (7 downto 0)
data_out_valid	std_logic
data_out_last	std_logic

hdr	**udp_tx_header_type**	
		data_length
		dst_ip_addr
		dst_port
		src_port
		checksum
data	**axi_out_type**	
		data_out
		data_out_valid
		data_out_last

UDPTX_RESULT_NONE	std_logic_vector (1 downto 0)	"00"
UDPTX_RESULT_SENDING	std_logic_vector (1 downto 0)	"01"
UDPTX_RESULT_ERR	std_logic_vector (1 downto 0)	"10"
UDPTX_RESULT_SENT	std_logic_vector (1 downto 0)	"11"

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data_length	std_logic_vector (15 downto 0)
src_ip_addr	std_logic_vector (31 downto 0)
dst_port	std_logic_vector (15 downto 0)
src_port	std_logic_vector (15 downto 0)
is_valid	std_logic

data_in	std_logic_vector (7 downto 0)
data_in_valid	std_logic
data_in_last	std_logic

hdr	**udp_rx_header_type**	
		data_length
		src_ip_addr
		dst_port
		src_port
		is_valid
data	**axi_in_type**	

		data_in data_in_valid data_in_last

clear_cache	std_logic

arp_controls	**arp_control_type**	
		clear_cache

ip_controls	**ip_control_type**	
		arp_controls

lookup_req ip	std_logic std_logic_vector (31 downto 0)

got_mac mac got_err	std_logic std_logic_vector (47 downto 0) std_logic

ip mac	std_logic_vector (7 downto 0) std_logic_vector (31 downto 0)

clear_cache	std_logic

IDLE,BUSY,SEARCHING,FOUND,NOT_FOUND

ip mac	std_logic_vector (7 downto 0) std_logic_vector (31 downto 0)

req	std_logic
ip	std_logic_vector (31 downto 0)

rep	std_logic	
entry	**arp_entry_t**	
		ip
		mac

status	**arp_store_rslt_t**	IDLE,BUSY,SEARCHIN
entry	**arp_entry_t**	
		ip
		mac

IDLE,REQUESTING,RECEIVED,ERROR

ip	std_logic_vector (7 downto 0)
mac	std_logic_vector (31 downto 0)

req	std_logic
ip	std_logic_vector (31 downto 0)

status	**arp_nwk_rslt_t**	IDLE,REQUESTING,RE
entry	**arp_entry_t**	
		ip
		mac

IP-**B**road**C**ast **ADDR**esse
MAC-**B**road**C**ast **ADDR**esse

std_logic_vector (7 downto 0) std_logic_vector (15 downto 0) std_logic_vector (31 downto 0)
std_logic_vector (7 downto 0) std_logic std_logic

veiter nach Aussen gereicht

std_logic_vector (7 downto 0)
std_logic_vector (15 downto 0)
std_logic_vector (31 downto 0)
std_logic
std_logic
std_logic_vector (7 downto 0)
std_logic_vector (3 downto 0)
std_logic_vector (7 downto 0)
std_logic
std_logic

std_logic

Tabelle1

std_logic_vector (15 downto 0)
std_logic_vector (31 downto 0)
std_logic_vector (15 downto 0)
std_logic_vector (15 downto 0)
std_logic_vector (15 downto 0)
std_logic_vector (7 downto 0)
std_logic
std_logic

std_logic_vector (15 downto 0)
std_logic_vector (31 downto 0)
std_logic_vector (15 downto 0)
std_logic_vector (15 downto 0)
std_logic

Tabelle1

std_logic_vector (7 downto 0)
std_logic
std_logic

std_logic

arp_control_type		
	clear_cache	std_logic

std_logic_vector (7 downto 0)
std_logic_vector (31 downto 0)

G,FOUND,NOT_FOUND
std_logic_vector (7 downto 0)
std_logic_vector (31 downto 0)

CEIVED,ERROR
std_logic_vector (7 downto 0)
std_logic_vector (31 downto 0)

Tabelle3

UDP_Complete_nomac

UDP TX signals	
	udp_tx_start
	udp_txi
	udp_tx_result
	udp_tx_data_out_ready
UDP RX signals	
	udp_rx_start
	udp_rxo
IP RX signals	
	ip_rx_hdr
System signals	
	rx_clk
	tx_clk
	reset
	our_ip_address
	our_mac_address
	control
status signals	
	arp_pkt_count
	ip_pkt_count
MAC Transmitter	
	mac_tx_tdata
	mac_tx_tvalid
	mac_tx_tready
	mac_tx_tfirst
	mac_tx_tlast
MAC Receiver	
	mac_rx_tdata
	mac_rx_tvalid
	mac_rx_tready
	mac_rx_tlast

IP_complete_nomac

IP Layer signals	
	IP Layer signals
	ip_tx_start
	ip_tx
	ip_tx_result
	ip_tx_data_out_ready
	ip_rx_start
	ip_rx
System signals	
	rx_clk

Tabelle3

	tx_clk
	reset
	our_ip_address
	our_mac_address
	control
Status signals	
	arp_pkt_count
	ip_pkt_count
MAC Transmitter	
	mac_tx_tdata
	mac_tx_tvalid
	mac_tx_tready
	mac_tx_tfirst
	mac_tx_tlast
MAC Receiver	
	mac_rx_tdata
	mac_rx_tvalid
	mac_rx_tready
	mac_rx_tlast

UDP_TX

UDP Layer signals	
	udp_tx_start
	udp_txi
	udp_tx_result
	udp_tx_data_out_ready
system signals	
	clk
	reset
IP layer TX signals	
	ip_tx_start
	ip_tx
	ip_tx_result
	ip_tx_data_out_ready

UDP_RX

UDP Layer signals	
	udp_rx_start
	udp_rxo
System signals	
	clk
	reset
IP layer RX signals	
	ip_rx_start
	ip_rx

IPv4

IP Layer signals	
	ip_tx_start
	ip_tx
	ip_tx_result
	ip_tx_data_out_ready
	ip_rx_start
	ip_rx
System control signals	
	rx_clk
	tx_clk
	reset
	our_ip_address
	our_mac_address
System status signals	
	rx_pkt_count
ARP lookup signals	
	arp_req_req
	arp_req_rslt
MAC layer RX signals	
	mac_data_in
	mac_data_in_valid
	mac_data_in_last
MAC layer TX signals	
	mac_tx_req
	mac_tx_granted
	mac_data_out_ready
	mac_data_out_valid
	mac_data_out_first
	mac_data_out_last
	mac_data_out

ARP

Lookup request signals	
	arp_req_req
	arp_req_rslt
MAC layer RX signals	
	data_in_clk
	reset
	data_in
	data_in_valid
	data_in_last
MAC layer TX signals	
	mac_tx_req
	mac_tx_granted
	data_out_clk
	data_out_ready

Tabelle3

	data_out_valid
	data_out_first
	data_out_last
	data_out
lookup request signals	
	our_mac_address
	our_ip_address
	control
	req_count

tx_arbitrator

	clk
	reset
	req_1
	grant_1
	data_1
	valid_1
	first_1
	last_1
	req_2
	grant_2
	data_2
	valid_2
	first_2
	last_2
	data
	valid
	first

in std_logic
in udp_tx_type
out std_logic_vector (1 downto 0)
out std_logic
out std_logic
out udp_rx_type
out ipv4_rx_header_type
in STD_LOGIC
in STD_LOGIC
in STD_LOGIC
in STD_LOGIC_VECTOR (31 downto 0)
in std_logic_vector (47 downto 0)
in udp_control_type
out STD_LOGIC_VECTOR(7 downto 0)
out STD_LOGIC_VECTOR(7 downto 0)
out std_logic_vector(7 downto 0)
out std_logic
in std_logic
out std_logic
out std_logic
in std_logic_vector(7 downto 0)
in std_logic
out std_logic
in std_logic

in std_logic
in ipv4_tx_type
out std_logic_vector (1 downto 0)
out std_logic
out std_logic
out ipv4_rx_type
in std_logic

in std_logic
in std_logic
in std_logic_vector (31 downto 0)
in std_logic_vector (47 downto 0)
in ip_control_type
out std_logic_vector(7 downto 0)
out std_logic_vector(7 downto 0)
out std_logic_vector(7 downto 0)
out std_logic
in std_logic
out std_logic
out std_logic
in std_logic_vector(7 downto 0)
in std_logic
out std_logic
in std_logic
in std_logic
in udp_tx_type
out std_logic_vector (1 downto 0)
out std_logic
in STD_LOGIC
in STD_LOGIC
out std_logic
out ipv4_tx_type
in std_logic_vector (1 downto 0)
in std_logic
udp_rx_start
udp_rxo
clk
reset
ip_rx_start
ip_rx

in std_logic
in ipv4_tx_type
out std_logic_vector (1 downto 0)
out std_logic
out std_logic
out ipv4_rx_type
in STD_LOGIC
in STD_LOGIC
in STD_LOGIC
in STD_LOGIC_VECTOR (31 downto 0)
in std_logic_vector (47 downto 0)
out STD_LOGIC_VECTOR(7 downto 0)
out arp_req_req_type
in arp_req_rslt_type
in STD_LOGIC_VECTOR (7 downto 0)
in STD_LOGIC
in STD_LOGIC
out std_logic
in std_logic
in std_logic
out std_logic
out std_logic
out std_logic
out std_logic_vector (7 downto 0)

in arp_req_req_type
out arp_req_rslt_type
in std_logic
in std_logic
in std_logic_vector (7 downto 0)
in std_logic
in std_logic
out std_logic
in std_logic
in std_logic
in std_logic

Tabelle3

out std_logic
out std_logic
out std_logic
out std_logic_vector (7 downto 0)

in std_logic_vector (47 downto 0)
in std_logic_vector (31 downto 0)
in arp_control_type
out std_logic_vector(7 downto 0)

in std_logic
in std_logic

in std_logic
out std_logic
in std_logic_vector(7 downto 0)
in std_logic
in std_logic
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in std_logic
out std_logic
in std_logic_vector(7 downto 0)
in std_logic
in std_logic
in std_logic

out std_logic_vector(7 downto 0)
out std_logic
out std_logic

Tabelle3

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Tabelle3

IP tx

Tabelle3

Tabelle3

Tabelle3

cxns

Tabelle3

Tabelle3

Tabelle3