

How Do Ring Transitions Work?

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Questions

Introduction

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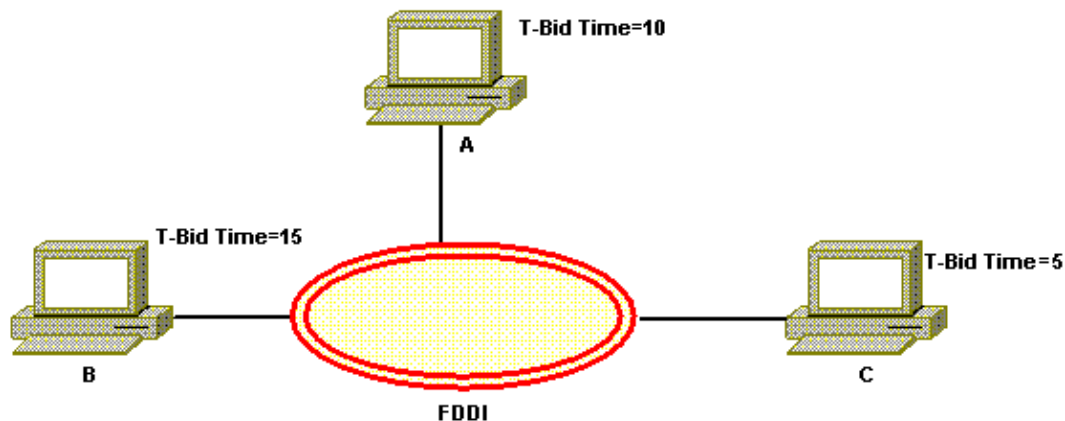
This document explains how ring transitions work.

Q. How do ring transitions work?

A. The FDDI ring implements the LEM that monitors each link for errors, and if the rate of errors crosses a threshold, Cisco recommends that you bring down the ring and reevaluate the link. Also, the Valid Transmission Timer (TVX) time-outs in 2.5 msec or 3.4 msec, based on implementation, if it does not see tokens or valid frames on the ring. The ring goes down and comes back up. Since the claim resolution typically takes the order of milliseconds, the transitioning does not affect upper layer operation as those protocols take the order of seconds to time-out. Moreover, if there is a persistent problem on the ring, one of the stations beacons to the links upstream that the station has a problem.

However, it is possible to have a marginal link that causes one station to TVX time-out frequently after it claims the ring is stable for awhile. If these transitions occur several times a minute, it affects the upper protocols. In this case, it is possible to find out who claims first on the ring if the ring has elements whose T-Bid time can be set manually and if code is present where the claim_ct is incremented only when the station generates claim frames.

Consider this FDDI ring. The number of stations on the ring can be expanded arbitrarily.



It is necessary to set up this contrived scenario where the T_Bid is fixed in order. This can be done on the routers with the **token-rotation-time** command. A unique situation is received on the claim_ct based on the router that claims first:

- ◆ If B claims first, when its claim frames hit C, they are no longer forwarded, and C enters claim state. In this case:

$$B = 1 \ C = 1 \ A = 0$$

- ◆ If A claims first, when the claims hit B, B forwards them and does not enter Claim state. They are no longer forwarded to C, and C enters Claim state. In this case:

$$B = 0 \ C = 1 \ A = 1$$

- ◆ If C claims first, both A and B forward the claims and do not enter Claim state. In this case:

$$B = 0 \ C = 1 \ A = 0$$

This scheme can be arbitrarily expanded based on the number of stations.

For non-Cisco routers, you must have a counter equivalent to the Claim counter. In case you have stations that do not have a claim_ct implementation, you can put an analyzer on the ring and achieve the same results.

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