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RENESAS TECHNICAL UPDATE

TOYOSU FORESIA, 3-2-24, Toyosu, Koto-ku, Tokyo 135-0061, Japan
Renesas Electronics Corporation

Product Category	System LSI		Document No.	TN-RZ*-A0073A/E	Rev.	1.00
Title	Advanced 5port Switch (A5PSW) function issues and usage notice		Information Category	Technical Notification		
Applicable Product	See below	Lot No. See below	Reference Document	RZ/N1D Group RZ/N1S Group RZ/N1L Group User's Manual (See below for details)		

We would like to inform about issues and usage notice regarding Advanced 5port switch (A5PSW) function as described below.

1. Applicable Product

Product Group	Part Number	Package Type	Configuration
RZ/N1D	R9A06G032NGBG	400BGA	Dual Cortex-A7, PRP/HSR
	R9A06G032VGBG	400BGA	Dual Cortex-A7
	R9A06G032PGBG	400BGA	Dual Cortex-A7, PRP/HSR, Security
	R9A06G032EGBG	400BGA	Dual Cortex-A7, Security
	R9A06G032VGBA	324BGA	Dual Cortex-A7
	R9A06G032EGBA	324BGA	Dual Cortex-A7, Security
RZ/N1S	R9A06G033NGBG	324BGA	Single Cortex-A7, PRP
	R9A06G033PGBG	324BGA	Single Cortex-A7, PRP, Security
	R9A06G033VGBA	196BGA	Single Cortex-A7
	R9A06G033EGBA	196BGA	Single Cortex-A7, Security
RZ/N1L	R9A06G034VGBA	196BGA	Cortex-M3

2. Reference Document

Reference document name	Document Number	Revision
RZ/N1D Group, RZ/N1S Group, RZ/N1L Group User's Manual: R-IN Engine and Ethernet Peripherals	R01UH0753EJ0110	V1.10

3. Issues

3.1. Forwarding issue between PRP ports

3.1.1. Issue content and condition

A5PSW (Advanced 5port Switch) forwards specific packets received at one PRP port to the other PRP port. According to the PRP specification, packet forwarding does not happen between PRP ports.

Specific packets:

- Broadcast packets
- Packets to be flooded (Unknown unicast and multicast packets)

3.1.2. Workaround of the issue

Please implement following 2 points

- Set 0 to the PRP group ports in the default mask registers (*) in order not to forward broadcast packet and unknown unicast and multicast packet.

  (*) UCAST_DEFAULT_MASK, BCAST_DEFAULT_MASK, MCAST_DEFAULT_MASK

  # masking at output port
- Send packets which cause the bug, broadcast packet and packet to be flooded, by CPU handling.

  i.e. Not using 5port Switch's PRP function for those packets

Behavior by the workaround are shown as below.

■ Case1: Sending packets which corresponds to the bug conditions

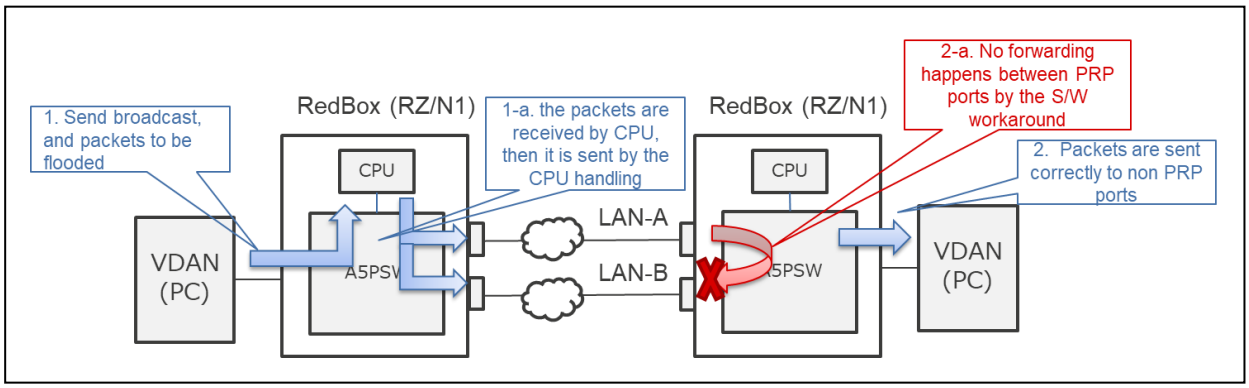

Figure 1: Example of sending packets which corresponds to the bug conditions

■ Case2: Sending packets which don't correspond to the bug conditions

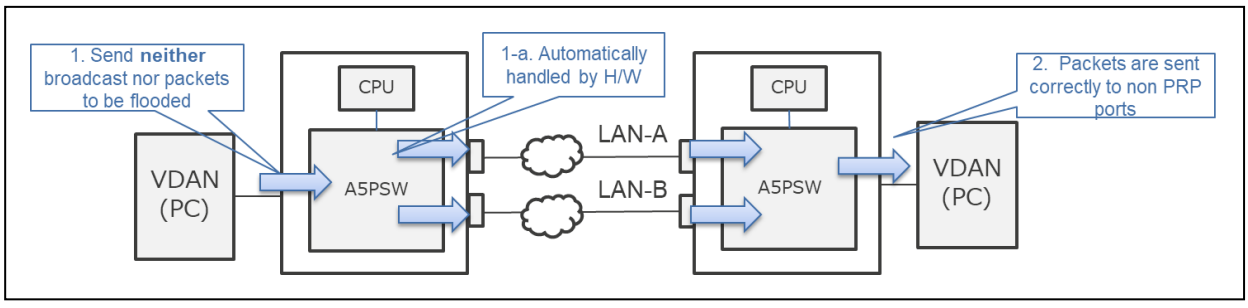

Figure 2: Example of sending packets which don't correspond to the bug conditions

3.2. Wrong LAN ID counter issue

3.2.1. Issue content and condition

PRP Wrong ID LAN-A/-B Count Registers (CntErrWrongLanA and CntErrWrongLanB) do not work correctly. Even if LanId is attached incorrectly, it is not detected in these count registers.

3.2.2. Workaround of the issue

It is prohibited to use PRP Wrong ID LAN-A/-B Count Registers (CntErrWrongLanA and CntErrWrongLanB). Workaround by software is the following.

1. Mirror the incoming frames on PRP ports to the management port with management tag to know which port incoming frame comes from, LAN A or LAN B.
2. Host CPU confirms all the frames from management port whether lanId is correct or not by SW, and software counter is incremented if it is incorrect.

All the PRP related processing like duplication discarding and normal frame forwarding are processed by HW.

In order to reduce CPU load, mirroring frames can be reduced by setting MIRROR_CNT register. Two options are available dependent on the situation as below, for example,

- Full inspection: for qualification you may want to be fully accurate, and mirror all the frames
- Production: here sampling 1 out of N frames would be sufficient to detect errors. In this mode MIRROR_CNT can be set to N to reduce the load on the CPU.

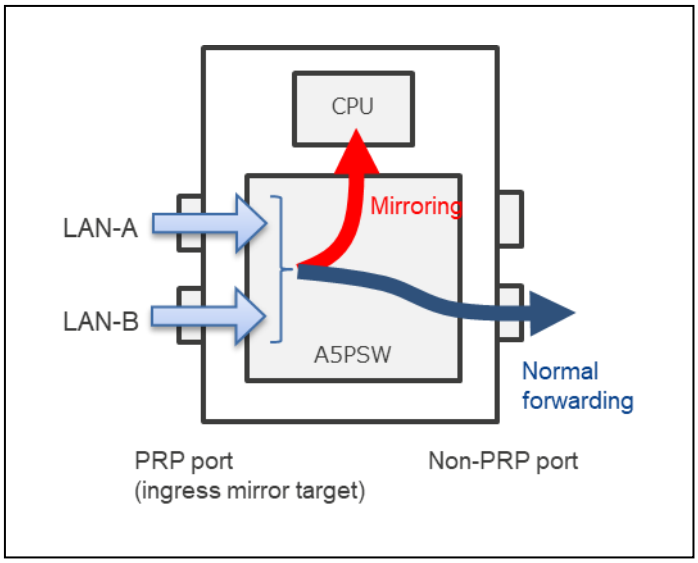

Figure 3: Frame forwarding by mirroring function

4. Usage Notice

4.1. Usage notice of VLAN input and output processing function when using ports within a PRP group

When using ports within a PRP group, the VLAN input and output processing function cannot be used.

4.2. Usage notice of Hub module when supporting Ethernet POWERLINK

When using Hub module, preamble of the frame output from A5PSW is extended compared with input frame. This is used to indicate the frame transmission to the next devices and to avoid the collision as soon as possible.

From the Ethernet standard point of view, extension of preamble is permitted. However, it is found that some Ethernet POWERLINK support devices can't receive the frame with extended preamble. Therefore, do not use Hub module when supporting Ethernet POWERLINK.

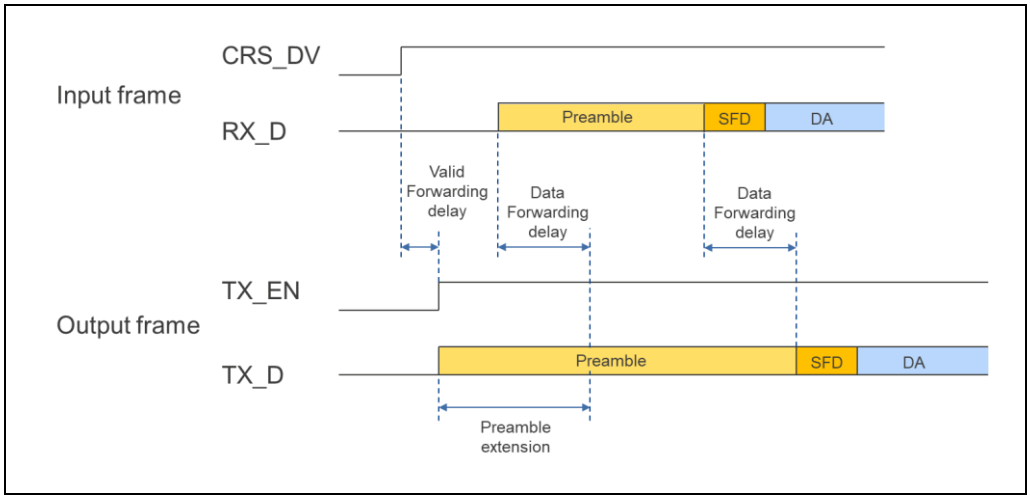

Figure 4: Timing of input and output frames in case of using Hub module

5. Update plan

Renesas will update User's Manual: R-IN Engine and Ethernet Peripherals on Renesas Web site. (Feb. 2021)