MP2GI — SRR
Architecture et Administration des Réseaux

Calculatrice et tous documents autorisés

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2heures – Tous documents autorisés – Répondre sur 2 copies : une pour les parties 1 et 2, l'autre pour la 3.

Note : Les durées *indicatives* sont de 50 minutes pour la partie 1, de 25 minutes pour la partie 2, de 45 minutes pour la partie 3. Ne *rien* en déduire sur le barème de correction ! Conseil : Gérez votre temps : il faut gagner des points à tous les exercices !

1 Routage — OSPF

On considère la trace en annexe. Seuls certains champs sont développés. Les paquets ne portant que des « LSA *headers* » sont des acquittements.

1. Expliquez comment sont formées les adresses Ethernet des différents paquets ?
2. Rappelez la différence entre un réseau de transit et un réseau *stub* ? (On ne parle pas des aires du même nom ?)
3. **D'après les paquets 90 et 91**, quelle est la topologie du réseau ? Vous ferez un schéma de la base de données OSPF. Il comporte une bizarrerie, laquelle ? (On rappelle que l'âge des LSA est augmenté d'une unité à chaque fois qu'il est relayé par un routeur.)
   Vous placerez sur le schéma un maximum d'information, comme les adresses Ethernet, les routeurs désignés, les adresses réseau ?
4. Après l'arrivée du paquet 96, quelle est la base de données OSPF ?
5. Le paquet 97 a été émis très peu de temps (quelques dixièmes de secondes) après le paquet 96, que s'est-il passé selon vous ? (On remarque au passage qu'un seul des deux paquets 96 et 97 est acquitté.)
6. Quelle est la topologie OSPF après la réception du paquet 114 ?
7. Et après celle du paquet 122 ?
8. Il s'est écoulé 29 secondes entre la réception de la trame 114 et celle de la trame 122. Dans ce réseau, le paramètre `RouterDeadInterval` est de 40 secondes. Qu'en pensez-vous ? Pouvez décrire précisément ce qui s'est passé ?

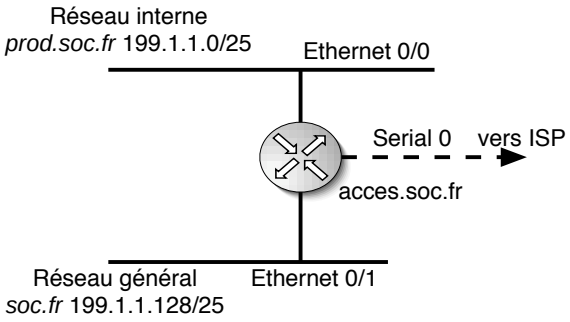

FIG. 1 – Réseau *soc.fr*

2 Filtrage

On considère le réseau de la figure 1, avec un serveur srv.soc.fr d'adresse 199.1.1.130 sur le réseau général.

Proposer des listes de filtrage sur acces.soc.fr pour limiter strictement le trafic des machines du réseau interne à :

1. accès de toutes les machines au serveur DNS srv.soc.fr (protocole "domain", tcp et udp, port serveur 53)
2. accès de toutes les machines à un serveur de mise à jour sur srv.soc.fr (protocole "propriétaire", tcp port serveur 900)
3. Trafic de courier entre le serveur de mail interne mail.prod.soc.fr (d'adresse 199.1.1.10) et le serveur de mail srv.soc.fr (protocole SMTP, tcp port serveur 25)

Utiliser la syntaxe des "access list" de Cisco. Ne pas oublier de préciser quelles interfaces sont concernées : donner les directives "access-list" et access-group".

3 Réseaux mobiles

A INSERER

Capture OSPF

```
Frame 90 (110 bytes on wire, 110 bytes captured)
Ethernet II, Src: 00:03:e3:58:6a:e1 , Dst: 01:00:5e:00:00:05
Internet Protocol, Src: 10.0.3.1 , Dst: 224.0.0.5
Open Shortest Path First
    OSPF Header
    LS Update Packet
        Number of LSAs: 1
        LS Type: Router-LSA
            LS Age: 1 seconds
            Do Not Age: False
            Options: 0x22 (DC, E)
            Link-State Advertisement Type: Router-LSA
            Link State ID: 10.0.3.1
            Advertising Router: 10.0.3.1
            LS Sequence Number: 0x80000008
            LS Checksum: 0xdce8
            Length: 48
            Flags: 0x00
            Number of Links: 2
            Type: Transit  ID: 10.0.3.1       Data: 10.0.3.1       Metric: 10
            Type: Stub     ID: 10.0.1.0       Data: 255.255.255.0  Metric: 10

Frame 91 (110 bytes on wire, 110 bytes captured)
Ethernet II, Src: 00:d0:06:13:60:38 , Dst: 01:00:5e:00:00:05
Internet Protocol, Src: 10.0.3.3 , Dst: 224.0.0.5
Open Shortest Path First
    OSPF Header
    LS Update Packet
        Number of LSAs: 1
        LS Type: Router-LSA
            LS Age: 2 seconds
            Do Not Age: False
            Options: 0x22 (DC, E)
            Link-State Advertisement Type: Router-LSA
            Link State ID: 10.0.2.2
            Advertising Router: 10.0.2.2
            LS Sequence Number: 0x80000009
            LS Checksum: 0xdee5
            Length: 48
            Flags: 0x00
            Number of Links: 2
            Type: Transit  ID: 10.0.2.2       Data: 10.0.2.2       Metric: 10
            Type: Stub     ID: 10.0.1.0       Data: 255.255.255.0  Metric: 10
```



```
Frame 92 (82 bytes on wire, 82 bytes captured)
Ethernet II, Src: 00:03:e3:58:6a:e1 , Dst: 01:00:5e:00:00:05
Internet Protocol, Src: 10.0.3.1 , Dst: 224.0.0.5
Open Shortest Path First
    OSPF Header
    OSPF Hello Packet

Frame 93 (78 bytes on wire, 78 bytes captured)
Ethernet II, Src: 00:d0:06:13:60:38 , Dst: 01:00:5e:00:00:05
Internet Protocol, Src: 10.0.3.3 , Dst: 224.0.0.5
Open Shortest Path First
    OSPF Header
    LSA Header
        LS Age: 1 seconds
        Do Not Age: False
        Options: 0x22 (DC, E)
        Link-State Advertisement Type: Router-LSA
        Link State ID: 10.0.3.1
        Advertising Router: 10.0.3.1
        LS Sequence Number: 0x80000008
        LS Checksum: 0xdce8
        Length: 48

Frame 94 (78 bytes on wire, 78 bytes captured)
Ethernet II, Src: 00:03:e3:58:6a:e1 , Dst: 01:00:5e:00:00:05
Internet Protocol, Src: 10.0.3.1 , Dst: 224.0.0.5
Open Shortest Path First
    OSPF Header
    LSA Header
        LS Age: 2 seconds
        Do Not Age: False
        Options: 0x22 (DC, E)
        Link-State Advertisement Type: Router-LSA
        Link State ID: 10.0.2.2
        Advertising Router: 10.0.2.2
        LS Sequence Number: 0x80000009
        LS Checksum: 0xdee5
        Length: 48

Frame 95 (82 bytes on wire, 82 bytes captured)
Ethernet II, Src: 00:d0:06:13:60:38 , Dst: 01:00:5e:00:00:05
Internet Protocol, Src: 10.0.3.3 , Dst: 224.0.0.5
Open Shortest Path First
    OSPF Header
    OSPF Hello Packet
```

```
Frame 96 (190 bytes on wire, 190 bytes captured)
Ethernet II, Src: 00:03:e3:58:6a:e1 , Dst: 01:00:5e:00:00:05
Internet Protocol, Src: 10.0.3.1 , Dst: 224.0.0.5
Open Shortest Path First
    OSPF Header
    LS Update Packet
        Number of LSAs: 3
        LS Type: Router-LSA
            LS Age: 1 seconds
            Do Not Age: False
            Options: 0x22 (DC, E)
            Link-State Advertisement Type: Router-LSA
            Link State ID: 10.0.3.1
            Advertising Router: 10.0.3.1
            LS Sequence Number: 0x80000009
            LS Checksum: 0x06b1
            Length: 48
            Flags: 0x00
            Number of Links: 2
            Type: Transit  ID: 10.0.3.1        Data: 10.0.3.1        Metric: 10
            Type: Transit  ID: 10.0.1.2        Data: 10.0.1.1        Metric: 10
        LS Type: Router-LSA
            LS Age: 2 seconds
            Do Not Age: False
            Options: 0x22 (DC, E)
            Link-State Advertisement Type: Router-LSA
            Link State ID: 10.0.2.2
            Advertising Router: 10.0.2.2
            LS Sequence Number: 0x8000000a
            LS Checksum: 0x2293
            Length: 48
            Flags: 0x00
            Number of Links: 2
            Type: Transit  ID: 10.0.2.2        Data: 10.0.2.2        Metric: 10
            Type: Transit  ID: 10.0.1.2        Data: 10.0.1.2        Metric: 10
        LS Type: Network-LSA
            LS Age: 2 seconds
            Do Not Age: False
            Options: 0x22 (DC, E)
            Link-State Advertisement Type: Network-LSA
            Link State ID: 10.0.1.2
            Advertising Router: 10.0.2.2
            LS Sequence Number: 0x80000001
            LS Checksum: 0x9969
            Length: 32
            Netmask: 255.255.255.0
```



```
            Attached Router: 10.0.2.2
            Attached Router: 10.0.3.1

Frame 97 (142 bytes on wire, 142 bytes captured)
Ethernet II, Src: 00:d0:06:13:60:38 , Dst: 01:00:5e:00:00:05
Internet Protocol, Src: 10.0.3.3 , Dst: 224.0.0.5
Open Shortest Path First
    OSPF Header
    LS Update Packet
        Number of LSAs: 2
        LS Type: Router-LSA
            LS Age: 2 seconds
            Do Not Age: False
            Options: 0x22 (DC, E)
            Link-State Advertisement Type: Router-LSA
            Link State ID: 10.0.2.2
            Advertising Router: 10.0.2.2
            LS Sequence Number: 0x8000000a
            LS Checksum: 0x2293
            Length: 48
            Flags: 0x00
            Number of Links: 2
            Type: Transit  ID: 10.0.2.2        Data: 10.0.2.2        Metric: 10
            Type: Transit  ID: 10.0.1.2        Data: 10.0.1.2        Metric: 10
        LS Type: Network-LSA
            LS Age: 2 seconds
            Do Not Age: False
            Options: 0x22 (DC, E)
            Link-State Advertisement Type: Network-LSA
            Link State ID: 10.0.1.2
            Advertising Router: 10.0.2.2
            LS Sequence Number: 0x80000001
            LS Checksum: 0x9969
            Length: 32
            Netmask: 255.255.255.0
            Attached Router: 10.0.2.2
            Attached Router: 10.0.3.1

Frame 98 (118 bytes on wire, 118 bytes captured)
Ethernet II, Src: 00:d0:06:13:60:38 , Dst: 01:00:5e:00:00:05
Internet Protocol, Src: 10.0.3.3 , Dst: 224.0.0.5
Open Shortest Path First
    OSPF Header
    LSA Header
        LS Age: 1 seconds
        Do Not Age: False
```

```
        Options: 0x22 (DC, E)
        Link-State Advertisement Type: Router-LSA
        Link State ID: 10.0.3.1
        Advertising Router: 10.0.3.1
        LS Sequence Number: 0x80000009
        LS Checksum: 0x06b1
        Length: 48
    LSA Header
        LS Age: 2 seconds
        Do Not Age: False
        Options: 0x22 (DC, E)
        Link-State Advertisement Type: Router-LSA
        Link State ID: 10.0.2.2
        Advertising Router: 10.0.2.2
        LS Sequence Number: 0x8000000a
        LS Checksum: 0x2293
        Length: 48
    LSA Header
        LS Age: 2 seconds
        Do Not Age: False
        Options: 0x22 (DC, E)
        Link-State Advertisement Type: Network-LSA
        Link State ID: 10.0.1.2
        Advertising Router: 10.0.2.2
        LS Sequence Number: 0x80000001
        LS Checksum: 0x9969
        Length: 32

Frame 99 (82 bytes on wire, 82 bytes captured)
Ethernet II, Src: 00:03:e3:58:6a:e1 , Dst: 01:00:5e:00:00:05
Internet Protocol, Src: 10.0.3.1 , Dst: 224.0.0.5
Open Shortest Path First
    OSPF Header
    OSPF Hello Packet

Frame 100 (82 bytes on wire, 82 bytes captured)
Ethernet II, Src: 00:d0:06:13:60:38 , Dst: 01:00:5e:00:00:05
Internet Protocol, Src: 10.0.3.3 , Dst: 224.0.0.5
Open Shortest Path First
    OSPF Header
    OSPF Hello Packet

[.......Paquets Hello suprimÃ©s...........]

Frame 113 (82 bytes on wire, 82 bytes captured)
Ethernet II, Src: 00:03:e3:58:6a:e1 , Dst: 01:00:5e:00:00:05
```



```
Internet Protocol, Src: 10.0.3.1 , Dst: 224.0.0.5
Open Shortest Path First
    OSPF Header
    OSPF Hello Packet

Frame 114 (98 bytes on wire, 98 bytes captured)
Ethernet II, Src: 00:03:e3:58:6a:e1 , Dst: 01:00:5e:00:00:05
Internet Protocol, Src: 10.0.3.1 , Dst: 224.0.0.5
Open Shortest Path First
    OSPF Header
    LS Update Packet
        Number of LSAs: 1
        LS Type: Router-LSA
            LS Age: 1 seconds
            Do Not Age: False
            Options: 0x22 (DC, E)
            Link-State Advertisement Type: Router-LSA
            Link State ID: 10.0.3.1
            Advertising Router: 10.0.3.1
            LS Sequence Number: 0x8000000a
            LS Checksum: 0x6880
            Length: 36
            Flags: 0x00
            Number of Links: 1
            Type: Transit  ID: 10.0.3.1        Data: 10.0.3.1        Metric: 10

Frame 115 (78 bytes on wire, 78 bytes captured)
Ethernet II, Src: 00:d0:06:13:60:38 , Dst: 01:00:5e:00:00:05
Internet Protocol, Src: 10.0.3.3 , Dst: 224.0.0.5
Open Shortest Path First
    OSPF Header
    LSA Header
        LS Age: 1 seconds
        Do Not Age: False
        Options: 0x22 (DC, E)
        Link-State Advertisement Type: Router-LSA
        Link State ID: 10.0.3.1
        Advertising Router: 10.0.3.1
        LS Sequence Number: 0x8000000a
        LS Checksum: 0x6880
        Length: 36

Frame 116 (82 bytes on wire, 82 bytes captured)
Ethernet II, Src: 00:d0:06:13:60:38 , Dst: 01:00:5e:00:00:05
Internet Protocol, Src: 10.0.3.3 , Dst: 224.0.0.5
Open Shortest Path First
```

```
    OSPF Header
    OSPF Hello Packet

[.......Paquets Hello suprimÃ©s...........]

Frame 121 (82 bytes on wire, 82 bytes captured)
Ethernet II, Src: 00:03:e3:58:6a:e1 , Dst: 01:00:5e:00:00:05
Internet Protocol, Src: 10.0.3.1 , Dst: 224.0.0.5
Open Shortest Path First
    OSPF Header
    OSPF Hello Packet

Frame 122 (142 bytes on wire, 142 bytes captured)
Ethernet II, Src: 00:d0:06:13:60:38 , Dst: 01:00:5e:00:00:05
Internet Protocol, Src: 10.0.3.3 , Dst: 224.0.0.5
Open Shortest Path First
    OSPF Header
    LS Update Packet
        Number of LSAs: 2
        LS Type: Router-LSA
            LS Age: 2 seconds
            Do Not Age: False
            Options: 0x22 (DC, E)
            Link-State Advertisement Type: Router-LSA
            Link State ID: 10.0.2.2
            Advertising Router: 10.0.2.2
            LS Sequence Number: 0x8000000b
            LS Checksum: 0xdae7
            Length: 48
            Flags: 0x00
            Number of Links: 2
            Type: Transit  ID: 10.0.2.2        Data: 10.0.2.2        Metric: 10
            Type: Stub     ID: 10.0.1.0        Data: 255.255.255.0   Metric: 10
        LS Type: Network-LSA
            LS Age: 3600 seconds
            Do Not Age: False
            Options: 0x22 (DC, E)
            Link-State Advertisement Type: Network-LSA
            Link State ID: 10.0.1.2
            Advertising Router: 10.0.2.2
            LS Sequence Number: 0x80000002
            LS Checksum: 0x976a
            Length: 32
            Netmask: 255.255.255.0
            Attached Router: 10.0.2.2
            Attached Router: 10.0.3.1
```



```
Frame 123 (98 bytes on wire, 98 bytes captured)
Ethernet II, Src: 00:03:e3:58:6a:e1 , Dst: 01:00:5e:00:00:05
Internet Protocol, Src: 10.0.3.1 , Dst: 224.0.0.5
Open Shortest Path First
    OSPF Header
    LSA Header
        LS Age: 2 seconds
        Do Not Age: False
        Options: 0x22 (DC, E)
        Link-State Advertisement Type: Router-LSA
        Link State ID: 10.0.2.2
        Advertising Router: 10.0.2.2
        LS Sequence Number: 0x8000000b
        LS Checksum: 0xdae7
        Length: 48
    LSA Header
        LS Age: 3600 seconds
        Do Not Age: False
        Options: 0x22 (DC, E)
        Link-State Advertisement Type: Network-LSA
        Link State ID: 10.0.1.2
        Advertising Router: 10.0.2.2
        LS Sequence Number: 0x80000002
        LS Checksum: 0x976a
        Length: 32

Frame 124 (82 bytes on wire, 82 bytes captured)
Ethernet II, Src: 00:d0:06:13:60:38 , Dst: 01:00:5e:00:00:05
Internet Protocol, Src: 10.0.3.3 , Dst: 224.0.0.5
Open Shortest Path First
    OSPF Header
    OSPF Hello Packet

Frame 125 (82 bytes on wire, 82 bytes captured)
Ethernet II, Src: 00:03:e3:58:6a:e1 , Dst: 01:00:5e:00:00:05
Internet Protocol, Src: 10.0.3.1 , Dst: 224.0.0.5
Open Shortest Path First
    OSPF Header
    OSPF Hello Packet
```