IBM 8239 Token-Ring Stackable Hub

LAN Segmentation

1. Introduction

With the explosive growth of switching technology for both Ethernet and Token-Ring LANs, the segmentation of traditional shared-bandwidth T-R LANs has become the focus of customer and marketing attention. In networks where switching or dedicated bandwidth is not present today and not foreseen in the near term, segmentation in the stackable hub is a viable alternative. Hubs provide a logical location for this capability given their stackable design, single point of concentration for devices in a network and the ability of a single hub in the stack to provide stack and network management functions.

2. The 8239 Product Family

The 8239 family of products began shipping in July, 1998. The primary building block of this hub offering is the Model 1. It is a fully functional concentrator or hub, with the additional capability of providing Ring-In/Ring-Out (RI/RO) connections to expand the LAN segment; stack management functions; and network management functions. The Model 2 is a fully functional hub that can be used as a standalone hub or as an expansion hub to increase the number of device attachments in the stack. An optional 16-port Expansion Feature for both models and, for
Model 1 only, RJ-45 copper or ST fiber RI/RO modules complete the offering.

All hubs in the stack are manageable from a single point using out-of-band access, available on both models, or in-band access via the Model 1. A Model 1 is required for network management functions. Information is accessed either through the terminal interface or an SNMP-compatible application. The 8239 is supported by IBM's Nways® Workgroup Manager for Windows NT®; Nways Manager for AIX®; and Nways Manager for HP-UX. The 8239 offers many or more of the same network management features as multifunction switching hubs but at a much lower price per port. If all your desktop LANs are Token Ring, the 8239's high performance and low cost-per-port make it an attractive choice.

3. Segmentation

Purpose
But what if your are starting to have bandwidth concerns or simply want to segregate the LAN traffic by department or location? The 8239 enables you to segment a single LAN into multiple LANs while maintaining stack management of all the hubs that make up the stack.

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Description
In the 8239 stack, segmentation is provided at the hub level, by wrapping a given hub in or out of the default single segment. This isolates the Data Path of one or more hubs from the Data Paths of the other hubs in the stack. All 16 ports in the hub, including additional ports if the optional feature card is installed, are treated as a single entity or hub when segmenting a ring. Every hub in a stack must be assigned to a segment. The factory default has all hubs assigned to a single segment. If, for example, a stack consisted of four hubs (any combination of models), it could be segmented into a maximum of four segments. If a stack consisted of the maximum eight hubs, from one to eight segments could be created. Hubs in the same segment must be adjacent to each other in ring order when you connect them with the intra-stack cables. Management of the stack is maintained because the Control Path of the stack is not affected when the Data Path is altered because of segmentation. If network management functions, like Ring-In/Ring-Out or RMON, are important for a particular segment, that segment must consist of at least one Model 1.

Prerequisite
The 8239 ships with its Operational Code already installed. Users are encouraged to always check the 8239 Home Page to determine the most recent level. For segmentation purposes, the Operational Code must be Version 2.0 or higher.

Network Management Functions
The 8239 offers an impressive array of network management functions as well as stack management capability. Functions like Ring-In/Ring-Out, RMON, 802.5, Surrogate MIB for media management, etc. are all programmed into the Model 1. Accordingly, a Model 1 must be included in each segment where this activity is required.

Stack Management Functions
Because the Control Path is not affected by segmentation, normal stack management activities and functions are not impacted by segmentation. These would include but are not limited to:
Beacon Recovery
Address-to-Port Mapping
Port Security
Operational code downloads
EIA-232 Out-Of-Band port
Ring-In/Ring-Out
Functions provided by network management applications

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Network Management Applications
The Nways Management applications for Windows NT, AIX, and HP-UX recognize 8239 segmentation. The screen image will graphically show the hubs in a stack and their associated segments, from the default single segment to the maximum potential of eight segments. The usual picture of the hub or hubs will be displayed with an oval ring on the right side of the screen showing the delineation of segments.

Example of Segmentation
Following are three examples of segmentation, taken from the *8239 Setup and User's Guide*. Figure 1 depicts a single segment with six units. This is the default configuration. Figure 2 shows four segments; two segments, each with only one hub; two segments, each with two hubs. Only segment One has a Model 1 and therefore has network management access. Figure 3 contains three segments and six hubs; each segment can be managed because a Model 1 is included in each.

For More Information
Please check out the 8239 Home Page on the Web at:
www.networking.ibm.com/netprod.html

Select **8239** for the machine type to see previous announcement literature, specification sheets, and technical support, including this paper and the *8239 Setup and User's Guide* containing detailed instructions for implementing segmentation.

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Figure 1: Single Segment

Figure 1 shows a stack of six units, with a single Model 1, in the initial stage. Note that all units are attached to the stack ring creating a single segment.

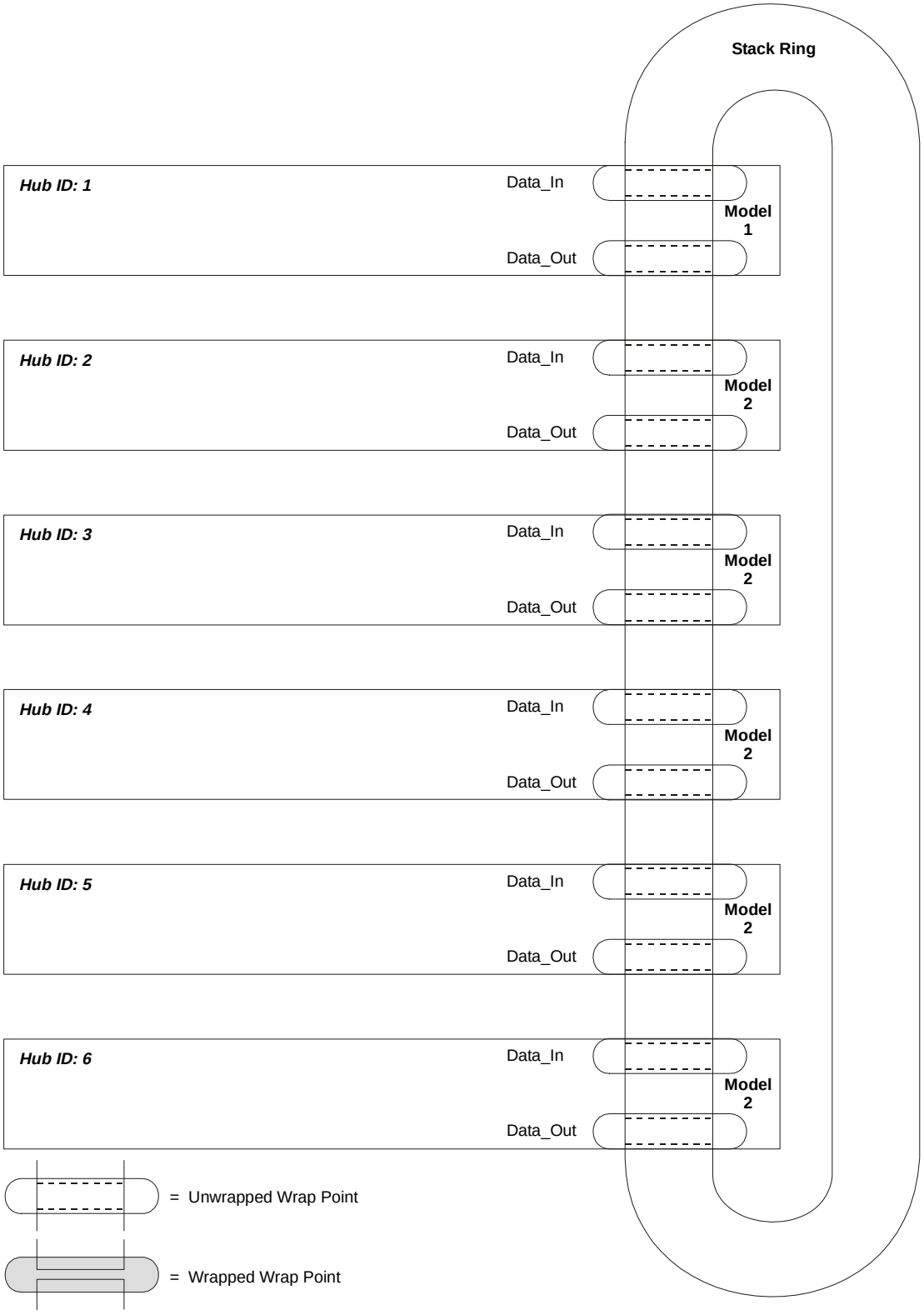

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Figure 2: Two Segments with One Unit Each and Two Segments with Two Units Each.

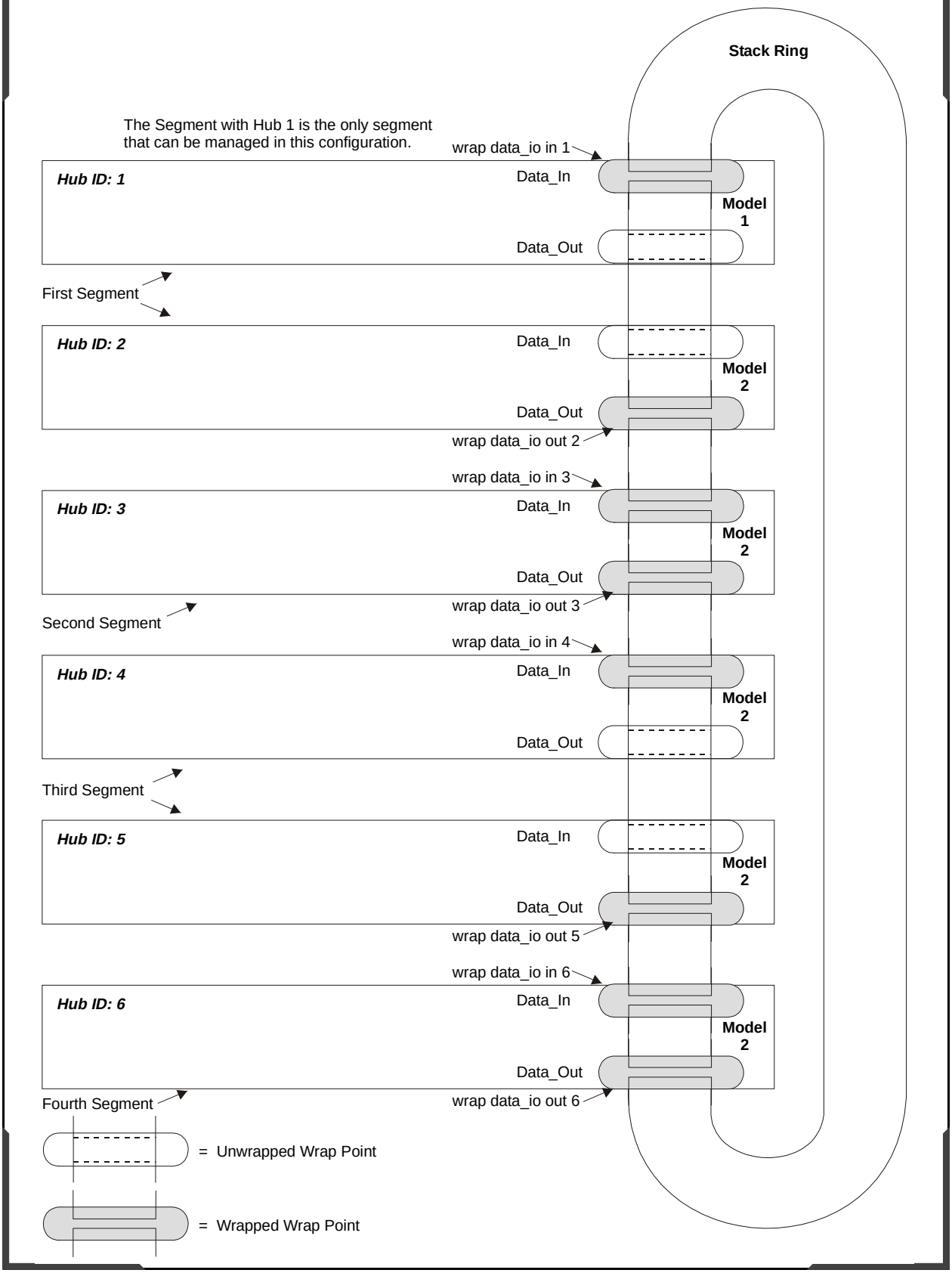

Figure 3: Three segments, each with a Model 1 for network management functions.