quick RFD Draft

mattia.milani

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1 Signaling

The signaling sequence used in all the experiments is AWAWAWA. In total 3 flaps. Advertisement and withdraws are separated by 300s 5 minutes. for this reason a simulation for sure can't endup before 1800s minutes (also the first advertisement is delayed by 300s).

MRAI doesn't affect withdraws, like specified in the Internet-Draft: Revisions to the BGP 'Minimum Route Advertisement Interval' published in 2012.

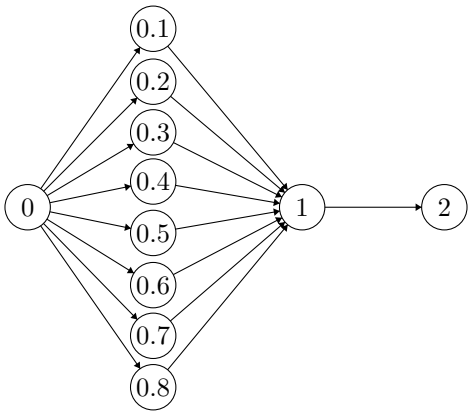
In all the experiments has been used the CISCO default set of values for RFD, presented in the table below.

Parameter	Value
withdrawal penalty	1.0
re-advertisement penalty	0.0
attribute change penalty	1.0
suppress threshold	2.0
half-life (min)	15 (900s)
Reuse Threshold	0.75
Max Suppress Time (min.)	60 (3600s)

Table 1: Cisco default RFD values

2 Complex line

2.1 Graph



In this graph I would like to study how the figure of merit of node 2 variate in function of the MRAI applied on all the edges.

MRAI value used: $[0, 1200]$ with a step of 50 seconds.

2.2 Results

Some figure of merit curve of the node 2 are below.

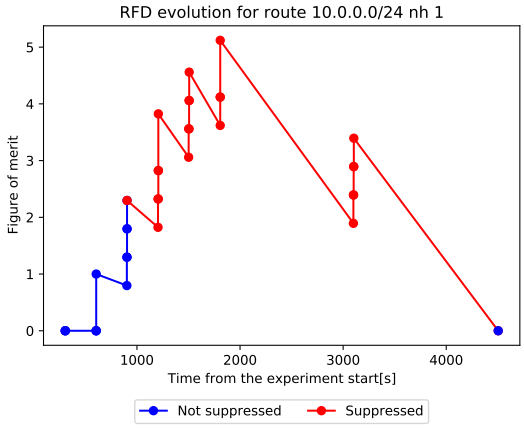


Figure 1: Constant MRAI at 0s

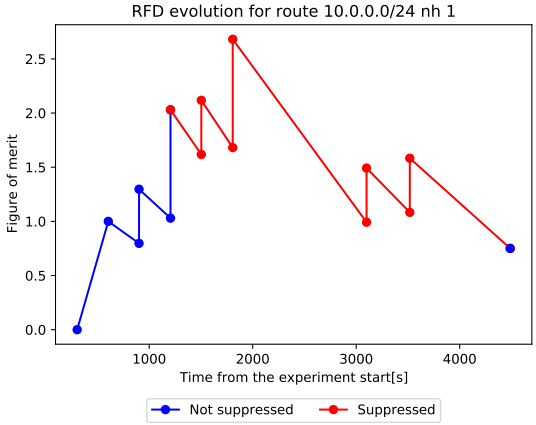


Figure 2: Constant MRAI at 500s

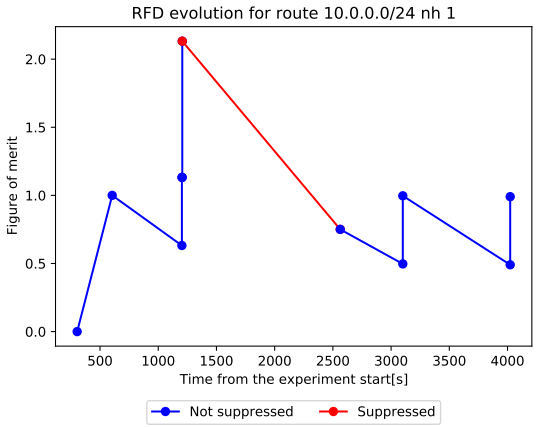


Figure 3: Constant MRAI at 1000s

Like is possible to see there is a variation on the figure of merit due to MRAI. The node 1 thanks to MRAI will be able to compress more messages and send less messages to node 2. Node 2 will receive less attribute variation.

Then lets see how many suppression happen in the network in function of MRAI in the next plot.

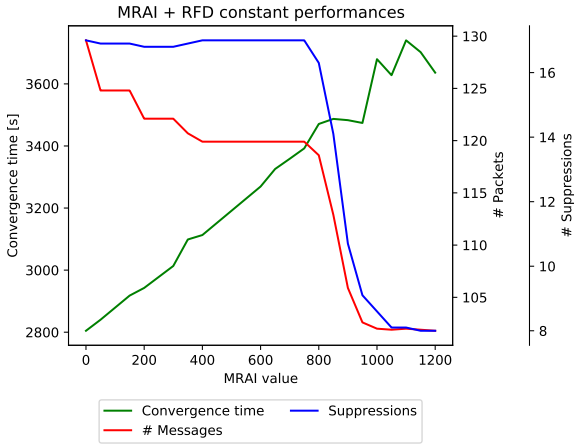
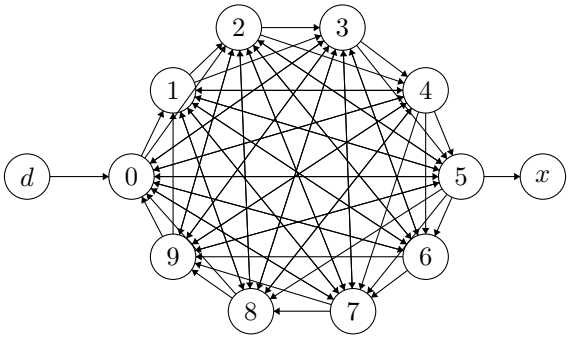


Figure 4: Evolution of the performances changing the constant MRAI in the links

In fig. 4 is possible to see that around 850/900 there is a variation in both the number of suppression and the messages transmitted. This is due to the fact that All the nodes start using a huge MRAI, so is possible for example that node 0.2 will cache two subsequent advertisement and don't send the second one. For this reason node 1 will have to recompute less times the best path. A slightly step on the convergence time is also noticeable from 800s to 1000s.

3 clique

Let's see what happen in a more complex network, I took a clique of dimension 10 with 2 more nodes, one that shares the destination to the clique and the second one that absorb the routes. The figure of the clique is the following, not all the arrow have been represented:



3.1 Results

This time the MRAI in the set $[0, 120]$ with steps of 5 seconds. We saw that there is a correlation with high MRAIs, unrealistic MRAIs? lets see what happen with more realistic values.

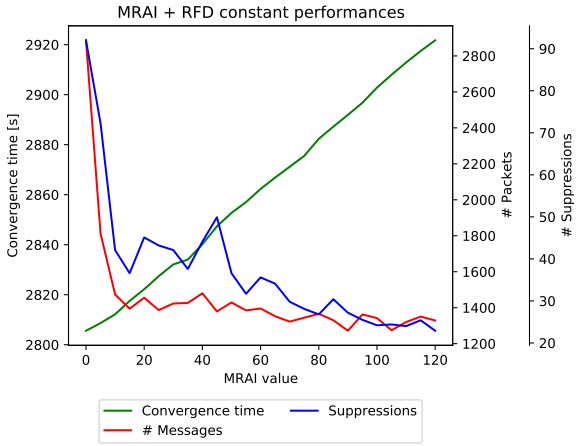
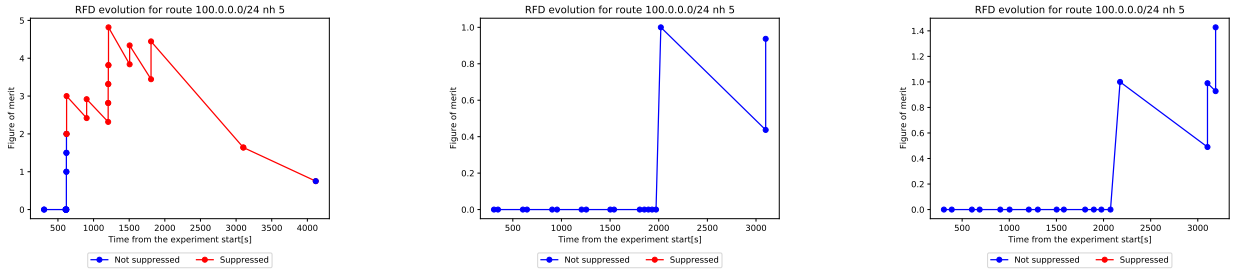


Figure 5: Evolution of the performances changing the constant MRAI in the links, graph clique

In fig. 5 is possible to see that also in a smaller MRAI set there are huge changes in the number of suppression that happens on average for each experiment. Also the number of messages decreases rapidaly and reaches what seems a constant value around 1300. The convergence time grows linearly.

How the node X figure of metit reacts with different MRAIS?



(a) MRAI = 0s (b) MRAI = 50s (c) MRAI = 100s

Figure 6: Evolution of the figure of merit in the node X with different MRAIs

But what about a comparison between the use of RFD and the same network without it?

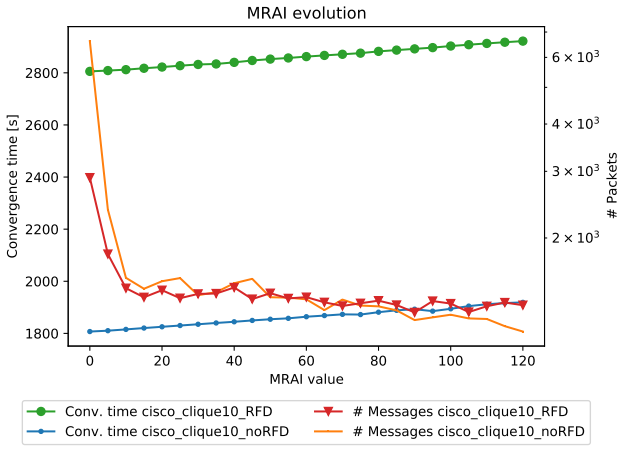


Figure 7: Comparison of the CLIQUE with RFD and the clique without it

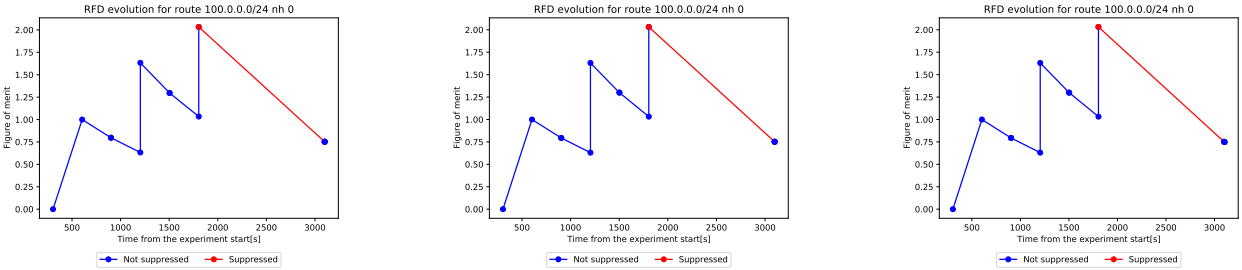
Figure 7 present the difference between the usage of RFD and the evolution without it. The number of messages are slightly equal for MRAIs higher than 20s but before this value the RFD permits to have less messages, thanks to the fact that it blocks some routes for a certain amount of time. Notice that the packets axis is in log scale. The convergence time grows linearly for both figures, always divided by around 1000s My supposition about this is that there is at least one node that for every MRAI suppress the best path of X without permitting the network to converge faster.

Like we saw in fig. 5 there is a variation on the number of suppression while the MRAI grows but with the supposition in Figure 7 we can suppose that:

While MRAI grows less nodes suppress the route but the convergence time is highly affected by a small subset of the node set.

3.2 node 5 evolution

I suppose the node that mostly affect the convergence time of the network is the node 5 that delays the convergence of the node X. The RFD refers to the couple (destination, nh) knowing that the node 5 has a relation with all the other nodes will have a voice in the RFD table for all the possible couples, for this reason I show only the evolution of the figure of merit for the couple (destination, 0) that is the best path for node 5. Lets see in the next figure how node 5 figure of merit evolves with different MRAIs.



(a) MRAI = 0s (b) MRAI = 50s (c) MRAI = 100s

Figure 8: Evolution of the figure of merit in the node X with different MRAIs

Node 5 always block the X best path for more or less 1000 seconds, that is the time division from the two time convergence line in fig. 7.