Universidad Carlos III de Madrid

Departamento de INGENIERIA TELEMATICA
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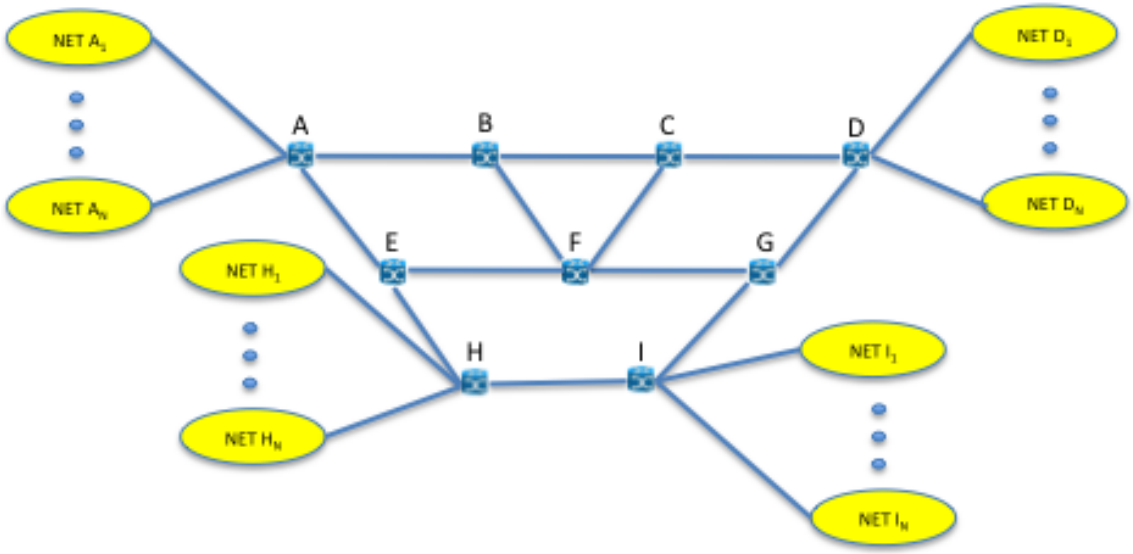
SWITCHING

GIT, GISC, GITT

STUDENT: **GROUP:**

Exercise (3p)

The next figure shows an MPLS network that interconnects a Lumber of IP Networks whose routers do not have MPLS capabilities. LSRs A, D, H and I provide MPLS access to N IP Networks. For instance LSR A provide access to $NETA_1$, $NETA_2$, … y $NETA_N$



1. Based on the next connectivity patterns:

- $NETA_1$ -> $NETD_1$, $NETD_2$, $NETD_3$, $NETH_1$, $NETI_1$.
- $NETA_2$ -> NET D_1, $NETD_2$, $NETD_3$, $NETH_1$, $NETI_1$
- $NETD_1$ -> $NETA_1$, $NETA_3$
- $NETD_2$ -> $NETA_1$, $NETA_3$
- $NETD_3$ -> $NETA_1$, $NETA_3$
- $NETH_1$ -> $NETA_1$
- $NETI_1$ -> $NETA_1$

Fill for LSRs: A, B, E, H and I the next "pseudo" MPLS routing tables that incluye: Source NET, Destination NET, Label In, Label operation, Label out. The tables should be filled for the next cases:

a) Merging is NOT active in the network. **(1p)**

b) Merging is active in the network **(1p)**

NOTE: DO NOT use penultimate hop doping to solve the exercise.

2. Describe the sequence of LDM messages required to establish an LSP between NETA1 and NETD1. The network is using Downstream on-demand, ordered, with conservative mode for the label retention. In case it is possible, please use the appropriate label according to the information you filled in bullet 1 a (no merging in the network). **(0.5p)**.

3. Let us assume we are using CR-LDP and we have already established the LSP A-B-C-D that is using 10Mbps. A new request tries to set up a new LSP H-E-F-C-D that needs 10Mbps as well. However, the capacity of the link C-D is 10Mbps. Explain which Traffic Engineering atribute can be used to solve the problema and how it works. **(0.5p)**

1.
a) NO merging:

LSR A:

Source NET	Dest. NET	Label IN	Operation	Label OUT

LSR B:

Source NET	Dest. NET	Label IN	Operation	Label OUT

LSR E:

Source NET	Dest. NET	Label IN	Operation	Label OUT

LSR H:

Source NET	Dest. NET	Label IN	Operation	Label OUT

LSR I:

Source NET	Dest. NET	Label IN	Operation	Label OUT

b) Merging active:

LSR A:

Source NET	Dest. NET	Label IN	Operation	Label OUT

LSR B:

Source NET	Dest. NET	Label IN	Operation	Label OUT

LSR E:

Source NET	Dest. NET	Label IN	Operation	Label OUT

LSR H:

Source NET	Dest. NET	Label IN	Operation	Label OUT

LSR I:

Source NET	Dest. NET	Label IN	Operation	Label OUT