N560 Series Application Guide

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Change Histroy

Version	Date	Effective S/W	Description
Rev 1.0	June 22, 2010	1.7.2 later	Initial version

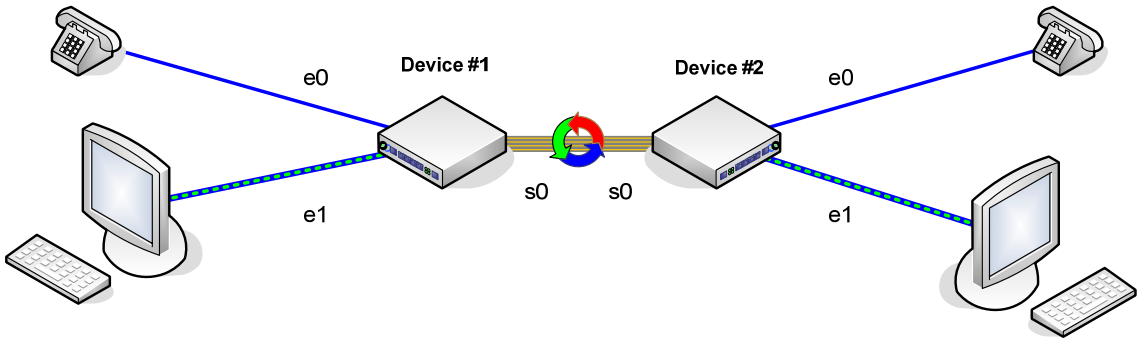
Contents

1 Simple LAN Extension

1.1 Overview

This function enables 2 LAN segments to simply connect to L2 level. Thus, all kinds of protocols (TCP/IP, IPv6, IPX, NETBEUI etc) which use Ethernet Frame can be utilized and also various tagged VLAN frames are transmitted transparently to two-way.

1.2 Network Diagram



1.3 Configuration for N560 Series

There is transparent mode in N560 Series. If you configure transparent mode by utilizing vlmode command, the both untagged frame and tagged frame are transmitted to two-way.

Device #1 Configuration Example

```
N564> (enable) set devicetype co
N564> (enable) restart pme all
This command will restart all pmes.
Do you want to continue (y/n) [n]? y
N564> (enable) set vlmode transparent
This command will flush all vlan group.
Do you want to continue (y/n) [n]? y
```

Device #2 Configuration Example

```
N564> (enable) set devicetype rt
N564> (enable) restart pme all
This command will restart all pmes.
Do you want to continue (y/n) [n]? y
N564> (enable) set vlmode transparent
This command will flush all vlan group.
Do you want to continue (y/n) [n]? y
```

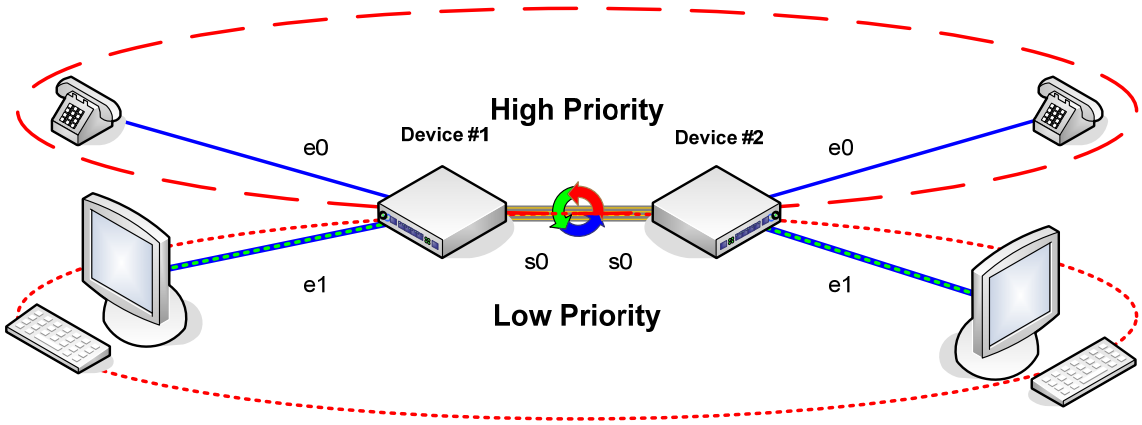
2 Simple QoS Bridge (Fixed Priority)

2.1 Overview

In case of “Simple LAN Extension”, all kinds of packets are processed in the way of first come and first served. If congestion occurs in the part of WAN, packet would be as dropped as difference of the bandwidth in the section of LAND and WAN irrespective of the specific types of application. When occurred this case, a general web browsing or file downloading can continue to come along well but some services such as VoIP or IPTV can seriously be fallen in a quality.

In this circumstances, if applied the function of ‘Packet Priority Control’ N560 series provide, even though congestion is came about in the part of WAN, service quality will be preserved by transmitting the packets depending on the priority order which is configured.

2.2 Network Diagram



2.3 Configuration for N560 Series

As shown in the above diagram, if normal devices cannot generate the packet which includes the information of priority order (802.1p or DSCP), N560 series start to act as a substitute. Connect the device of high priority (e.g. VoIP device) to e0 port and the device of low priority (e.g. web surfing, file download) to e1 port respectively. And set up the priority of e0 to 7, e1 port to 0.

Device #1 Configuration Example

```
N564> (enable) set devicetype co
N564> (enable) restart pme all
This command will restart all pmes.
Do you want to continue (y/n) [n]? y
N564> (enable) set vlmode transparent
This command will flush all vlan group.
Do you want to continue (y/n) [n]? y
N564> (enable) set port e0,e1 classifier fixed
N564> (enable) set port e0 fixed-priority 7
N564> (enable) set port e1 fixed-priority 0
```

Device #2 Configuration Example

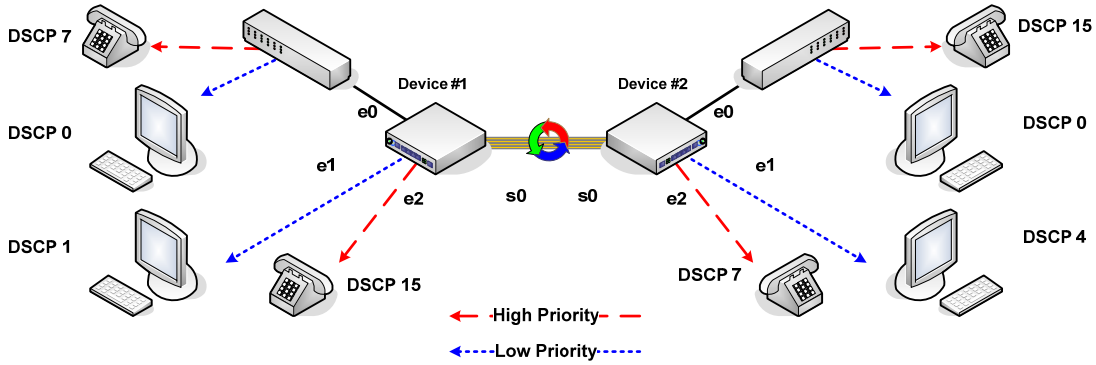
```
N564> (enable) set devicetype rt
N564> (enable) restart pme all
This command will restart all pmes.
Do you want to continue (y/n) [n]? y
N564> (enable) set vlmode transparent
This command will flush all vlan group.
Do you want to continue (y/n) [n]? y
N564> (enable) set port e0,e1 classifier fixed
N564> (enable) set port e0 fixed-priority 7
N564> (enable) set port e1 fixed-priority 0
```

3 QoS Classifier

3.1 Overview

To obtain QoS effect is easy by controlling the priority order of ports in case of “Simple QoS Bridge” but the bigger network circumstances, the more complex QoS features are required. N560 series products have a priority queue of 4 level, which means that it provides the differential priority order for 4 different services. For instance, we put ‘VoIP service’ which is sensitive for delay on the top of the priority order, the service of ‘Video streaming’ in the middle and ‘common internet access service’ like web surging on the lower part, thus, satisfactory service quality would be entirely preserved. In general, the field which can be used to determine the priority order of packets is Differentiated Services Code Point (DSCP from IP header or the priority field from 802.1Q VLAN tag. In the below example, it shows how to sort out and manage VoIP packets and general internet packets through DSCP measure.

3.2 Network Diagram



3.3 Configuration for N560 Series

As shown in the above diagram, it assume that common devices produce the packets which includes DSCP value. In this case, N560 series products control the priority order based on DSCP filed which is included in the packet. N560 series products can appoint a priority order for respectively different DSCP values. In this example, set up 7 and 15 which are used in VoIP Phone as a top priority order, with regards to 0,1 and 4 which is separately used in the common traffic as the lowest priority order.

Device #1 Configuration Example

```
N564> (enable) set devicetype co
N564> (enable) restart pme all
This command will restart all pmes.
Do you want to continue (y/n) [n]? y
N564> (enable) set vlmode transparent
This command will flush all vlan group.
Do you want to continue (y/n) [n]? y
N564> (enable) set port e0,e1,e2 classifier dscp
N564> (enable) set qos dscp-map 7,15 7
N564> (enable) set qos dscp-map 0,1,4 0
```

Device #2 Configuration Example

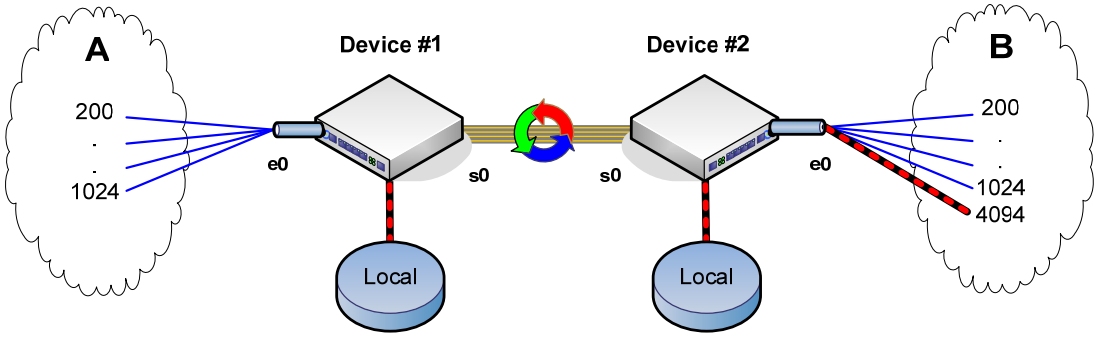
```
N564> (enable) set devicetype rt
N564> (enable) restart pme all
This command will restart all pmes.
Do you want to continue (y/n) [n]? y
N564> (enable) set vlmode transparent
This command will flush all vlan group.
Do you want to continue (y/n) [n]? y
N564> (enable) set port e0,e1,e2 classifier dscp
N564> (enable) set qos dscp-map 7,15 7
N564> (enable) set qos dscp-map 0,1,4 0
```

4 VLAN Trunk

4.1 Overview

N560 series provide the function of “VLAN Trunk”, which transmit only 802.1Q tagged frame that has a specific VLAN-ID among two LAN segments.

4.2 Network Diagram



4.3 Configuration for N560 Series

In this example, only the frame which has VLAN-ID among 200 and 1024 will be forwarded to two-way, if not having such a VLAN-ID, it will be deleted. VLAND-ID 4094 is used for the channel to manage two devices, it only allows the access in the B network.

Device #1 Configuration Example

```
N564> (enable) set devicetype co
N564> (enable) restart pme all
This command will restart all pmes.
Do you want to continue (y/n) [n]? y
N564> (enable) set vlmode trunk
This command will flush all vlan group.
Do you want to continue (y/n) [n]? y
N564> (enable) set trunk 200-1024 e0,s0
N564> (enable) set trunk 4094 s0
N564> (enable) set interface m1 vid 4094
```

Device #2 Configuration Example

```
N564> (enable) set devicetype rt
N564> (enable) restart pme all
This command will restart all pmes.
Do you want to continue (y/n) [n]? y
N564> (enable) set vlmode trunk
This command will flush all vlan group.
Do you want to continue (y/n) [n]? y
N564> (enable) set trunk 200-1024 e0,s0
N564> (enable) set trunk 4094 e0,s0
N564> (enable) set interface m1 vid 4094
```

5 VLAN Stacking (Q-in-Q)

5.1 Overview

The number of VLAND defined in 802.1Q is 4096, if the size of network is bigger, allocation of VLAN-ID is subjected to various restrictions. In order to work out, MAC-in-MAC, Q-in-Q are use. Q-in-Q is supportive for N560 series products. Below is an example that transmits 'provider tag' which was integrated by several 'customer tag' through the function of Q-in-Q.

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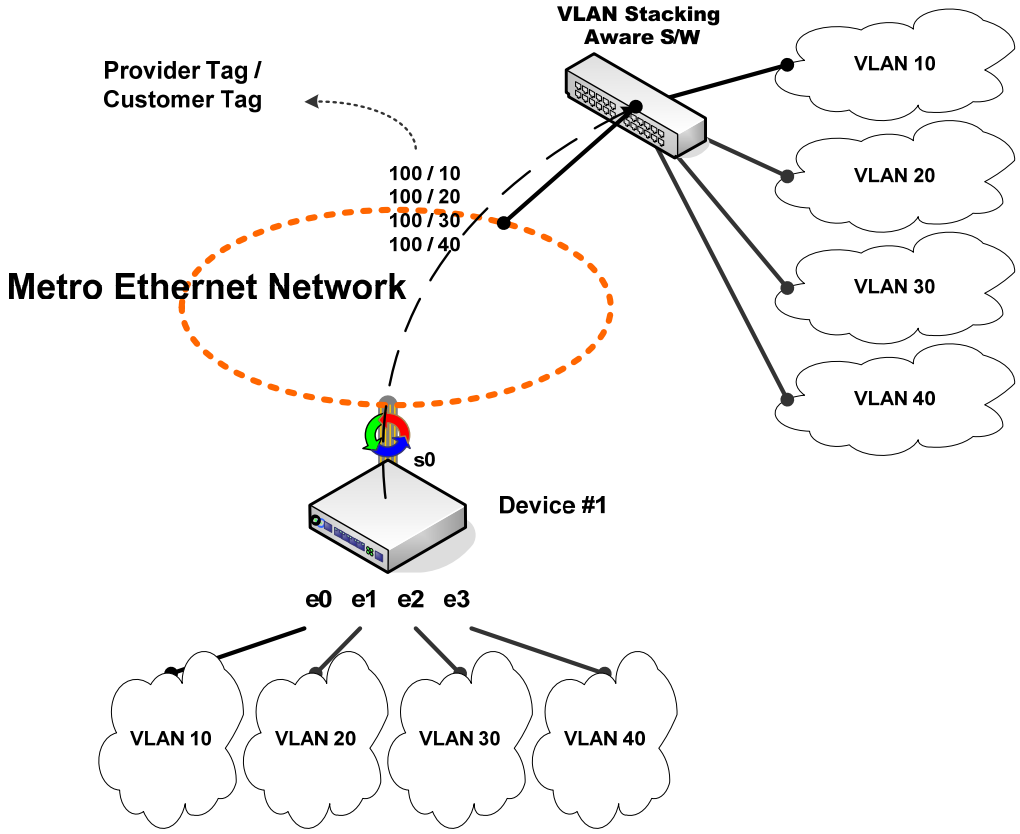
5.2 Network Diagram



5.3 Configuration for N560 Series

In this example, transmission of respectively separated network as VLAN 10, VLAN 20, VLAN 30, VLAN 40 will be made after re-tagging as pvid which is 100. If using the VLAN Stacking, to join another VLAN Network is possible without losing the internal network VLAN information.

In case of using the function of doubletag to s0, when the tagged frame came into e0 is going to

s0, the additional tagging of 100,that is, pvid of e0 will be done before going out. Also additional tagging of pvid, 100 will be done before the other tagged frame came into e2 is going to s0,
In the contrary, if the frame with VLAN Stacking comes into s0, as it deletes the tag which was additionally attached with in the portion of s0, so after this portion, it will be processed like an ordinary tagged frame.

Device #1 Configuration Example

```
N564> (enable) set vlmode normal
This command will flush all vlan group.
Do you want to continue (y/n) [n]? y
N564> (enable) set vlan 10 e0,s0 tag
N564> (enable) set vlan 20 e1,s0 tag
N564> (enable) set vlan 30 e2,s0 tag
N564> (enable) set vlan 40 e3,s0 tag
N564> (enable) set port e0,e1,e2,e3,s0 pvid 100
N564> (enable) set doubletag-id 0x8100
N564> (enable) set port s0 doubletag enable
```