

TN5087- Madge Smart Ringswitch and Axis Communications' Servers - Interoperability Issues

This Technical Note may be distributed internally, to Madge partners, and to customers to explain compatibility issues between Ringswitch Family and Axis Token Ring Print Server/CD-ROM Server devices

Overview

Recently Madge Networks has become aware of incompatibility issues between the Smart Ringswitch family of Token Ring switches, and Axis Communications' Token Ring Print and CD-ROM Servers. Axis Communications and Madge Networks have worked closely to find a solution to the problem, the details of which are covered here.

Products Affected

Part Numbers	Madge Token Ring Switches	Chipset
57-96	Smart Ringswitch	RingRunner
58-27	Smart Ringswitch Express	"
57-61	Smart Ringswitch Plus	"
57-63	Smart Ringswitch 8-port TR Module	"
57-91	Smart Ringswitch 4-port TR Copper Module	"
57-92	Smart Ringswitch 4-port TR Fiber Module	"
57-49	Smart GroupSwitch Module	"

	Axis Print/CD-ROM Servers	
	Axis 640, 642, 660, 670, 670 MIO,	ETRAX 4, ETRAX 3
	Axis StorPoint CD TR and StorPoint CD TR/T	ETRAX 4

Problem Description

The problem can be seen as a sustained 'silent period' on the Token Ring where stations are unable to send or receive frames. Ring management tools will not recognise this occurrence and will be unable to rectify it. It is therefore feasible that this situation may continue to persist for an indefinite period.

The issue concerns differences in Madge's and Axis' implementation of the IEEE 802.5 Token Ring specification. Although both vendors are fully compatible with the Token Ring standard, the specification [ISO/IEC 8802-5:1995], does not detail the priority lowering mechanisms. Due to the different interpretations, a situation may arise which will cause the failure of the MAC process on the ring.

Sequence of Events

1. Axis Print or CD-ROM server transmits a frame.
2. At about the same time, the Ringswitch has a MAC or switched frame ready to transmit on the ring.
3. Since there is no token available yet, the Ringswitch makes a Priority 4 reservation on the Axis frame.
4. Axis server strips its transmitted frame, and releases a Token at Priority 4.

5. The Ringswitch acquires the Token, and sends its frame.
6. Ringswitch strips the frame, and has another frame to send so it releases a Token with Priority 4 and Reservation 4.
7. When the Axis server receives the Token, it issues an SFS followed by a Token at Priority 4 (*SFS-Start of Frame Sequence*).
8. The Ringswitch sees the SFS/Token sequence as a token embedded inside a frame, a combination that the Ringswitch considers to be illegal.
9. The Ringswitch still has a frame ready to transmit so reserves the SFS/Token at Priority 4.
10. This sequence repeats and the Ring is now at Priority 4. The Ringswitch cannot send, and as no other station on the ring is using Priority 4 a ring 'deadlock' situation occurs. No recovery timers in the MACs on the ring fire because the ring appears to be flooded with both frames and tokens.

Problem Resolution

The current recommended workaround solution is to use the Smart Ringbridge (Part no. 58-20) or similar bridge device to connect the Ringswitch to the Token Ring where the Axis servers are connected.

Opportunity arose during the development cycle of a new ASIC (known as Aleutian) to resolve all incompatibility issues of the Axis print servers. This new silicon will be used with a new 8-Port TR Module (58-24) and Smart Ringswitch Express (58-27).

Appendix A – Extract from IEEE 802.5 Token Ring Specification

ISO/IEC 8802-5 : 1995 (E)

ANSI/IEEE Std 802.5-1995 LOCAL AND METROPOLITAN AREA NETWORKS:

Page 58

During transmission of a token (TX_TK), a station releases a token at its output independent of the value of the FTI flag. A token is released when

- a) The station releases a token after capturing a token and transmitting its frames.
- b) The active monitor creates a token after purging the ring.
- c) A priority stacking station lowers the ring priority. The exact mechanism to lower the ring priority is not specified. Different mechanisms have been used to lower the priority of the ring. These mechanisms are as follows:
 - 1) The station changes the old token into an abort delimiter and (after a short delay) creates a new token.
 - 2) The station changes the old token into a start-of-frame sequence and then (after a short delay) creates a new token.
 - 3) The station removes the old token and (after a short delay) creates a new token.
 - 4) The station modifies the AC field as it repeats the token.

NOTE: The Axis Servers use method 2, whereas the Ringswitch use method 4.

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