1. Description

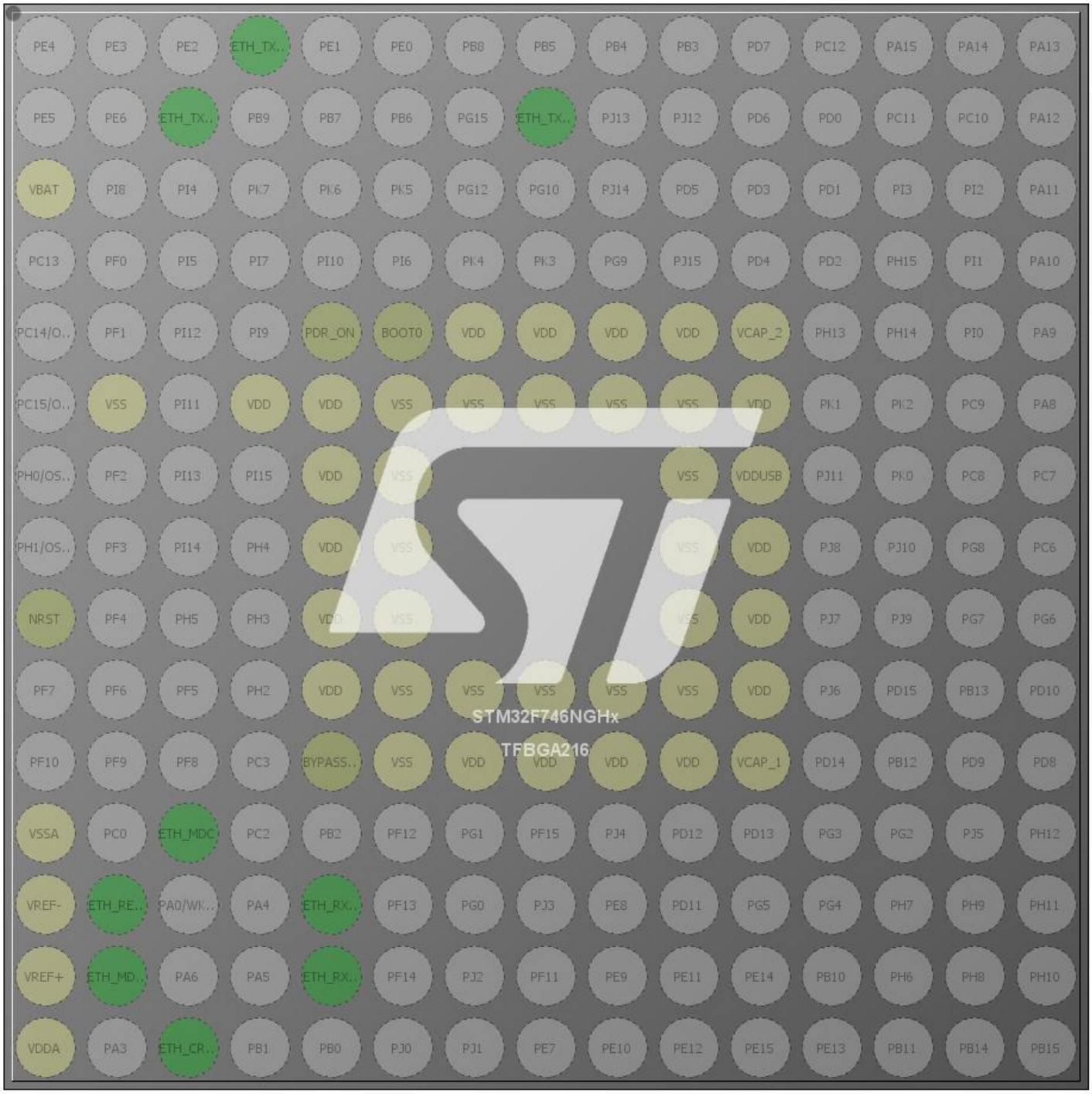
1.1. Project

Project Name	lwipBasic
Board Name	STM32F746G-DISCO
Generated with:	STM32CubeMX 4.16.1
Date	12/01/2016

1.2. MCU

MCU Series	STM32F7
MCU Line	STM32F7x6
MCU name	STM32F746NGHx
MCU Package	TFBGA216
MCU Pin number	216

2. Pinout Configuration

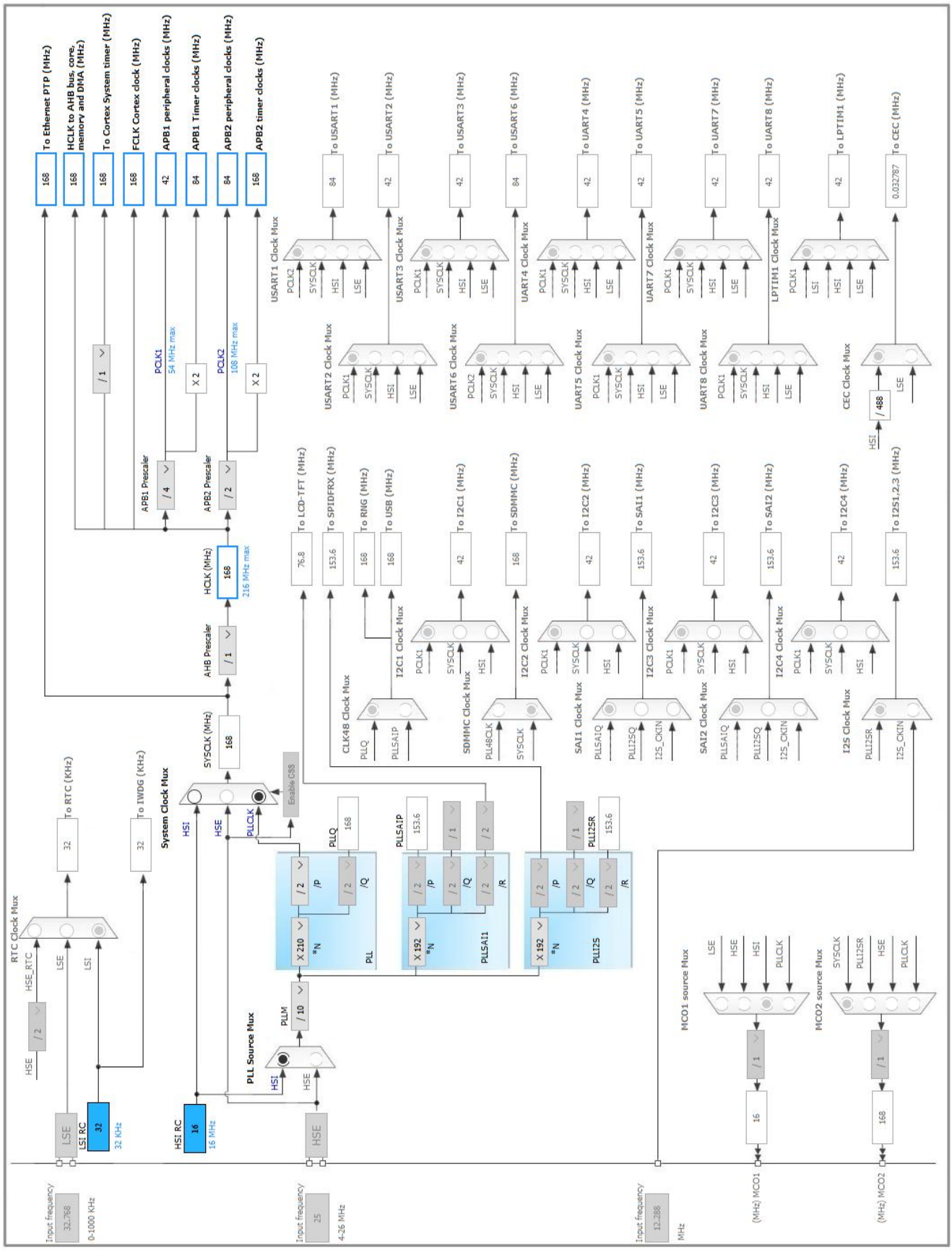


3. Pins Configuration

Pin Number TFBGA216	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
A4	PG14	I/O	ETH_TXD1	
B3	PG13	I/O	ETH_TXD0	
B8	PG11	I/O	ETH_TX_EN	
C1	VBAT	Power		
E5	PDR_ON	Reset		
E6	BOOT0	Boot		
E7	VDD	Power		
E8	VDD	Power		
E9	VDD	Power		
E10	VDD	Power		
E11	VCAP_2	Power		
F2	VSS	Power		
F4	VDD	Power		
F5	VDD	Power		
F6	VSS	Power		
F7	VSS	Power		
F8	VSS	Power		
F9	VSS	Power		
F10	VSS	Power		
F11	VDD	Power		
G5	VDD	Power		
G6	VSS	Power		
G10	VSS	Power		
G11	VDDUSB	Power		
H5	VDD	Power		
H6	VSS	Power		
H10	VSS	Power		
H11	VDD	Power		
J1	NRST	Reset		
J5	VDD	Power		
J6	VSS	Power		
J10	VSS	Power		
J11	VDD	Power		
K5	VDD	Power		
K6	VSS	Power		
K7	VSS	Power		

Pin Number TFBGA216	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
K8	VSS	Power		
K9	VSS	Power		
K10	VSS	Power		
K11	VDD	Power		
L5	BYPASS_REG	Reset		
L6	VSS	Power		
L7	VDD	Power		
L8	VDD	Power		
L9	VDD	Power		
L10	VDD	Power		
L11	VCAP_1	Power		
M1	VSSA	Power		
M3	PC1	I/O	ETH_MDC	
N1	VREF-	Power		
N2	PA1	I/O	ETH_REF_CLK	
N5	PC4	I/O	ETH_RXD0	
P1	VREF+	Power		
P2	PA2	I/O	ETH_MDIO	
P5	PC5	I/O	ETH_RXD1	
R1	VDDA	Power		
R3	PA7	I/O	ETH_CRS_DV	

4. Clock Tree Configuration



5. IPs and Middleware Configuration

5.1. ETH

Mode: RMII

5.1.1. Parameter Settings:

Advanced : Ethernet Media Configuration:

Auto Negotiation	Enabled

General : Ethernet Configuration:

Ethernet MAC Address	00:80:E1:00:00:00
PHY Address	**0 ***

Ethernet Basic Configuration:

Rx Mode	Polling Mode
TX IP Header Checksum Computation	By hardware

5.1.2. Advanced Parameters:

External PHY Configuration:

PHY Address Name	DP83848_PHY_ADDRESS
PHY Address Value	0
PHY Reset delay these values are based on a 1 ms Systick interrupt	**0x000000FF ***
PHY Configuration delay	**0x00000FFF ***
PHY Read TimeOut	**0x0000FFFF ***
PHY Write TimeOut	**0x0000FFFF ***

Common : External PHY Configuration:

Transceiver Basic Control Register	**0x00 ***
Transceiver Basic Status Register	**0x01 ***
PHY Reset	**0x8000 ***
Select loop-back mode	**0x4000 ***
Set the full-duplex mode at 100 Mb/s	**0x2100 ***
Set the half-duplex mode at 100 Mb/s	**0x2000 ***
Set the full-duplex mode at 10 Mb/s	**0x0100 ***
Set the half-duplex mode at 10 Mb/s	**0x0000 ***
Enable auto-negotiation function	**0x1000 ***

Restart auto-negotiation function	**0x0200 ***
Select the power down mode	**0x0800 ***
Isolate PHY from MII	**0x0400 ***
Auto-Negotiation process completed	**0x0020 ***
Valid link established	**0x0004 ***
Jabber condition detected	**0x0002 ***

Extended : External PHY Configuration:

PHY status register Offset	**0x10 ***
MII Interrupt Control Register	**0x11 ***
MII Interrupt Status and Misc. Control Register	**0x12 ***
PHY Link mask	**0x0001 ***
PHY Speed mask	**0x0002 ***
PHY Duplex mask	**0x0004 ***
PHY Enable interrupts	**0x0002 ***
PHY Enable output interrupt events	**0x0001 ***
Enable Interrupt on change of link status	**0x0020 ***
HY link status interrupt mask	**0x2000 ***

5.2. SYS

Timebase Source: SysTick

5.3. LWIP

mode: Enabled

Advanced parameters are not listed except if modified by user.

5.3.1. General Settings:

LwIP Version:

LwIP Version (Version of LwIP supported by CubeMX ** CubeMX specific **)	1.5.0_RC0_20160211

DHCP Option:

LWIP_DHCP (DHCP Module)	**Disabled ***

IP Address Settings:

IP_ADDRESS (IP Address)	**192.168.010.010 ***
NETMASK_ADDRESS (Netmask Address)	**255.255.255.000 ***
GATEWAY_ADDRESS (Gateway Address)	000.000.000.000

RTOS Settings:

WITH_RTOS (Use FREERTOS ** CubeMX specific **)	Disabled

Protocols Options:

LWIP_ICMP (ICMP Module Activation)	Enabled
LWIP_IGMP (IGMP Module)	Disabled
LWIP_DNS (DNS Module)	Disabled
LWIP_UDP (UDP Module)	Enabled
MEMP_NUM_UDP_PCB (Number of UDP Connections)	4
LWIP_TCP (TCP Module)	Enabled
MEMP_NUM_TCP_PCB (Number of TCP Connections)	5

5.3.2. Key Options:

Platform Specific Locking:

SYS_LIGHTWEIGHT_PROT (Memory Functions Protection)	Disabled
NO_SYS (LwIP Facilities)	LwIP Facilities Disabled
NO_SYS_NO_TIMERS (Drop Support For sys_timeout)	Disabled

Memory Options:

MEM_SIZE (Heap Memory Size)	1600

Internal Memory Pool Sizes:

MEMP_NUM_PBUF (Number of Memory Pool struct Pbufs)	16
MEMP_NUM_RAW_PCB (Number of Raw Protocol Control Blocks)	4
MEMP_NUM_TCP_PCB_LISTEN (Number of Listening TCP Connections)	8
MEMP_NUM_TCP_SEG (Number of TCP Segments simultaneously queued)	16
MEMP_NUM_LOCALHOSTLIST (Number of Host Entries in the Local Host List)	1

Pbuf Options:

PBUF_POOL_SIZE (Number of Buffers in the Pbuf Pool)	16
PBUF_POOL_BUFSIZE (Size of each pbuf in the pbuf pool)	592

ARP Options:

LWIP_ARP (ARP Functionality)	Enabled

TCP Options:

TCP_TTL (Number of Time-To-Live Used by TCP Packets)	255
TCP_WND (TCP Receive Window Maximum Size)	2144
TCP_QUEUE_OOSEQ (Allow Out-Of-Order Incoming Packets)	Enabled
TCP_MSS (Maximum Segment Size)	536
TCP_SND_BUF (TCP Sender Buffer Space)	1072
TCP_SND_QUEUELEN (Number of Packet Buffers Allowed for TCP Sender)	9

Network Interfaces Options:

LWIP_NETIF_STATUS_CALLBACK (Callback Function on Interface Status Changes)	Disabled
LWIP_NETIF_LINK_CALLBACK (Callback Function on Interface Link Changes)	Disabled
LWIP_NETIF_LOOPBACK (NETIF Loopback)	Disabled

Socket Options:

LWIP_SOCKET (Socket API)	Disabled

5.3.3. IPv6:

IPv6 Options:

LWIP_IPV6 (IPv6 Protocol)	Disabled

5.3.4. HTTPD:

HTTPD Options:

LWIP_HTTPD (LwIP HTTPD Support ** CubeMX specific **)	Disabled

5.3.5. SNMP:

SNMP Options:

LWIP_SNMP (LwIP SNMP Agent)	Disabled

5.3.6. SNTP:

SNTP Options:

LWIP_SNTP (LWIP SNTP Support ** CubeMX specific **)	Disabled

5.3.7. Perf/Checks:

Sanity Checks:

LWIP_DISABLE_TCP_SANITY_CHECKS (TCP Sanity Checks)	Disabled
LWIP_DISABLE_MEMP_SANITY_CHECKS (MEMP Sanity Checks)	Disabled

Performance Options:

LWIP_PERF (Performace Testing for LwIP)	Disabled

5.3.8. Statistics:

Statistics Options:

LWIP_STATS (Statictics Collection)	Disabled

5.3.9. Checksum:

Checksum Options:

CHECKSUM_BY_HARDWARE (Hardware Checksum ** CubeMX specific **)	Disabled
LWIP_CHECKSUM_CTRL_PER_NETIF (Generate/Check Checksum per Netif)	Disabled
CHECKSUM_GEN_IP (Generate Software Checksum for Outgoing IP Packets)	Disabled
CHECKSUM_GEN_UDP (Generate Software Checksum for Outgoing UDP Packets)	Disabled
CHECKSUM_GEN_TCP (Generate Software Checksum for Outgoing TCP Packets)	Disabled
CHECKSUM_GEN_ICMP (Generate Software Checksum for Outgoing ICMP Packets)	Disabled
CHECKSUM_GEN_ICMP6 (Generate Software Checksum for Outgoing ICMP6 Packets)	Disabled
CHECKSUM_CHECK_IP (Generate Software Checksum for Incoming IP Packets)	Disabled
CHECKSUM_CHECK_UDP (Generate Software Checksum for Incoming UDP Packets)	Disabled
CHECKSUM_CHECK_TCP (Generate Software Checksum for Incoming TCP Packets)	Disabled
CHECKSUM_CHECK_ICMP (Generate Software Checksum for Incoming ICMP Packets)	Disabled
CHECKSUM_CHECK_ICMP6 (Generate Software Checksum for Incoming ICMP6 Packets)	Disabled

5.3.10. Debug:

Debugging Options:

LWIP_DBG_MIN_LEVEL (Minimum Level)	All

*** User modified value**

6. System Configuration

6.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
ETH	PG14	ETH_TXD1	Alternate Function Push Pull	No pull-up and no pull-down	**Very High** *	
	PG13	ETH_TXD0	Alternate Function Push Pull	No pull-up and no pull-down	**Very High** *	
	PG11	ETH_TX_EN	Alternate Function Push Pull	No pull-up and no pull-down	**Very High** *	
	PC1	ETH_MDC	Alternate Function Push Pull	No pull-up and no pull-down	**Very High** *	
	PA1	ETH_REF_CLK	Alternate Function Push Pull	No pull-up and no pull-down	**Very High** *	
	PC4	ETH_RXD0	Alternate Function Push Pull	No pull-up and no pull-down	**Very High** *	
	PA2	ETH_MDIO	Alternate Function Push Pull	No pull-up and no pull-down	**Very High** *	
	PC5	ETH_RXD1	Alternate Function Push Pull	No pull-up and no pull-down	**Very High** *	
	PA7	ETH_CRS_DV	Alternate Function Push Pull	No pull-up and no pull-down	**Very High** *	

6.2. DMA configuration

nothing configured in DMA service

6.3. NVIC configuration

Interrupt Table	Enable	Preenmption Priority	SubPriority
Non maskable interrupt	true	0	0
Hard fault interrupt	true	0	0
Memory management fault	true	0	0
Pre-fetch fault, memory access fault	true	0	0
Undefined instruction or illegal state	true	0	0
System service call via SWI instruction	true	0	0
Debug monitor	true	0	0
Pendable request for system service	true	0	0
System tick timer	true	0	0
PVD interrupt through EXTI line 16	unused		
Flash global interrupt	unused		
RCC global interrupt	unused		
Ethernet global interrupt	unused		
Ethernet wake-up interrupt through EXTI line 19	unused		
FPU global interrupt	unused		

*** User modified value**

7. Power Consumption Calculator report

7.1. Microcontroller Selection

Series	STM32F7
Line	STM32F7x6
MCU	STM32F746NGHx
Datasheet	027590_Rev4

7.2. Parameter Selection

Temperature	25
Vdd	3.3

8. Software Project

8.1. Project Settings

Name	Value
Project Name	lwipBasic
Project Folder	C:\Users\Gebruiker\Desktop\Embedded_systems\workspace\lwipBasic
Toolchain / IDE	SW4STM32
Firmware Package Name and Version	STM32Cube FW_F7 V1.4.1

8.2. Code Generation Settings

Name	Value
STM32Cube Firmware Library Package	Copy only the necessary library files
Generate peripheral initialization as a pair of '.c/.h' files	No
Backup previously generated files when re-generating	No
Delete previously generated files when not re-generated	Yes
Set all free pins as analog (to optimize the power consumption)	No