Title: Undetectable Loop Using UK Method for Route Aggregation within RDCs

Source: IBM

Reference: SC6 N7195: ″Editor′s Disposition of Comments on CD 10747″

In reviewing the aggregation methods that are contained in SC6 N7195, the USA has discovered a situation where there can be an undetectable routeing loop. Consider the topology shown in Figure 1:

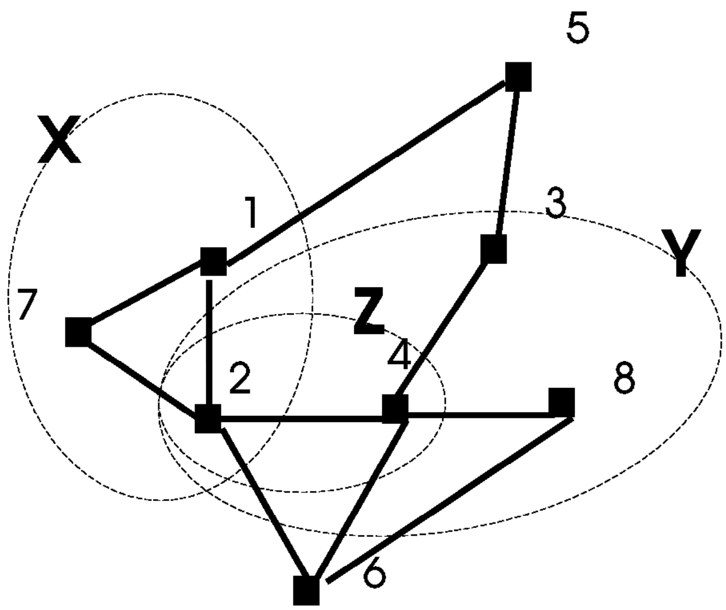

Figure 1. An Example Topology

We will consider two paths: a) from RD5 to RD1 to RD2, and b) from RD5 to RD3 to RD4 to RD2. These routes will be aggregated at 2, and then will be advertised to RD6.

Using the methods that the editor described in the Disposition of Comments (SC6 N7195), the two paths that are available at RD2 for aggregation will be:

Path 1: RDSEQ(5),CONFSEQ(X,1),CONFSEQ(Y,),CONFSEQ(Z,2)

Path 2: RDSEQ(5),CONFSEQ(Y,3),CONFSEQ(Z,4),CONFSEQ(X,2)

After aggregation in RD2, the path becomes:

RDSET(5), CONFSET(X,(1,2)),CONFSET(Y,3),CONFSET(Z,(2,4)),

Upon exiting Z, Y, and X on the way to RD6, the advertised path becomes (in step-by-step order according to the proposed aggregation procedures):

a) RDSET(5),CONFSET(X,(1,2)), CONFSET(Y,(3,Z))

b) RDSET(5),CONFSET(X,(1,2,Y))

c) RDSET(5,X)

and the information that the path has traversed confederation Y has been lost.

Hence, if this route is now advertised by RD6 back to an RD located within confederation Y or Z, but not within X, through which it has already passed, there can be an undetectable routeing loop. For example, if it were advertised to RD4, it would appear as:

RDSET(5,X),RDSEQ(6),CONFSEQ(Y,),CONFSEQ(Z,4)

Note that no RDI appears more than once, so no loop will be detected, even though the route may in fact have entered RD4 for a second time.