Hello.

I want to make an UDP communication using my STM32F407 based board, where the PC forms the server side.

I checked most of the posts related to the Ethernet+F407 topic, but could not find any comments that could have lead me in the right direction. The most relevant discussion is this one: discussion link , however there the standard peripheral library was finally chosen which solved the problem.

In the following i mention all the steps i made.

0) STM32F4xx_Ethernet_Example\udp_echo_client project works fine, i tested using the echotool.exe software provided in the STM32F4DIS-BB zip package. The problem is that it is based on the SPL, but so far i was working with HAL therefore i would not like to switch back to the old one.

1) i downloaded the latest STM32Cube package, and tried to modify
the STM324xG_EVAL\LwIP_UDP_Echo_Client project using the parameters applied in the STM32F4DIS-BB example, these are

2) Project options were changed to 407VGTx, 8Mhz, ST-Link Debugger
3) in the main.h file i modified (IP of the PC: 192.168.0.18)
a. #define DEST_IP_ADDR3 18
b. #define GW_ADDR3 18
4) in the ethernetif.c file i modified the complete HAL_ETH_MspInit function to

```
void HAL_ETH_MspInit(ETH_HandleTypeDef *heth)
{
  GPIO_InitTypeDef GPIO_InitStructure;

  /* Enable GPIOs clocks */
  __HAL_RCC_GPIOA_CLK_ENABLE();
  __HAL_RCC_GPIOB_CLK_ENABLE();
  __HAL_RCC_GPIOC_CLK_ENABLE();
  __HAL_RCC_GPIOD_CLK_ENABLE();
  __HAL_RCC_GPIOE_CLK_ENABLE();

    /* Enable SYSCFG clock */
    __HAL_RCC_SYSCFG_CLK_ENABLE();

    /* Ethernet pins configuration ************************************************/
  /*
        ETH_RMII_REF_CLK-------> PA1 - ok
        ETH_MDIO --------------> PA2 - ok
        ETH_RMII_CRS_DV -------> PA7 - ok

                ETH_MDC ----------------> PC1 - ok
        ETH_RMII_RXD0   -------> PC4 - ok
        ETH_RMII_RXD1   -------> PC5 - ok

                ETH_RMII_TX_EN  -------> PB11 - ok
        ETH_RMII_TXD0   -------> PB12 - ok
        ETH_RMII_TXD1   -------> PB13 - ok

        ETH_RST_PIN     -------> PE2 - ok
  */

  /* Configure PA1, PA2 , PA7 */
  GPIO_InitStructure.Pin = GPIO_PIN_1 | GPIO_PIN_2 | GPIO_PIN_7;
  GPIO_InitStructure.Speed = GPIO_SPEED_HIGH;
  GPIO_InitStructure.Mode = GPIO_MODE_AF_PP;
  GPIO_InitStructure.Pull = GPIO_NOPULL;
  GPIO_InitStructure.Alternate = GPIO_AF11_ETH;
  HAL_GPIO_Init(GPIOA, &GPIO_InitStructure);
```

```
  /* Configure PB11,PB12 and PB13 */
  GPIO_InitStructure.Pin = GPIO_PIN_11 | GPIO_PIN_12 | GPIO_PIN_13;
  HAL_GPIO_Init(GPIOB, &GPIO_InitStructure);

  /* Configure PC1, PC4 and PC5 */
  GPIO_InitStructure.Pin = GPIO_PIN_1 | GPIO_PIN_4 | GPIO_PIN_5;
  HAL_GPIO_Init(GPIOC, &GPIO_InitStructure);

    /* Configure the PHY RST  pin */
    GPIO_InitStructure.Pin = GPIO_PIN_2;
    GPIO_InitStructure.Mode = GPIO_MODE_OUTPUT_PP;
    GPIO_InitStructure.Pull = GPIO_PULLUP;
    GPIO_InitStructure.Speed = GPIO_SPEED_FAST;
    HAL_GPIO_Init(GPIOE, &GPIO_InitStructure);

    HAL_GPIO_WritePin(GPIOE,GPIO_PIN_2, GPIO_PIN_RESET);
    HAL_Delay(100);
  HAL_GPIO_WritePin(GPIOE,GPIO_PIN_2,   GPIO_PIN_SET);
    HAL_Delay(100);

  /* Enable ETHERNET clock  */
  __HAL_RCC_ETH_CLK_ENABLE();
}
```

5) I modified the following in the low_level_init function:
EthHandle.Init.MediaInterface = ETH_MEDIA_INTERFACE_RMII;
EthHandle.Init.PhyAddress = 0x01;
6) I also updated the stm32f4xx_hal_conf.h file according to the stm32f4x7_eth_conf.h of STM32F4DIS-BB project, however the most of them were left unchanged since in the former STL based project those were not used (such as for example the PHY_AUTONEGOTIATION). Here i also observed that the PHY_RESET_DELAY and PHY_CONFIG_DELAY values are quite big, later i changed back these to the original values.

```
/* ################## Ethernet peripheral configuration ##################### */

/* Section 1 : Ethernet peripheral configuration */

/* MAC ADDRESS: MAC_ADDR0:MAC_ADDR1:MAC_ADDR2:MAC_ADDR3:MAC_ADDR4:MAC_ADDR5 */
#define MAC_ADDR0   2
#define MAC_ADDR1   0
#define MAC_ADDR2   0
#define MAC_ADDR3   0
#define MAC_ADDR4   0
#define MAC_ADDR5   0

/* Definition of the Ethernet driver buffers size and count */
#define ETH_RX_BUF_SIZE                ETH_MAX_PACKET_SIZE /* buffer size for receive
*/
#define ETH_TX_BUF_SIZE                ETH_MAX_PACKET_SIZE /* buffer size for transmit
*/
#define ETH_RXBUFNB                    ((uint32_t)4)       /* 4 Rx buffers of size ETH_RX_BUF_SIZE
*/
#define ETH_TXBUFNB                    ((uint32_t)4)       /* 4 Tx buffers of size ETH_TX_BUF_SIZE
*/

/* Section 2: PHY configuration section */

/* DP83848 PHY Address*/
#define DP83848_PHY_ADDRESS             0x01
/* PHY Reset delay these values are based on a 1 ms Systick interrupt*/
#define PHY_RESET_DELAY    ((uint32_t)0x000FFFFF)
/* PHY Configuration delay */
#define PHY_CONFIG_DELAY   ((uint32_t)0x00FFFFFF)

#define PHY_READ_TO                     ((uint32_t)0x0000FFFF)
#define PHY_WRITE_TO                    ((uint32_t)0x0000FFFF)

/* Section 3: Common PHY Registers */
```

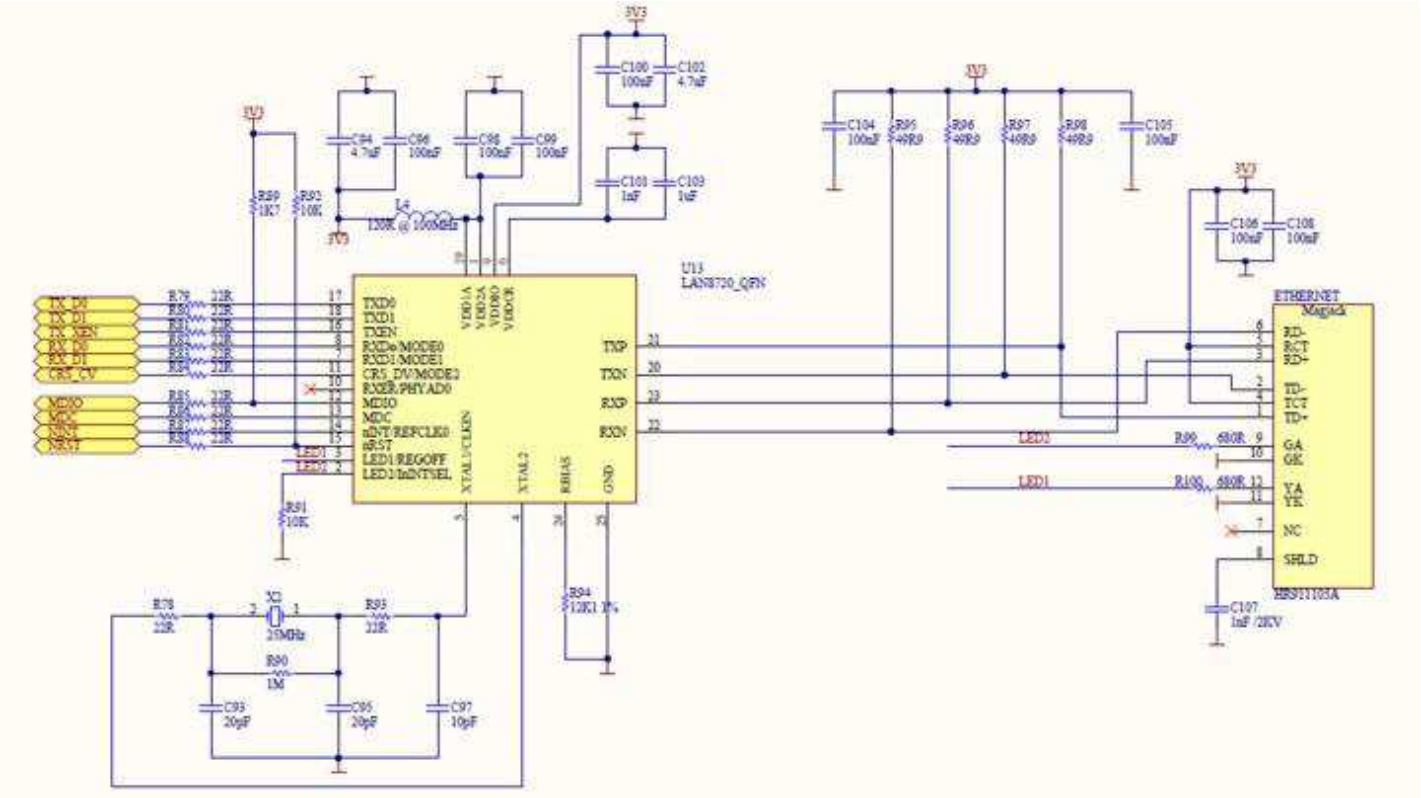
```
#define PHY_BCR                          ((uint16_t)0x00)    /*!< Transceiver Basic Control
Register   - ok */
#define PHY_BSR                          ((uint16_t)0x01)    /*!< Transceiver Basic Status
Register    - ok */

#define PHY_RESET                        ((uint16_t)0x8000)  /*!< PHY
Reset                                                       - ok */
#define PHY_LOOPBACK                     ((uint16_t)0x4000)  /*!< Select loop-back
mode                                - ok*/
#define PHY_FULLDUPLEX_100M              (18)
#define PHY_HALFDUPLEX_100M              (8)
#define PHY_FULLDUPLEX_10M               (14)
#define PHY_HALFDUPLEX_10M               (4)
#define PHY_AUTONEGOTIATION              ((uint16_t)0x1000)  /*!< Enable auto-negotiation
function     */
#define PHY_RESTART_AUTONEGOTIATION      ((uint16_t)0x0200)  /*!< Restart auto-negotiation
function    */
#define PHY_POWERDOWN                    ((uint16_t)0x0800)  /*!< Select the power down
mode           */
#define PHY_ISOLATE                      ((uint16_t)0x0400)  /*!< Isolate PHY from
MII                */

#define PHY_AUTONEGO_COMPLETE            ((uint16_t)0x0020)  /*!< Auto-Negotiation process
completed   */
#define PHY_LINKED_STATUS                ((uint16_t)0x0004)  /*!< Valid link
established               */
#define PHY_JABBER_DETECTION             ((uint16_t)0x0002)  /*!< Jabber condition
detected            */

/* Section 4: Extended PHY Registers */

#define PHY_SR    ((uint16_t)31) /* Value for DP83848 PHY */
#define PHY_MICR                         ((uint16_t)0x11)    /*!< MII Interrupt Control
Register                  */
#define PHY_MISR                         ((uint16_t)0x12)    /*!< MII Interrupt Status and Misc.
Control Register */

#define PHY_LINK_STATUS                  ((uint16_t)0x0001)  /*!< PHY Link
mask                                    */
#define PHY_SPEED_STATUS                 ((uint16_t)0x0002)  /*!< PHY Speed
mask                                   */
#define PHY_DUPLEX_STATUS                ((uint16_t)0x001C)



#define PHY_MICR_INT_EN                  ((uint16_t)0x0002)  /*!< PHY Enable
interrupts                            */
#define PHY_MICR_INT_OE                  ((uint16_t)0x0001)  /*!< PHY Enable output interrupt
events              */

#define PHY_MISR_LINK_INT_EN             ((uint16_t)0x0020U)  /*!< Enable Interrupt on change of
link status       */
#define PHY_LINK_INTERRUPT               ((uint16_t)0x2000U)  /*!< PHY link status interrupt
mask                   */
```

7) In the main.c file i changed the clock configuration to RCC_OscInitStruct.PLL.PLLM = 8; since 8MHz oscillator is used. I also commented out the BSP_Config() and HAL_GPIO_EXTI_Callback functions. Therefore the main looks like this

```
int main(void)
{
  HAL_Init();

  /* Configure the system clock to 168 MHz */
  SystemClock_Config();

   /* Initialize the LwIP stack */
  lwip_init();
```

```
  /* Configure the Network interface */
  Netif_Config();

  /* udp client connect */
  udp_echoclient_connect();

  udp_echoclient_send();

  /* Notify user about the network interface config */
  User_notification(&gnetif);

  /* Infinite loop */
  while (1)
  {
    /* Read a received packet from the Ethernet buffers and send it
       to the lwIP for handling */
    ethernetif_input(&gnetif);

    /* Handle timeouts */
    sys_check_timeouts();
  }
}
```

Compiled and loaded it, started the echootool with /p udp /s commands, however i was unable to get the communication between the PC and the board. Here is the schematic i used to interface the MCU:



Any tips? Is there anyone who could help me? Anyone who faced the same problem?

Thank you in advance.
Best regards,
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