

Relatório de Redes de Computadores

2º Trabalho Laboratorial

Luiz Henrique Mamede Queiroz	202102362
David José Prata Barbedo Magalhães	201907075

Sumário

Esse trabalho laboratorial foi elaborado para o curso de Redes de Computadores e tem como objetivo o desenvolvimento de uma aplicação de download que utiliza o protocolo FTP e a configuração e análise de uma rede de computadores.

Ao realizar esse projeto, os conhecimentos adquiridos nas aulas teóricas do curso puderam ser aplicados para implementar o programa conforme o protocolo mencionado e para configurar a rede conforme requerido.

Introdução

Este projeto foi desenvolvido com o propósito de criar e testar um programa de download que utiliza o protocolo FTP, além de configurar uma rede de computadores conforme as diretrizes estabelecidas no guião fornecido. O relatório está organizado da seguinte forma:

1. Introdução
2. Parte 1 – Aplicação Download
3. Parte 2 – Configuração e Análise de rede
4. Conclusão
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Parte 1- Aplicação Download

Arquitetura da aplicação Download:

A aplicação é projetada para fazer o download de um ficheiro a partir de um servidor FTP especificado como argumento da função. É suportado o modo passivo para a transferência de dados e inclui funções para fazer parse da FTP URL, estabelecer tanto a conexão de controlo quando de dados, fazer a autenticação, entrar em modo passivo, requerer a transferência de ficheiro e lidar com as respostas do servidor.

Estrutura Geral: São utilizados 2 ficheiros, download.h e download.c. No download.h estão definidas as macros para tamanho de respostas e para códigos de resposta do servidor, estão definidas structs para o tipo de conexão (controlo ou dados), para o guardar informação da FTP URL (host, resource, filename, ip, user e password) e para o estado na obtenção da resposta do servidor (start, response para resposta única, responses para múltiplas respostas e end). Também estão declaradas as funções implementadas no ficheiro download.c. No ficheiro download.c está a implementação das funções.

FTP URL Parsing: A função 'parse' extrai a informação (user, password, host, resource) da FTP URL fornecida como argumento.

Operações com Socket: Funções relacionadas com socket ('getSocket', 'closeSocket') são responsáveis por criar e encerrar os sockets.

Estabelecimento de Conexão: A aplicação utiliza as funções 'connectToServer' para estabelecer conexão com o servidor através do socket. Ela utiliza 2 conexões. Uma de controlo (sockA) e outra para transferência de dados (sockB). A conexão de controlo é usada para fazer a autenticação no servidor através da função 'authToServer'. A conexão de dados é usada para a transferência dos dados.

Comandos FTP: A função 'sendToServer' é responsável por enviar os comandos FTP para o servidor.

Passive Mode: A função que lida com o modo passivo é a 'passiveMode' onde é requerido o modo passivo e é analisada a resposta retornada através da função 'parsePasvResponse' obtendo assim a porta e o server IP para a conexão de dados.

Transferência de Ficheiro: A transferência de ficheiro é feita primeiro com o pedido através da função 'requestFileTransfer' onde o comando requerendo a transferência é enviado ao servidor e depois o ficheiro é obtido com a função 'getFileTrans'.

Tratando Respostas: A função 'responseCode' analisa as respostas FTP do servidor e devolve através da variável response no argumento da função como também devolve o código da resposta como retorno da função. Essa função é implementada para lidar com múltiplas respostas também.

A aplicação funciona fazendo o parse da URL enviada como argumento na chamada do programa, obtém o IP com a função 'getIP' que precisa do hostname, cria dois sockets A e B, conecta o socketA ao servidor com o IP obtido utilizando a função 'connectToServer', depois faz a autenticação nesse server com a função 'authToServer', entra em modo passivo com a função 'passiveMode', conecta o socket B com o IP do servidor e porta obtidos na função 'passiveMode' utilizando a função 'connectToServer', então ela faz o pedido de transferência de arquivo com a função 'requestFileTransfer' e obtém o arquivo com a função 'getFileTransfer', encerra a conexão do socket A com o servidor com a função 'closeConnectionToServer' e por fim encerra a ligação dos sockets A e B com a função 'closeSocket'.

Usando a aplicação download:

Foram feitos vários testes para verificar se a aplicação estava funcionando corretamente. Em um dos testes foi utilizado a URL: <ftp://ftp.up.pt/pub/kodi/timestamp.txt>. Neste teste foi possível perceber que a aplicação conseguiu se conectar ao servidor, se autenticar em modo anônimo, obter o modo passivo, requerer a transferência de ficheiro, obter o ficheiro concluindo a transferência e encerrar a conexão com o servidor.

Isso ocorreu conforme mostrado na figura abaixo onde é possível verificar o download bem-sucedido do ficheiro timestamp.txt.

```
● (base) luizqueiroz@Luizs-Air rcom-proj2 % ./download ftp://ftp.up.pt/pub/kodi/timestamp.txt
220
331 Please specify the password.
230 Login successful.
227 Entering Passive Mode (193,137,29,15,224,17).
150 Opening BINARY mode data connection for pub/kodi/timestamp.txt (11 bytes).
226 Transfer complete.
221 Goodbye.
● (base) luizqueiroz@Luizs-Air rcom-proj2 % cat timestamp.txt
1703204401
```

Parte 2 – Configuração e Análise de Rede

Exp 1

1 - What are the commands required to configure this experience?

Os comandos requeridos são o `ifconfig ethX up` e `ifconfig ethX <IP>`

2 – What are the ARP packets and what are they used for?

São pacotes de rede que são usados para fazer o mapeamento de um endereço de IP com o endereço MAC dentro de uma rede local.

3 – What are the MAC and IP addresses of ARP packets and why?

Os endereços de IP são o 172.16.10.254 e 172.16.10.1 e os endereços MAC são 00:21:5a:61:2f:24 e 00:21:5a:61:2d:ef, respectivamente.

4 – What packets does the ping command generate?

Gera pacotes do tipo ICMP (Internet Control Message Protocol) para checar o alcance de um host numa rede.

5 – What are the MAC and IP addresses of the ping packets?

São os endereços de MAC e IP das máquinas TUX13 e TUX14, ou seja, IP -> 172.16.10.1 / MAC -> 00:21:5a:61:2f:24 e IP-> 172.16.10.254 / MAC -> 00:21:5a:61:2d:ef.

6 – How to determine if a receiving Ethernet frame is ARP, IP, ICMP?

No wireshark, na coluna protocol é designado o seu tipo. Isso pode ser visto pelo EtherType dentro do cabeçalho do frame para saber se é ARP ou IP e, se necessário, dentro do campo protocol para saber o tipo de protocolo.

7 – How to determine the length of a receiving frame?

No wireshark, na coluna length é possível. E no cabeçalho do frame, existe um campo para o tamanho.

8 – What is the loopback interface and why is it important?

É uma interface de rede virtual que permite que a máquina consiga se comunicar com ela mesma usando um endereço de IP. Ela é importante pois ajuda a validar o funcionamento da rede sem a necessidade de conexões de rede externas.

Exp 2

1 – How to configure bridgeY0?

Depois de adicionar a bridge com o comando `/interface bridge add name=bridgeY0`, é necessário remover as portas conectadas na bridge default para então adicionar as portas na bridgeY0. Isso é feito com os comandos `/interface bridge port remove [find interface=etherX]` e `/interface bridge port add bridge=bridgeY0 interface=etherX`.

2 – How many broadcast domains are there? How can you conclude it from the logs?

Existem 2 domínios de broadcast já que 2 bridges foram criadas. A partir dos logs, é possível ver que ao fazer ping -b 172.16.10.255 no TUX13, o ping do TUX13 obteve resposta do TUX14 mas não obteve

resposta do TUX12. E ao fazer ping -b 172.16.11.255 no TUX12, não se obtém resposta pois o TUX13 e TUX14 estão em outra bridge e logo em outro domínio de broadcast.

Exp 3

1 – What are the commands required to configure this experience?

Configurar eth1 do TUX14:

```
ifconfig eth1 up
```

```
ifconfig eth1 172.16.51.253/24
```

Adicionar a porta na bridge:

```
/interface bridge port remove [find interface=etherX]
```

```
/interface bridge port add bridge=bridge11 interface=etherX
```

Enable IP forwarding:

```
sysctl net.ipv4.ip_forward=1
```

Disable ICMP echo ignore broadcast:

```
sysctl net.ipv4.icmp_echo_ignore_broadcasts=0
```

Reconfigurar TUX13 e TUX12 para que eles possam alcançar um ao outro:

```
route add -net 172.16.10.0/24 gw 172.16.11.253
```

```
route add -net 172.16.11.0/24 gw 172.16.10.254
```

2 – What routes are there in the tuxes? What are their meaning?

Existem rotas com destino para 172.16.10.0 e para 172.16.11.0. Isso quer dizer que os TUX conseguem se alcançar, a diferença está no caminho que será percorrido, pois o TUX14 está ligado as duas bridges, logo ele funcionará como ponte para o TUX13 alcançar o TUX12 (pelo gateway 172.16.10.254) e vice-versa (pelo gateway 172.16.11.253).

3 – What information does an entry of the forwarding table contain?

Contém o endereço de destino, o gateway, a máscara, flags, métrica, ref, use e interface.

4 – What ARP messages, and associated MAC addresses, are observed and why?

É feito um ping do TUX13 para o TUX12, entretanto as ARP messages com os endereços MAC associados são do TUX13 e TUX14 e não do TUX12. Isso acontece por causa da rota feita que faz com que o TUX13 leve para o TUX14 (que é o gateway) e este leva para o TUX12, logo o TUX13 precisa do endereço MAC do TUX14 e não do TUX12.

5 – What ICMP packets are observed and why?

Os pacotes ICMP observados são os que tem como endereço de origem o TUX13 e como endereço de destino o TUX12 indicando que a rede está configurada corretamente.

6 – What are the IP and MAC addresses associated to ICMP packets and why?

O endereço de IP associado aos pacotes ICMP são os endereços de IP do TUX13 (origem) e do TUX12 (destino), entretanto o endereço MAC é do TUX14, pois é a máquina que faz a conexão entre as duas bridges.

Exp 4

1 – How to configure a static route in a commercial router?

Primeiro, se deve adicionar o router a rede interna através da bridge correspondente (como foi feito ao conectar o router a uma porta do Switch e configurar essa porta na bridge desejada), depois configurar o ip do router (tanto o interno quanto o externo) e, por fim, se necessário, adicionar a rota (no caso foi utilizado o comando `/ip route add dst-address=? gateway=?`)

2 – What are the paths followed by the packets in the experiments carried out and why?

Com a remoção da rota 172.16.10.0/24 pelo Tux14 no Tux12, os pacotes foram reencaminhados para o router, pois é a rota default do Tux12 e o router encaminhou os pacotes para o Tux13 passando pelo Tux14, pois ele tem essa rota.

Ao adicionar a rota 172.16.10.0/24 pelo Tux14 no Tux12, os pacotes foram encaminhados para o Tux14 e em seguida para o Tux13, pois a rota mais curta já estava disponível.

3 – How to configure NAT in a commercial router?

É possível utilizar no terminal do router o comando `/ip firewall nat remove 0`, para remover a NAT e utilizar o comando `/ip firewall nat add chain=srcnat action=masquerade out-interface=ether1` para configurar a NAT. Caso a NAT esteja desabilitada, utilizar o comando `/ip firewall nat enable 0` para habilitar a NAT.

4 – What does NAT do?

A NAT (Network Address Translation) é responsável por mapear os endereços de IP da rede privada para um único endereço de IP público. Dessa forma, se for necessário enviar um pacote para a rede externa, isso é feito usando o endereço público como origem. Desse modo, quando a máquina de destino responder, ela enviará a resposta para esse endereço público. Após isso, esse endereço público será traduzido de volta para o endereço privado que enviou o pacote. Assim, o número de endereços públicos utilizados pode ser reduzido.

Exp 5

1 – How to configure the DNS service in a host?

É possível configurar ao editar o ficheiro `/etc/resolv.conf` dos TUX com: `"nameserver <IP>"`

2 – What packets are exchanged by DNS and what information is transported?

São pacotes DNS que são trocados (DNS queries e DNS responses). A informação transportada é o mapeamento entre o hostname e o seu endereço de IP.

Exp 6

1 – How many TCP connections are opened by your FTP application?

2 conexões são abertas. Uma para controlo e outra para dados.

2 – In what connection is transported the FTP control information?

Na primeira conexão que é aberta, a conexão de controlo. Com ela é possível a troca de comandos e respostas do servidor.

3 – What are the phases of a TCP connection?

As fases são de estabelecimento de conexão, transferência de dados e encerramento de conexão.

4 – How does the ARQ TCP mechanism work? What are the relevant TCP fields? What relevant information can be observed in the logs?

O ARQ (Automatic Repeat Request) garante de forma confiável e ordenada a entrega de dados usando uma sequência de números, reconhecimentos, retransmissões e controle de fluxo. Primeiro, há a divisão de dados em segmentos que são atribuídos uma sequência de números, depois é feito o reconhecimento para estabelecer a conexão, depois é feita a transmissão dos segmentos de dados e o reconhecimento pelo receptor (o remetente acompanha os seguimentos que foram recebidos com sucesso e retransmite só os segmentos que não foram reconhecidos) e, por fim, a conexão é encerrada. Os campos TCP relevantes são source port, destination port, sequence number, acknowledgment number, data offset e control flags. Pode ser observada informações relativas a perda de pacotes através da sequência e reconhecimento dos números atribuídos aos segmentos de dados, como também de retransmissões e congestionamentos. Também pode ser observado as TCP Flags para saber o estado da conexão.

5 – How does the TCP congestion control mechanism work? What are the relevant fields. How did the throughput of the data connection evolve along the time? Is it according to the TCP congestion control mechanism?

Ele funciona administrando o fluxo de dados para evitar congestionamento e responder as condições da rede de forma efetiva. Para isso, ele usa mecanismos como slow start, congestion avoidance, fast retransmit, fast recovery e window scaling. Os campos relevantes são congestion window, slow start threshold, duplicate acknowledgments, sequence and acknowledgment number e round-trip time.

6 – Is the throughput of a TCP data connections disturbed by the appearance of a second TCP connection? How?

Sim, pois as conexões TCP compartilham a largura de banda, assim quando há múltiplas conexões, elas podem sofrer redução no throughput.

Conclusão

Neste trabalho, consolidamos os aprendizados com a implementação e teste do programa de download via FTP, assim como com a configuração detalhada da rede de computadores, conforme as orientações do guião.

Assim, foi possível aprender mais sobre protocolos de rede e aprofundar os conhecimentos em protocolos como FTP e TCP. Além disso, devido a parte de configuração de rede do trabalho, foi possível entender como se configura um IP, como se implementa uma bridge num Switch, como se configura um router em linux, como se configura um commercial router, como funciona a NAT e o DNS.

Referências

1. [Beej's Guide to Network Programming](#)
2. [Mikrotik RouterOS](#)
3. RFC959-FTP
4. RFC1738

Anexos

Anexo 1- Código da Aplicação Download

Ficheiro Download.h

```
#include <stdio.h>
#include <sys/socket.h>
#include <netinet/in.h>
#include <arpa/inet.h>
#include <stdlib.h>
#include <unistd.h>
#include <netdb.h>
#include <string.h>

#define BUFFER_SIZE 1024
#define MAX_SIZE 512

#define SERVER_FTP_PORT 21
```



```
#define SERVER_DATA_CONNECTION_OPENED 125
#define SERVER_DATA_CONNECTION 150
#define SERVER_WELCOME 220
#define SERVER_QUIT 221
#define SERVER_TRANSFER_COMPLETE 226
#define SERVER_PASSIVE_MODE 227
#define SERVER_LOGIN_SUCCESSFUL 230
#define SERVER_PASSWORD 331
```

```
enum Socket_type {
    controlo,
    dados,
};
```

```
enum State {
    START,
    RESPONSE,
    RESPONSES,
    END,
};
```

```
struct URL {
    char user[MAX_SIZE];
    char password[MAX_SIZE];
    char host[MAX_SIZE];
    char resource[MAX_SIZE];
    char filename[MAX_SIZE];
    char ip[MAX_SIZE];
};
```

```
int parse(char *parsing, struct URL *url);
```

```
int getSocket();
```

```
int closeSocket(int sockfd);
```

```

int closeConnectionToServer(int sockfd);

void handlingServerAddr(struct sockaddr_in *server_addr, char *server_address, int server_port);

int connectToServer(int sockfd, enum Socket_type type, char *server_address, int server_port);

int authToServer(int sockfd, char *user, char *password);

int sendToServer(int sockfd, char *buf);

int passiveMode(int sockfd, char *serverIP, int *port);

int responseCode(int sockfd, char *response);

int parsePasvResponse(char *response, char *serverIP, int *port);

int getHostEntry(char *host, struct hostent **h);

int getIP(char *host, char *ip);

int requestFileTransfer(int sockfd, char* resource);

int getFileTransfer(int sockfd1, int sockfd2, char *filename);

```

Ficheiro Download.c

```

#include "download.h"

int parse(char *parsing, struct URL *url) {
    if (sscanf(parsing, "ftp://%[^:]:%[^@]@%[/^\]*/%s",
        url->user,
        url->password,
        url->host,
        url->resource
    ) == 4) {

```

```

    } else if (sscanf(parsing, "ftp://%[^/]/%s",
        url->host,
        url->resource
    ) == 2) {
        strcpy(url->user, "anonymous");
        strcpy(url->password, "anonymous");
    } else {
        return -1;
    }

    char *last = strrchr(url->resource, '/');
    if (last != NULL) {
        strcpy(url->filename, last + 1);
    } else {
        strcpy(url->filename, url->resource);
    }

    return 0;
}

int getSocket() {
    int sockfd;

    if ((sockfd = socket(AF_INET, SOCK_STREAM, 0)) < 0) {
        perror("socket()");
        return -1;
    }

    return sockfd;
}

int closeSocket(int sockfd) {
    if (close(sockfd) < 0) {
        perror("close()");
        return -1;
    }
}

```

```

    return 0;
}

int closeConnectionToServer(int sockfd) {
    if (sendToServer(sockfd, "quit\r\n")) return -1;

    char response[BUFFER_SIZE];
    if (responseCode(sockfd, response) != SERVER_QUIT) return -1;

    return 0;
}

void handlingServerAddr(struct sockaddr_in *server_addr, char *server_address, int server_port) {
    bzero((char *) server_addr, sizeof(*server_addr));
    server_addr->sin_family = AF_INET;
    server_addr->sin_addr.s_addr = inet_addr(server_address);
    server_addr->sin_port = htons(server_port);
}

int connectToServer(int sockfd, enum Socket_type type, char *server_address, int server_port) {
    struct sockaddr_in server_addr;
    memset(&server_addr, 0, sizeof(server_addr));

    handlingServerAddr(&server_addr, server_address, server_port);

    if (connect(sockfd,
                (struct sockaddr *) &server_addr,
                sizeof(server_addr)) < 0) {
        perror("connect()");
        return -1;
    }

    if (type == control) {
        char response[BUFFER_SIZE];
        if (responseCode(sockfd, response) != SERVER_WELCOME) return -1;
    }
}

```

```

    return 0;
}

int authToServer(int sockfd, char *user, char *password) {
    char response[BUFFER_SIZE];
    char userCommand[5+strlen(user)+2];
    sprintf(userCommand, "USER %s\r\n", user);

    if (sendToServer(sockfd, userCommand)) return -1;

    if (responseCode(sockfd, response) != SERVER_PASSWORD) return -1;

    char passwordCommand[5+strlen(password)+2];
    sprintf(passwordCommand, "PASS %s\r\n", password);

    if (sendToServer(sockfd, passwordCommand)) return -1;
    if (responseCode(sockfd, response) != SERVER_LOGIN_SUCCESSFUL) return -1;

    return 0;
}

int sendToServer(int sockfd, char *buf) {
    size_t bytes;
    bytes = write(sockfd, buf, strlen(buf));

    if (bytes <= 0) {
        perror("write()");
        return -1;
    }

    return 0;
}

int passiveMode(int sockfd, char *serverIP, int *port) {
    char response[BUFFER_SIZE];
    if (sendToServer(sockfd, "pasv\r\n")) return -1;
    if (responseCode(sockfd, response) != SERVER_PASSIVE_MODE) return -1;

```

```

    if (parsePasvResponse(response, serverIP, port)) return -1;

    return 0;
}

int responseCode(int sockfd, char *response) {
    char serverResponse[BUFFER_SIZE], responseByte;
    ssize_t responseBytes = 0, byte;
    enum State state = START;

    while (state != END) {
        byte = recv(sockfd, &responseByte, 1, 0);
        if (byte < 0) {
            perror("Error receiving response");
            return -1;
        }
        serverResponse[responseBytes++] = responseByte;

        switch (state) {
            case START:
                if (responseByte == ' ') {
                    state = RESPONSE;
                } else if (responseByte == '-') {
                    state = RESPONSES;
                } else if (responseByte == '\n') {
                    state = END;
                }

                break;
            case RESPONSE:
                if (responseByte == '\n') {
                    state = END;
                }

                break;
            case RESPONSES:
                if (responseByte == '\n') {

```

```

        state = START;
        memset(serverResponse, 0, sizeof(serverResponse));
        responseBytes = 0;
    }

    break;
case END:
    break;

default:
    return -1;
}
}

serverResponse[responseBytes] = '\0';
strcpy(response, serverResponse);
printf("%s", response);

int responseCode;
sscanf(response, "%3d", &responseCode);

return responseCode;
}

int parsePasvResponse(char *response, char *serverIP, int *port) {
    unsigned int ip1, ip2, ip3, ip4, port1, port2;

    sscanf(response, "227 Entering Passive Mode (%u,%u,%u,%u,%u,%u).",
        &ip1, &ip2, &ip3, &ip4, &port1, &port2);

    sprintf(serverIP, "%u.%u.%u.%u", ip1, ip2, ip3, ip4);
    *port = port1*256 + port2;

    return 0;
}

```

```

int getHostEntry(char *host, struct hostent **h) {
    if ((*h = gethostbyname(host)) == NULL) {
        perror("gethostbyname()");
        return -1;
    }

    return 0;
}

int getIP(char *host, char *ip) {
    struct hostent *h = NULL;

    if (getHostEntry(host, &h)) return -1;

    strcpy(ip, inet_ntoa(*(struct in_addr *) h->h_addr));

    return 0;
}

int requestFileTransfer(int sockfd, char* resource) {
    char response[BUFFER_SIZE];
    char FileTransferCommand[5+strlen(resource)+2];
    sprintf(FileTransferCommand, "retr %s\r\n", resource);

    if (sendToServer(sockfd, FileTransferCommand)) return -1;

    int code = responseCode(sockfd, response);
    if (code != SERVER_DATA_CONNECTION && code != SERVER_DATA_CONNECTION_OPENED) return -1;

    return 0;
}

int getFileTransfer(int sockfd1, int sockfd2, char *filename) {
    char response[BUFFER_SIZE], data[BUFFER_SIZE];
    ssize_t bytes;

    FILE *fd = fopen(filename, "wb");

```



```

    if (fd == NULL) return -1;

    while ((bytes = recv(sockfd2, data, sizeof(data), 0)) > 0) {
        if (fwrite(data, 1, bytes, fd) != bytes) return -1;
    }

    if (bytes < 0) return -1;

    fclose(fd);

    if (responseCode(sockfd1, response) != SERVER_TRANSFER_COMPLETE) return -1;

    return 0;
}

int main(int argc, char **argv) {
    if (argc != 2) {
        fprintf(stderr, "Usage: %s ftp://[<user>:<password>@]<host>/<url-path>\n", argv[0]);
        exit(-1);
    }

    int sockA, sockB;
    struct URL url;
    memset(&url, 0, sizeof(url));

    if (parse(argv[1], &url)) {
        fprintf(stderr, "Usage: %s ftp://[<user>:<password>@]<host>/<url-path>\n", argv[0]);
        exit(-1);
    }

    if (getIP(url.host, url.ip)) {
        fprintf(stderr, "Erro ao obter o IP");
        exit(-1);
    }

    if ((sockA = getSocket()) == -1) {
        fprintf(stderr, "Erro ao obter o socket A");
    }

```

```

    exit(-1);
}

if ((sockB = getSocket()) == -1) {
    fprintf(stderr, "Erro ao obter o socket B");
    exit(-1);
}

if (connectToServer(sockA, controlo, url.ip, SERVER_FTP_PORT)) {
    fprintf(stderr, "Erro ao conectar com o servidor A");
    exit(-1);
}

if (authToServer(sockA, url.user, url.password)) {
    fprintf(stderr, "Erro ao autenticar no servidor");
    exit(-1);
}

char serverIP[MAX_SIZE];
int port;
if (passiveMode(sockA, serverIP, &port)) {
    fprintf(stderr, "Erro ao entrar em modo passivo");
    exit(-1);
}

if (connectToServer(sockB, dados, serverIP, port)) {
    fprintf(stderr, "Erro ao conectar no servidor B");
    exit(-1);
}

if (requestFileTransfer(sockA, url.resource)) {
    fprintf(stderr, "Erro ao pedir a transferencia do ficheiro");
    exit(-1);
}

if (getFileTransfer(sockA, sockB, url.filename)) {
    fprintf(stderr, "Erro ao transferir o ficheiro");
}

```

```

    exit(-1);
}

if (closeConnectionToServer(sockA)) {
    fprintf(stderr, "Erro ao encerrar a conexão com o servidor");
    exit(-1);
}

if (closeSocket(sockA)) {
    fprintf(stderr, "Erro ao encerrar o socket A");
    exit(-1);
}

if (closeSocket(sockB)) {
    fprintf(stderr, "Erro ao encerrar o socket B");
    exit(-1);
}

return 0;
}

```

Anexo 2 – Comandos de Configuração

Exp 1

No console do Switch:
/system reset-configuration

Tux13:
ifconfig eth0 up
ifconfig eth0 172.16.10.1/24

Tux14:
ifconfig eth0 up
ifconfig eth0 172.16.10.254/24

Tux13 e Tux14:
ifconfig

Tux13:
ping 172.16.10.254

Tux14:
ping 172.16.10.1

Tux13 e Tux14:
route -n
arp -a

Tux13:
arp -d 172.16.10.254/24

Tux13:
ping 172.16.10.254

Exp 2

Tux12:
ifconfig eth0 up
ifconfig eth0 172.16.11.1/24

Tux12:
No console do Switch:
/interface bridge add name=bridge10
/interface bridge add name=bridge11
/interface bridge port remove [find interface=ether2]
/interface bridge port remove [find interface=ether8]
/interface bridge port remove [find interface=ether24]
/interface bridge port add bridge=bridge10 interface=ether2
/interface bridge port add bridge=bridge10 interface=ether24
/interface bridge port add bridge=bridge11 interface=ether8

Tux13:
ping 172.16.10.254
ping 172.16.11.1
ping -b 172.16.10.255

Tux12:
ping -b 172.16.11.255

Exp 3

Tux14:
ifconfig eth1 up
ifconfig eth1 172.16.11.253/24

No console do Switch:

```
/interface bridge port remove [find interface=ether12]  
/interface bridge port add bridge=bridge11 interface=ether12
```

Tux14:

```
sysctl net.ipv4.ip_forward=1  
sysctl net.ipv4.icmp_echo_ignore_broadcasts=0
```

Tux14:

ifconfig

Tux12:

```
route add -net 172.16.10.0/24 gw 172.16.11.253
```

Tux13:

```
route add -net 172.16.11.0/24 gw 172.16.10.254
```

Tux13, Tux14, Tux12:

route -n

Tux13:

```
ping 172.16.10.254  
ping 172.16.11.253  
ping 172.16.11.1
```

Tux12:

```
arp -d 172.16.11.253
```

Tux13:

```
arp -d 172.16.10.254
```

Tux14:

```
arp -d 172.16.10.1  
arp -d 172.16.11.1
```

Tux13:

```
ping 172.16.11.1
```

Exp 4

No console do Switch:

```
/interface bridge port remove [find interface=ether17]  
/interface bridge port add bridge=bridge11 interface=ether17
```

No console do Router:

```
/system reset-configuration
```

```
/ip address add address=172.16.1.19/24 interface=ether1
/ip address add address=172.16.11.254/24 interface=ether2
```

```
Tux12:
route add default gw 172.16.11.254
```

```
Tux13:
route add default gw 172.16.10.254
```

```
Tux14:
route add default gw 172.16.11.254
```

```
No console do Router:
/ip route add dst-address=172.16.10.0/24 gateway=172.16.11.253
/ip route add dst-address=0.0.0.0/0 gateway=172.16.1.254
```

```
Tux13:
ping 172.16.10.254
ping 172.16.11.1
ping 172.16.11.254
```

```
Tux12:
sysctl net.ipv4.conf.eth0.accept_redirects=0
sysctl net.ipv4.conf.all.accept_redirects=0
route del -net 172.16.10.0/24 gw 172.16.11.253
ping 172.16.10.1
traceroute -n 172.16.10.1
route add -net 172.16.10.0/24 gw 172.16.11.253
traceroute -n 172.16.10.1
sysctl net.ipv4.conf.eth0.accept_redirects=1
sysctl net.ipv4.conf.all.accept_redirects=1
```

```
Tux13:
ping 172.16.1.254
```

```
No console do Router:
/ip firewall nat disable 0
```

```
Tux13:
ping 172.16.1.254
```

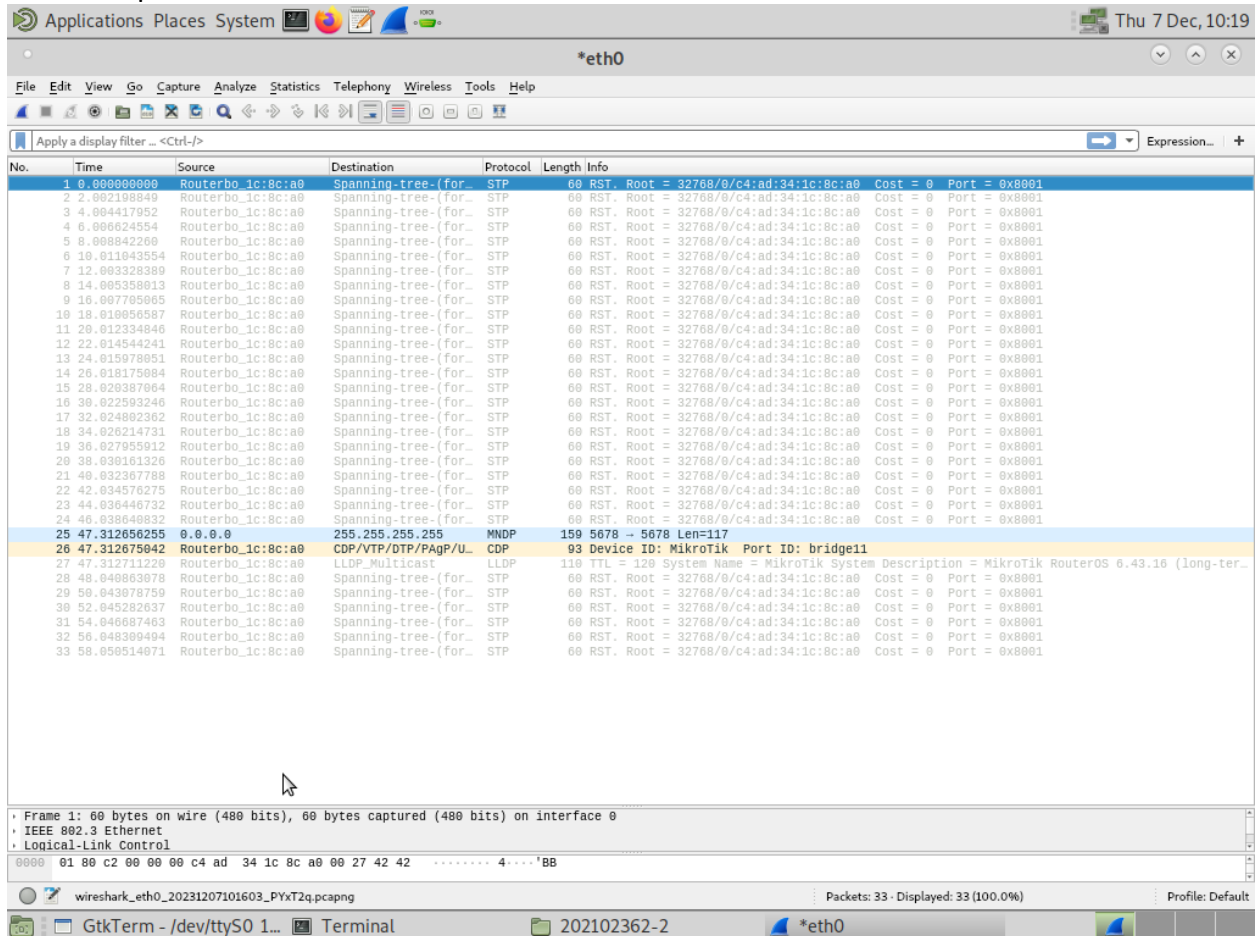
```
Router console:
/ip firewall nat enable 0
```

Exp 5

Tux12, Tux13, Tux14:
ping google.com

Anexo 3 – Logs Capturados

Tux12 - Exp 2 – Tux13 Broadcast

Applications Places System  Thu 7 Dec, 10:19

*eth0

File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help

Apply a display filter ... <Ctrl-/> Expression...

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000000	Routerbo_1c:8c:a0	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:a0 Cost = 0 Port = 0x8001
2	2.002190849	Routerbo_1c:8c:a0	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:a0 Cost = 0 Port = 0x8001
3	4.004417952	Routerbo_1c:8c:a0	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:a0 Cost = 0 Port = 0x8001
4	6.006624554	Routerbo_1c:8c:a0	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:a0 Cost = 0 Port = 0x8001
5	8.008842260	Routerbo_1c:8c:a0	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:a0 Cost = 0 Port = 0x8001
6	10.011043554	Routerbo_1c:8c:a0	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:a0 Cost = 0 Port = 0x8001
7	12.003283890	Routerbo_1c:8c:a0	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:a0 Cost = 0 Port = 0x8001
8	14.005358013	Routerbo_1c:8c:a0	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:a0 Cost = 0 Port = 0x8001
9	16.007705065	Routerbo_1c:8c:a0	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:a0 Cost = 0 Port = 0x8001
10	18.010050587	Routerbo_1c:8c:a0	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:a0 Cost = 0 Port = 0x8001
11	20.012334846	Routerbo_1c:8c:a0	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:a0 Cost = 0 Port = 0x8001
12	22.014544241	Routerbo_1c:8c:a0	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:a0 Cost = 0 Port = 0x8001
13	24.015978051	Routerbo_1c:8c:a0	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:a0 Cost = 0 Port = 0x8001
14	26.018175084	Routerbo_1c:8c:a0	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:a0 Cost = 0 Port = 0x8001
15	28.020387064	Routerbo_1c:8c:a0	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:a0 Cost = 0 Port = 0x8001
16	30.022593246	Routerbo_1c:8c:a0	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:a0 Cost = 0 Port = 0x8001
17	32.024802362	Routerbo_1c:8c:a0	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:a0 Cost = 0 Port = 0x8001
18	34.026214731	Routerbo_1c:8c:a0	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:a0 Cost = 0 Port = 0x8001
19	36.027955912	Routerbo_1c:8c:a0	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:a0 Cost = 0 Port = 0x8001
20	38.030161326	Routerbo_1c:8c:a0	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:a0 Cost = 0 Port = 0x8001
21	40.032367788	Routerbo_1c:8c:a0	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:a0 Cost = 0 Port = 0x8001
22	42.034576275	Routerbo_1c:8c:a0	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:a0 Cost = 0 Port = 0x8001
23	44.036446732	Routerbo_1c:8c:a0	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:a0 Cost = 0 Port = 0x8001
24	46.038640832	Routerbo_1c:8c:a0	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:a0 Cost = 0 Port = 0x8001
25	47.312656255	0.0.0.0	255.255.255.255	MNBP	150	5678 - 5678 Len=117
26	47.312675042	Routerbo_1c:8c:a0	CDP/VTP/DTP/PAQP/U...	CDP	93	Device ID: MikroTik Port ID: bridge11
27	47.312711220	Routerbo_1c:8c:a0	LLDP_Multicast	LLDP	110	TTL = 120 System Name = MikroTik System Description = MikroTik RouterOS 6.43.16 (long-ter...
28	48.040863078	Routerbo_1c:8c:a0	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:a0 Cost = 0 Port = 0x8001
29	50.043078759	Routerbo_1c:8c:a0	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:a0 Cost = 0 Port = 0x8001
30	52.045282637	Routerbo_1c:8c:a0	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:a0 Cost = 0 Port = 0x8001
31	54.046687463	Routerbo_1c:8c:a0	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:a0 Cost = 0 Port = 0x8001
32	56.048399494	Routerbo_1c:8c:a0	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:a0 Cost = 0 Port = 0x8001
33	58.050514071	Routerbo_1c:8c:a0	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:a0 Cost = 0 Port = 0x8001

Frame 1: 60 bytes on wire (480 bits), 60 bytes captured (480 bits) on interface 0

IEEE 802.3 Ethernet

Logical-Link Control

0000 01 80 c2 00 00 00 c4 ad 34 1c 8c a0 00 27 42 42 4....'BB

wireshark_eth0_20231207101603_PyXT2q.pcapng Packets: 33 · Displayed: 33 (100.0%) Profile: Default

GtkTerm - /dev/ttyS0 1... Terminal 202102362-2 *eth0

Tux12 – Exp 2 – Tux12 Broadcast

Applications Places System Thu 7 Dec, 10:27

*eth0

File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help

Apply a display filter ... <Ctrl-/> Expression...

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000000	Routerbo_1c:8c:a0	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:a0 Cost = 0 Port = 0x8001
2	2.002207090	Routerbo_1c:8c:a0	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:a0 Cost = 0 Port = 0x8001
3	4.004424657	Routerbo_1c:8c:a0	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:a0 Cost = 0 Port = 0x8001
4	6.006652555	Routerbo_1c:8c:a0	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:a0 Cost = 0 Port = 0x8001
5	7.271987782	172.16.11.1	172.16.11.255	ICMP	98	Echo (ping) request id=0x0bd4, seq=1/256, ttl=64 (no response found!)
6	8.008970090	Routerbo_1c:8c:a0	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:a0 Cost = 0 Port = 0x8001
7	8.293036261	172.16.11.1	172.16.11.255	ICMP	98	Echo (ping) request id=0x0bd4, seq=2/512, ttl=64 (no response found!)
8	9.317008449	172.16.11.1	172.16.11.255	ICMP	98	Echo (ping) request id=0x0bd4, seq=3/768, ttl=64 (no response found!)
9	10.010478959	Routerbo_1c:8c:a0	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:a0 Cost = 0 Port = 0x8001
10	10.341007236	172.16.11.1	172.16.11.255	ICMP	98	Echo (ping) request id=0x0bd4, seq=4/1024, ttl=64 (no response found!)
11	11.1365002950	172.16.11.1	172.16.11.255	ICMP	98	Echo (ping) request id=0x0bd4, seq=5/1280, ttl=64 (no response found!)
12	12.012609389	Routerbo_1c:8c:a0	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:a0 Cost = 0 Port = 0x8001
13	12.389046435	172.16.11.1	172.16.11.255	ICMP	98	Echo (ping) request id=0x0bd4, seq=6/1536, ttl=64 (no response found!)
14	13.413012956	172.16.11.1	172.16.11.255	ICMP	98	Echo (ping) request id=0x0bd4, seq=7/1792, ttl=64 (no response found!)
15	14.014912905	Routerbo_1c:8c:a0	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:a0 Cost = 0 Port = 0x8001
16	14.437008429	172.16.11.1	172.16.11.255	ICMP	98	Echo (ping) request id=0x0bd4, seq=8/2048, ttl=64 (no response found!)
17	15.4610083756	172.16.11.1	172.16.11.255	ICMP	98	Echo (ping) request id=0x0bd4, seq=9/2304, ttl=64 (no response found!)
18	16.017131109	Routerbo_1c:8c:a0	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:a0 Cost = 0 Port = 0x8001
19	16.4850003381	172.16.11.1	172.16.11.255	ICMP	98	Echo (ping) request id=0x0bd4, seq=10/2560, ttl=64 (no response found!)
20	17.509043723	172.16.11.1	172.16.11.255	ICMP	98	Echo (ping) request id=0x0bd4, seq=11/2816, ttl=64 (no response found!)
21	18.010342381	Routerbo_1c:8c:a0	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:a0 Cost = 0 Port = 0x8001
22	18.533038460	172.16.11.1	172.16.11.255	ICMP	98	Echo (ping) request id=0x0bd4, seq=12/3072, ttl=64 (no response found!)
23	19.557041856	172.16.11.1	172.16.11.255	ICMP	98	Echo (ping) request id=0x0bd4, seq=13/3328, ttl=64 (no response found!)
24	20.021551218	Routerbo_1c:8c:a0	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:a0 Cost = 0 Port = 0x8001
25	20.581041971	172.16.11.1	172.16.11.255	ICMP	98	Echo (ping) request id=0x0bd4, seq=14/3584, ttl=64 (no response found!)
26	21.605042993	172.16.11.1	172.16.11.255	ICMP	98	Echo (ping) request id=0x0bd4, seq=15/3840, ttl=64 (no response found!)
27	22.023757401	Routerbo_1c:8c:a0	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:a0 Cost = 0 Port = 0x8001
28	22.629039964	172.16.11.1	172.16.11.255	ICMP	98	Echo (ping) request id=0x0bd4, seq=16/4096, ttl=64 (no response found!)
29	23.653041545	172.16.11.1	172.16.11.255	ICMP	98	Echo (ping) request id=0x0bd4, seq=17/4352, ttl=64 (no response found!)
30	24.025972174	Routerbo_1c:8c:a0	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:a0 Cost = 0 Port = 0x8001
31	24.677039424	172.16.11.1	172.16.11.255	ICMP	98	Echo (ping) request id=0x0bd4, seq=18/4608, ttl=64 (no response found!)
32	25.701041144	172.16.11.1	172.16.11.255	ICMP	98	Echo (ping) request id=0x0bd4, seq=19/4864, ttl=64 (no response found!)
33	26.028187226	Routerbo_1c:8c:a0	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:a0 Cost = 0 Port = 0x8001
34	26.725037068	172.16.11.1	172.16.11.255	ICMP	98	Echo (ping) request id=0x0bd4, seq=20/5120, ttl=64 (no response found!)
35	28.030401021	Routerbo_1c:8c:a0	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:a0 Cost = 0 Port = 0x8001

Frame 1: 60 bytes on wire (480 bits), 60 bytes captured (480 bits) on interface 0

IEEE 802.3 Ethernet

Logical-Link Control

0000 01 80 c2 00 00 00 c4 ad 34 1c 8c a0 00 27 42 42 4....'BB

wireshark_eth0_20231207102404_8fVWpS.pcapng Packets: 35 - Displayed: 35 (100.0%) Profile: Default

GtkTerm - /dev/ttyS0 1... Terminal [20120362-2] *eth0

Tux12 – Exp 4 - Ping Tux13

Applications Places System Fri 8 Dec, 11:54

***eth0**

File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help

Apply a display filter ... <Ctrl-/-> Expression... +

No.	Time	Source	Destination	Proto	Length	Info
8	8.068550210	Routerbo_1c:8c:a0	Spanning-tree-(for-bridges)_00	STP	60	RST. Root = 32768/0/74:4d:28:ea:ae:33 Cost = 10 Port = 0x8001
9	10.010720240	Routerbo_1c:8c:a0	Spanning-tree-(for-bridges)_00	STP	60	RST. Root = 32768/0/74:4d:28:ea:ae:33 Cost = 10 Port = 0x8001
10	10.799563840	172.16.11.1	172.16.10.1	ICMP	98	Echo (ping) request id=0x4c75, seq=1/256, ttl=64 (reply in 11)
11	10.799998880	172.16.10.1	172.16.11.1	ICMP	98	Echo (ping) reply id=0x4c75, seq=1/256, ttl=63 (request in 10)
12	11.814331544	172.16.11.1	172.16.10.1	ICMP	98	Echo (ping) request id=0x4c75, seq=2/512, ttl=64 (reply in 14)
13	11.814493994	172.16.11.254	172.16.11.1	ICMP	120	Redirect (Redirect for host)
14	11.814766520	172.16.10.1	172.16.11.1	ICMP	98	Echo (ping) reply id=0x4c75, seq=2/512, ttl=63 (request in 12)
15	12.012970681	Routerbo_1c:8c:a0	Spanning-tree-(for-bridges)_00	STP	60	RST. Root = 32768/0/74:4d:28:ea:ae:33 Cost = 10 Port = 0x8001
16	12.838327890	172.16.11.1	172.16.10.1	ICMP	98	Echo (ping) request id=0x4c75, seq=3/768, ttl=64 (reply in 18)
17	12.838492054	172.16.11.254	172.16.11.1	ICMP	120	Redirect (Redirect for host)
18	12.838680456	172.16.10.1	172.16.11.1	ICMP	98	Echo (ping) reply id=0x4c75, seq=3/768, ttl=63 (request in 16)
19	13.862331307	172.16.11.1	172.16.10.1	ICMP	98	Echo (ping) request id=0x4c75, seq=4/1024, ttl=64 (reply in 21)
20	13.862494107	172.16.11.254	172.16.11.1	ICMP	120	Redirect (Redirect for host)
21	13.862673389	172.16.10.1	172.16.11.1	ICMP	98	Echo (ping) reply id=0x4c75, seq=4/1024, ttl=63 (request in 19)
22	14.015026777	Routerbo_1c:8c:a0	Spanning-tree-(for-bridges)_00	STP	60	RST. Root = 32768/0/74:4d:28:ea:ae:33 Cost = 10 Port = 0x8001
23	14.886329120	172.16.11.1	172.16.10.1	ICMP	98	Echo (ping) request id=0x4c75, seq=5/1280, ttl=64 (reply in 25)
24	14.886492347	172.16.11.254	172.16.11.1	ICMP	120	Redirect (Redirect for host)
25	14.886672747	172.16.10.1	172.16.11.1	ICMP	98	Echo (ping) reply id=0x4c75, seq=5/1280, ttl=63 (request in 23)
26	15.910935040	172.16.11.1	172.16.10.1	ICMP	98	Echo (ping) request id=0x4c75, seq=6/1536, ttl=64 (reply in 28)
27	15.910910772	172.16.11.254	172.16.11.1	ICMP	120	Redirect (Redirect for host)
28	15.910702067	172.16.10.1	172.16.11.1	ICMP	98	Echo (ping) reply id=0x4c75, seq=6/1536, ttl=63 (request in 26)
29	15.912826770	Kye_04:20:09	HewlettP_61:2e:c3	ARP	60	Who has 172.16.11.1? Tell 172.16.11.253
30	15.912833474	HewlettP_61:2e:c3	Kye_04:20:09	ARP	42	172.16.11.1 is at 00:21:5a:61:2e:c3
31	15.942311334	HewlettP_61:2e:c3	Routerbo_ea:ae:33	ARP	42	Who has 172.16.11.254? Tell 172.16.11.1
32	15.942584483	Routerbo_ea:ae:33	HewlettP_61:2e:c3	ARP	60	172.16.11.254 is at 74:4d:28:ea:ae:33
33	16.007172390	Routerbo_1c:8c:a0	Spanning-tree-(for-bridges)_00	STP	60	RST. Root = 32768/0/74:4d:28:ea:ae:33 Cost = 10 Port = 0x8001
34	16.934350474	172.16.11.1	172.16.10.1	ICMP	98	Echo (ping) request id=0x4c75, seq=7/1792, ttl=64 (reply in 35)
35	16.934708689	172.16.10.1	172.16.11.1	ICMP	98	Echo (ping) reply id=0x4c75, seq=7/1792, ttl=63 (request in 34)
36	17.958344944	172.16.11.1	172.16.10.1	ICMP	98	Echo (ping) request id=0x4c75, seq=8/2048, ttl=64 (reply in 38)
37	17.958526134	172.16.11.254	172.16.11.1	ICMP	120	Redirect (Redirect for host)
38	17.958703158	172.16.10.1	172.16.11.1	ICMP	98	Echo (ping) reply id=0x4c75, seq=8/2048, ttl=63 (request in 36)
39	18.009320142	Routerbo_1c:8c:a0	Spanning-tree-(for-bridges)_00	STP	60	RST. Root = 32768/0/74:4d:28:ea:ae:33 Cost = 10 Port = 0x8001
40	18.982344442	172.16.11.1	172.16.10.1	ICMP	98	Echo (ping) request id=0x4c75, seq=9/2304, ttl=64 (reply in 41)
41	18.982608923	172.16.10.1	172.16.11.1	ICMP	98	Echo (ping) reply id=0x4c75, seq=9/2304, ttl=63 (request in 40)
42	20.006347851	172.16.11.1	172.16.10.1	ICMP	98	Echo (ping) request id=0x4c75, seq=10/2560, ttl=64 (reply in 43)
43	20.006685323	172.16.10.1	172.16.11.1	ICMP	98	Echo (ping) reply id=0x4c75, seq=10/2560, ttl=63 (request in 42)
44	20.011483819	Routerbo_1c:8c:a0	Spanning-tree-(for-bridges)_00	STP	60	RST. Root = 32768/0/74:4d:28:ea:ae:33 Cost = 10 Port = 0x8001
45	21.013656435	Routerbo_1c:8c:a0	Spanning-tree-(for-bridges)_00	STP	60	RST. Root = 32768/0/74:4d:28:ea:ae:33 Cost = 10 Port = 0x8001

▶ Frame 10: 98 bytes on wire (784 bits), 98 bytes captured (784 bits) on interface 0
 ▶ Ethernet II, Src: HewlettP_61:2e:c3 (00:21:5a:61:2e:c3), Dst: Routerbo_ea:ae:33 (74:4d:28:ea:ae:33)
 ▶ Internet Protocol Version 4, Src: 172.16.11.1, Dst: 172.16.10.1
 ▶ Internet Control Message Protocol

Ethernet (eth), 14 bytes Packets: 45 · Displayed: 45 (100.0%) · Dropped: 0 (0.0%) Profile: Default

Terminal 202102362-2 GtkTerm - /dev/ttyS0 1... *eth0

Tux13 – Exp 1 – Ping Tux14

Applications Places System Thu 7 Dec, 09:43

exp1_p7_test_file.pcapng

File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help

Apply a display filter ... <Ctrl-/> Expression...

No.	Time	Source	Destination	Protocol	Length	Info
8	19.010869747	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:99 Cost = 0 Port = 0x8002
9	12.013932575	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:99 Cost = 0 Port = 0x8002
10	14.015197679	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:99 Cost = 0 Port = 0x8002
11	16.017378536	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:99 Cost = 0 Port = 0x8002
12	18.019548339	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:99 Cost = 0 Port = 0x8002
13	20.021712065	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:99 Cost = 0 Port = 0x8002
14	21.733619011	HewlettP_61:2d:ef	Broadcast	ARP	42	Who has 172.16.10.254? Tell 172.16.10.1
15	21.733719791	HewlettP_61:2f:24	HewlettP_61:2d:ef	ARP	60	172.16.10.254 is at 00:21:5a:61:2f:24
16	21.733727963	172.16.10.1	172.16.10.254	ICMP	98	Echo (ping) request id=0x1162, seq=1/256, ttl=64 (reply in 17)
17	21.733815194	172.16.10.254	172.16.10.1	ICMP	98	Echo (ping) reply id=0x1162, seq=1/256, ttl=64 (request in 16)
18	22.023876779	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:99 Cost = 0 Port = 0x8002
19	22.749726569	172.16.10.1	172.16.10.254	ICMP	98	Echo (ping) request id=0x1162, seq=2/512, ttl=64 (reply in 20)
20	22.749829445	172.16.10.254	172.16.10.1	ICMP	98	Echo (ping) reply id=0x1162, seq=2/512, ttl=64 (request in 19)
21	23.769719243	172.16.10.1	172.16.10.254	ICMP	98	Echo (ping) request id=0x1162, seq=3/768, ttl=64 (reply in 22)
22	23.769823864	172.16.10.254	172.16.10.1	ICMP	98	Echo (ping) reply id=0x1162, seq=3/768, ttl=64 (request in 21)
23	24.026055552	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:99 Cost = 0 Port = 0x8002
24	24.793718973	172.16.10.1	172.16.10.254	ICMP	98	Echo (ping) request id=0x1162, seq=4/1024, ttl=64 (reply in 25)
25	24.793828941	172.16.10.254	172.16.10.1	ICMP	98	Echo (ping) reply id=0x1162, seq=4/1024, ttl=64 (request in 24)
26	25.817717865	172.16.10.1	172.16.10.254	ICMP	98	Echo (ping) request id=0x1162, seq=5/1280, ttl=64 (reply in 27)
27	25.817847141	172.16.10.254	172.16.10.1	ICMP	98	Echo (ping) reply id=0x1162, seq=5/1280, ttl=64 (request in 26)
28	26.028228458	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:99 Cost = 0 Port = 0x8002
29	26.734724341	HewlettP_61:2f:24	HewlettP_61:2d:ef	ARP	60	Who has 172.16.10.1? Tell 172.16.10.254
30	26.734746550	HewlettP_61:2d:ef	HewlettP_61:2f:24	ARP	42	172.16.10.1 is at 00:21:5a:61:2d:ef
31	26.841715710	172.16.10.1	172.16.10.254	ICMP	98	Echo (ping) request id=0x1162, seq=6/1536, ttl=64 (reply in 32)
32	26.841807271	172.16.10.254	172.16.10.1	ICMP	98	Echo (ping) reply id=0x1162, seq=6/1536, ttl=64 (request in 31)
33	27.865716480	172.16.10.1	172.16.10.254	ICMP	98	Echo (ping) request id=0x1162, seq=7/1792, ttl=64 (reply in 34)
34	27.865818944	172.16.10.254	172.16.10.1	ICMP	98	Echo (ping) reply id=0x1162, seq=7/1792, ttl=64 (request in 33)
35	28.030464895	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:99 Cost = 0 Port = 0x8002
36	28.889722084	172.16.10.1	172.16.10.254	ICMP	98	Echo (ping) request id=0x1162, seq=8/2048, ttl=64 (reply in 37)
37	28.889826636	172.16.10.254	172.16.10.1	ICMP	98	Echo (ping) reply id=0x1162, seq=8/2048, ttl=64 (request in 36)
38	29.913717974	172.16.10.1	172.16.10.254	ICMP	98	Echo (ping) request id=0x1162, seq=9/2304, ttl=64 (reply in 39)
39	29.913846551	172.16.10.254	172.16.10.1	ICMP	98	Echo (ping) reply id=0x1162, seq=9/2304, ttl=64 (request in 38)
40	30.032569599	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:99 Cost = 0 Port = 0x8002
41	30.937782499	172.16.10.1	172.16.10.254	ICMP	98	Echo (ping) request id=0x1162, seq=10/2560, ttl=64 (reply in 41)
42	30.937798300	172.16.10.254	172.16.10.1	ICMP	98	Echo (ping) reply id=0x1162, seq=10/2560, ttl=64 (request in 42)
43	32.034746310	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:99 Cost = 0 Port = 0x8002
44	34.036921567	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:99 Cost = 0 Port = 0x8002
45	36.020001640	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:99 Cost = 0 Port = 0x8002

Frame 1: 60 bytes on wire (480 bits), 60 bytes captured (480 bits) on interface 0

- IEEE 802.3 Ethernet
- Logical-Link Control

```

0000 01 00 c2 00 00 00 c4 ad 34 1c 8c 99 00 27 42 42 .....4...BB
0010 03 00 00 02 02 3c 80 00 c4 ad 34 1c 8c 99 00 00 .....<...4...
0020 00 00 00 00 c4 ad 34 1c 8c 99 00 02 00 00 14 00 .....4.....
0030 02 00 0f 00 00 00 00 00 00 00 00 00 00 00 00 .....

```

Ready to load or capture Packets: 47 · Displayed: 47 (100.0%) Profile: Default

Terminal [up202102363-3] exp1_p7_test_file.pca... Terminal

Applications Places System
exp2_p4_test_file.pcapng
Thu 7 Dec, 10:13

File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help
Expression...

Apply a display filter... <Ctrl>F
➔

No.	Time	Source	Destination	Protocol	Length	Info
4	0.00028443	Router01-IC-B0/0a	Spanning-tree (for-bridges) - STP	60	801	Root = 32768/0/0:4:34:1c:0b:0a Cost = 0 Port = Bx0001
5	0.000893228	Router01-IC-B0/0a	Spanning-tree (for-bridges) - STP	60	801	Root = 32768/0/0:4:34:1c:0b:0a Cost = 0 Port = Bx0001
6	0.002790383	172.16.10.1	98 Echo (ping) request 10<8x15f9, seq=2/156, ttl=04 (reply in 7)	ICMP	98	Echo (ping) request 10<8x15f9, seq=2/156, ttl=04 (reply in 7)
7	0.002842454	172.16.10.254	98 Echo (ping) reply 10<8x15f9, seq=2/156, ttl=04 (request in 6)	ICMP	98	Echo (ping) reply 10<8x15f9, seq=2/156, ttl=04 (request in 6)
8	0.01039069	Router01-IC-B0/0a	Spanning-tree (for-bridges) - STP	60	801	Root = 32768/0/0:4:34:1c:0b:0a Cost = 0 Port = Bx0001
9	0.010404512	172.16.10.1	98 Echo (ping) request 10<8x15f9, seq=2/512, ttl=04 (reply in 11)	ICMP	98	Echo (ping) request 10<8x15f9, seq=2/512, ttl=04 (reply in 11)
10	0.042031214	172.16.10.254	98 Echo (ping) reply 10<8x15f9, seq=2/512, ttl=04 (request in 9)	ICMP	98	Echo (ping) reply 10<8x15f9, seq=2/512, ttl=04 (request in 9)
11	0.118097630	172.16.10.1	98 Echo (ping) request 10<8x15f9, seq=3/788, ttl=04 (reply in 12)	ICMP	98	Echo (ping) request 10<8x15f9, seq=3/788, ttl=04 (reply in 12)
12	0.118125420	172.16.10.254	98 Echo (ping) reply 10<8x15f9, seq=3/788, ttl=04 (request in 11)	ICMP	98	Echo (ping) reply 10<8x15f9, seq=3/788, ttl=04 (request in 11)
13	0.140110000	Router01-IC-B0/0a	Spanning-tree (for-bridges) - STP	60	801	Root = 32768/0/0:4:34:1c:0b:0a Cost = 0 Port = Bx0001
14	0.142097468	172.16.10.1	98 Echo (ping) request 10<8x15f9, seq=4/1824, ttl=04 (reply in 15)	ICMP	98	Echo (ping) request 10<8x15f9, seq=4/1824, ttl=04 (reply in 15)
15	0.142229747	172.16.10.254	98 Echo (ping) reply 10<8x15f9, seq=4/1824, ttl=04 (request in 14)	ICMP	98	Echo (ping) reply 10<8x15f9, seq=4/1824, ttl=04 (request in 14)
16	0.150098056	172.16.10.1	98 Echo (ping) request 10<8x15f9, seq=5/1288, ttl=04 (reply in 17)	ICMP	98	Echo (ping) request 10<8x15f9, seq=5/1288, ttl=04 (reply in 17)
17	0.160238625	172.16.10.254	98 Echo (ping) reply 10<8x15f9, seq=5/1288, ttl=04 (request in 16)	ICMP	98	Echo (ping) reply 10<8x15f9, seq=5/1288, ttl=04 (request in 16)
18	0.160311000	Router01-IC-B0/0a	Spanning-tree (for-bridges) - STP	60	801	Root = 32768/0/0:4:34:1c:0b:0a Cost = 0 Port = Bx0001
19	0.175007140	172.16.10.1	42 Who has 172.16.10.17 Tell 172.16.10.1	ARP	60	Who has 172.16.10.17 Tell 172.16.10.1
20	0.1750074830	172.16.10.1	42 Who has 172.16.10.17 Tell 172.16.10.1	ARP	60	Who has 172.16.10.17 Tell 172.16.10.1
21	0.160008850	172.16.10.1	98 Echo (ping) request 10<8x15f9, seq=6/1536, ttl=04 (request in 22)	ICMP	98	Echo (ping) request 10<8x15f9, seq=6/1536, ttl=04 (request in 22)
22	0.160119035	172.16.10.254	98 Echo (ping) reply 10<8x15f9, seq=6/1536, ttl=04 (request in 21)	ICMP	98	Echo (ping) reply 10<8x15f9, seq=6/1536, ttl=04 (request in 21)
23	0.222030328	172.16.10.1	42 Who has 172.16.10.254? Tell 172.16.10.1	ARP	60	Who has 172.16.10.254? Tell 172.16.10.1
24	0.222102845	172.16.10.1	42 Who has 172.16.10.254? Tell 172.16.10.1	ARP	60	Who has 172.16.10.254? Tell 172.16.10.1
25	0.214090004	172.16.10.1	98 Echo (ping) request 10<8x15f9, seq=7/1792, ttl=04 (request in 26)	ICMP	98	Echo (ping) request 10<8x15f9, seq=7/1792, ttl=04 (request in 26)
26	0.214222947	172.16.10.254	98 Echo (ping) reply 10<8x15f9, seq=7/1792, ttl=04 (request in 25)	ICMP	98	Echo (ping) reply 10<8x15f9, seq=7/1792, ttl=04 (request in 25)
27	0.210708000	Router01-IC-B0/0a	Spanning-tree (for-bridges) - STP	60	801	Root = 32768/0/0:4:34:1c:0b:0a Cost = 0 Port = Bx0001
28	0.238096738	172.16.10.1	98 Echo (ping) request 10<8x15f9, seq=8/2944, ttl=04 (request in 28)	ICMP	98	Echo (ping) request 10<8x15f9, seq=8/2944, ttl=04 (request in 28)
29	0.238205855	172.16.10.1	98 Echo (ping) request 10<8x15f9, seq=8/2944, ttl=04 (request in 28)	ICMP	98	Echo (ping) request 10<8x15f9, seq=8/2944, ttl=04 (request in 28)
30	0.262098933	172.16.10.1	98 Echo (ping) request 10<8x15f9, seq=9/2384, ttl=04 (reply in 31)	ICMP	98	Echo (ping) request 10<8x15f9, seq=9/2384, ttl=04 (reply in 31)
31	0.262238843	172.16.10.254	98 Echo (ping) reply 10<8x15f9, seq=9/2384, ttl=04 (request in 30)	ICMP	98	Echo (ping) reply 10<8x15f9, seq=9/2384, ttl=04 (request in 30)
32	0.01007					

Tux13 - Exp 2 – Tux13 Broadcast

Applications Places System Thu 7 Dec, 10:20

*eth0

File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help

Apply a display filter ... <Ctrl-/> Expression...

No.	Time	Source	Destination	Protocol	Length	Info
11	18.697508520	172.16.10.1	172.16.10.255	ICMP		98 Echo (ping) request id=0x1703, seq=1/256, ttl=64 (no response found!)
12	18.697717973	172.16.10.254	172.16.10.1	ICMP		98 Echo (ping) reply id=0x1703, seq=1/256, ttl=64
13	19.717927712	172.16.10.1	172.16.10.255	ICMP		98 Echo (ping) request id=0x1703, seq=2/512, ttl=64 (no response found!)
14	19.718110347	172.16.10.254	172.16.10.1	ICMP		98 Echo (ping) reply id=0x1703, seq=2/512, ttl=64
15	20.011486296	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP		60 RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
16	20.741931074	172.16.10.1	172.16.10.255	ICMP		98 Echo (ping) request id=0x1703, seq=3/768, ttl=64 (no response found!)
17	20.742114058	172.16.10.254	172.16.10.1	ICMP		98 Echo (ping) reply id=0x1703, seq=3/768, ttl=64
18	21.765932341	172.16.10.1	172.16.10.255	ICMP		98 Echo (ping) request id=0x1703, seq=4/1024, ttl=64 (no response found!)
19	21.766106315	172.16.10.254	172.16.10.1	ICMP		98 Echo (ping) reply id=0x1703, seq=4/1024, ttl=64
20	22.013601438	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP		60 RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
21	22.789931024	172.16.10.1	172.16.10.255	ICMP		98 Echo (ping) request id=0x1703, seq=5/1280, ttl=64 (no response found!)
22	22.790114007	172.16.10.254	172.16.10.1	ICMP		98 Echo (ping) reply id=0x1703, seq=5/1280, ttl=64
23	23.802927236	HewlettP_61:2f:24	HewlettP_61:2f:24	ARP		60 Who has 172.16.10.1? Tell 172.16.10.254
24	23.802948189	HewlettP_61:2f:24	HewlettP_61:2f:24	ARP		42 172.16.10.1 is at 00:21:5a:61:2d:ef
25	23.813920837	172.16.10.1	172.16.10.255	ICMP		98 Echo (ping) request id=0x1703, seq=6/1536, ttl=64 (no response found!)
26	23.814065757	172.16.10.254	172.16.10.1	ICMP		98 Echo (ping) reply id=0x1703, seq=6/1536, ttl=64
27	24.015091174	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP		60 RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
28	24.841928322	172.16.10.1	172.16.10.255	ICMP		98 Echo (ping) request id=0x1703, seq=7/1792, ttl=64 (no response found!)
29	24.842109141	172.16.10.254	172.16.10.1	ICMP		98 Echo (ping) reply id=0x1703, seq=7/1792, ttl=64
30	25.861930564	172.16.10.1	172.16.10.255	ICMP		98 Echo (ping) request id=0x1703, seq=8/2048, ttl=64 (no response found!)
31	25.862108728	172.16.10.254	172.16.10.1	ICMP		98 Echo (ping) reply id=0x1703, seq=8/2048, ttl=64
32	26.016835715	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP		60 RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
33	26.885990015	172.16.10.1	172.16.10.255	ICMP		98 Echo (ping) request id=0x1703, seq=9/2304, ttl=64 (no response found!)
34	26.886104906	172.16.10.254	172.16.10.1	ICMP		98 Echo (ping) reply id=0x1703, seq=9/2304, ttl=64
35	27.009933028	172.16.10.1	172.16.10.255	ICMP		98 Echo (ping) request id=0x1703, seq=10/2560, ttl=64 (no response found!)
36	27.010180538	172.16.10.254	172.16.10.1	ICMP		98 Echo (ping) reply id=0x1703, seq=10/2560, ttl=64
37	28.019034921	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP		60 RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
38	28.933931780	172.16.10.1	172.16.10.255	ICMP		98 Echo (ping) request id=0x1703, seq=11/2816, ttl=64 (no response found!)
39	28.934120281	172.16.10.254	172.16.10.1	ICMP		98 Echo (ping) reply id=0x1703, seq=11/2816, ttl=64
40	29.957933256	172.16.10.1	172.16.10.255	ICMP		98 Echo (ping) request id=0x1703, seq=12/3072, ttl=64 (no response found!)
41	29.958109465	172.16.10.254	172.16.10.1	ICMP		98 Echo (ping) reply id=0x1703, seq=12/3072, ttl=64
42	30.021239225	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP		60 RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
43	30.981946676	172.16.10.1	172.16.10.255	ICMP		98 Echo (ping) request id=0x1703, seq=13/3328, ttl=64 (no response found!)
44	30.982125468	172.16.10.254	172.16.10.1	ICMP		98 Echo (ping) reply id=0x1703, seq=13/3328, ttl=64
45	32.805932308	172.16.10.1	172.16.10.255	ICMP		98 Echo (ping) request id=0x1703, seq=14/3584, ttl=64 (no response found!)
46	32.806112278	172.16.10.254	172.16.10.1	ICMP		98 Echo (ping) reply id=0x1703, seq=14/3584, ttl=64
47	32.824405094	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP		60 RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
48	33.029931819	172.16.10.1	172.16.10.255	ICMP		98 Echo (ping) request id=0x1703, seq=15/3840, ttl=64 (no response found!)
49	33.030111310	172.16.10.254	172.16.10.1	ICMP		98 Echo (ping) reply id=0x1703, seq=15/3840, ttl=64
50	34.025310083	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP		60 RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
51	34.053929593	172.16.10.1	172.16.10.255	ICMP		98 Echo (ping) request id=0x1703, seq=16/4096, ttl=64 (no response found!)
52	34.054094697	172.16.10.254	172.16.10.1	ICMP		98 Echo (ping) reply id=0x1703, seq=16/4096, ttl=64
53	35.077936517	172.16.10.1	172.16.10.255	ICMP		98 Echo (ping) request id=0x1703, seq=17/4352, ttl=64 (no response found!)
54	35.078121805	172.16.10.254	172.16.10.1	ICMP		98 Echo (ping) reply id=0x1703, seq=17/4352, ttl=64
55	36.827509079	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP		60 RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
56	37.301301746	0.0.0.0	255.255.255.255	MNDP	159	5678 - 5678 Len=117

0000 01 80 c2 00 00 00 c4 ad 34 1c 8c 9a 00 27 42 42 4-***BB

wireshark_eth0_20231207101612_S3|SPN.pcapng Packets: 58 - Displayed: 58 (100.0%) Profile: Default

Terminal up202102363-3 exp2_p4_test_file.pca... *eth0

Tux13 - Exp 2 – Tux12 Broadcast

Applications Places System Thu 7 Dec, 10:26

*eth0

File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help

Apply a display filter ... <Ctrl-/> Expression... +

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000000	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
2	0.043803061	0.0.0.0	255.255.255.255	MNDP	150	5678 - 5678 Len=117
3	0.043834140	Routerbo_1c:8c:9a	CDP/VTP/DTP/PAGP/U...	CDP	93	Device ID: MikroTik Port ID: bridge10
4	0.043879467	Routerbo_1c:8c:9a	LLDP_Multicast	LLDP	110	TTL = 120 System Name = MikroTik System Description = MikroTik RouterOS 6.43.1...
5	2.002218132	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
6	4.004430119	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
7	6.006635960	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
8	8.008850251	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
9	10.011053927	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
10	12.013269685	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
11	14.015469240	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
12	16.017683322	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
13	18.019888953	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
14	20.021521050	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
15	22.023735830	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
16	24.025942928	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
17	26.028156311	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
18	28.030365365	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
19	30.032576394	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
20	32.034788640	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
21	34.036988614	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
22	36.039200670	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
23	38.041409933	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
24	40.043621221	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
25	42.045826014	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
26	44.048042750	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
27	46.050252642	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
28	48.052456317	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
29	50.054663904	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001

Frame 1: 60 bytes on wire (480 bits), 60 bytes captured (480 bits) on interface 0
 IEEE 802.3 Ethernet
 Logical-Link Control
 0000 01 80 c2 00 00 00 c4 ad 34 1c 8c 9a 00 27 42 42 4.....'BB

wireshark_eth0_20231207102349_znBWNg.pcapng Packets: 29 - Displayed: 29 (100.0%) Profile: Default

Terminal up202102363-3 *eth0

Tux13 – Exp 3 – Ping outras interfaces

Applications Places System Thu 7 Dec, 10:57

*eth0

File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help

Apply a display filter => <Ctrl-/> Expression...

No.	Time	Source	Destination	Protocol	Length	Info
4	6.006749591	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
5	8.009000339	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
6	8.817005982	172.16.10.1	172.16.10.254	ICMP	98	Echo (ping) request id=0x1dc3, seq=1/256, ttl=64 (reply in 7)
7	8.817163822	172.16.10.254	172.16.10.1	ICMP	98	Echo (ping) reply id=0x1dc3, seq=1/256, ttl=64 (request in 6)
8	9.047034037	172.16.10.1	172.16.10.254	ICMP	98	Echo (ping) request id=0x1dc3, seq=2/512, ttl=64 (reply in 9)
9	9.047192987	172.16.10.254	172.16.10.1	ICMP	98	Echo (ping) reply id=0x1dc3, seq=2/512, ttl=64 (request in 8)
10	10.011236212	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
11	10.071029996	172.16.10.1	172.16.10.254	ICMP	98	Echo (ping) request id=0x1dc3, seq=3/768, ttl=64 (reply in 12)
12	10.071161018	172.16.10.254	172.16.10.1	ICMP	98	Echo (ping) reply id=0x1dc3, seq=3/768, ttl=64 (request in 11)
13	11.095025606	172.16.10.1	172.16.10.254	ICMP	98	Echo (ping) request id=0x1dc3, seq=4/1024, ttl=64 (reply in 14)
14	11.095156138	172.16.10.254	172.16.10.1	ICMP	98	Echo (ping) reply id=0x1dc3, seq=4/1024, ttl=64 (request in 13)
15	12.013483398	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
16	12.019030434	172.16.10.1	172.16.10.254	ICMP	98	Echo (ping) request id=0x1dc3, seq=5/1280, ttl=64 (reply in 17)
17	12.019159012	172.16.10.254	172.16.10.1	ICMP	98	Echo (ping) reply id=0x1dc3, seq=5/1280, ttl=64 (request in 16)
18	13.043035542	172.16.10.1	172.16.10.254	ICMP	98	Echo (ping) request id=0x1dc3, seq=6/1536, ttl=64 (reply in 19)
19	13.043166634	172.16.10.254	172.16.10.1	ICMP	98	Echo (ping) reply id=0x1dc3, seq=6/1536, ttl=64 (request in 18)
20	14.010731772	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
21	14.064052658	HewlettP_61:2f:24	HewlettP_61:2f:24	ARP	60	Who has 172.16.10.1? Tell 172.16.10.254
22	14.064071655	HewlettP_61:2f:24	HewlettP_61:2f:24	ARP	42	172.16.10.1 is at 00:21:5a:61:2d:ef
23	14.071042763	HewlettP_61:2f:24	HewlettP_61:2f:24	ARP	42	Who has 172.16.10.254? Tell 172.16.10.1
24	14.071190617	HewlettP_61:2f:24	HewlettP_61:2f:24	ARP	60	172.16.10.254 is at 00:21:5a:61:2f:24
25	16.017984476	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
26	18.020228939	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
27	20.022475427	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
28	21.065221925	172.16.10.1	172.16.11.253	ICMP	98	Echo (ping) request id=0x1dcd, seq=1/256, ttl=64 (reply in 29)
29	21.065383118	172.16.11.253	172.16.10.1	ICMP	98	Echo (ping) reply id=0x1dcd, seq=1/256, ttl=64 (request in 28)
30	22.024725337	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
31	22.071030590	172.16.10.1	172.16.11.253	ICMP	98	Echo (ping) request id=0x1dcd, seq=2/512, ttl=64 (reply in 32)
32	22.071160597	172.16.11.253	172.16.10.1	ICMP	98	Echo (ping) reply id=0x1dcd, seq=2/512, ttl=64 (request in 31)
33	23.095033045	172.16.10.1	172.16.11.253	ICMP	98	Echo (ping) request id=0x1dcd, seq=3/768, ttl=64 (reply in 34)
34	23.095161972	172.16.11.253	172.16.10.1	ICMP	98	Echo (ping) reply id=0x1dcd, seq=3/768, ttl=64 (request in 33)
35	24.020608193	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
36	24.019034103	172.16.10.1	172.16.11.253	ICMP	98	Echo (ping) request id=0x1dcd, seq=4/1024, ttl=64 (reply in 37)
37	24.019192851	172.16.11.253	172.16.10.1	ICMP	98	Echo (ping) reply id=0x1dcd, seq=4/1024, ttl=64 (request in 36)
38	25.043033344	172.16.10.1	172.16.11.253	ICMP	98	Echo (ping) request id=0x1dcd, seq=5/1280, ttl=64 (reply in 39)
39	25.043166531	172.16.11.253	172.16.10.1	ICMP	98	Echo (ping) reply id=0x1dcd, seq=5/1280, ttl=64 (request in 38)
40	26.020206231	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
41	26.067035658	172.16.10.1	172.16.11.253	ICMP	98	Echo (ping) request id=0x1dcd, seq=6/1536, ttl=64 (reply in 42)
42	26.067160959	172.16.11.253	172.16.10.1	ICMP	98	Echo (ping) reply id=0x1dcd, seq=6/1536, ttl=64 (request in 41)
43	27.091034070	172.16.10.1	172.16.11.253	ICMP	98	Echo (ping) request id=0x1dcd, seq=7/1792, ttl=64 (reply in 44)
44	27.091160435	172.16.11.253	172.16.10.1	ICMP	98	Echo (ping) reply id=0x1dcd, seq=7/1792, ttl=64 (request in 43)
45	28.031440459	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
46	30.033701512	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001

Frame 72: 60 bytes on wire (480 bits), 60 bytes captured (480 bits) on interface 0

- IEEE 802.3 Ethernet
- Logical-Link Control

0000 01 80 c2 00 00 00 c4 ad 34 1c 8c 9a 00 27 42 42 4.....B

Frame (frame), 60 bytes

Packets: 74 - Displayed: 74 (100.0%) - Dropped: 0 (0.0%) Profile: Default

Terminal Computer *eth0

Applications Places System *eth0 Thu 7 Dec, 10:58

File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help

Apply a display filter ... <Ctrl-/> Expression...

No.	Time	Source	Destination	Protocol	Length	Info
33	23.895033045	172.16.10.1	172.16.11.253	ICMP	98	Echo (ping) request id=0x1dcd, seq=3/768, ttl=64 (reply in 34)
34	23.895161972	172.16.11.253	172.16.10.1	ICMP	98	Echo (ping) reply id=0x1dcd, seq=3/768, ttl=64 (request in 33)
35	24.026968193	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
36	24.919034103	172.16.10.1	172.16.11.253	ICMP	98	Echo (ping) request id=0x1dcd, seq=4/1024, ttl=64 (reply in 37)
37	24.919192851	172.16.11.253	172.16.10.1	ICMP	98	Echo (ping) reply id=0x1dcd, seq=4/1024, ttl=64 (request in 36)
38	25.943033344	172.16.10.1	172.16.11.253	ICMP	98	Echo (ping) request id=0x1dcd, seq=5/1280, ttl=64 (reply in 39)
39	25.943166531	172.16.11.253	172.16.10.1	ICMP	98	Echo (ping) reply id=0x1dcd, seq=5/1280, ttl=64 (request in 38)
40	26.025206231	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
41	26.967025658	172.16.10.1	172.16.11.253	ICMP	98	Echo (ping) request id=0x1dcd, seq=6/1536, ttl=64 (reply in 42)
42	26.967166959	172.16.11.253	172.16.10.1	ICMP	98	Echo (ping) reply id=0x1dcd, seq=6/1536, ttl=64 (request in 41)
43	27.991034978	172.16.10.1	172.16.11.253	ICMP	98	Echo (ping) request id=0x1dcd, seq=7/1792, ttl=64 (reply in 44)
44	27.991164315	172.16.11.253	172.16.10.1	ICMP	98	Echo (ping) reply id=0x1dcd, seq=7/1792, ttl=64 (request in 43)
45	28.031448459	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
46	30.033701512	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
47	32.035947391	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
48	32.862792760	0.0.0.0	255.255.255.255	MNDP	150	5678 - 5678 Len=117
49	32.862826424	Routerbo_1c:8c:9a	CDP/VTP/DTP/PAGP/U...	CDP	93	Device ID: MikroTik Port ID: bridge10
50	32.862873427	Routerbo_1c:8c:9a	LLDP_Multicast	LLDP	110	TTL = 120 System Name = MikroTik System Description = MikroTik RouterOS 6.
51	34.038109866	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
52	34.681142893	172.16.10.1	172.16.11.1	ICMP	98	Echo (ping) request id=0x1dd4, seq=1/256, ttl=64 (reply in 53)
53	34.681561310	172.16.11.1	172.16.10.1	ICMP	98	Echo (ping) reply id=0x1dd4, seq=1/256, ttl=63 (request in 52)
54	35.793023577	172.16.10.1	172.16.11.1	ICMP	98	Echo (ping) request id=0x1dd4, seq=2/512, ttl=64 (reply in 55)
55	35.793268649	172.16.11.1	172.16.10.1	ICMP	98	Echo (ping) reply id=0x1dd4, seq=2/512, ttl=63 (request in 54)
56	36.040446354	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
57	36.727030802	172.16.10.1	172.16.11.1	ICMP	98	Echo (ping) request id=0x1dd4, seq=3/768, ttl=64 (reply in 58)
58	36.727268170	172.16.11.1	172.16.10.1	ICMP	98	Echo (ping) reply id=0x1dd4, seq=3/768, ttl=63 (request in 57)
59	37.751030720	172.16.10.1	172.16.11.1	ICMP	98	Echo (ping) request id=0x1dd4, seq=4/1024, ttl=64 (reply in 60)
60	37.751272719	172.16.11.1	172.16.10.1	ICMP	98	Echo (ping) reply id=0x1dd4, seq=4/1024, ttl=63 (request in 59)
61	38.042688791	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
62	38.775030800	172.16.10.1	172.16.11.1	ICMP	98	Echo (ping) request id=0x1dd4, seq=5/1280, ttl=64 (reply in 63)
63	38.775290948	172.16.11.1	172.16.10.1	ICMP	98	Echo (ping) reply id=0x1dd4, seq=5/1280, ttl=63 (request in 62)
64	39.799031648	172.16.10.1	172.16.11.1	ICMP	98	Echo (ping) request id=0x1dd4, seq=6/1536, ttl=64 (reply in 65)
65	39.799273158	172.16.11.1	172.16.10.1	ICMP	98	Echo (ping) reply id=0x1dd4, seq=6/1536, ttl=63 (request in 64)
66	40.044933394	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
67	40.823034032	172.16.10.1	172.16.11.1	ICMP	98	Echo (ping) request id=0x1dd4, seq=7/1792, ttl=64 (reply in 68)
68	40.823277497	172.16.11.1	172.16.10.1	ICMP	98	Echo (ping) reply id=0x1dd4, seq=7/1792, ttl=63 (request in 67)
69	42.047192034	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
70	44.049116974	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
71	46.051363742	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
72	48.053608763	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
73	50.055850781	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
74	52.058101390	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001

Frame 72: 60 bytes on wire (480 bits), 60 bytes captured (480 bits) on interface 0

- IEEE 802.3 Ethernet
- Logical-Link Control


0000 01 00 c2 00 00 00 c4 ad 34 1c 8c 9a 00 27 42 42 4....BB

Frame (frame), 60 bytes

Packets: 74 · Displayed: 74 (100.0%) · Dropped: 0 (0.0%) Profile: Default

Terminal Computer *eth0

Tux13 – Exp 4 – Ping RC

Applications Places System  Fri 8 Dec, 11:19

exp4_p3_test_file.pcapng

File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help

Apply a display filter... <Ctrl-/> Expression...

No.	Time	Source	Destination	Protocol	Length	Info
62	38.048249832	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP		60 RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
63	38.027283071	HewlettP_61:2d:ef	HewlettP_61:2f:24	ARP		42 Who has 172.16.10.254? Tell 172.16.10.1
64	38.027342819	HewlettP_61:2d:ef	HewlettP_61:2d:ef	ARP		60 172.16.10.254 is at 00:21:5a:61:2f:24
65	39.023230461	172.16.10.1	172.16.11.1	ICMP		98 Echo (ping) request id=0x4f2d, seq=8/2048, ttl=64 (reply in 66)
66	39.0232520364	172.16.11.1	172.16.10.1	ICMP		98 Echo (ping) reply id=0x4f2d, seq=8/2048, ttl=63 (request in 65)
67	40.042317783	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP		60 RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
68	40.047234812	172.16.10.1	172.16.11.1	ICMP		98 Echo (ping) request id=0x4f2d, seq=9/2304, ttl=64 (reply in 69)
69	40.047488678	172.16.11.1	172.16.10.1	ICMP		98 Echo (ping) reply id=0x4f2d, seq=9/2304, ttl=63 (request in 68)
70	41.071236297	172.16.10.1	172.16.11.1	ICMP		98 Echo (ping) request id=0x4f2d, seq=9/2304, ttl=64 (reply in 71)
71	41.071490629	172.16.11.1	172.16.10.1	ICMP		98 Echo (ping) reply id=0x4f2d, seq=9/2304, ttl=63 (request in 70)
72	41.121052273	0.0.0.0	255.255.255.255	MNDP		159 5678 - 5678 Len=117
73	41.121092431	Routerbo_1c:8c:9a	CDP/VTP/DTP/PAQP/U...	CDP		93 Device ID: MikroTik Port ID: bridge10
74	41.121142715	Routerbo_1c:8c:9a	LLDP_Multicast	LLDP		110 TTL = 120 System Name = MikroTik System Description = MikroTik RouterOS 6.45.1
75	42.044392272	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP		60 RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
76	44.046413672	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP		60 RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
77	45.927697647	172.16.10.1	172.16.11.254	ICMP		98 Echo (ping) request id=0x4f3a, seq=1/256, ttl=64 (reply in 78)
78	45.928030292	172.16.11.254	172.16.10.1	ICMP		98 Echo (ping) reply id=0x4f3a, seq=1/256, ttl=63 (request in 77)
79	46.048469362	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP		60 RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
80	46.059235986	172.16.10.1	172.16.11.254	ICMP		98 Echo (ping) request id=0x4f3a, seq=2/512, ttl=64 (reply in 81)
81	46.059495580	172.16.11.254	172.16.10.1	ICMP		98 Echo (ping) reply id=0x4f3a, seq=2/512, ttl=63 (request in 80)
82	47.983235251	172.16.10.1	172.16.11.254	ICMP		98 Echo (ping) request id=0x4f3a, seq=3/768, ttl=64 (reply in 83)
83	47.983492819	172.16.11.254	172.16.10.1	ICMP		98 Echo (ping) reply id=0x4f3a, seq=3/768, ttl=63 (request in 82)
84	48.050546839	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP		60 RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
85	49.007237948	172.16.10.1	172.16.11.254	ICMP		98 Echo (ping) request id=0x4f3a, seq=4/1024, ttl=64 (reply in 86)
86	49.007521427	172.16.11.254	172.16.10.1	ICMP		98 Echo (ping) reply id=0x4f3a, seq=4/1024, ttl=63 (request in 85)
87	50.031235823	172.16.10.1	172.16.11.254	ICMP		98 Echo (ping) request id=0x4f3a, seq=5/1280, ttl=64 (reply in 88)
88	50.031497232	172.16.11.254	172.16.10.1	ICMP		98 Echo (ping) reply id=0x4f3a, seq=5/1280, ttl=63 (request in 87)
89	50.052576540	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP		60 RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
90	51.055238168	172.16.10.1	172.16.11.254	ICMP		98 Echo (ping) request id=0x4f3a, seq=6/1536, ttl=64 (reply in 91)
91	51.055487285	172.16.11.254	172.16.10.1	ICMP		98 Echo (ping) reply id=0x4f3a, seq=6/1536, ttl=63 (request in 90)
92	52.054662562	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP		60 RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
93	52.079237775	172.16.10.1	172.16.11.254	ICMP		98 Echo (ping) request id=0x4f3a, seq=7/1792, ttl=64 (reply in 94)
94	52.079485985	172.16.11.254	172.16.10.1	ICMP		98 Echo (ping) reply id=0x4f3a, seq=7/1792, ttl=63 (request in 93)
95	53.103237595	172.16.10.1	172.16.11.254	ICMP		98 Echo (ping) request id=0x4f3a, seq=8/2048, ttl=64 (reply in 96)
96	53.103503664	172.16.11.254	172.16.10.1	ICMP		98 Echo (ping) reply id=0x4f3a, seq=8/2048, ttl=63 (request in 95)
97	54.056738148	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP		60 RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
98	54.127237064	172.16.10.1	172.16.11.254	ICMP		98 Echo (ping) request id=0x4f3a, seq=9/2304, ttl=64 (reply in 99)
99	54.127518667	172.16.11.254	172.16.10.1	ICMP		98 Echo (ping) reply id=0x4f3a, seq=9/2304, ttl=63 (request in 98)
100	55.151237103	172.16.10.1	172.16.11.254	ICMP		98 Echo (ping) request id=0x4f3a, seq=10/2560, ttl=64 (reply in 101)
101	55.151492297	172.16.11.254	172.16.10.1	ICMP		98 Echo (ping) reply id=0x4f3a, seq=10/2560, ttl=63 (request in 100)
102	56.058767318	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP		60 RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
103	58.060856136	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP		60 RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001

Frame 74: 110 bytes on wire (880 bits), 110 bytes captured (880 bits) on interface 0
 Ethernet II, Src: Routerbo_1c:8c:9a (c4:ad:34:1c:8c:9a), Dst: LLDP_Multicast (01:80:c2:00:00:0e)
 Link Layer Discovery Protocol

0000 01 80 c2 00 00 0e c4 ad 34 1c 8c 9a 88 cc 02 07 4.....

Ready to load or capture Packets: 103 - Displayed: 103 (100.0%) - Dropped: 0 (0.0%) Profile: Default

Terminal up202102363-3 [exp1_p6.png] exp4_p3_test_file.pca...

Tux13 – Exp 4 – Ping Tux12

Applications Places System Fri 8 Dec, 11:18

exp4_p3_test_file.pcapng

File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help

Apply a display filter ... <Ctrl-/> Expression...

No.	Time	Source	Destination	Protocol	Length	Info
37	24.025789367	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
38	26.027877985	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
39	28.022131381	172.16.10.1	91.209.16.78	NTP	90	NTP Version 4, client
40	29.030921315	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
41	28.031030945	91.209.16.78	172.16.10.1	NTP	90	NTP Version 4, server
42	30.032984037	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
43	31.856168646	172.16.10.1	172.16.11.1	ICMP	98	Echo (ping) request id=0x4f2d, seq=1/256, ttl=64 (reply in 44)
44	31.856649418	172.16.11.1	172.16.10.1	ICMP	98	Echo (ping) reply id=0x4f2d, seq=1/256, ttl=63 (request in 43)
45	32.034157967	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
46	32.879238412	172.16.10.1	172.16.11.1	ICMP	98	Echo (ping) request id=0x4f2d, seq=2/512, ttl=64 (reply in 47)
47	32.879528034	172.16.11.1	172.16.10.1	ICMP	98	Echo (ping) reply id=0x4f2d, seq=2/512, ttl=63 (request in 46)
48	33.903261604	172.16.10.1	172.16.11.1	ICMP	98	Echo (ping) request id=0x4f2d, seq=3/768, ttl=64 (reply in 49)
49	33.903575880	172.16.11.1	172.16.10.1	ICMP	98	Echo (ping) reply id=0x4f2d, seq=3/768, ttl=63 (request in 48)
50	34.036191057	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
51	34.927237286	172.16.10.1	172.16.11.1	ICMP	98	Echo (ping) request id=0x4f2d, seq=4/1024, ttl=64 (reply in 52)
52	34.927530749	172.16.11.1	172.16.10.1	ICMP	98	Echo (ping) reply id=0x4f2d, seq=4/1024, ttl=63 (request in 51)
53	35.051236049	172.16.10.1	172.16.11.1	ICMP	98	Echo (ping) request id=0x4f2d, seq=5/1280, ttl=64 (reply in 54)
54	35.051499272	172.16.11.1	172.16.10.1	ICMP	98	Echo (ping) reply id=0x4f2d, seq=5/1280, ttl=63 (request in 53)
55	36.038203218	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
56	36.075235471	172.16.10.1	172.16.11.1	ICMP	98	Echo (ping) request id=0x4f2d, seq=6/1536, ttl=64 (reply in 57)
57	36.075495133	172.16.11.1	172.16.10.1	ICMP	98	Echo (ping) reply id=0x4f2d, seq=6/1536, ttl=63 (request in 56)
58	37.110959385	HewlettP_61:2f:24	HewlettP_61:2f:24	ARP	60	Who has 172.16.10.1? Tell 172.16.10.254
59	37.110966928	HewlettP_61:2d:ef	HewlettP_61:2f:24	ARP	42	172.16.10.1 is at 00:21:5a:61:2d:ef
60	37.999237568	172.16.10.1	172.16.11.1	ICMP	98	Echo (ping) request id=0x4f2d, seq=7/1792, ttl=64 (reply in 61)
61	37.999496951	172.16.11.1	172.16.10.1	ICMP	98	Echo (ping) reply id=0x4f2d, seq=7/1792, ttl=63 (request in 60)
62	38.045249832	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
63	38.927203071	HewlettP_61:2d:ef	HewlettP_61:2f:24	ARP	42	Who has 172.16.10.254? Tell 172.16.10.1
64	38.927342810	HewlettP_61:2f:24	HewlettP_61:2d:ef	ARP	60	172.16.10.254 is at 00:21:5a:61:2f:24
65	39.023230461	172.16.10.1	172.16.11.1	ICMP	98	Echo (ping) request id=0x4f2d, seq=8/2048, ttl=64 (reply in 66)
66	39.023250364	172.16.11.1	172.16.10.1	ICMP	98	Echo (ping) reply id=0x4f2d, seq=8/2048, ttl=63 (request in 65)
67	40.042317783	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
68	40.047234812	172.16.10.1	172.16.11.1	ICMP	98	Echo (ping) request id=0x4f2d, seq=9/2304, ttl=64 (reply in 69)
69	40.047488678	172.16.11.1	172.16.10.1	ICMP	98	Echo (ping) reply id=0x4f2d, seq=9/2304, ttl=63 (request in 68)
70	41.071236297	172.16.10.1	172.16.11.1	ICMP	98	Echo (ping) request id=0x4f2d, seq=10/2560, ttl=64 (reply in 71)
71	41.071496629	172.16.11.1	172.16.10.1	ICMP	98	Echo (ping) reply id=0x4f2d, seq=10/2560, ttl=63 (request in 70)
72	41.121052273	0.0.0.0	255.255.255.255	MNDP	159	5678 - 5678 Len=117
73	41.121092431	Routerbo_1c:8c:9a	CDP/VTP/DTP/PAGP/U...	CDP	93	Device ID: MikroTik Port ID: bridge10
74	41.121142715	Routerbo_1c:8c:9a	LLDP_Multicast	LLDP	110	TTL = 120 System Name = MikroTik System Description = MikroTik RouterOS 6.44.1
75	42.044392272	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
76	44.048413672	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
77	45.027697647	172.16.10.1	172.16.11.254	ICMP	98	Echo (ping) request id=0x4f3a, seq=1/256, ttl=64 (reply in 78)
78	45.028030292	172.16.11.254	172.16.10.1	ICMP	98	Echo (ping) reply id=0x4f3a, seq=1/256, ttl=63 (request in 77)
79	46.048469362	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001

Frame 84: 60 bytes on wire (480 bits), 60 bytes captured (480 bits) on interface 0

IEEE 802.3 Ethernet

Logical-Link Control

0000 01 00 c2 00 00 c4 ad 34 1c 8c 9a 00 27 42 42 4....BB





Ready to load or capture

Packets: 103 · Displayed: 103 (100.0%)

Profile: Default

Terminal up202102363-3 [exp1_p6.png] exp4_p3_test_file.pca...

Tux13 – Exp 4 – Ping Tux14

Applications Places System     Fri 8 Dec, 11:18

exp4_p3_test_file.pcapng

File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help

Apply a display filter ... <Ctrl-/> Expression...

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000000	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
2	2.002203672	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
3	4.004356967	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
4	6.006440048	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
5	7.076085686	172.16.10.1	172.16.10.254	ICMP	98	Echo (ping) request id=0x4f1d, seq=1/256, ttl=64 (reply in 6)
6	7.076239756	172.16.10.254	172.16.10.1	ICMP	98	Echo (ping) reply id=0x4f1d, seq=1/256, ttl=64 (request in 5)
7	8.008711563	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
8	9.007243350	172.16.10.1	172.16.10.254	ICMP	98	Echo (ping) request id=0x4f1d, seq=2/512, ttl=64 (reply in 9)
9	9.007402938	172.16.10.254	172.16.10.1	ICMP	98	Echo (ping) reply id=0x4f1d, seq=2/512, ttl=64 (request in 8)
10	10.010905692	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
11	10.031241043	172.16.10.1	172.16.10.254	ICMP	98	Echo (ping) request id=0x4f1d, seq=3/768, ttl=64 (reply in 12)
12	10.031364942	172.16.10.254	172.16.10.1	ICMP	98	Echo (ping) reply id=0x4f1d, seq=3/768, ttl=64 (request in 11)
13	11.055237321	172.16.10.1	172.16.10.254	ICMP	98	Echo (ping) request id=0x4f1d, seq=4/1024, ttl=64 (reply in 14)
14	11.055366248	172.16.10.254	172.16.10.1	ICMP	98	Echo (ping) reply id=0x4f1d, seq=4/1024, ttl=64 (request in 13)
15	12.013111464	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
16	12.079237911	172.16.10.1	172.16.10.254	ICMP	98	Echo (ping) request id=0x4f1d, seq=5/1280, ttl=64 (reply in 17)
17	12.079350924	172.16.10.254	172.16.10.1	ICMP	98	Echo (ping) reply id=0x4f1d, seq=5/1280, ttl=64 (request in 16)
18	13.047084859	HewlettP_61:2f:24	HewlettP_61:2d:ef	ARP	60	Who has 172.16.10.1? Tell 172.16.10.254
19	13.047106021	HewlettP_61:2d:ef	HewlettP_61:2f:24	ARP	42	172.16.10.1 is at 00:21:5a:61:2d:ef
20	13.071204796	HewlettP_61:2d:ef	HewlettP_61:2f:24	ARP	42	Who has 172.16.10.254? Tell 172.16.10.1
21	13.071302015	HewlettP_61:2f:24	HewlettP_61:2d:ef	ARP	60	172.16.10.254 is at 00:21:5a:61:2f:24
22	13.103226750	172.16.10.1	172.16.10.254	ICMP	98	Echo (ping) request id=0x4f1d, seq=6/1536, ttl=64 (reply in 23)
23	13.103347227	172.16.10.254	172.16.10.1	ICMP	98	Echo (ping) reply id=0x4f1d, seq=6/1536, ttl=64 (request in 22)
24	14.015201730	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
25	14.127236595	172.16.10.1	172.16.10.254	ICMP	98	Echo (ping) request id=0x4f1d, seq=7/1792, ttl=64 (reply in 26)
26	14.127388779	172.16.10.254	172.16.10.1	ICMP	98	Echo (ping) reply id=0x4f1d, seq=7/1792, ttl=64 (request in 25)
27	15.151237204	172.16.10.1	172.16.10.254	ICMP	98	Echo (ping) request id=0x4f1d, seq=8/2048, ttl=64 (reply in 28)
28	15.151368017	172.16.10.254	172.16.10.1	ICMP	98	Echo (ping) reply id=0x4f1d, seq=8/2048, ttl=64 (request in 27)
29	16.017290328	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
30	16.175248343	172.16.10.1	172.16.10.254	ICMP	98	Echo (ping) request id=0x4f1d, seq=9/2304, ttl=64 (reply in 31)
31	16.175378668	172.16.10.254	172.16.10.1	ICMP	98	Echo (ping) reply id=0x4f1d, seq=9/2304, ttl=64 (request in 30)
32	17.199239842	172.16.10.1	172.16.10.254	ICMP	98	Echo (ping) request id=0x4f1d, seq=10/2560, ttl=64 (reply in 33)
33	17.199369259	172.16.10.254	172.16.10.1	ICMP	98	Echo (ping) reply id=0x4f1d, seq=10/2560, ttl=64 (request in 32)
34	18.019436696	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
35	20.021564919	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
36	22.023700794	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
37	24.025789367	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
38	26.027877985	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
39	28.022131381	172.16.10.1	91.209.10.78	NTP	90	NTP Version 4, client
40	28.030021313	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
41	28.031030945	91.209.10.78	172.16.10.1	NTP	90	NTP Version 4, server
42	30.032964037	Routerbo_1c:8c:9a	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8001
43	31.056168646	172.16.10.1	172.16.11.1	ICMP	98	Echo (ping) request id=0x4f2d, seq=1/256, ttl=64 (reply in 44)

Frame 84: 60 bytes on wire (480 bits), 60 bytes captured (480 bits) on interface 0
 IEEE 802.3 Ethernet
 Logical-Link Control
 0000 01 80 c2 00 00 00 c4 ad 34 1c 8c 9a 00 27 42 42 4....'BB

Ready to load or capture Packets: 103 · Displayed: 103 (100.0%) Profile: Default

Terminal up202102363-3 [exp1_p6.png] exp4_p3_test_file.pca...

Tux13 – Exp 6 – Run application

The image displays the Wireshark network protocol analyzer interface. The top menu bar includes File, Edit, View, Go, Capture, Analyze, Statistics, Telephony, Wireless, Tools, and Help. The title bar shows the file name 'exp6_p3_1_test_file.pcapng' and the date 'Mon 11 Dec, 18:24'.

The main display area is divided into three panes:

- Packet List:** Shows a list of captured packets with columns for No., Time, Source, Destination, Protocol, and Length/Info. The list includes packets for Spanning-tree, DNS, TCP, and FTP. Notable packets include:
 - Packet 4: Standard query request for 'netlab1.fe.up.pt'.
 - Packet 7: SYN packet from 192.168.10.1 to 192.168.109.136.
 - Packet 8: ACK packet from 192.168.10.1 to 192.168.109.136.
 - Packet 9: FTP 'Welcome to netlab-FTP server' message.
 - Packet 10: FTP 'Request: user anonymous' message.
 - Packet 11: FTP 'Request: pass anonymous' message.
 - Packet 12: FTP 'Request: pasv' message.
 - Packet 13: FTP 'Response: 227 Entering Passive Mode (192,168,109,136,182,214)'.
 - Packet 14: FTP 'Request: retr pub.txt' message.
 - Packet 15: FTP 'Response: 150 Opening BINARY mode data connection for pub.txt (672 bytes)'.
 - Packet 16: FTP data transfer (672 bytes).
 - Packet 17: FTP 'Request: quit' message.
 - Packet 18: FTP 'Response: 221 Goodbye' message.
- Packet Details:** Provides a hierarchical view of the selected packet (Packet 16). It shows:
 - Frame 1: 60 bytes on wire (480 bits), 60 bytes captured (480 bits) on interface 0.
 - IEEE 802.3 Ethernet II
 - Logical-Link Control
 - Spanning Tree Protocol
- Packet Bytes:** Displays the raw packet data in hexadecimal and ASCII. The first few bytes are '0000 01 80 c2 00 00 00 c4 ad 34 1c 8c 9b 00 27 42 42'.

The bottom status bar indicates 'Packets: 47 • Displayed: 47 (100.0%)' and 'Profile: Default'. The bottom toolbar includes buttons for 'Ready to load or capture', 'Terminal', 'download_app', and 'exp6_p3_1_test_file.p...'.

Tux14 – Exp 2 – Tux13 Broadcast

Applications Places System Thu 7 Dec, 10:17

***eth0**

File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help

Apply a display filter ... <Ctrl-/> Expression...



No.	Time	Source	Destination	Protocol	Length	Info
7	8.696251947	172.16.10.254	172.16.10.1	ICMP	98	Echo (ping) reply id=0x1703, seq=1/256, ttl=64
8	9.716599157	172.16.10.1	172.16.10.255	ICMP	98	Echo (ping) request id=0x1703, seq=2/512, ttl=64 (no response found!)
9	9.716630725	172.16.10.254	172.16.10.1	ICMP	98	Echo (ping) reply id=0x1703, seq=2/512, ttl=64
10	10.010079215	Routerbo_1c:8c:b0	Spanning-tree-(for_	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8002
11	10.740587962	172.16.10.1	172.16.10.255	ICMP	98	Echo (ping) request id=0x1703, seq=3/768, ttl=64 (no response found!)
12	10.740618902	172.16.10.254	172.16.10.1	ICMP	98	Echo (ping) reply id=0x1703, seq=3/768, ttl=64
13	11.764564335	172.16.10.1	172.16.10.255	ICMP	98	Echo (ping) request id=0x1703, seq=4/1024, ttl=64 (no response found!)
14	11.764595973	172.16.10.254	172.16.10.1	ICMP	98	Echo (ping) reply id=0x1703, seq=4/1024, ttl=64
15	12.012534003	Routerbo_1c:8c:b0	Spanning-tree-(for_	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8002
16	12.788558029	172.16.10.1	172.16.10.255	ICMP	98	Echo (ping) request id=0x1703, seq=5/1280, ttl=64 (no response found!)
17	12.788588200	172.16.10.254	172.16.10.1	ICMP	98	Echo (ping) reply id=0x1703, seq=5/1280, ttl=64
18	13.801362171	HewlettP_61:2f:24	HewlettP_61:2d:ef	ARP	42	Who has 172.16.10.1? Tell 172.16.10.254
19	13.801516310	HewlettP_61:2d:ef	HewlettP_61:2f:24	ARP	60	172.16.10.1 is at 00:21:5a:61:2d:ef
20	13.812506954	172.16.10.1	172.16.10.255	ICMP	98	Echo (ping) request id=0x1703, seq=6/1536, ttl=64 (no response found!)
21	13.812529094	172.16.10.254	172.16.10.1	ICMP	98	Echo (ping) reply id=0x1703, seq=6/1536, ttl=64
22	14.013622752	Routerbo_1c:8c:b0	Spanning-tree-(for_	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8002
23	14.840519804	172.16.10.1	172.16.10.255	ICMP	98	Echo (ping) request id=0x1703, seq=7/1792, ttl=64 (no response found!)
24	14.840551163	172.16.10.254	172.16.10.1	ICMP	98	Echo (ping) reply id=0x1703, seq=7/1792, ttl=64
25	15.860505097	172.16.10.1	172.16.10.255	ICMP	98	Echo (ping) request id=0x1703, seq=8/2048, ttl=64 (no response found!)
26	15.860536240	172.16.10.254	172.16.10.1	ICMP	98	Echo (ping) reply id=0x1703, seq=8/2048, ttl=64
27	16.013534911	Routerbo_1c:8c:b0	Spanning-tree-(for_	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8002
28	16.884485241	172.16.10.1	172.16.10.255	ICMP	98	Echo (ping) request id=0x1703, seq=9/2304, ttl=64 (no response found!)
29	16.884516600	172.16.10.254	172.16.10.1	ICMP	98	Echo (ping) reply id=0x1703, seq=9/2304, ttl=64
30	17.908472649	172.16.10.1	172.16.10.255	ICMP	98	Echo (ping) request id=0x1703, seq=10/2560, ttl=64 (no response found!)
31	17.908503240	172.16.10.254	172.16.10.1	ICMP	98	Echo (ping) reply id=0x1703, seq=10/2560, ttl=64
32	18.017505718	Routerbo_1c:8c:b0	Spanning-tree-(for_	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8002
33	18.932467600	172.16.10.1	172.16.10.255	ICMP	98	Echo (ping) request id=0x1703, seq=11/2816, ttl=64 (no response found!)
34	18.932499797	172.16.10.254	172.16.10.1	ICMP	98	Echo (ping) reply id=0x1703, seq=11/2816, ttl=64
35	19.956439992	172.16.10.1	172.16.10.255	ICMP	98	Echo (ping) request id=0x1703, seq=12/3072, ttl=64 (no response found!)
36	19.956472538	172.16.10.254	172.16.10.1	ICMP	98	Echo (ping) reply id=0x1703, seq=12/3072, ttl=64
37	20.010079862	Routerbo_1c:8c:b0	Spanning-tree-(for_	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8002
38	20.080442705	172.16.10.1	172.16.10.255	ICMP	98	Echo (ping) request id=0x1703, seq=13/3328, ttl=64 (no response found!)
39	20.080473565	172.16.10.254	172.16.10.1	ICMP	98	Echo (ping) reply id=0x1703, seq=13/3328, ttl=64
40	22.004412573	172.16.10.1	172.16.10.255	ICMP	98	Echo (ping) request id=0x1703, seq=14/3584, ttl=64 (no response found!)
41	22.004444081	172.16.10.254	172.16.10.1	ICMP	98	Echo (ping) reply id=0x1703, seq=14/3584, ttl=64
42	22.021849287	Routerbo_1c:8c:b0	Spanning-tree-(for_	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8002
43	23.028397397	172.16.10.1	172.16.10.255	ICMP	98	Echo (ping) request id=0x1703, seq=15/3840, ttl=64 (no response found!)
44	23.028427568	172.16.10.254	172.16.10.1	ICMP	98	Echo (ping) reply id=0x1703, seq=15/3840, ttl=64
45	24.023690094	Routerbo_1c:8c:b0	Spanning-tree-(for_	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8002
46	24.052369439	172.16.10.1	172.16.10.255	ICMP	98	Echo (ping) request id=0x1703, seq=16/4096, ttl=64 (no response found!)
47	24.052397097	172.16.10.254	172.16.10.1	ICMP	98	Echo (ping) reply id=0x1703, seq=16/4096, ttl=64
48	25.076375355	172.16.10.1	172.16.10.255	ICMP	98	Echo (ping) request id=0x1703, seq=17/4352, ttl=64 (no response found!)
49	25.076406854	172.16.10.254	172.16.10.1	ICMP	98	Echo (ping) reply id=0x1703, seq=17/4352, ttl=64
50	26.023056700	Routerbo_1c:8c:b0	Spanning-tree-(for_	STP	60	RST. Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8002
51	27.290603603	0.0.0.0	255.255.255.255	MNDP	159	5678 - 5678 Len=117
52	27.290635590	Routerbo_1c:8c:9a	CDP/VTP/DTP/PagP/U...	CDP	93	Device ID: Mikrotik Port ID: bridge10

0000 01 00 c2 00 00 00 c4 ad 34 1c 8c b0 00 27 42 42 4....BB

wireshark_eth0_20231207101622_zgUUVZ.pcapng Packets: 63 - Displayed: 63 (100.0%) Profile: Default

Terminal [up20102362-4] *eth0

Tux14 – Exp 2 – Tux12 Broadcast

Applications Places System  Thu 7 Dec, 10:25 

***eth0**

File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help

Apply a display filter ... <Ctrl-/> Expression...

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000000	Routerbo_1c:8c:b0	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8002
2	0.002176324	Routerbo_1c:8c:b0	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8002
3	4.004361378	Routerbo_1c:8c:b0	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8002
4	6.006537772	Routerbo_1c:8c:b0	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8002
5	8.008710814	Routerbo_1c:8c:b0	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8002
6	10.010888884	Routerbo_1c:8c:b0	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8002
7	12.013069128	Routerbo_1c:8c:b0	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8002
8	12.050813206	0.0.0.0	255.255.255.255	MNDP	150	5678 - 5678 Len=117
9	12.050859442	Routerbo_1c:8c:9a	CDP/VTP/OTF/PagP/U...	CDP	93	Device ID: MikroTik Port ID: bridge10
10	12.050899191	Routerbo_1c:8c:9a	LLDP_Multicast	LLDP	110	TTL = 120 System Name = MikroTik System Description = MikroTik RouterOS 6.43.16 (long-ter...
11	14.015259343	Routerbo_1c:8c:b0	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8002
12	16.017436365	Routerbo_1c:8c:b0	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8002
13	18.019614086	Routerbo_1c:8c:b0	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8002
14	20.021798861	Routerbo_1c:8c:b0	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8002
15	22.023969319	Routerbo_1c:8c:b0	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8002
16	24.026152139	Routerbo_1c:8c:b0	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8002
17	26.028323644	Routerbo_1c:8c:b0	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8002
18	28.030503399	Routerbo_1c:8c:b0	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8002
19	30.032686679	Routerbo_1c:8c:b0	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8002
20	32.034279521	Routerbo_1c:8c:b0	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8002
21	34.036462319	Routerbo_1c:8c:b0	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8002
22	36.038637386	Routerbo_1c:8c:b0	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8002
23	38.040819158	Routerbo_1c:8c:b0	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8002
24	40.043000938	Routerbo_1c:8c:b0	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8002
25	42.045175857	Routerbo_1c:8c:b0	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8002
26	44.047361750	Routerbo_1c:8c:b0	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8002
27	46.049539671	Routerbo_1c:8c:b0	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8002
28	48.051711116	Routerbo_1c:8c:b0	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8002
29	50.053892538	Routerbo_1c:8c:b0	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8002
30	52.056069840	Routerbo_1c:8c:b0	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8002
31	54.058249936	Routerbo_1c:8c:b0	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8002
32	56.060429892	Routerbo_1c:8c:b0	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8002
33	58.062606615	Routerbo_1c:8c:b0	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8002
34	60.064783728	Routerbo_1c:8c:b0	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8002
35	62.066955792	Routerbo_1c:8c:b0	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8002
36	64.069132605	Routerbo_1c:8c:b0	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8002
37	66.071313888	Routerbo_1c:8c:b0	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8002
38	68.073499143	Routerbo_1c:8c:b0	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8002
39	68.865590661	fe80::221:5aff:fe6...	ff02::2	ICMPv6	70	Router Solicitation from 00:21:5a:61:2d:ef
40	70.075674150	Routerbo_1c:8c:b0	Spanning-tree-(for...	STP	60	RST, Root = 32768/0/c4:ad:34:1c:8c:9a Cost = 0 Port = 0x8002

Frame 1: 60 bytes on wire (480 bits), 60 bytes captured (480 bits) on interface 0
 IEEE 802.3 Ethernet
 Logical-Link Control

0000 01 80 c2 00 00 00 c4 ad 34 1c 8c b0 00 27 42 42 4....'BB

wireshark_eth0_20231207102336_kb907L.pcapng Packets: 40 · Displayed: 40 (100.0%) Profile: Default

Terminal up202102362-4 *eth0

Tux14 – Exp 3 – Tux13 ping Tux12

Applications Places System Tue 5 Dec, 14:17

Capturing from eth0

File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help

Apply a display filter ... <Ctrl-/> Expression...

No.	Time	Source	Destination	Protocol	Length	Info
317	313.908626377	172.16.10.1	172.16.11.1	ICMP	98	Ecl
318	314.094953969	Routerbo_1c:8c:99	Spanning-tree-(for...	STP	60	RS
319	314.938398459	172.16.10.1	172.16.11.1	ICMP	98	Ecl
320	315.962371899	172.16.10.1	172.16.11.1	ICMP	98	Ecl
321	316.094259828	Routerbo_1c:8c:99	Spanning-tree-(for...	STP	60	RS
322	316.227467621	172.16.10.1	193.136.28.10	DNS	81	Sti
323	316.227471811	172.16.10.1	193.136.28.10	DNS	81	Sti
324	316.378325093	HewlettP_61:2d:ef	HewlettP_61:2f:24	ARP	60	Wh
325	316.378337155	HewlettP_61:2f:24	HewlettP_61:2d:ef	ARP	42	17:
326	316.986357700	172.16.10.1	172.16.11.1	ICMP	98	Ecl
327	318.010336029	172.16.10.1	172.16.11.1	ICMP	98	Ecl
328	318.096557747	Routerbo_1c:8c:99	Spanning-tree-(for...	STP	60	RS
329	319.034327288	172.16.10.1	172.16.11.1	ICMP	98	Ecl
330	319.193615335	0.0.0.0	255.255.255.255	MNDP	157	56:
331	319.193651722	Routerbo_1c:8c:9b	CDP/VTP/DTP/PagP/U...	CDP	93	Dei
332	319.193696639	Routerbo_1c:8c:9b	LLDP Multicast	LLDP	116	Tr
333	320.058299041	172.16.10.1	172.16.11.1	ICMP	98	Ecl
334	320.098869703	Routerbo_1c:8c:99	Spanning-tree-(for...	STP	60	RS
335	321.082274856	172.16.10.1	172.16.11.1	ICMP	98	Ecl
336	321.232501920	172.16.10.1	172.16.1.1	DNS	97	Sti
337	321.232506739	172.16.10.1	172.16.1.1	DNS	97	Sti
338	322.091078559	Routerbo_1c:8c:99	Spanning-tree-(for...	STP	60	RS
339	322.106240962	172.16.10.1	172.16.11.1	ICMP	98	Ecl
340	323.130233119	172.16.10.1	172.16.11.1	ICMP	98	Ecl
341	324.093367398	Routerbo_1c:8c:99	Spanning-tree-(for...	STP	60	RS
342	324.154226693	172.16.10.1	172.16.11.1	ICMP	98	Ecl
343	325.178199295	172.16.10.1	172.16.11.1	ICMP	98	Ecl
344	326.095684392	Routerbo_1c:8c:99	Spanning-tree-(for...	STP	60	RS
345	326.202158327	172.16.10.1	172.16.11.1	ICMP	98	Ecl
346	326.237503744	172.16.10.1	193.136.28.10	DNS	97	Sti
347	326.237507725	172.16.10.1	193.136.28.10	DNS	97	Sti
348	327.226142592	172.16.10.1	172.16.11.1	ICMP	98	Ecl
349	328.097989903	Routerbo_1c:8c:99	Spanning-tree-(for...	STP	60	RS

Frame 1: 60 bytes on wire (480 bits), 60 bytes captured (480 bits) on interface 0
 IEEE 802.3 Ethernet
 Logical-Link Control
 Spanning Tree Protocol

eth0: <live capture in progress> Packets: 349 · Displayed: 349 (100.0%) Profile: Default

Capturing from eth1

File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help

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No.	Time	Source	Destination	Protocol	Length	Info
143	264.184367377	Routerbo_1c:8c:9f	Spanning-tree-(for...	STP	60	RS
144	266.186674235	Routerbo_1c:8c:9f	Spanning-tree-(for...	STP	60	RS
145	268.189983467	Routerbo_1c:8c:9f	Spanning-tree-(for...	STP	60	RS
146	270.191296401	Routerbo_1c:8c:9f	Spanning-tree-(for...	STP	60	RS
147	272.193597461	Routerbo_1c:8c:9f	Spanning-tree-(for...	STP	60	RS
148	274.195914027	Routerbo_1c:8c:9f	Spanning-tree-(for...	STP	60	RS
149	276.198217812	Routerbo_1c:8c:9f	Spanning-tree-(for...	STP	60	RS
150	278.200532631	Routerbo_1c:8c:9f	Spanning-tree-(for...	STP	60	RS
151	280.202840606	Routerbo_1c:8c:9f	Spanning-tree-(for...	STP	60	RS
152	282.205140442	Routerbo_1c:8c:9f	Spanning-tree-(for...	STP	60	RS
153	284.207474017	Routerbo_1c:8c:9f	Spanning-tree-(for...	STP	60	RS
154	286.199773938	Routerbo_1c:8c:9f	Spanning-tree-(for...	STP	60	RS
155	288.202095540	Routerbo_1c:8c:9f	Spanning-tree-(for...	STP	60	RS
156	290.204406728	Routerbo_1c:8c:9f	Spanning-tree-(for...	STP	60	RS
157	292.206710163	Routerbo_1c:8c:9f	Spanning-tree-(for...	STP	60	RS
158	294.208047795	Routerbo_1c:8c:9f	Spanning-tree-(for...	STP	60	RS
159	296.211339567	Routerbo_1c:8c:9f	Spanning-tree-(for...	STP	60	RS
160	298.213441466	Routerbo_1c:8c:9f	Spanning-tree-(for...	STP	60	RS
161	300.215734914	Routerbo_1c:8c:9f	Spanning-tree-(for...	STP	60	RS
162	302.218027594	Routerbo_1c:8c:9f	Spanning-tree-(for...	STP	60	RS
163	304.220348979	Routerbo_1c:8c:9f	Spanning-tree-(for...	STP	60	RS
164	306.222649600	Routerbo_1c:8c:9f	Spanning-tree-(for...	STP	60	RS
165	308.224962624	Routerbo_1c:8c:9f	Spanning-tree-(for...	STP	60	RS
166	310.227256631	Routerbo_1c:8c:9f	Spanning-tree-(for...	STP	60	RS
167	312.219560600	Routerbo_1c:8c:9f	Spanning-tree-(for...	STP	60	RS
168	314.221880528	Routerbo_1c:8c:9f	Spanning-tree-(for...	STP	60	RS
169	316.224186338	Routerbo_1c:8c:9f	Spanning-tree-(for...	STP	60	RS
170	316.489343591	192.168.88.1	255.255.255.255	MNDP	157	56:
171	316.489374321	Routerbo_1c:8c:99	CDP/VTP/DTP/PagP/U...	CDP	188	Dei
172	318.226498155	Routerbo_1c:8c:9f	Spanning-tree-(for...	STP	60	RS
173	320.228695432	Routerbo_1c:8c:9f	Spanning-tree-(for...	STP	60	RS
174	322.230999635	Routerbo_1c:8c:9f	Spanning-tree-(for...	STP	60	RS
175	324.233309915	Routerbo_1c:8c:9f	Spanning-tree-(for...	STP	60	RS

Frame 1: 60 bytes on wire (480 bits), 60 bytes captured (480 bits) on interface 0
 IEEE 802.3 Ethernet
 Logical-Link Control
 Spanning Tree Protocol

eth1: <live capture in progress> Packets: 175 · Displayed: 175 (100.0%) Profile: Default

Terminal [GtkTerm - /dev/ttySO ... Capturing from eth1 Capturing from eth0

Tux14 – Exp 4 – Tux13 Ping

Applications Places System Tue 5 Dec, 14:17

Capturing from eth0

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No.	Time	Source	Destination	Protocol	Length	Info
317	313.908626377	172.16.10.1	172.16.11.1	ICMP	98	Ecl
318	314.094953969	Routerbo_1c:8c:99	Spanning-tree-(for...	STP	60	RS
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149	276.198217812	Routerbo_1c:8c:9f	Spanning-tree-(for...	STP	60	RS
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