QoSINUS

Un exemple de service actif: contrôle de la QoS

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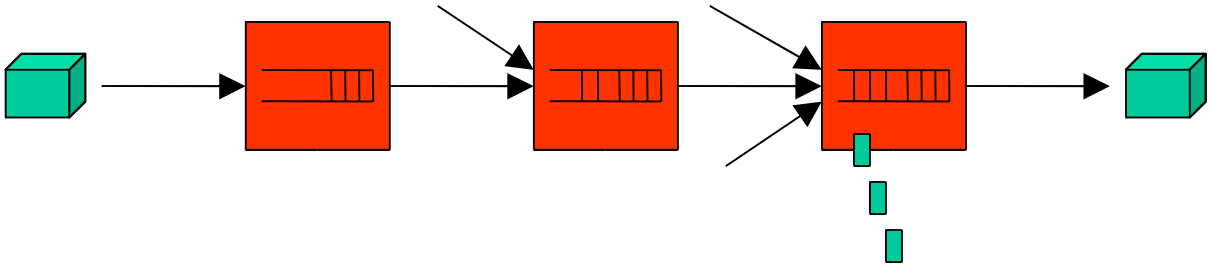
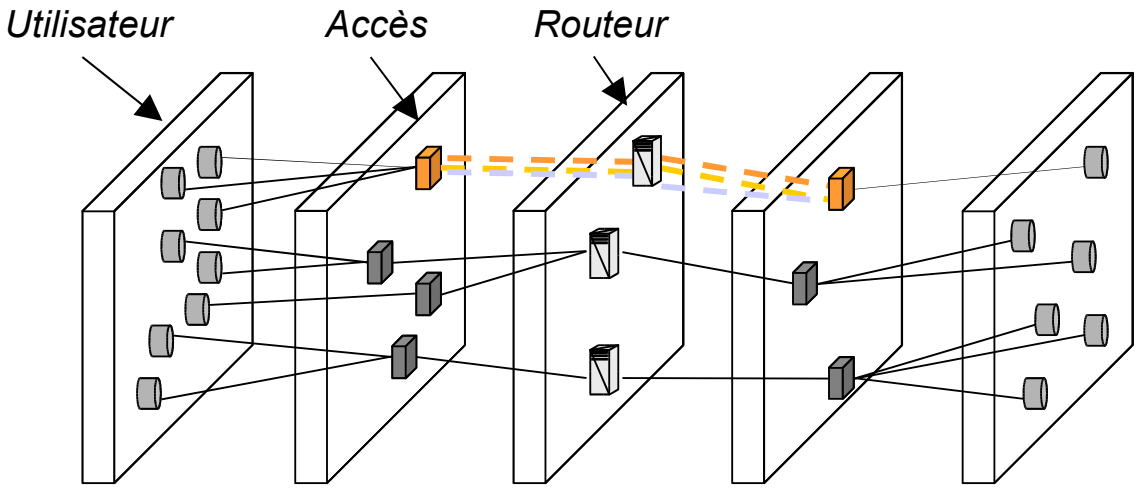
Limites du modèle Best Effort



- Qualité de service IP insuffisante et imprévisible.
- Des types d'application différents (interactive, multimédia, transfert massif) ne peuvent pas recevoir de traitements différents.

Principe de DiffServ

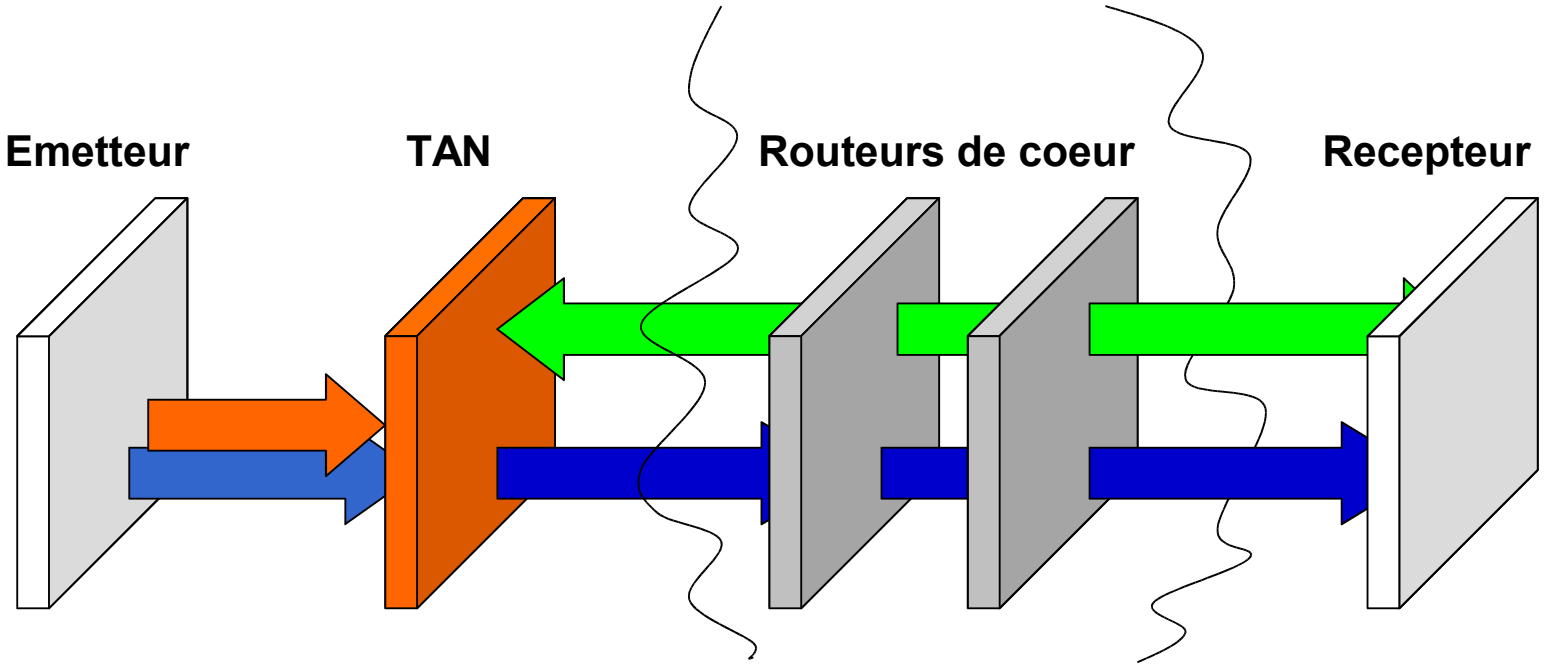


- Offrir différentes qualités de service à différentes classes de trafic en contrôlant les débit, délai et perte de paquets.
  - Algorithmes d'ordonnancement appropriés.
  - Gestion des ressources aux frontières.
- Classes identifiées par un code: le DSCP.

Limites de DiffServ

- Les performances d'une classe DiffServ peuvent varier dans le temps et d'un réseau à l'autre.
- Besoin d'aider une application à choisir la classe DiffServ qui lui convient à un instant donné.
- QoSINUS est un service actif d'association dynamique de classe DiffServ à une requête de QoS.

Principe de QoSINUS



Emission flux

Requête QoS

Monitoring

Marquage
Contrôle
d'admission

Routage
DiffServ

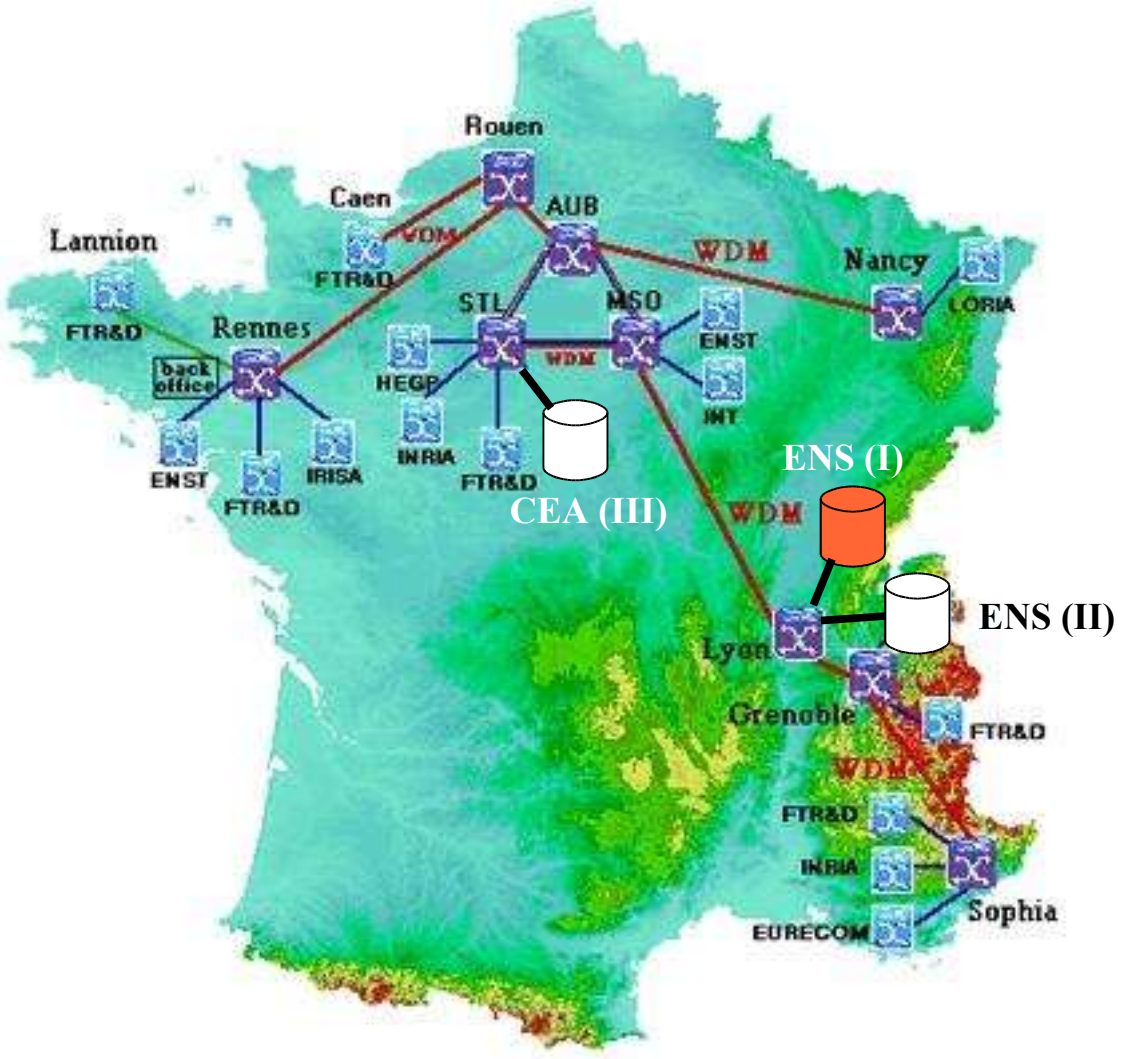
Ack-React

- Requête:
  - Date de début d'émission;
  - Date de fin d'émission;
  - Débit.
- Utilisation des messages d'acquittement pour évaluer la performance d'un transfert.
- Passage dans une classe DiffServ plus prioritaire si le flux prend du retard.
- Le flux le plus en retard est le plus prioritaire (“Earliest deadline first”).

Topologie

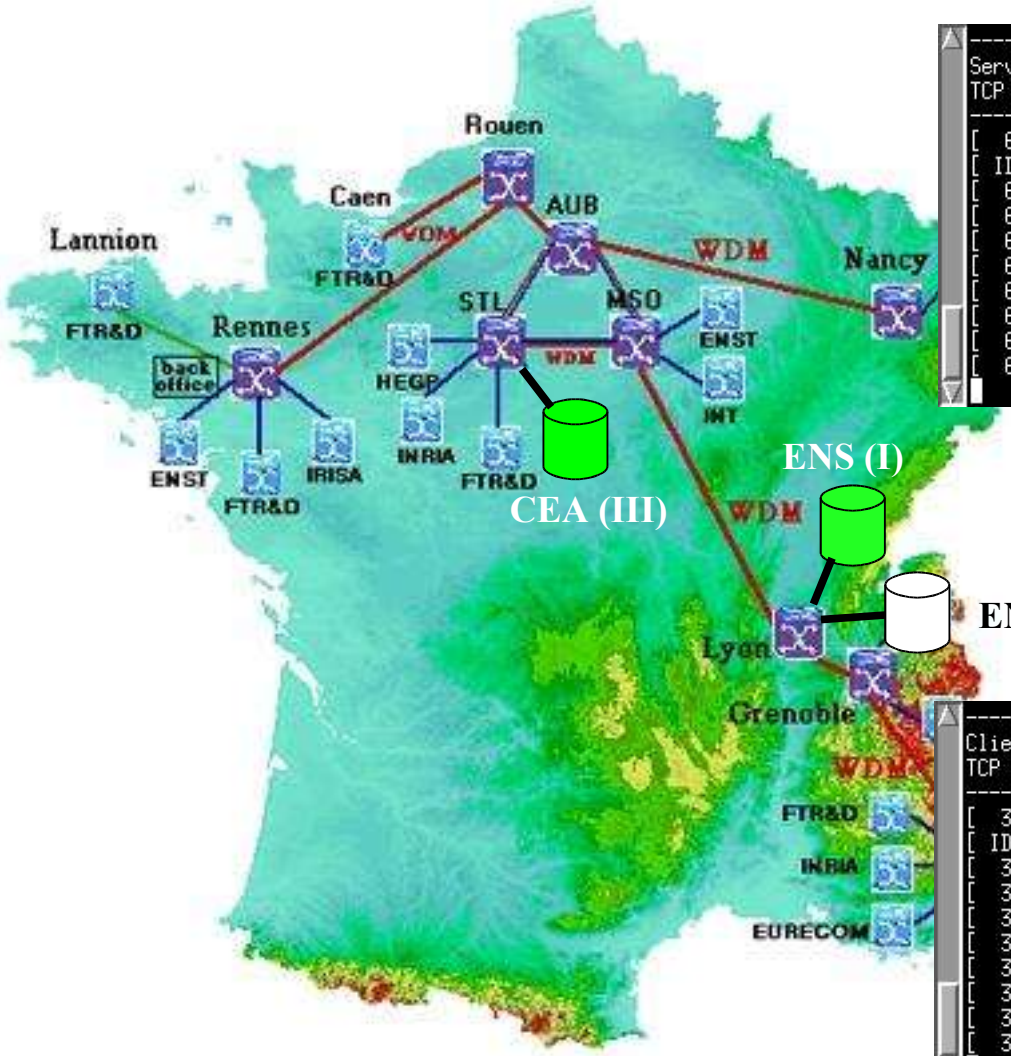

Rouen
Caen
AUB
Lannion
FTR&D
WDM
WDM
Nancy
LORIA
STL
MSO
Rennes
ENST
back office
HEGP
WDM
INT
ENST
IRISA
INRIA
FTR&D
FTR&D
CEA (III)
ENS (I)
WDM
ENS (II)
Lyon
Grenoble
FTR&D
WDM
FTR&D
INRIA
Sophia
EURECOM

Requête de QoS




```
<?xml version="1.0"?>
<sls type="QOS_REQ">

<flowid destination="193.48.21.97"
        destport="5005"
        source="193.253.175.182"
        sourceport="0"/>

<guarantees>
        <rate value="medium"/>
</guarantees>

<schedule start="10" stop="70"/>

</sls>
```

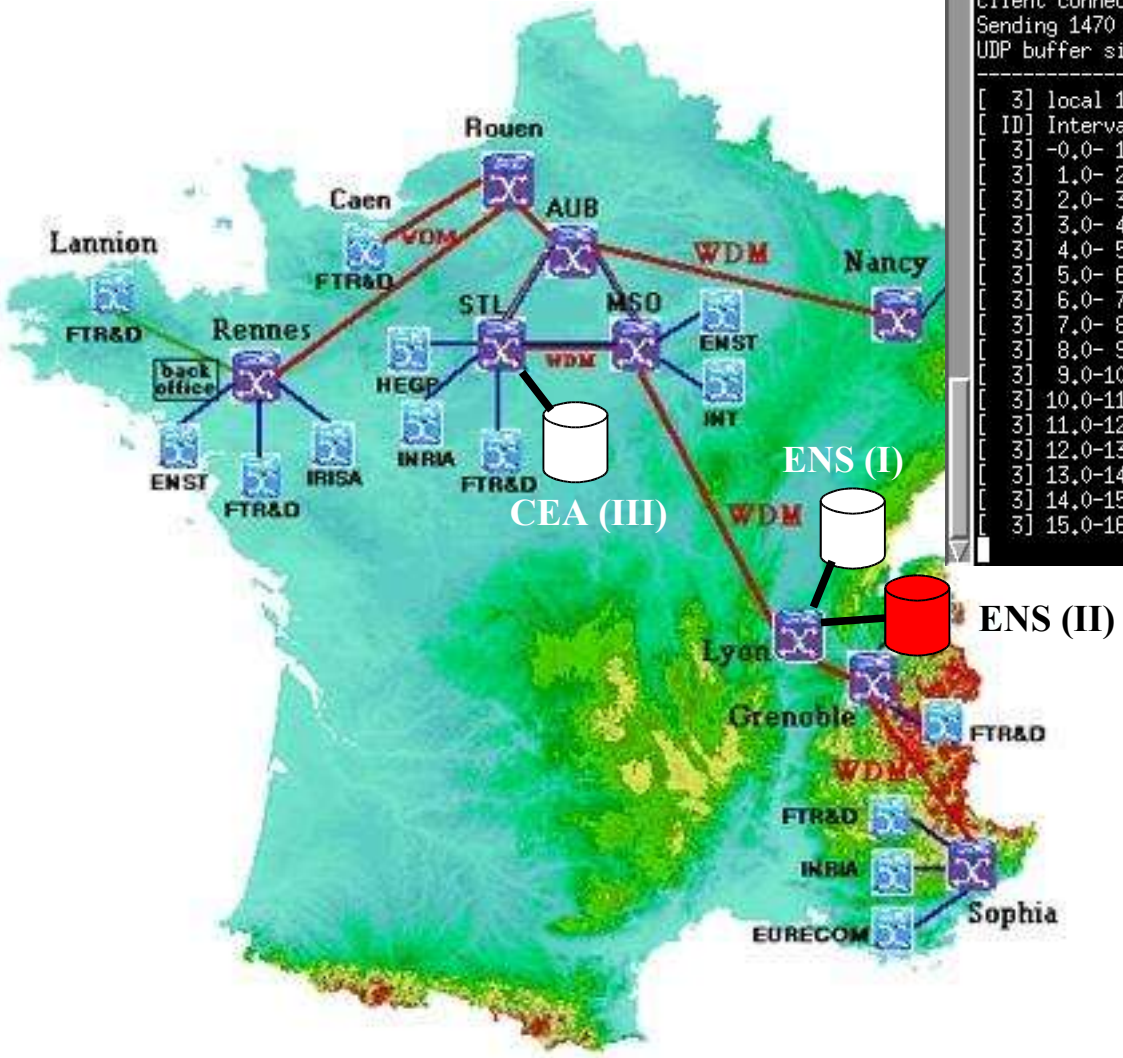
Flux applicatif




```
------------------------------------------------------------
Server listening on TCP port 5005
TCP window size: 85.3 KByte (default)
------------------------------------------------------------
[  6] local 193.48.21.97 port 5005 connected with 193.253.175.182 port 33737
[ ID] Interval       Transfer     Bandwidth
[  6]  0.0- 1.0 sec  9.91 MBytes  83.1 Mbits/sec
[  6]  1.0- 2.0 sec  10.2 MBytes  85.4 Mbits/sec
[  6]  2.0- 3.0 sec  10.2 MBytes  85.5 Mbits/sec
[  6]  3.0- 4.0 sec  10.2 MBytes  85.5 Mbits/sec
[  6]  4.0- 5.0 sec  10.2 MBytes  85.6 Mbits/sec
[  6]  5.0- 6.0 sec  10.2 MBytes  85.3 Mbits/sec
[  6]  6.0- 7.0 sec  10.2 MBytes  85.3 Mbits/sec
[  6]  7.0- 8.0 sec  10.2 MBytes  85.6 Mbits/sec
```

```
------------------------------------------------------------
Client connecting to 193.48.21.97, TCP port 5005
TCP window size: 64.0 KByte (default)
------------------------------------------------------------
[  3] local 193.253.175.182 port 33739 connected with 193.48.21.97 port 5005
[ ID] Interval       Transfer     Bandwidth
[  3]  0.0- 1.0 sec  9.98 MBytes  83.5 Mbits/sec
[  3]  1.0- 2.0 sec  10.2 MBytes  85.4 Mbits/sec
[  3]  2.0- 3.0 sec  10.1 MBytes  85.2 Mbits/sec
[  3]  3.0- 4.0 sec  10.2 MBytes  85.2 Mbits/sec
[  3]  4.0- 5.0 sec  10.2 MBytes  85.5 Mbits/sec
[  3]  5.0- 6.0 sec  10.2 MBytes  85.4 Mbits/sec
[  3]  6.0- 7.0 sec  10.2 MBytes  85.6 Mbits/sec
[  3]  7.0- 8.0 sec  10.2 MBytes  85.5 Mbits/sec
```

Trafic concurrent




```
------------------------------------------------------------
Client connecting to 193.252.226.111, UDP port 5001
Sending 1470 byte datagrams
UDP buffer size: 2.00 MByte (WARNING: requested 1.00 MByte)
------------------------------------------------------------
[  3] local 193.253.175.183 port 32773 connected with 193.252.226.111 port 5001
[ ID] Interval       Transfer     Bandwidth
[  3] -0.0- 1.0 sec   117 MBytes   979 Mbits/sec
[  3]  1.0- 2.0 sec   117 MBytes   979 Mbits/sec
[  3]  2.0- 3.0 sec   117 MBytes   979 Mbits/sec
[  3]  3.0- 4.0 sec   117 MBytes   979 Mbits/sec
[  3]  4.0- 5.0 sec   117 MBytes   980 Mbits/sec
[  3]  5.0- 6.0 sec   117 MBytes   980 Mbits/sec
[  3]  6.0- 7.0 sec   117 MBytes   979 Mbits/sec
[  3]  7.0- 8.0 sec   117 MBytes   979 Mbits/sec
[  3]  8.0- 9.0 sec   117 MBytes   979 Mbits/sec
[  3]  9.0-10.0 sec   117 MBytes   979 Mbits/sec
[  3] 10.0-11.0 sec   117 MBytes   980 Mbits/sec
[  3] 11.0-12.0 sec   117 MBytes   979 Mbits/sec
[  3] 12.0-13.0 sec   117 MBytes   979 Mbits/sec
[  3] 13.0-14.0 sec   117 MBytes   979 Mbits/sec
[  3] 14.0-15.0 sec   117 MBytes   979 Mbits/sec
[  3] 15.0-16.0 sec   117 MBytes   979 Mbits/sec
```

Filtrage des ACKs et marquage