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1 Preface

The first part of the document describes the reasoning which led us to the construction of the current form of the QSPN v2. If you are just interested in the description of the QSPN v1 and v2 and you already know the concept of

2.3 The QSPN

Netsukuku implements its own algorithm, the *QSPN* (

4.2 Proprieties of the tracer packet

1. A node *D* which received a TP, can know the exact route covered by the TP. Therefore, *D* can know the route to reach the source node *S*, which sent the TP, and the routes to reach the nodes standing in the middle of the route.

   For example, suppose that the TP received by *D* is: *{S, A, B, C, D}*. By looking at the packet *D* will know that the route to reach *B* is $C \rightarrow B$ to reach *A* is $C \rightarrow B \rightarrow A$, and finally to reach *S* is $C \rightarrow B \rightarrow A \rightarrow S$. The same also applies for all the other nodes which received the TP, f.e, *B*

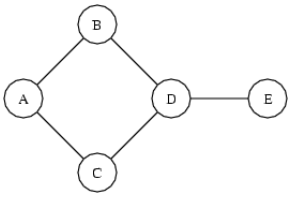


Figure 2: A simple graph with one segment and one cycle

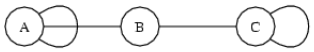
Given this graph as input the algorithm will output:

$A \rightarrow B \rightarrow D \rightarrow C$
$A \rightarrow B \rightarrow D \rightarrow E$
$A \rightarrow C \rightarrow D \rightarrow B$
$A \rightarrow C \rightarrow D \rightarrow E$
$B \rightarrow A \rightarrow C \rightarrow D \rightarrow E$
$B \rightarrow D \rightarrow C \rightarrow A$
$B \rightarrow D \rightarrow E$
$C \rightarrow A \rightarrow B \rightarrow D \rightarrow E$
$C \rightarrow D \rightarrow B \rightarrow A$
$C \rightarrow D \rightarrow E$
$D \rightarrow B \rightarrow A \rightarrow C$
$D \rightarrow C \rightarrow A \rightarrow B$
$D \rightarrow E$

7 Routes

9.3 Cyclicity

When a CTP reaches the extremity of a segment, it is back forwarded, thus it's as if the extreme nodes had a link with themselves.



called *extreme nodes*

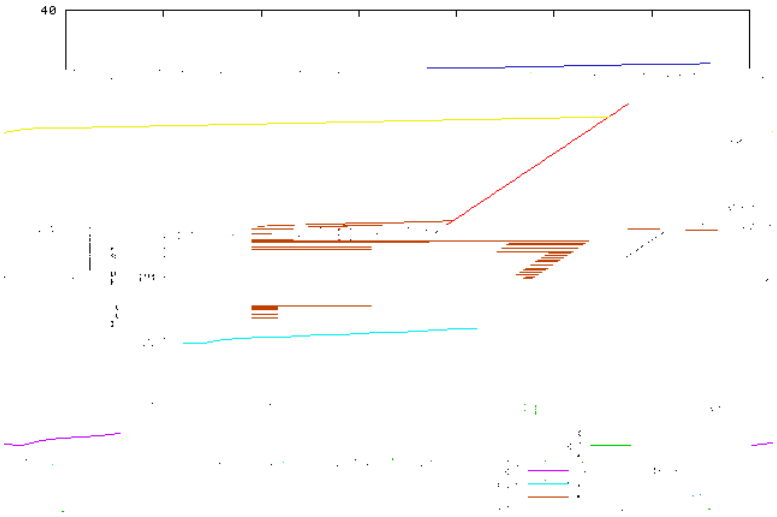
3. Q^2

12.2.2 Asymmetry in Q^2

The QSPN v2 is a very flexible algorithm that can be adapted to a large range of

The first two are almost identical, indeed they di□er only in the first three hops. The last two are, instead, totally di□erent from all the 7thers.
Since the first two routes are redundant, the node *S* should keep in memory only one of them, saving up space for the 7thers non-redundant routes.

Keeping redundant routes in the routing table isn't optimal, because if one of the



The complete graph is the worst case for the Q^2, therefore in the general case the mean TP flux will be:

$$\Phi_m \leq n$$

where

^_^