Redes I

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Documentação da camada física

A camada física foi implementada em python, e consta com as classes: client.py, server.py, frame.py e utils.

O projeto segue o seguinte fluxo:

- 1 O servidor fica escutando em uma porta, esperando por uma conexão do cliente;
- 2 O cliente recebe a mensagem a ser enviada do usuário, juntamente com o ip de destino, monta um frame em modo de leitura humana, salva, converte para binário (através da função string2bits) e também o salva;
- 3 O frame convertido é enviado para o servidor através da conexão aberta previamente. O cliente fecha o seu envio de mensagens (para evitar um *bug* de razão desconhecida);
- 4 O servidor lê o frame recebido e o salva em um arquivo;
- 5 O frame salvo é lido e desconvertido para o modo de leitura humana (através da função bits2string). A mensagem desconvertida é salva em um arquivo;
- 6 O servidor então envia uma mensagem ('Recebido!') para o cliente através da conexão aberta. Essa mensagem é previamente salva num frame (arquivo) em modo de leitura humana, depois é convertida para binário e salva em outro arquivo, então é enviada ao cliente.
- 7 O cliente recebe a mensagem binária do servidor, escreve a mensagem num arquivo em modo de leitura humana, desconverte-a, salva em outro arquivo e exibe para o usuário.

As mensagens enviadas e recebidas são armazenadas em arquivos nas pastas *sent* e *received*, respectivamente, de cada processo (cliente e servidor). O arquivo em formato de leitura humana tem por nome *frame.txt* e o em formato binário é chamado por *bin-frame.txt*.

API Documentation

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September 6, 2019

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Class client Module client

1 Module client

1.1 Variables

Name	Description
package	Value: None

1.2 Class client

object — client.client

Defines client class

1.2.1 Methods

init(self)
Defines default constructor for client class
Overrides: objectinit

receiveFromAbove(self, connectionSocket, ipAddr, message)

Receives message and destination ip from upper layers, put it into a frame, save this frame and convert it to binary-mode. The converted frame is also saved and fowarded to sendToServer method.

receiveFromServer(self, connection)

Receives binary frame from server and sends it to upper layers

sendToAbove(self, cvtdPDUPath)

Sends given frame (which path is pointed by cvtdPDUPath) to upper layers

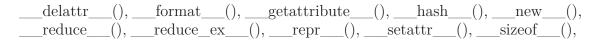
 ${\bf sendToServer}(\textit{self}, \textit{connection}, \textit{payloadSize}, \textit{cvtdPDUFile})$

Sends to server addressed by connection the converted PDU File cvtdPDUFile with payload size of payloadSize

connectToServer(self, ipAddr, port)

Returns socket connection with given ip in the given port

Inherited from object



 $__str__(), __subclasshook__()$

1.2.2 Properties

Name	Description
Inherited from object	
class	

Class frame Module frame

2 Module frame

2.1 Variables

Name	Description			
package	Value: None			

2.2 Class frame



Defines a Ethernet frame with MAC addresses for destine, origin, payload's size and payload

2.2.1 Methods

init(self, destMACAddr, origMACAddr, message, payloadSize=0, payloadStrSize=',', frameType=',')				
Defines frame's default construct				
Overrides: objectinit				

readPDU(self, pathDesired)

Reads file indicated by pathDesired and populates the frame object with data obtained from the file

```
\mathbf{writePDU}(\mathit{self}, \mathit{pathDesired})
```

Writes original or converted PDU to disk in the pathDesired location

convertPDU(self)

Returns frame object in simulated binary way

${\bf deconvertPDU}(\mathit{self})$

Converts frame from binary to human readable format

$Inherited\ from\ object$



Class frame Module frame

$$__str__(), __subclasshook__()$$

2.2.2 Properties

Name	Description
Inherited from object	
class	

2.2.3 Class Variables

Name	Description
HEADER_SIZE	Value: 112
MAX_PAYLOAD_SIZE	Value: 1500

Class server Module server

3 Module server

3.1 Variables

Name	Description
package	Value: None

3.2 Class server



Defines a server class

3.2.1 Methods

init(self)				
Defines server's default constructor				
Overrides: objectinit				

receiveFromAbove(self, connectionSocket, ipAddr, message)

Receives message from upper layer, saves it as human readable and binary frames and send it to client

receiveFromClient(self, clientSocket)

Returns the frame data received from client as file

 $\mathbf{sendToAbove}(\mathit{self}, \ \mathit{cvtdPDUPath})$

Sends message received from client to the upper layer

 $\mathbf{sendToClient}(self,\ connection,\ payloadSize,\ cvtdPDUFile)$

Sends binary frame to client

 $\mathbf{run}(self)$

Turns server's socket binded to hostname and PORT and that listens to up to one connections

Class server Module server

Inherited fro	т објест
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delattr(),	_format()),ge	etattribu	ıte((),hash	(), _	new_	()
reduce(),	_reduce_ex_	(), _	repr	_(), _	_setattr	_(),	_sizeof	_(),
str(),sul	bclasshook	()						

3.2.2 Properties

Name	Description
Inherited from object	
class	

Variables Module util

4 Module util

4.1 Functions

$\mathbf{ping}(ipAddr)$

Returns if ping command was successful for given ipAddr

$\mathbf{genMACAddr}(ipAddr)$

Tests if the given ipAddr is on the local network and returns the MAC Address of the respective device

string2bits(s=', fill=8)

Converts given string to the respective ascii-binary version (using 8 bits)

bits2string(b=None)

Converts given ascii-binary string to the respective ascii version (using 8 bits)

calcCollisionProb(down, up)

Return if there is a collision for given interval

4.2 Variables

Name	Description
package	Value: None

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