Trabalho 2

Configuração de uma Rede e Desenvolvimento de uma Aplicação de Download

Relatório Final

Mestrado Integrado em Engenharia Informática e Computação

Redes de Computadores

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Sumário

Este relatório tem como objetivo explicar o segundo projeto da Unidade Curricular de Redes de Computadores. Este projeto dividiu-se em duas partes: numa primeira parte, foi desenvolvida uma aplicação de *download;* numa segunda parte, foram realizadas seis experiências especificadas no enunciado com o intuito de configurar uma rede.

Nas secções que se seguem, será explorado o desenvolvimento da referida aplicação e será feita uma análise das experiências mencionadas.

Índice

Sumário 2

Índice ..... **Error! Bookmark not defined.**

1. Introdução 4

2. Parte 1 – Aplicação de Download 5

2.1 Arquitetura 5

2.2 Resultados de Download 7

3. Parte 2 – Configuração da Rede e análise 8

3.1 Configuração de um IP de Rede 8

3.1.1 Conceitos 8

3.1.2 Experiência 9

3.2 Implementação de duas Redes LAN's Virtuais num Switch 9

3.3 Configuração de um router em LINUX 10

3.4 Configuração de um router comercial e implementação de NAT 11

3.5 DNS 13

3.6 Ligações TCP 14

4.Conclusões 15

5.Anexo 16

1. Introdução

O segundo projeto de Redes de Computadores, como já foi referido, divide-se um duas partes principais. Na primeira parte, foi pedida a elaboração de uma aplicação de *download* que procedesse à transferência de um ficheiro, implementando o protocolo FTP. Na segunda parte, foi pedida a configuração de uma rede. Este configuração foi dividida em várias experiências e respeita a seguinte ordem:

1. Configuração de um IP de rede;
2. Implementação de duas redes LAN*'s* virtuais num *switch*;
3. Configuração de um *router* em LINUX;
4. Configuração de um *router* comercial com e implementação de NAT;
5. DNS*;*
6. Ligações TCP*;*

2. Parte 1 – Aplicação de *Download*

Para a realização desta primeira parte, o grupo baseou-se em vários documentos destacando-se os seguintes: o ficheiro RFC959 que descreve o protocolo de transferência de dados (FTP) e o ficheiro RFC1738 que informa acerca do uso de URL e o seu devido tratamento.

2.1 Arquitetura

Para uma melhor organização e estrututa, a aplicação divide-se em duas camadas: a de processamento do URL e a do cliente FTP.

A aplicação desenvolvida aceita um *link* como argumento, especificado na linha de comandos e permite que o *download* seja feito de forma anónima ou não. Caso não se pretenda o anonimato, basta fornecer no URL o utilizador, seguido por ':', a palavra-passe e por fim '@'. Se tais dados não forem fornecidos, assume-se o utilizador como anónimo ("*anonymous"*) e a palavra-passe como sendo nula.

Relativamente ao processamento do URL, foi criada uma *struct* que guarda as várias informações representadas no *link*: *urlToParse, user, password, host, ip, path, filename, hasUser* e *port*. O atributo *port* é sempre 21, pois é o número de controlo do protocolo FTP.

```
typedef char url_size[128];

typedef struct URL {
    const char * urlToParse;    // string to url
    url_size user;              // string to user
    url_size password;          // string to password
    url_size host;              // string to host
    url_size ip;                // string to IP
    url_size path;              // string to path
    url_size filename;          // string to filename
    int hasUser;
    int port;                   // integer to port
} url;
```

Na execução do programa, são chamadas várias funções:

```
void initURL(url* url, const char* urlToParse);
int parseURL(url* url); // Parse a string with the url to create the URL structure
int getIpByHost(url* url); // gets an IP by host name
int checkIfValid(char * string);
char * getStringBeforeChar(char * string, char symbol)
```

A função ***initURL*** guarda o URL recebido e aloca memória para os vários atributos. Em seguida, a ***parseURL*** processa a variável *urlToParse* (*link* recebido na linha de comandos) *e* guarda toda a informação necessária. Por último, a função ***getIPByHost***, que chama a função *gethostbyname* com o *host* da *struct,* converte o *hostname* para um endereço IP.

As funções ***checkIfValid*** e ***getStringBeforeChar*** são funções auxiliares da *parseURL* e verificam se o URL recebido é constituído por caracteres válidos e obtêm uma *string* antes de um determinado caracter, respetivamente.

O cliente FTP é representado por uma estrutura que contém dois descritores, um relativo ao *socket* de controlo e outro ao de dados.

```
typedef struct FTP
{
    int control_fd; // file descriptor to control socket
    int data_fd; // file descriptor to data socket
} ftp;
```

Na execução do programa, são chamadas várias funções:

```
int ftpLogin(ftp* ftp, const char* user, const char* password);
int ftpChangeDir(ftp* ftp, const char* path);
int ftpRetrieve(ftp* ftp, const char* filename);
int ftpPassive(ftp* ftp);
int ftpDownload(ftp* ftp, const char* filename);
int ftpConnect(ftp* ftp, const char* ip, int port);
int ftpDisconnect(ftp* ftp);
int ftpWrite(ftp* ftp, const char* str, size_t size);
int ftpRead(ftp* ftp, char* str, size_t size);
```

Depois de interpretar a informação introduzida pelo utilizador, isto é, após o processamento do *URL*, procede-se à ligação do cliente FTP ao servidor FTP através de um *socket* TCP. Para tal efeito usou-se a função ***ftpConnect***.

De seguida, procede-se à verificação do *username* e da *password*, verificações que se encontram no ficheiro *Main.c*. O envio destas credenciais para o servidor é realizado pela função ***ftpLogin***.

O próximo passo é a alteração do diretório atual para o diretório onde se encontra o ficheiro esta troca de diretório é efetuada pela função ***ftpChangeDir***.

A função ***ftpPassive*** permite a entrada em modo passivo que conduz a uma comunicação bidirecional entre o servidor e o cliente FTP.

A transmissão e transferência do ficheiro são tratadas pelas funções ***ftpRetrive*** e ***ftpDownload***, respetivamente.

Por fim, é terminada a ligação, isto é, desconectada e como tal, chamada a função ***ftpDisconnect***.

2.2 Resultados de Download

A aplicação desenvolvida foi testada não só em modo normal, ou seja, com um utilizador e palavra-passe, mas também em modo anónimo. Para efeito de teste, foram realizados diversos *dowloads*, todos bem sucedidos, tendo o maior ficheiro testado 500MB.

Caso ocorra algum erro, a aplicação termina e o erro é impresso na consola. Caso contrário, é impresso na consola uma mensagem a dizer que a transferência foi bem sucedida e qual o tamanho do ficheiro.

3. Parte 2 – Configuração da Rede e análise

3.1 Configuração de um IP de Rede

3.1.1 Conceitos

Esta experiência teve como objetivo não só a compreensão da configuração de IP's em máquinas diferentes, numa mesma rede, mas também a identificação e distinção dos diferentes pacotes enviados entre si.

Existem vários tipos de pacotes de dados, como por exemplo os ARP. Este protocolo é responsável por mapear um endereço de rede para um endereço físico (MAC). Quando um pacote chega a um *gateway*, este pede ao ARP para encontrar um *host* físico ou um endereço MAC que corresponda ao endereço IP. Por sua vez, este procura na sua cache e, se nenhuma entrada for encontrada, o ARP transmite um pacote de solicitação, que contém o IP para o qual se pretende saber o MAC, para todas as máquinas da mesma LAN. Se, em alguma máquina, ocorrer uma correspondência, então esta envia um pacote que contém o seu endereço MAC à máquina que solicitou a informação e o ARP guarda na sua tabela os dados para uma próxima ocorrência.

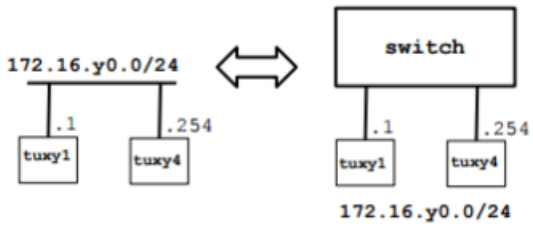
Cada pacote de dados contém, no cabeçalho das tramas enviadas, informação relativa ou ao tipo de protocolo ou ao tamanho da trama.

No primeiro caso, o pacote de dados contém um identificador constituído por 2 bytes, *EtherType*, que permite identificar o protocolo associado. Por exemplo, no caso do ARP, o identificador é 0x0806 e, no caso do IP (IPv4), o identificador corresponde ao valor 0x0800. Nesta circunstância, visto que o tamanho não é especificado, este é obtido através de um delimitador de início da trama e o *interpacket gap*.

Quando uma interface de rede é desconectada, não é possível estabelecer qualquer tipo de comunição com essa interface e, por conseguinte, o próprio computador não consegue comunicar consigo mesmo. De forma a que tal seja evitado, a interface de *loopback* garante a ligação de quaisquer aplicações no computador com servidores do mesmo.

O *loopback* é, portanto, uma interface de rede virtual que o computador usa para comunicar consigo próprio. A sua utilização reflete-se principalmente na realização de diagnósticos, na solução de problemas e ainda na ligação a servidores em execução na máquina local.

3.1.2 Experiência



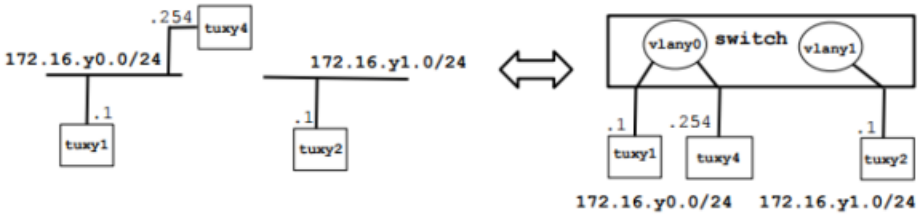
Para a realização desta experiência, primeiro foram configurados os IP's das portas eth0 de dois computadores, o tux41 e o tux44, utilizando o comando ***ifconfig*** e o comando ***route***, necessário para adicionar rotas à tabela de reencaminhamento.

Em seguida, enviou-se o comando ***ping*** para verificar a conetividade entre as duas máquinas configuradas. Este comando gera e envia para o endereço escolhido pacotes ICMP (um protocolo que relata erros caso um determinado serviço ou host não possa ser alcançado para o envio de pacotes) e aguarda por uma resposta.

Após a verificação da ligação entre as duas máquinas, foram apagadas todas as entradas na tabela ARP recorrendo ao comando **arp -d < ip address >**. Por fim, repetiu-se o comando ping, registando os resultados através do *Wireshark*.

Analisando os resultados guardados pelo *Wireshark*, observa-se que é perguntado à rede qual o endereço MAC com um endereço de IP igual. Por sua vez, o computador responde com o endereço MAC respetivo e, a partir daí, verifica-se que, para cada pedido ICMP, segue-se uma resposta.

3.2 Implementação de duas Redes LAN's Virtuais num *Switch*



Inicialmente, configurou-se o tux2, tendo em conta as configurações já feitas na primeira experiência.

Em seguida, foram criadas (e configuradas) duas LAN's virtuais diferentes:

- VLAN 40 – 172.16.40.0/24 – à qual pertecem os computadores tux41 e o tux44;
- VLAN 41 – 172.16.41.0/24 – à qual pertence o computador tux42.

A criação e configuração da *vlan* requer a inserção dos seguintes comandos na consola do *switch:*

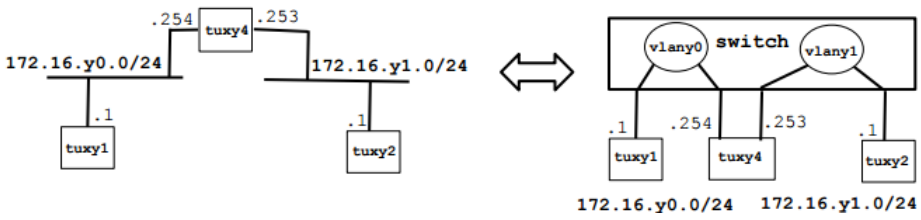
1. configure terminal
2. vlan x (x corresponde ao número da VLAN; no nosso caso, 40)
3. interface fastethernet 0/y (y corresponde ao número da porta no *switch* que se pretende adicionar à VLAN)
4. switchport mode access
5. switchport access vlan x
6. end

Enquanto que o primeiro passo é sempre necessário, pois serve para abrir o modo de configuração, o segundo passo cria uma VLAN. Para adicionar portas à VLAN é necessário usar os passos 3 a 5, com a porta que se deseja adicionar. Por fim, para sair do modo de configuração, utiliza-se o comando **end**.

Prosseguindo com a experiência, fez-se **ping** do tux1 para o tux4. Tendo em conta que ambos pertencem à mesma rede, verificou-se que não foi enviado qualquer pacote ARP para saber o endereço MAC. Contudo, ao fazer ping do tux1 para o tux2, verificou-se, no *Wireshark*, a inexistência de uma resposta, pois não existe uma forma de comunicação entre as duas redes.

Assim, como só IPs dentro da mesma VLAN respondem aos *broadcasts,* pode concluir-se que cada VLAN tem um *brodcast domain* diferente.

3.3 Configuração de um *router* em LINUX



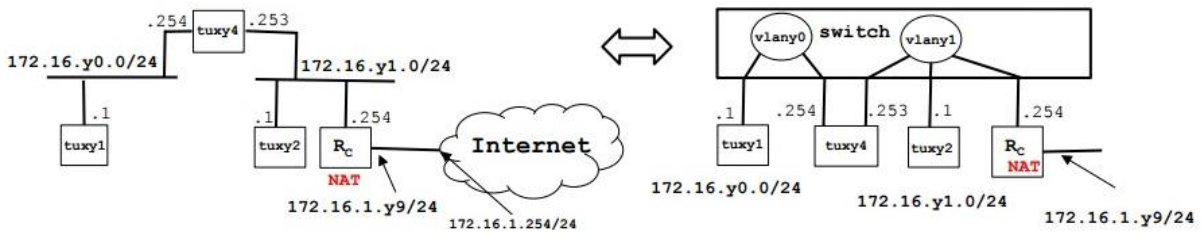
O objetivo desta experiência é fazer com que o tux4 se comporte como um *router* entre as duas LAN's virtuais criadas na experiência anterior. Este computador já conhece a VLAN 40 mas desconhece a VLAN 41 que será usada para comunicar com o tux2. Como a interface *ethernet* 0 já estava ocupada para comunicar com o tux1, foi necessário ligar a interface *ethernet* 1 e configurá-la com um IP cuja a gama é idêntica à do tux2, adicionando posteriormente a interface à VLAN 41.

Em teoria já se possui uma ligação como a que está na imagem acima, no entanto, ainda é impossível para o tux1 comunicar com o tux2 uma vez que este desconhece o caminho a percorrer até lá. Para isto, foi utilizado o comando "*route add –net 172.16.41.0 gw 172.16.40.254*" que faz com que o primeiro endereço seja o destino e o segundo endereço seja para onde reencaminhar o pacote (tux4).

Nesta fase da experiência, o tux1 já consegue alcançar o tux2, mas o contrário não se verifica então, agora no tux2, adiciona-se uma rota da mesma forma para que consiga alcançar o tux1, através do tux4: "*route add –net 172.16.40.0 gw 172.16.41.253*". Para ativar o reencaminhamento, foi utilizado o comando "*echo 1 > /proc/sys/net/ipv4/ip_forward*" que altera o ficheiro "ip_forward" para 1, este reencaminhamento é feito para o tux2 uma vez que é o único ligado à única VLAN conhecida pelo tux4, exceto o caminho por onde recebeu.

Depois destes passos todos, é possível o tux1 *pingar* o tux2. Como não consegue ligar-se diretamente ao tux2, primeiro encaminha o pacote para o tux4 que, como conhece a VLAN 41, à qual o tux2 está ligado, reencaminha o pacote para o tux2, funcionando como um *router*.

3.4 Configuração de um *router* comercial e implementação de NAT



Como o nome indica, esta experiência pretende configurar um *router* comercial e implementar o sistema de NAT corretamente. NAT (*Network Adress Translation*) é um sistema que possibilita a comunicação entre os computadores de rede privada (sala de redes da faculdade de engenharia) com redes externas. É necessário este sistema porque, ao tentar conectar com redes externas, os IP's da rede privada não serão reconhecidos e não haverá permissões para troca de dados. O sistema de NAT serve para reescrever os IP's da rede privada, para que estes sejam aceites por redes externas.

Primeiramente, para observar as diferenças, o *router* foi configurado sem NAT. Para esta configuração, foi utilizada a seguinte sequência de comandos:

1. interface fastethernet 0/0
2. ip address 172.16.41.254 255.255.255.0
3. no shutdown
4. exit
5. show interface fastethernet 0/0
6. interface fastethernet 0/1
7. ip address 172.16.1.49 255.255.255.0
8. no shutdown
9. exit
10. show interface fastethernet 0/1
11. configure terminal
12. router rip
13. version 2
14. network 172.16.40.0
15. no auto-summary
16. end
17. show ip route

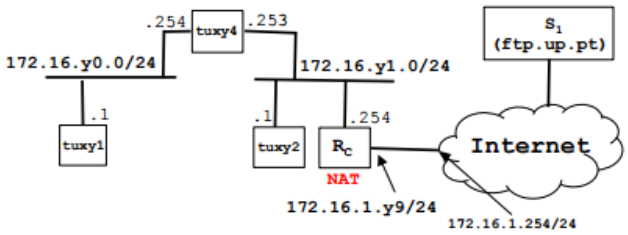
Esta sequência de comandos configura as interfaces *fastethernet 0/0* e *fastethernet 0/1* do *router* para que sejam identificadas com o IP especificado (172.16.41.254 e 172.16.1.49, respetivamente). O comando "no shutdown" serve apenas para, caso o *router* seja desligado, não se perca a configuração e o "show interface" serve para verificar se a interface está bem configurada. Após a configuração das interfaces é adicionada uma rota para que o *router* consiga alcançar o tux1 (172.16.40.0) e, obviamente, no tux1 cria-se a rota para o exterior (*lab network*). Em teoria, está tudo pronto para a ligação entre o tux1 e o exterior, mas quando o *ping* é efetuado, o exterior aparece como inalcançável (pode ser comprovado no anexo – Experiência 4).

Não foi possível estabelecer a conexão com o exterior devido à necessidade de NAT que foi acima enunciada. Seguindo a experiência, recorremos à implementação de NAT no *router* e com os comandos "ip nat pool ovrld 172.16.1.49 172.16.1.49 prefix 24" e "ip nat inside source list 1 pool ovrld overload" é permitida a reescrita do *IP* de vários computadores da rede para um mesmo *IP* conhecido no exterior.

Seguidamente, criou-se a lista de acessos e permissões de pacotes e foram definidas as rotas internas e externas para que seja possível comunicar com o exterior e com o laboratório. Finalmente, no tux1, foi feito um *ping* para o *router* que foi enviado e recebido com sucesso, como demonstrado no anexo. Este *ping* não passou pelo tux2 porque a sua rota foi eliminada anteriormente ficando o *router* como reencaminhamento por *default*.

3.5 DNS

A experiência 5 tem por base a configuração do DNS (*Domain Name System*) que, consequentemente, permite a ligação a redes externas, fazendo com que seja possível o acesso à *Internet* através de uma rede interna criada.



A configuração do DNS passa por adicionar estas duas linhas:

1. search netlab.fe.up.pt
2. nameserver 172.16.1.1

no ficheiro *resolv.conf* que se encontra no diretório */etc*.

O servidor DNS é responsável por converter um endereço *web* num IP. Este servidor recebe um primeiro pacote com o domínio do *website* e responde com o IP correspondente. De seguida recebe um segundo pacote que realiza a operação oposta, isto é, o servidor DNS recebe um IP e devolve o nome do domínio associado a esse IP, esta técnica denomina-se *Reverse DNS Lookup*.

Para testar o funcionamento desta experiência acedeu-se através do *browser* a um *website*, neste caso o *Facebook*.

3.6 Ligações TCP

Nesta experiência executou-se e compilou-se a aplicação FTP desenvolvida com o intuito de realizar o *download* de um ficheiro, o qual foi realizado com sucesso demonstrando a configuração correta da rede.

A aplicação abre duas ligações TCP. A primeira ligação visa o estabelecimento de comunicação com o servidor, enquanto a segunda ligação se dedica à transferência do ficheiro.

Uma ligação TCP é subdivide-se em quatro fases:

1. Estabelecimento da Ligação
2. Transferência de Dados
3. Adequação de Parâmetros
4. Termino da Ligação

A TCP (*Transmision Control Protocol*) utiliza *Selective Repeat* ARQ (*Automatic Repeat Request*) que é semelhante a GO-BACK-N ARQ, exceto, no caso de o recetor não parar o processamento de pacotes recebidos, após a deteção de um erro. Este método de controlo de erros na transmissão de dados que usa ACKs e *timeouts*. ACKs são mensagens enviadas pelo recetor que indicam que a trama de dados foi recebida corretamente, já os *timeouts* representam o tempo estipulado para esperar por um ACK. Se, por alguma razão, não for recebido nenhum ACK antes de um *timeout* a trama é retransmitida até ser recebida. Os campos mais relevantes deste tipo de ligação são o ACK, o tamanho da janela e o número de sequência.

O mecanismo de congestionamento da TCP mantém uma janela de congestão que consiste numa estimativa do número de octetos que a rede consegue encaminhar, não enviando um número de octetos superior ao tamanho mínimo da janela definida pelo recetor. Verifica-se que o tamanho da janela aumenta rapidamente nos primeiros segundos e de seguida estagna.

No caso de existirem duas ligações TCP existe uma diminuição da taxa de transmissão, uma vez que cada ligação tem uma taxa de transferência de dados igual e estão a ser realizadas em silmultâneo.

4.Conclusões

Com a execução deste trabalho foi possível consolidar os conhecimentos lecionados na Unidade Curricular de Redes de Computadores, nomeadamente pacotes de rede e protocolos de comunicação.

A realização da aplicação de download ajudou-nos a perceber na íntegra as ligações FTP e em cada experiência realizada nas aulas práticas crescia o interesse e a curiosidade por estas configurações e ligações que estão presentes no nosso dia a dia.

Por fim, pode concluir que a dimensão da rede com que trabalhamos é bastante pequena e que seriam necessários mais meios e um maior nível de conhecimento para desenvolver algo de dimensões superiores.

5.Anexo

Experiência 1

o.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	CiscoInc_d4:1c:0a	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/0/00:24:50:92:b9:80 Cost = 4 Port = 0x800a
2	2.033266	CiscoInc_d4:1c:0a	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/0/00:24:50:92:b9:80 Cost = 4 Port = 0x800a
3	4.058553	CiscoInc_d4:1c:0a	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/0/00:24:50:92:b9:80 Cost = 4 Port = 0x800a
4	6.093837	CiscoInc_d4:1c:0a	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/0/00:24:50:92:b9:80 Cost = 4 Port = 0x800a
5	7.537568	CiscoInc_d4:1c:0a	CiscoInc_d4:1c:0a	LOOP	60	Reply
6	8.118927	CiscoInc_d4:1c:0a	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/0/00:24:50:92:b9:80 Cost = 4 Port = 0x800a
7	10.150694	CiscoInc_d4:1c:0a	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/0/00:24:50:92:b9:80 Cost = 4 Port = 0x800a
8	12.184033	CiscoInc_d4:1c:0a	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/0/00:24:50:92:b9:80 Cost = 4 Port = 0x800a
9	14.219368	CiscoInc_d4:1c:0a	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/0/00:24:50:92:b9:80 Cost = 4 Port = 0x800a
10	15.525480	HewlettP_5a:7b:ea	Broadcast	ARP	42	Who has 172.16.40.1? Tell 172.16.40.254
11	15.525776	G-ProCom_8c:af:af	HewlettP_5a:7b:ea	ARP	60	172.16.40.1 is at 00:0f:fe:8c:af:af
12	15.525790	172.16.40.254	172.16.40.1	ICMP	98	Echo (ping) request id=0x53b3, seq=1/256, ttl=64 (reply in 13)
13	15.526053	172.16.40.1	172.16.40.254	ICMP	98	Echo (ping) reply id=0x53b3, seq=1/256, ttl=64 (request in 12)
14	16.271105	CiscoInc_d4:1c:0a	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/0/00:24:50:92:b9:80 Cost = 4 Port = 0x800a
15	16.525171	172.16.40.254	172.16.40.1	ICMP	98	Echo (ping) request id=0x53b3, seq=2/512, ttl=64 (reply in 16)
16	16.525443	172.16.40.1	172.16.40.254	ICMP	98	Echo (ping) reply id=0x53b3, seq=2/512, ttl=64 (request in 15)
17	17.525156	172.16.40.254	172.16.40.1	ICMP	98	Echo (ping) request id=0x53b3, seq=3/768, ttl=64 (reply in 18)
18	17.525471	172.16.40.1	172.16.40.254	ICMP	98	Echo (ping) reply id=0x53b3, seq=3/768, ttl=64 (request in 17)
19	17.548428	CiscoInc_d4:1c:0a	CiscoInc_d4:1c:0a	LOOP	60	Reply
20	18.277889	CiscoInc_d4:1c:0a	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/0/00:24:50:92:b9:80 Cost = 4 Port = 0x800a
21	18.525168	172.16.40.254	172.16.40.1	ICMP	98	Echo (ping) request id=0x53b3, seq=4/1024, ttl=64 (reply in 22)
22	18.525442	172.16.40.1	172.16.40.254	ICMP	98	Echo (ping) reply id=0x53b3, seq=4/1024, ttl=64 (request in 21)
23	19.525168	172.16.40.254	172.16.40.1	ICMP	98	Echo (ping) request id=0x53b3, seq=5/1280, ttl=64 (reply in 24)
24	19.525486	172.16.40.1	172.16.40.254	ICMP	98	Echo (ping) reply id=0x53b3, seq=5/1280, ttl=64 (request in 23)
25	19.959998	CiscoInc_d4:1c:0a	CDP/VTP/DTP/PAgP/UD…	DTP	60	Dynamic Trunk Protocol
26	19.960104	CiscoInc_d4:1c:0a	CDP/VTP/DTP/PAgP/UD…	DTP	90	Dynamic Trunk Protocol
27	20.313081	CiscoInc_d4:1c:0a	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/0/00:24:50:92:b9:80 Cost = 4 Port = 0x800a
28	20.525170	172.16.40.254	172.16.40.1	ICMP	98	Echo (ping) request id=0x53b3, seq=6/1536, ttl=64 (reply in 29)

Experiência 2

Passo 4:

- Tux1

lo.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
2	0.494990	CiscoInc_d4:1c:03	CiscoInc_d4:1c:03	LOOP	60	Reply
3	2.004563	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
4	4.009431	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
5	6.014290	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
6	8.019111	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
7	10.023865	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
8	10.493999	CiscoInc_d4:1c:03	CiscoInc_d4:1c:03	LOOP	60	Reply
9	12.028707	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
10	14.033807	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
11	14.787903	172.16.40.1	172.16.40.254	ICMP	98	Echo (ping) request id=0x0955, seq=1/256, ttl=64 (reply in 12)
12	14.788044	172.16.40.254	172.16.40.1	ICMP	98	Echo (ping) reply id=0x0955, seq=1/256, ttl=64 (request in 11)
13	15.787184	172.16.40.1	172.16.40.254	ICMP	98	Echo (ping) request id=0x0955, seq=2/512, ttl=64 (reply in 14)
14	15.787442	172.16.40.254	172.16.40.1	ICMP	98	Echo (ping) reply id=0x0955, seq=2/512, ttl=64 (request in 13)
15	16.038446	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
16	16.787184	172.16.40.1	172.16.40.254	ICMP	98	Echo (ping) request id=0x0955, seq=3/768, ttl=64 (reply in 17)
17	16.787314	172.16.40.254	172.16.40.1	ICMP	98	Echo (ping) reply id=0x0955, seq=3/768, ttl=64 (request in 16)
18	17.787185	172.16.40.1	172.16.40.254	ICMP	98	Echo (ping) request id=0x0955, seq=4/1024, ttl=64 (reply in 19)
19	17.787442	172.16.40.254	172.16.40.1	ICMP	98	Echo (ping) reply id=0x0955, seq=4/1024, ttl=64 (request in 18)
20	18.043225	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
21	18.787187	172.16.40.1	172.16.40.254	ICMP	98	Echo (ping) request id=0x0955, seq=5/1280, ttl=64 (reply in 22)
22	18.787530	172.16.40.254	172.16.40.1	ICMP	98	Echo (ping) reply id=0x0955, seq=5/1280, ttl=64 (request in 21)
23	19.798739	HewlettP_5a:7b:ea	G-ProCom_8c:af:af	ARP	60	Who has 172.16.40.1? Tell 172.16.40.254
24	19.798766	G-ProCom_8c:af:af	HewlettP_5a:7b:ea	ARP	42	172.16.40.1 is at 00:0f:fe:8c:af:af
25	20.048062	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
26	20.501340	CiscoInc_d4:1c:03	CiscoInc_d4:1c:03	LOOP	60	Reply
27	22.053013	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
28	24.057665	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003

Passo 5:

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	CiscoInc_3a:fc:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/10/fc:fb:fb:3a:fc:00 Cost = 0 Port = 0x8003
2	2.009937	CiscoInc_3a:fc:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/10/fc:fb:fb:3a:fc:00 Cost = 0 Port = 0x8003
3	4.009676	CiscoInc_3a:fc:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/10/fc:fb:fb:3a:fc:00 Cost = 0 Port = 0x8003
4	6.014306	CiscoInc_3a:fc:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/10/fc:fb:fb:3a:fc:00 Cost = 0 Port = 0x8003
5	8.024259	CiscoInc_3a:fc:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/10/fc:fb:fb:3a:fc:00 Cost = 0 Port = 0x8003
6	8.505762	CiscoInc_3a:fc:03	CiscoInc_3a:fc:03	LOOP	60	Reply
7	10.024189	CiscoInc_3a:fc:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/10/fc:fb:fb:3a:fc:00 Cost = 0 Port = 0x8003
8	11.330184	172.16.10.1	172.16.10.254	ICMP	98	Echo (ping) request id=0x0efc, seq=1/256, ttl=64 (reply in 9)
9	11.330557	172.16.10.254	172.16.10.1	ICMP	98	Echo (ping) reply id=0x0efc, seq=1/256, ttl=64 (request in 8)
10	12.028982	CiscoInc_3a:fc:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/10/fc:fb:fb:3a:fc:00 Cost = 0 Port = 0x8003
11	12.329175	172.16.10.1	172.16.10.254	ICMP	98	Echo (ping) request id=0x0efc, seq=2/512, ttl=64 (reply in 12)
12	12.329329	172.16.10.254	172.16.10.1	ICMP	98	Echo (ping) reply id=0x0efc, seq=2/512, ttl=64 (request in 11)
13	13.328178	172.16.10.1	172.16.10.254	ICMP	98	Echo (ping) request id=0x0efc, seq=3/768, ttl=64 (reply in 14)
14	13.328414	172.16.10.254	172.16.10.1	ICMP	98	Echo (ping) reply id=0x0efc, seq=3/768, ttl=64 (request in 13)
15	14.038823	CiscoInc_3a:fc:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/10/fc:fb:fb:3a:fc:00 Cost = 0 Port = 0x8003
16	14.328191	172.16.10.1	172.16.10.254	ICMP	98	Echo (ping) request id=0x0efc, seq=4/1024, ttl=64 (reply in 17)
17	14.328348	172.16.10.254	172.16.10.1	ICMP	98	Echo (ping) reply id=0x0efc, seq=4/1024, ttl=64 (request in 16)
18	15.328199	172.16.10.1	172.16.10.254	ICMP	98	Echo (ping) request id=0x0efc, seq=5/1280, ttl=64 (reply in 19)
19	15.328413	172.16.10.254	172.16.10.1	ICMP	98	Echo (ping) reply id=0x0efc, seq=5/1280, ttl=64 (request in 18)
20	16.038619	CiscoInc_3a:fc:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/10/fc:fb:fb:3a:fc:00 Cost = 0 Port = 0x8003
21	16.328206	172.16.10.1	172.16.10.254	ICMP	98	Echo (ping) request id=0x0efc, seq=6/1536, ttl=64 (reply in 22)
22	16.328366	172.16.10.254	172.16.10.1	ICMP	98	Echo (ping) reply id=0x0efc, seq=6/1536, ttl=64 (request in 21)
23	16.334980	HewlettP_a6:a4:f8	G-ProCom_8b:e4:ef	ARP	60	Who has 172.16.10.1? Tell 172.16.10.254
24	16.335001	G-ProCom_8b:e4:ef	HewlettP_a6:a4:f8	ARP	42	172.16.10.1 is at 00:0f:fe:8b:e4:ef
25	17.328196	172.16.10.1	172.16.10.254	ICMP	98	Echo (ping) request id=0x0efc, seq=7/1792, ttl=64 (reply in 26)
26	17.328547	172.16.10.254	172.16.10.1	ICMP	98	Echo (ping) reply id=0x0efc, seq=7/1792, ttl=64 (request in 25)
27	18.043564	CiscoInc_3a:fc:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/10/fc:fb:fb:3a:fc:00 Cost = 0 Port = 0x8003
28	18.328194	172.16.10.1	172.16.10.254	ICMP	98	Echo (ping) request id=0x0efc, seq=8/2048, ttl=64 (reply in 29)

Passo 7:

- Tux1

No.	Time	Source	Destination	Protocol	Length	Info
23	36.087248	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
24	38.091930	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
25	40.132673	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
26	40.328463	CiscoInc_d4:1c:03	CiscoInc_d4:1c:03	LOOP	60	Reply
27	42.135084	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
28	44.139947	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
29	46.149859	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
30	48.149568	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
31	48.846016	CiscoInc_d4:1c:03	CDP/VTP/DTP/PAgP/UD…	CDP	435	Device ID: tux-sw4 Port ID: FastEthernet0/1
32	49.194878	172.16.40.1	172.16.40.255	ICMP	98	Echo (ping) request id=0x0a0b, seq=1/256, ttl=64 (no response found!)
33	50.154390	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
34	50.194142	172.16.40.1	172.16.40.255	ICMP	98	Echo (ping) request id=0x0a0b, seq=2/512, ttl=64 (no response found!)
35	50.322365	CiscoInc_d4:1c:03	CiscoInc_d4:1c:03	LOOP	60	Reply
36	51.194143	172.16.40.1	172.16.40.255	ICMP	98	Echo (ping) request id=0x0a0b, seq=3/768, ttl=64 (no response found!)
37	52.164551	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
38	52.194134	172.16.40.1	172.16.40.255	ICMP	98	Echo (ping) request id=0x0a0b, seq=4/1024, ttl=64 (no response found!)
39	53.194148	172.16.40.1	172.16.40.255	ICMP	98	Echo (ping) request id=0x0a0b, seq=5/1280, ttl=64 (no response found!)
40	54.164094	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
41	54.194138	172.16.40.1	172.16.40.255	ICMP	98	Echo (ping) request id=0x0a0b, seq=6/1536, ttl=64 (no response found!)
42	55.194132	172.16.40.1	172.16.40.255	ICMP	98	Echo (ping) request id=0x0a0b, seq=7/1792, ttl=64 (no response found!)
43	56.168800	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
44	56.194139	172.16.40.1	172.16.40.255	ICMP	98	Echo (ping) request id=0x0a0b, seq=8/2048, ttl=64 (no response found!)
45	57.194146	172.16.40.1	172.16.40.255	ICMP	98	Echo (ping) request id=0x0a0b, seq=9/2304, ttl=64 (no response found!)
46	58.178740	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
47	58.194136	172.16.40.1	172.16.40.255	ICMP	98	Echo (ping) request id=0x0a0b, seq=10/2560, ttl=64 (no response found!)
48	60.178527	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
49	60.329767	CiscoInc_d4:1c:03	CiscoInc_d4:1c:03	LOOP	60	Reply
50	62.183368	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003

- Tux2

No.	Time	Source	Destination	Protocol	Length	Info
6	8.019510	CiscoInc_d4:1c:04	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/41/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8004
7	10.024396	CiscoInc_d4:1c:04	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/41/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8004
8	12.029557	CiscoInc_d4:1c:04	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/41/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8004
9	12.110257	CiscoInc_d4:1c:04	CiscoInc_d4:1c:04	LOOP	60	Reply
10	14.034262	CiscoInc_d4:1c:04	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/41/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8004
11	16.039034	CiscoInc_d4:1c:04	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/41/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8004
12	18.044022	CiscoInc_d4:1c:04	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/41/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8004
13	20.048783	CiscoInc_d4:1c:04	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/41/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8004
14	22.075746	CiscoInc_d4:1c:04	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/41/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8004
15	22.117834	CiscoInc_d4:1c:04	CiscoInc_d4:1c:04	LOOP	60	Reply
16	24.075343	CiscoInc_d4:1c:04	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/41/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8004
17	26.080286	CiscoInc_d4:1c:04	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/41/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8004
18	28.085218	CiscoInc_d4:1c:04	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/41/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8004
19	30.090087	CiscoInc_d4:1c:04	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/41/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8004
20	32.094904	CiscoInc_d4:1c:04	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/41/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8004
21	32.112005	CiscoInc_d4:1c:04	CiscoInc_d4:1c:04	LOOP	60	Reply
22	34.099795	CiscoInc_d4:1c:04	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/41/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8004
23	36.104730	CiscoInc_d4:1c:04	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/41/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8004
24	38.109599	CiscoInc_d4:1c:04	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/41/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8004
25	40.114469	CiscoInc_d4:1c:04	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/41/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8004
26	42.119871	CiscoInc_d4:1c:04	CiscoInc_d4:1c:04	LOOP	60	Reply
27	42.120876	CiscoInc_d4:1c:04	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/41/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8004
28	44.124342	CiscoInc_d4:1c:04	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/41/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8004
29	46.156633	CiscoInc_d4:1c:04	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/41/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8004
30	46.515382	CiscoInc_d4:1c:04	CDP/VTP/DTP/PAgP/UD…	CDP	435	Device ID: tux-sw4 Port ID: FastEthernet0/2
31	48.159197	CiscoInc_d4:1c:04	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/41/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8004
32	50.164090	CiscoInc_d4:1c:04	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/41/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8004
33	52.124071	CiscoInc_d4:1c:04	CiscoInc_d4:1c:04	LOOP	60	Reply

- Tux4

No.	Time	Source	Destination	Protocol	Length	Info
7	10.061494	CiscoInc_d4:1c:06	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8006
8	10.255586	CiscoInc_d4:1c:06	CiscoInc_d4:1c:06	LOOP	60	Reply
9	12.063560	CiscoInc_d4:1c:06	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8006
10	14.068877	CiscoInc_d4:1c:06	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8006
11	16.078121	CiscoInc_d4:1c:06	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8006
12	18.076923	CiscoInc_d4:1c:06	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8006
13	19.122149	172.16.40.1	172.16.40.255	ICMP	98	Echo (ping) request id=0x0a0b, seq=1/256, ttl=64 (no response found!)
14	20.082084	CiscoInc_d4:1c:06	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8006
15	20.121454	172.16.40.1	172.16.40.255	ICMP	98	Echo (ping) request id=0x0a0b, seq=2/512, ttl=64 (no response found!)
16	20.249810	CiscoInc_d4:1c:06	CiscoInc_d4:1c:06	LOOP	60	Reply
17	21.121493	172.16.40.1	172.16.40.255	ICMP	98	Echo (ping) request id=0x0a0b, seq=3/768, ttl=64 (no response found!)
18	22.093398	CiscoInc_d4:1c:06	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8006
19	22.121511	172.16.40.1	172.16.40.255	ICMP	98	Echo (ping) request id=0x0a0b, seq=4/1024, ttl=64 (no response found!)
20	23.121576	172.16.40.1	172.16.40.255	ICMP	98	Echo (ping) request id=0x0a0b, seq=5/1280, ttl=64 (no response found!)
21	24.092523	CiscoInc_d4:1c:06	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8006
22	24.121593	172.16.40.1	172.16.40.255	ICMP	98	Echo (ping) request id=0x0a0b, seq=6/1536, ttl=64 (no response found!)
23	25.121638	172.16.40.1	172.16.40.255	ICMP	98	Echo (ping) request id=0x0a0b, seq=7/1792, ttl=64 (no response found!)
24	26.097639	CiscoInc_d4:1c:06	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8006
25	26.121669	172.16.40.1	172.16.40.255	ICMP	98	Echo (ping) request id=0x0a0b, seq=8/2048, ttl=64 (no response found!)
26	27.121726	172.16.40.1	172.16.40.255	ICMP	98	Echo (ping) request id=0x0a0b, seq=9/2304, ttl=64 (no response found!)
27	28.106912	CiscoInc_d4:1c:06	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8006
28	28.121743	172.16.40.1	172.16.40.255	ICMP	98	Echo (ping) request id=0x0a0b, seq=10/2560, ttl=64 (no response found!)
29	30.107694	CiscoInc_d4:1c:06	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8006
30	30.257760	CiscoInc_d4:1c:06	CiscoInc_d4:1c:06	LOOP	60	Reply
31	32.112543	CiscoInc_d4:1c:06	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8006
32	34.121899	CiscoInc_d4:1c:06	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8006
33	34.653405	CiscoInc_d4:1c:06	CDP/VTP/DTP/PAgP/UD…	CDP	435	Device ID: tux-sw4 Port ID: FastEthernet0/4
34	36.120818	CiscoInc_d4:1c:06	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8006

Passo 10:

- Tux1

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	CiscoInc_d4:1c:03	CiscoInc_d4:1c:03	LOOP	60	Reply
2	0.184340	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
3	2.189275	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
4	4.193961	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
5	6.198773	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
6	8.203692	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
7	10.007176	CiscoInc_d4:1c:03	CiscoInc_d4:1c:03	LOOP	60	Reply
8	10.208445	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
9	12.214324	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
10	14.218099	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
11	16.223045	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
12	18.227829	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
13	20.006241	CiscoInc_d4:1c:03	CiscoInc_d4:1c:03	LOOP	60	Reply
14	20.232653	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
15	22.237358	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
16	24.242263	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
17	26.247095	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
18	28.251900	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
19	30.013507	CiscoInc_d4:1c:03	CiscoInc_d4:1c:03	LOOP	60	Reply
20	30.256732	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
21	32.261519	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
22	34.266434	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
23	36.271134	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
24	38.275983	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
25	40.012586	CiscoInc_d4:1c:03	CiscoInc_d4:1c:03	LOOP	60	Reply
26	40.280838	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
27	42.285819	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
28	44.290467	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003

- Tux2

lo.	Time	Source	Destination	Protocol	Length	Info
4	4.009692	CiscoInc_d4:1c:04	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/41/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8004
5	6.014618	CiscoInc_d4:1c:04	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/41/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8004
6	7.625601	CiscoInc_d4:1c:04	CiscoInc_d4:1c:04	LOOP	60	Reply
7	8.019492	CiscoInc_d4:1c:04	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/41/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8004
8	10.024410	CiscoInc_d4:1c:04	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/41/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8004
9	12.029238	CiscoInc_d4:1c:04	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/41/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8004
10	14.034237	CiscoInc_d4:1c:04	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/41/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8004
11	16.039017	CiscoInc_d4:1c:04	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/41/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8004
12	17.633179	CiscoInc_d4:1c:04	CiscoInc_d4:1c:04	LOOP	60	Reply
13	18.043932	CiscoInc_d4:1c:04	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/41/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8004
14	20.048846	CiscoInc_d4:1c:04	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/41/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8004
15	22.053692	CiscoInc_d4:1c:04	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/41/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8004
16	24.058584	CiscoInc_d4:1c:04	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/41/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8004
17	24.805479	172.16.41.1	172.16.41.255	ICMP	98	Echo (ping) request id=0x0779, seq=1/256, ttl=64 (no response found!)
18	25.812924	172.16.41.1	172.16.41.255	ICMP	98	Echo (ping) request id=0x0779, seq=2/512, ttl=64 (no response found!)
19	26.063477	CiscoInc_d4:1c:04	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/41/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8004
20	26.820916	172.16.41.1	172.16.41.255	ICMP	98	Echo (ping) request id=0x0779, seq=3/768, ttl=64 (no response found!)
21	27.632570	CiscoInc_d4:1c:04	CiscoInc_d4:1c:04	LOOP	60	Reply
22	27.828915	172.16.41.1	172.16.41.255	ICMP	98	Echo (ping) request id=0x0779, seq=4/1024, ttl=64 (no response found!)
23	28.068410	CiscoInc_d4:1c:04	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/41/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8004
24	28.836916	172.16.41.1	172.16.41.255	ICMP	98	Echo (ping) request id=0x0779, seq=5/1280, ttl=64 (no response found!)
25	29.844916	172.16.41.1	172.16.41.255	ICMP	98	Echo (ping) request id=0x0779, seq=6/1536, ttl=64 (no response found!)
26	30.073274	CiscoInc_d4:1c:04	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/41/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8004
27	30.852919	172.16.41.1	172.16.41.255	ICMP	98	Echo (ping) request id=0x0779, seq=7/1792, ttl=64 (no response found!)
28	31.860918	172.16.41.1	172.16.41.255	ICMP	98	Echo (ping) request id=0x0779, seq=8/2048, ttl=64 (no response found!)
29	32.078191	CiscoInc_d4:1c:04	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/41/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8004
30	34.083047	CiscoInc_d4:1c:04	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/41/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8004
31	36.087926	CiscoInc_d4:1c:04	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/41/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8004

- Tux4

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	CiscoInc_d4:1c:06	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8006
2	2.004900	CiscoInc_d4:1c:06	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8006
3	4.008030	CiscoInc_d4:1c:06	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8006
4	5.770063	CiscoInc_d4:1c:06	CiscoInc_d4:1c:06	LOOP	60	Reply
5	6.013054	CiscoInc_d4:1c:06	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8006
6	8.018226	CiscoInc_d4:1c:06	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8006
7	10.023159	CiscoInc_d4:1c:06	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8006
8	12.028508	CiscoInc_d4:1c:06	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8006
9	14.033768	CiscoInc_d4:1c:06	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8006
10	15.769526	CiscoInc_d4:1c:06	CiscoInc_d4:1c:06	LOOP	60	Reply
11	16.038911	CiscoInc_d4:1c:06	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8006
12	18.044217	CiscoInc_d4:1c:06	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8006
13	20.047233	CiscoInc_d4:1c:06	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8006
14	22.054102	CiscoInc_d4:1c:06	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8006
15	24.057224	CiscoInc_d4:1c:06	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8006
16	25.777158	CiscoInc_d4:1c:06	CiscoInc_d4:1c:06	LOOP	60	Reply
17	26.063307	CiscoInc_d4:1c:06	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8006
18	28.067272	CiscoInc_d4:1c:06	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8006
19	30.072522	CiscoInc_d4:1c:06	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8006
20	32.077693	CiscoInc_d4:1c:06	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8006
21	34.082920	CiscoInc_d4:1c:06	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8006

Experiência 3

Passo 1:

No.	Time	Source	Destination	Protocol	Length	Info
13	20.045882	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
14	21.044076	CiscoInc_d4:1c:03	CiscoInc_d4:1c:03	LOOP	60	Reply
15	22.050788	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
16	24.055566	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
17	25.538131	172.16.40.1	172.16.41.1	ICMP	98	Echo (ping) request id=0x4519, seq=1/256, ttl=64 (no response found!)
18	26.060412	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
19	26.546747	172.16.40.1	172.16.41.1	ICMP	98	Echo (ping) request id=0x4519, seq=2/512, ttl=64 (no response found!)
20	27.554736	172.16.40.1	172.16.41.1	ICMP	98	Echo (ping) request id=0x4519, seq=3/768, ttl=64 (no response found!)
21	28.069493	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
22	28.562728	172.16.40.1	172.16.41.1	ICMP	98	Echo (ping) request id=0x4519, seq=4/1024, ttl=64 (no response found!)
23	29.570742	172.16.40.1	172.16.41.1	ICMP	98	Echo (ping) request id=0x4519, seq=5/1280, ttl=64 (no response found!)
24	30.070126	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
25	30.548642	G-ProCom_8c:af:af	HewlettP_5a:7b:ea	ARP	42	Who has 172.16.40.254? Tell 172.16.40.1
26	30.548887	HewlettP_5a:7b:ea	G-ProCom_8c:af:af	ARP	60	172.16.40.254 is at 00:21:5a:5a:7b:ea
27	30.578749	172.16.40.1	172.16.41.1	ICMP	98	Echo (ping) request id=0x4519, seq=6/1536, ttl=64 (no response found!)
28	31.051478	CiscoInc_d4:1c:03	CiscoInc_d4:1c:03	LOOP	60	Reply
29	31.586736	172.16.40.1	172.16.41.1	ICMP	98	Echo (ping) request id=0x4519, seq=7/1792, ttl=64 (no response found!)
30	32.074903	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
31	32.594730	172.16.40.1	172.16.41.1	ICMP	98	Echo (ping) request id=0x4519, seq=8/2048, ttl=64 (no response found!)
32	33.602736	172.16.40.1	172.16.41.1	ICMP	98	Echo (ping) request id=0x4519, seq=9/2304, ttl=64 (no response found!)
33	34.080047	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
34	34.610739	172.16.40.1	172.16.41.1	ICMP	98	Echo (ping) request id=0x4519, seq=10/2560, ttl=64 (no response found!)
35	35.618731	172.16.40.1	172.16.41.1	ICMP	98	Echo (ping) request id=0x4519, seq=11/2816, ttl=64 (no response found!)
36	36.089653	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
37	36.626748	172.16.40.1	172.16.41.1	ICMP	98	Echo (ping) request id=0x4519, seq=12/3072, ttl=64 (no response found!)
38	37.634733	172.16.40.1	172.16.41.1	ICMP	98	Echo (ping) request id=0x4519, seq=13/3328, ttl=64 (no response found!)
39	38.089446	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003

Passo 5:

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
2	2.009877	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
3	4.009692	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
4	5.272659	172.16.40.1	172.16.41.1	ICMP	98	Echo (ping) request id=0x47d1, seq=1/256, ttl=64 (reply in 5)
5	5.273168	172.16.41.1	172.16.40.1	ICMP	98	Echo (ping) reply id=0x47d1, seq=1/256, ttl=63 (request in 4)
6	6.014442	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
7	6.271663	172.16.40.1	172.16.41.1	ICMP	98	Echo (ping) request id=0x47d1, seq=2/512, ttl=64 (reply in 8)
8	6.272134	172.16.41.1	172.16.40.1	ICMP	98	Echo (ping) reply id=0x47d1, seq=2/512, ttl=63 (request in 7)
9	7.143561	CiscoInc_d4:1c:03	CiscoInc_d4:1c:03	LOOP	60	Reply
10	7.270665	172.16.40.1	172.16.41.1	ICMP	98	Echo (ping) request id=0x47d1, seq=3/768, ttl=64 (reply in 11)
11	7.271113	172.16.41.1	172.16.40.1	ICMP	98	Echo (ping) reply id=0x47d1, seq=3/768, ttl=63 (request in 10)
12	8.024209	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
13	8.270533	172.16.40.1	172.16.41.1	ICMP	98	Echo (ping) request id=0x47d1, seq=4/1024, ttl=64 (reply in 14)
14	8.270980	172.16.41.1	172.16.40.1	ICMP	98	Echo (ping) reply id=0x47d1, seq=4/1024, ttl=63 (request in 13)
15	9.270533	172.16.40.1	172.16.41.1	ICMP	98	Echo (ping) request id=0x47d1, seq=5/1280, ttl=64 (reply in 16)
16	9.271020	172.16.41.1	172.16.40.1	ICMP	98	Echo (ping) reply id=0x47d1, seq=5/1280, ttl=63 (request in 15)
17	10.024096	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
18	10.270531	172.16.40.1	172.16.41.1	ICMP	98	Echo (ping) request id=0x47d1, seq=6/1536, ttl=64 (reply in 19)
19	10.270988	172.16.41.1	172.16.40.1	ICMP	98	Echo (ping) reply id=0x47d1, seq=6/1536, ttl=63 (request in 18)
20	10.285132	HewlettP_5a:7b:ea	G-ProCom_8c:af:af	ARP	60	Who has 172.16.40.1? Tell 172.16.40.254
21	10.285154	G-ProCom_8c:af:af	HewlettP_5a:7b:ea	ARP	42	172.16.40.1 is at 00:0f:fe:8c:af:af
22	11.270541	172.16.40.1	172.16.41.1	ICMP	98	Echo (ping) request id=0x47d1, seq=7/1792, ttl=64 (reply in 23)
23	11.271008	172.16.41.1	172.16.40.1	ICMP	98	Echo (ping) reply id=0x47d1, seq=7/1792, ttl=63 (request in 22)
24	12.040106	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003

Passo 6:

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	172.16.40.1	172.16.41.1	ICMP	98	Echo (ping) request id=0x4837, seq=70/17920, ttl=63 (reply in 2)
2	0.000029	172.16.41.1	172.16.40.1	ICMP	98	Echo (ping) reply id=0x4837, seq=70/17920, ttl=64 (request in 1)
3	0.154027	CiscoInc_d4:1c:04	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/41/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8004
4	1.000029	172.16.40.1	172.16.41.1	ICMP	98	Echo (ping) request id=0x4837, seq=71/18176, ttl=63 (reply in 5)
5	1.000058	172.16.41.1	172.16.40.1	ICMP	98	Echo (ping) reply id=0x4837, seq=71/18176, ttl=64 (request in 4)
6	2.000087	172.16.40.1	172.16.41.1	ICMP	98	Echo (ping) request id=0x4837, seq=72/18432, ttl=63 (reply in 7)
7	2.000113	172.16.41.1	172.16.40.1	ICMP	98	Echo (ping) reply id=0x4837, seq=72/18432, ttl=64 (request in 6)
8	2.163968	CiscoInc_d4:1c:04	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/41/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8004
9	3.000099	172.16.40.1	172.16.41.1	ICMP	98	Echo (ping) request id=0x4837, seq=73/18688, ttl=63 (reply in 10)
10	3.000126	172.16.41.1	172.16.40.1	ICMP	98	Echo (ping) reply id=0x4837, seq=73/18688, ttl=64 (request in 9)
11	3.585781	172.16.41.1	172.16.40.1	ICMP	98	Echo (ping) request id=0x5224, seq=1/256, ttl=64 (reply in 12)
12	3.586187	172.16.40.1	172.16.41.1	ICMP	98	Echo (ping) reply id=0x5224, seq=1/256, ttl=63 (request in 11)
13	4.000110	172.16.40.1	172.16.41.1	ICMP	98	Echo (ping) request id=0x4837, seq=74/18944, ttl=63 (reply in 14)
14	4.000137	172.16.41.1	172.16.40.1	ICMP	98	Echo (ping) reply id=0x4837, seq=74/18944, ttl=64 (request in 13)
15	4.163801	CiscoInc_d4:1c:04	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/41/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8004
16	4.586125	172.16.41.1	172.16.40.1	ICMP	98	Echo (ping) request id=0x5224, seq=2/512, ttl=64 (reply in 17)
17	4.586519	172.16.40.1	172.16.41.1	ICMP	98	Echo (ping) reply id=0x5224, seq=2/512, ttl=63 (request in 16)
18	5.000139	172.16.40.1	172.16.41.1	ICMP	98	Echo (ping) request id=0x4837, seq=75/19200, ttl=63 (reply in 19)
19	5.000169	172.16.41.1	172.16.40.1	ICMP	98	Echo (ping) reply id=0x4837, seq=75/19200, ttl=64 (request in 18)
20	5.573443	CiscoInc_d4:1c:04	CiscoInc_d4:1c:04	LOOP	60	Reply
21	5.586133	172.16.41.1	172.16.40.1	ICMP	98	Echo (ping) request id=0x5224, seq=3/768, ttl=64 (reply in 22)
22	5.586519	172.16.40.1	172.16.41.1	ICMP	98	Echo (ping) reply id=0x5224, seq=3/768, ttl=63 (request in 21)
23	6.000162	172.16.40.1	172.16.41.1	ICMP	98	Echo (ping) request id=0x4837, seq=76/19456, ttl=63 (reply in 24)
24	6.000188	172.16.41.1	172.16.40.1	ICMP	98	Echo (ping) reply id=0x4837, seq=76/19456, ttl=64 (request in 23)

Passo 7:

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
2	0.146188	CiscoInc_d4:1c:03	CiscoInc_d4:1c:03	LOOP	60	Reply
3	1.388042	172.16.40.1	172.16.41.1	ICMP	98	Echo (ping) request id=0x4916, seq=1/256, ttl=64 (reply in 4)
4	1.388547	172.16.41.1	172.16.40.1	ICMP	98	Echo (ping) reply id=0x4916, seq=1/256, ttl=63 (request in 3)
5	1.999909	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
6	2.226418	172.16.40.1	193.136.28.10	DNS	81	Standard query 0x3c86 AAAA tux41.netlab.fe.up.pt
7	2.226765	172.16.40.254	172.16.40.1	ICMP	109	Destination unreachable (Network unreachable)
8	2.388006	172.16.40.1	172.16.41.1	ICMP	98	Echo (ping) request id=0x4916, seq=2/512, ttl=64 (reply in 9)
9	2.388463	172.16.41.1	172.16.40.1	ICMP	98	Echo (ping) reply id=0x4916, seq=2/512, ttl=63 (request in 8)
10	3.387020	172.16.40.1	172.16.41.1	ICMP	98	Echo (ping) request id=0x4916, seq=3/768, ttl=64 (reply in 11)
11	3.387470	172.16.41.1	172.16.40.1	ICMP	98	Echo (ping) reply id=0x4916, seq=3/768, ttl=63 (request in 10)
12	4.004756	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
13	4.386021	172.16.40.1	172.16.41.1	ICMP	98	Echo (ping) request id=0x4916, seq=4/1024, ttl=64 (reply in 14)
14	4.386470	172.16.41.1	172.16.40.1	ICMP	98	Echo (ping) reply id=0x4916, seq=4/1024, ttl=63 (request in 13)
15	5.385800	172.16.40.1	172.16.41.1	ICMP	98	Echo (ping) request id=0x4916, seq=5/1280, ttl=64 (reply in 16)
16	5.386247	172.16.41.1	172.16.40.1	ICMP	98	Echo (ping) reply id=0x4916, seq=5/1280, ttl=63 (request in 15)
17	6.014702	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
18	6.385802	172.16.40.1	172.16.41.1	ICMP	98	Echo (ping) request id=0x4916, seq=6/1536, ttl=64 (reply in 19)
19	6.386297	172.16.41.1	172.16.40.1	ICMP	98	Echo (ping) reply id=0x4916, seq=6/1536, ttl=63 (request in 18)
20	7.231474	172.16.40.1	172.16.1.1	DNS	81	Standard query 0x3c86 AAAA tux41.netlab.fe.up.pt
21	7.231741	172.16.40.254	172.16.40.1	ICMP	109	Destination unreachable (Network unreachable)
22	7.384969	172.16.40.1	172.16.41.1	ICMP	98	Echo (ping) request id=0x4916, seq=7/1792, ttl=64 (reply in 23)
23	7.385421	172.16.41.1	172.16.40.1	ICMP	98	Echo (ping) reply id=0x4916, seq=7/1792, ttl=63 (request in 22)
24	8.014346	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003

Experiência 4

Passo 3:

- Tux2

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
2	2.005152	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
3	3.623659	CiscoInc_d4:1c:03	CiscoInc_d4:1c:03	LOOP	60	Reply
4	4.009511	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
5	6.014513	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
6	6.690082	172.16.40.1	172.16.41.1	ICMP	98	Echo (ping) request id=0x066b, seq=1/256, ttl=64 (reply in 7)
7	6.690606	172.16.41.1	172.16.40.1	ICMP	98	Echo (ping) reply id=0x066b, seq=1/256, ttl=63 (request in 6)
8	7.689087	172.16.40.1	172.16.41.1	ICMP	98	Echo (ping) request id=0x066b, seq=2/512, ttl=64 (reply in 9)
9	7.689582	172.16.41.1	172.16.40.1	ICMP	98	Echo (ping) reply id=0x066b, seq=2/512, ttl=63 (request in 8)
10	8.019210	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
11	8.688088	172.16.40.1	172.16.41.1	ICMP	98	Echo (ping) request id=0x066b, seq=3/768, ttl=64 (reply in 12)
12	8.688543	172.16.41.1	172.16.40.1	ICMP	98	Echo (ping) reply id=0x066b, seq=3/768, ttl=63 (request in 11)
13	9.687814	172.16.40.1	172.16.41.1	ICMP	98	Echo (ping) request id=0x066b, seq=4/1024, ttl=64 (reply in 14)
14	9.688317	172.16.41.1	172.16.40.1	ICMP	98	Echo (ping) reply id=0x066b, seq=4/1024, ttl=63 (request in 13)
15	10.024040	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
16	10.687800	172.16.40.1	172.16.41.1	ICMP	98	Echo (ping) request id=0x066b, seq=5/1280, ttl=64 (reply in 17)
17	10.688268	172.16.41.1	172.16.40.1	ICMP	98	Echo (ping) reply id=0x066b, seq=5/1280, ttl=63 (request in 16)
18	11.687826	172.16.40.1	172.16.41.1	ICMP	98	Echo (ping) request id=0x066b, seq=6/1536, ttl=64 (reply in 19)
19	11.688069	172.16.41.1	172.16.40.1	ICMP	98	Echo (ping) reply id=0x066b, seq=6/1536, ttl=63 (request in 18)
20	11.700058	HewlettP_5a:7b:ea	G-ProCom_8c:af:af	ARP	60	Who has 172.16.40.1? Tell 172.16.40.254
21	11.700072	G-ProCom_8c:af:af	HewlettP_5a:7b:ea	ARP	42	172.16.40.1 is at 00:0f:fe:8c:af:af
22	12.028867	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
23	12.687768	172.16.40.1	172.16.41.1	ICMP	98	Echo (ping) request id=0x066b, seq=7/1792, ttl=64 (reply in 24)
24	12.688230	172.16.41.1	172.16.40.1	ICMP	98	Echo (ping) reply id=0x066b, seq=7/1792, ttl=63 (request in 23)
25	13.630912	CiscoInc_d4:1c:03	CiscoInc_d4:1c:03	LOOP	60	Reply
26	13.687819	172.16.40.1	172.16.41.1	ICMP	98	Echo (ping) request id=0x066b, seq=8/2048, ttl=64 (reply in 27)
27	13.688291	172.16.41.1	172.16.40.1	ICMP	98	Echo (ping) reply id=0x066b, seq=8/2048, ttl=63 (request in 26)
28	14.033840	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003

- Tux4

No.	Time	Source	Destination	Protocol	Length	Info
4	4.004755	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
5	6.014592	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
6	8.014294	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
7	10.019424	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
8	11.707354	CiscoInc_d4:1c:03	CiscoInc_d4:1c:03	LOOP	60	Reply
9	12.045987	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
10	12.161560	172.16.40.1	172.16.40.254	ICMP	98	Echo (ping) request id=0x0640, seq=1/256, ttl=64 (reply in 11)
11	12.161772	172.16.40.254	172.16.40.1	ICMP	98	Echo (ping) reply id=0x0640, seq=1/256, ttl=64 (request in 10)
12	13.160562	172.16.40.1	172.16.40.254	ICMP	98	Echo (ping) request id=0x0640, seq=2/512, ttl=64 (reply in 13)
13	13.160764	172.16.40.254	172.16.40.1	ICMP	98	Echo (ping) reply id=0x0640, seq=2/512, ttl=64 (request in 12)
14	14.050513	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
15	14.159556	172.16.40.1	172.16.40.254	ICMP	98	Echo (ping) request id=0x0640, seq=3/768, ttl=64 (reply in 16)
16	14.159753	172.16.40.254	172.16.40.1	ICMP	98	Echo (ping) reply id=0x0640, seq=3/768, ttl=64 (request in 15)
17	15.159181	172.16.40.1	172.16.40.254	ICMP	98	Echo (ping) request id=0x0640, seq=4/1024, ttl=64 (reply in 18)
18	15.159380	172.16.40.254	172.16.40.1	ICMP	98	Echo (ping) reply id=0x0640, seq=4/1024, ttl=64 (request in 17)
19	16.050249	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
20	16.159192	172.16.40.1	172.16.40.254	ICMP	98	Echo (ping) request id=0x0640, seq=5/1280, ttl=64 (reply in 21)
21	16.159390	172.16.40.254	172.16.40.1	ICMP	98	Echo (ping) reply id=0x0640, seq=5/1280, ttl=64 (request in 20)
22	17.159201	172.16.40.1	172.16.40.254	ICMP	98	Echo (ping) request id=0x0640, seq=6/1536, ttl=64 (reply in 23)
23	17.159397	172.16.40.254	172.16.40.1	ICMP	98	Echo (ping) reply id=0x0640, seq=6/1536, ttl=64 (request in 22)
24	17.164637	HewlettP_5a:7b:ea	G-ProCom_8c:af:af	ARP	60	Who has 172.16.40.1? Tell 172.16.40.254
25	17.164654	G-ProCom_8c:af:af	HewlettP_5a:7b:ea	ARP	42	172.16.40.1 is at 00:0f:fe:8c:af:af
26	18.055014	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
27	18.159190	172.16.40.1	172.16.40.254	ICMP	98	Echo (ping) request id=0x0640, seq=7/1792, ttl=64 (reply in 28)
28	18.159390	172.16.40.254	172.16.40.1	ICMP	98	Echo (ping) reply id=0x0640, seq=7/1792, ttl=64 (request in 27)
29	19.159215	172.16.40.1	172.16.40.254	ICMP	98	Echo (ping) request id=0x0640, seq=8/2048, ttl=64 (reply in 30)
30	19.159465	172.16.40.254	172.16.40.1	ICMP	98	Echo (ping) reply id=0x0640, seq=8/2048, ttl=64 (request in 29)
31	20.059896	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003

- RC

lo.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
2	2.009576	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
3	4.009529	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
4	5.779390	CiscoInc_d4:1c:03	CiscoInc_d4:1c:03	LOOP	60	Reply
5	6.014287	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
6	8.019055	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
7	10.023859	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
8	12.033680	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
9	13.320576	172.16.40.1	172.16.41.254	ICMP	98	Echo (ping) request id=0x0604, seq=1/256, ttl=64 (reply in 10)
10	13.321297	172.16.41.254	172.16.40.1	ICMP	98	Echo (ping) reply id=0x0604, seq=1/256, ttl=254 (request in 9)
11	14.033595	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
12	14.319578	172.16.40.1	172.16.41.254	ICMP	98	Echo (ping) request id=0x0604, seq=2/512, ttl=64 (reply in 13)
13	14.320198	172.16.41.254	172.16.40.1	ICMP	98	Echo (ping) reply id=0x0604, seq=2/512, ttl=254 (request in 12)
14	15.318580	172.16.40.1	172.16.41.254	ICMP	98	Echo (ping) request id=0x0604, seq=3/768, ttl=64 (reply in 15)
15	15.319195	172.16.41.254	172.16.40.1	ICMP	98	Echo (ping) reply id=0x0604, seq=3/768, ttl=254 (request in 14)
16	15.786734	CiscoInc_d4:1c:03	CiscoInc_d4:1c:03	LOOP	60	Reply
17	16.038398	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
18	16.318399	172.16.40.1	172.16.41.254	ICMP	98	Echo (ping) request id=0x0604, seq=4/1024, ttl=64 (reply in 19)
19	16.319008	172.16.41.254	172.16.40.1	ICMP	98	Echo (ping) reply id=0x0604, seq=4/1024, ttl=254 (request in 18)
20	17.318387	172.16.40.1	172.16.41.254	ICMP	98	Echo (ping) request id=0x0604, seq=5/1280, ttl=64 (reply in 21)
21	17.319045	172.16.41.254	172.16.40.1	ICMP	98	Echo (ping) reply id=0x0604, seq=5/1280, ttl=254 (request in 20)
22	18.048246	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
23	18.318398	172.16.40.1	172.16.41.254	ICMP	98	Echo (ping) request id=0x0604, seq=6/1536, ttl=64 (reply in 24)
24	18.319016	172.16.41.254	172.16.40.1	ICMP	98	Echo (ping) reply id=0x0604, seq=6/1536, ttl=254 (request in 23)
25	18.325753	HewlettP_5a:7b:ea	G-ProCom_8c:af:af	ARP	60	Who has 172.16.40.1? Tell 172.16.40.254
26	18.325772	G-ProCom_8c:af:af	HewlettP_5a:7b:ea	ARP	42	172.16.40.1 is at 00:0f:fe:8c:af:af
27	19.318405	172.16.40.1	172.16.41.254	ICMP	98	Echo (ping) request id=0x0604, seq=7/1792, ttl=64 (reply in 28)
28	19.319042	172.16.41.254	172.16.40.1	ICMP	98	Echo (ping) reply id=0x0604, seq=7/1792, ttl=254 (request in 27)

Passo 4:

37	6.014652	CiscoInc_d4:1c:04	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/41/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8004
38	8.019524	CiscoInc_d4:1c:04	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/41/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8004
39	9.285496	172.16.41.1	193.136.28.10	DNS	86	Standard query 0x38bd PTR 253.41.16.172.in-addr.arpa
40	9.285643	172.16.41.253	172.16.41.1	ICMP	114	Redirect (Redirect for host)
41	9.291055	HewlettP_d7:45:c4	Kye_25:1a:f4	ARP	42	Who has 172.16.41.253? Tell 172.16.41.1
42	9.291148	Kye_25:1a:f4	HewlettP_d7:45:c4	ARP	60	172.16.41.253 is at 00:c0:df:25:1a:f4
43	10.016327	CiscoInc_d4:1c:04	CiscoInc_d4:1c:04	LOOP	60	Reply
44	10.030205	CiscoInc_d4:1c:04	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/41/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8004
45	12.029288	CiscoInc_d4:1c:04	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/41/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8004
46	14.034255	CiscoInc_d4:1c:04	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/41/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8004
47	14.290545	172.16.41.1	172.16.1.1	DNS	86	Standard query 0x38bd PTR 253.41.16.172.in-addr.arpa
48	14.290691	172.16.41.253	172.16.41.1	ICMP	114	Redirect (Redirect for host)
49	16.060952	CiscoInc_d4:1c:04	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/41/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8004

Passo 5:

No.	Time	Source	Destination	Protocol	Length	Info
9	12.028925	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
10	13.584259	172.16.40.1	172.16.1.254	ICMP	98	Echo (ping) request id=0x0a81, seq=1/256, ttl=64 (no response found!)
11	14.038621	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
12	14.591729	172.16.40.1	172.16.1.254	ICMP	98	Echo (ping) request id=0x0a81, seq=2/512, ttl=64 (no response found!)
13	15.599723	172.16.40.1	172.16.1.254	ICMP	98	Echo (ping) request id=0x0a81, seq=3/768, ttl=64 (no response found!)
14	16.038322	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
15	16.607725	172.16.40.1	172.16.1.254	ICMP	98	Echo (ping) request id=0x0a81, seq=4/1024, ttl=64 (no response found!)
16	17.615725	172.16.40.1	172.16.1.254	ICMP	98	Echo (ping) request id=0x0a81, seq=5/1280, ttl=64 (no response found!)
17	18.043172	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
18	18.585622	G-ProCom_8c:af:af	HewlettP_5a:7b:ea	ARP	42	Who has 172.16.40.254? Tell 172.16.40.1
19	18.623713	172.16.40.1	172.16.1.254	ICMP	98	Echo (ping) request id=0x0a81, seq=6/1536, ttl=64 (no response found!)
20	19.585627	G-ProCom_8c:af:af	HewlettP_5a:7b:ea	ARP	42	Who has 172.16.40.254? Tell 172.16.40.1
21	19.631716	172.16.40.1	172.16.1.254	ICMP	98	Echo (ping) request id=0x0a81, seq=7/1792, ttl=64 (no response found!)
22	20.048106	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
23	20.585638	G-ProCom_8c:af:af	HewlettP_5a:7b:ea	ARP	42	Who has 172.16.40.254? Tell 172.16.40.1
24	20.593450	CiscoInc_d4:1c:03	CiscoInc_d4:1c:03	LOOP	60	Reply
25	20.639722	172.16.40.1	172.16.1.254	ICMP	98	Echo (ping) request id=0x0a81, seq=8/2048, ttl=64 (no response found!)
26	21.647711	G-ProCom_8c:af:af	Broadcast	ARP	42	Who has 172.16.40.254? Tell 172.16.40.1
27	22.052800	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
28	22.645635	G-ProCom_8c:af:af	Broadcast	ARP	42	Who has 172.16.40.254? Tell 172.16.40.1
29	23.645633	G-ProCom_8c:af:af	Broadcast	ARP	42	Who has 172.16.40.254? Tell 172.16.40.1
30	24.057646	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
31	24.662919	G-ProCom_8c:af:af	Broadcast	ARP	42	Who has 172.16.40.254? Tell 172.16.40.1
32	24.695417	CiscoInc_d4:1c:03	CDP/VTP/DTP/PAgP/UD…	CDP	435	Device ID: tux-sw4 Port ID: FastEthernet0/1
33	25.661628	G-ProCom_8c:af:af	Broadcast	ARP	42	Who has 172.16.40.254? Tell 172.16.40.1
34	26.062460	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
35	26.661623	G-ProCom_8c:af:af	Broadcast	ARP	42	Who has 172.16.40.254? Tell 172.16.40.1
36	28.067526	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003

Passo 7:

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
2	1.836908	172.16.40.1	172.16.1.254	ICMP	98	Echo (ping) request id=0x1055, seq=1/256, ttl=64 (reply in 3)
3	1.838084	172.16.1.254	172.16.40.1	ICMP	98	Echo (ping) reply id=0x1055, seq=1/256, ttl=62 (request in 2)
4	2.004872	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
5	2.838176	172.16.40.1	172.16.1.254	ICMP	98	Echo (ping) request id=0x1055, seq=2/512, ttl=64 (reply in 6)
6	2.838997	172.16.1.254	172.16.40.1	ICMP	98	Echo (ping) reply id=0x1055, seq=2/512, ttl=62 (request in 5)
7	3.837239	172.16.40.1	172.16.1.254	ICMP	98	Echo (ping) request id=0x1055, seq=3/768, ttl=64 (reply in 8)
8	3.838061	172.16.1.254	172.16.40.1	ICMP	98	Echo (ping) reply id=0x1055, seq=3/768, ttl=62 (request in 7)
9	4.014808	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
10	4.837237	172.16.40.1	172.16.1.254	ICMP	98	Echo (ping) request id=0x1055, seq=4/1024, ttl=64 (reply in 11)
11	4.838069	172.16.1.254	172.16.40.1	ICMP	98	Echo (ping) reply id=0x1055, seq=4/1024, ttl=62 (request in 10)
12	5.837237	172.16.40.1	172.16.1.254	ICMP	98	Echo (ping) request id=0x1055, seq=5/1280, ttl=64 (reply in 13)
13	5.838048	172.16.1.254	172.16.40.1	ICMP	98	Echo (ping) reply id=0x1055, seq=5/1280, ttl=62 (request in 12)
14	5.997852	CiscoInc_d4:1c:03	CiscoInc_d4:1c:03	LOOP	60	Reply
15	6.014554	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
16	6.837252	172.16.40.1	172.16.1.254	ICMP	98	Echo (ping) request id=0x1055, seq=6/1536, ttl=64 (reply in 19)
17	6.837930	HewlettP_5a:7b:ea	G-ProCom_8c:af:af	ARP	60	Who has 172.16.40.1? Tell 172.16.40.254
18	6.837946	G-ProCom_8c:af:af	HewlettP_5a:7b:ea	ARP	42	172.16.40.1 is at 00:0f:fe:8c:af:af
19	6.837953	172.16.1.254	172.16.40.1	ICMP	98	Echo (ping) reply id=0x1055, seq=6/1536, ttl=62 (request in 16)
20	7.837240	172.16.40.1	172.16.1.254	ICMP	98	Echo (ping) request id=0x1055, seq=7/1792, ttl=64 (reply in 21)
21	7.838072	172.16.1.254	172.16.40.1	ICMP	98	Echo (ping) reply id=0x1055, seq=7/1792, ttl=62 (request in 20)
22	8.019367	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
23	8.837243	172.16.40.1	172.16.1.254	ICMP	98	Echo (ping) request id=0x1055, seq=8/2048, ttl=64 (reply in 24)
24	8.838050	172.16.1.254	172.16.40.1	ICMP	98	Echo (ping) reply id=0x1055, seq=8/2048, ttl=62 (request in 23)
25	9.837243	172.16.40.1	172.16.1.254	ICMP	98	Echo (ping) request id=0x1055, seq=9/2304, ttl=64 (reply in 26)
26	9.838087	172.16.1.254	172.16.40.1	ICMP	98	Echo (ping) reply id=0x1055, seq=9/2304, ttl=62 (request in 25)
27	10.029305	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
28	10.837242	172.16.40.1	172.16.1.254	ICMP	98	Echo (ping) request id=0x1055, seq=10/2560, ttl=64 (reply in 29)

Experiência 5

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	172.16.40.1	54.68.119.170	TCP	66	44546→443 [ACK] Seq=1 Ack=1 Win=760 Len=0 TSval=26982456 TSecr=1004392912
2	0.185909	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
3	0.216760	54.68.119.170	172.16.40.1	TCP	66	[TCP ACKed unseen segment] 443→44546 [ACK] Seq=1 Ack=2 Win=79 Len=0 TSval=1004395472 TSecr=26962038
4	1.581528	CiscoInc_d4:1c:03	CiscoInc_d4:1c:03	LOOP	60	Reply
5	1.713227	172.16.40.1	172.16.1.1	DNS	76	Standard query 0x2868 A www.facebook.com
6	1.715389	172.16.1.1	172.16.40.1	DNS	244	Standard query response 0x2868 A www.facebook.com CNAME star-mini.c10r.facebook.com A 31.13.70.36 NS b.ns.c…
7	1.715703	172.16.40.1	31.13.70.36	ICMP	98	Echo (ping) request id=0x172e, seq=1/256, ttl=64 (reply in 8)
8	1.900193	31.13.70.36	172.16.40.1	ICMP	98	Echo (ping) reply id=0x172e, seq=1/256, ttl=75 (request in 7)
9	1.900448	172.16.40.1	172.16.1.1	DNS	84	Standard query 0x7016 PTR 36.70.13.31.in-addr.arpa
10	1.994223	172.16.1.1	172.16.40.1	DNS	446	Standard query response 0x7016 PTR 36.70.13.31.in-addr.arpa PTR edge-star-mini-shv-01-lax3.facebook.com NS …
11	2.185674	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
12	2.716150	172.16.40.1	31.13.70.36	ICMP	98	Echo (ping) request id=0x172e, seq=2/512, ttl=64 (reply in 13)
13	2.900156	31.13.70.36	172.16.40.1	ICMP	98	Echo (ping) reply id=0x172e, seq=2/512, ttl=75 (request in 12)
14	3.657630	172.16.40.1	31.13.70.36	TLSv1.2	112	Application Data
15	3.716095	172.16.40.1	31.13.70.36	ICMP	98	Echo (ping) request id=0x172e, seq=3/768, ttl=64 (reply in 19)
16	3.841324	31.13.70.36	172.16.40.1	TCP	66	443→51564 [ACK] Seq=1 Ack=47 Win=122 Len=0 TSval=478596060 TSecr=26983370
17	3.841350	31.13.70.36	172.16.40.1	TLSv1.2	112	Application Data
18	3.880006	172.16.40.1	31.13.70.36	TCP	66	51564→443 [ACK] Seq=47 Ack=47 Win=323 Len=0 TSval=26983426 TSecr=478596060
19	3.900097	31.13.70.36	172.16.40.1	ICMP	98	Echo (ping) reply id=0x172e, seq=3/768, ttl=75 (request in 15)
20	3.938112	172.16.40.1	172.16.1.1	DNS	86	Standard query 0xa3fa PTR 170.119.68.54.in-addr.arpa
21	3.939389	172.16.1.1	172.16.40.1	DNS	370	Standard query response 0xa3fa PTR 170.119.68.54.in-addr.arpa PTR ec2-54-68-119-170.us-west-2.compute.amazo…
22	3.939805	172.16.40.1	172.16.1.1	DNS	88	Standard query 0xc302 PTR 174.238.210.194.in-addr.arpa
23	3.941474	172.16.1.1	172.16.40.1	DNS	147	Standard query response 0xc302 No such name PTR 174.238.210.194.in-addr.arpa SOA ns01.fccn.pt
24	3.941760	172.16.40.1	172.16.1.1	DNS	88	Standard query 0x20f0 PTR 176.238.210.194.in-addr.arpa
25	3.943354	172.16.1.1	172.16.40.1	DNS	147	Standard query response 0x20f0 No such name PTR 176.238.210.194.in-addr.arpa SOA ns01.fccn.pt
26	3.943594	172.16.40.1	172.16.1.1	DNS	83	Standard query 0x241b PTR 9.90.13.31.in-addr.arpa
27	3.944778	172.16.1.1	172.16.40.1	DNS	441	Standard query response 0x241b PTR 9.90.13.31.in-addr.arpa PTR edge-atlas-shv-01-lhr3.facebook.com NS b.ns.…
28	3.945019	172.16.40.1	172.16.1.1	DNS	85	Standard query 0xc817 PTR 203.69.13.31.in-addr.arpa

Experiência 6

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
2	2.004643	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
3	2.933307	172.16.40.1	172.16.1.1	DNS	69	Standard query 0x2bc1 A ftp.up.pt
4	2.933348	172.16.40.1	172.16.1.1	DNS	69	Standard query 0x7d8f AAAA ftp.up.pt
5	2.934960	172.16.1.1	172.16.40.1	DNS	554	Standard query response 0x2bc1 A ftp.up.pt A 193.136.37.8 NS a.dns.pt NS ns2.nic.fr NS e.dns.pt NS ns2.dns.…
6	2.934976	172.16.1.1	172.16.40.1	DNS	538	Standard query response 0x7d8f AAAA ftp.up.pt AAAA 2001:690:2200:910::8 NS ns2.dns.pt NS e.dns.pt NS b.dns.…
7	2.935463	172.16.40.1	193.136.37.8	TCP	74	47947→21 [SYN] Seq=0 Win=29200 Len=0 MSS=1460 SACK_PERM=1 TSval=3392549 TSecr=0 WS=128
8	2.939655	193.136.37.8	172.16.40.1	TCP	70	21→47947 [SYN, ACK] Seq=0 Ack=1 Win=5792 Len=0 MSS=1380 SACK_PERM=1 TSval=542263925 TSecr=3392549
9	2.939677	172.16.40.1	193.136.37.8	TCP	66	47947→21 [ACK] Seq=1 Ack=1 Win=29200 Len=0 TSval=3392550 TSecr=542263925
10	2.944465	193.136.37.8	172.16.40.1	FTP	106	Response: 220 Bem-vindo \303\240 Universidade do Porto
11	2.944489	172.16.40.1	193.136.37.8	TCP	66	47947→21 [ACK] Seq=1 Ack=41 Win=29200 Len=0 TSval=3392552 TSecr=542263925
12	3.079013	172.16.40.1	172.16.1.1	DNS	85	Standard query 0x18d7 PTR 8.37.136.193.in-addr.arpa
13	3.080146	172.16.1.1	172.16.40.1	DNS	356	Standard query response 0x18d7 PTR 8.37.136.193.in-addr.arpa PTR ftp.up.pt NS ns2.up.pt NS ns1.up.pt NS ns3…
14	4.009451	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
15	6.014380	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
16	6.786226	CiscoInc_d4:1c:03	CiscoInc_d4:1c:03	LOOP	60	Reply
17	8.019183	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
18	8.082828	172.16.40.1	172.16.1.1	DNS	85	Standard query 0x3b2d PTR 8.37.136.193.in-addr.arpa
19	8.084127	172.16.1.1	172.16.40.1	DNS	356	Standard query response 0x3b2d PTR 8.37.136.193.in-addr.arpa PTR ftp.up.pt NS ns4.up.pt NS ns2.up.pt NS ns1…
20	8.752928	172.16.40.1	193.136.37.8	FTP	82	Request: user anonymous
21	8.754795	193.136.37.8	172.16.40.1	TCP	66	21→47947 [ACK] Seq=41 Ack=17 Win=5792 Len=0 TSval=542265379 TSecr=3394004
22	8.754823	193.136.37.8	172.16.40.1	FTP	100	Response: 331 Please specify the password.
23	8.754837	172.16.40.1	193.136.37.8	TCP	66	47947→21 [ACK] Seq=17 Ack=75 Win=29200 Len=0 TSval=3394004 TSecr=542265379
24	10.023936	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
25	12.028777	CiscoInc_d4:1c:03	Spanning-tree-(for-…	STP	60	Conf. Root = 32768/40/30:37:a6:d4:1c:00 Cost = 0 Port = 0x8003
26	12.081418	172.16.40.1	193.136.37.8	FTP	84	Request: pass up201403526
27	12.085185	193.136.37.8	172.16.40.1	FTP	89	Response: 230 Login successful.
28	12.085216	172.16.40.1	193.136.37.8	TCP	66	47947→21 [ACK] Seq=35 Ack=98 Win=29200 Len=0 TSval=3394837 TSecr=542266211