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Link Aggregation Configuration Guide

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Comments and questions about how the … system software works are welcomed. Please review the FAQ in the related manual, and if your question is not covered, send email by using the following web page:

http://www.raisecom.com/en/xcontactus/contactus.htm.

If you have comments on the … specification, instead of the web page above, please send comments to:

export@raisecom.com

We hope to hear from you!

CONTENTS

Release Notes---------- 5
Chapter 1 Link Aggregation Configuration Guide---------- 1
1.1 Link aggregation function principle ----------1
1.2 Static aggregation function configuration----------1
1.2.1 Static aggregation default configuration----------1
1.2.2 Configure static aggregation ----------1
1.2.3 Monitoring and maintaining----------3
1.2.4 Typical configuration example ----------3

Release Notes

Date of Release	Manual Version	Software Version	Revisions

Preface

About This Manual

This manual introduces primary functions of the configuration management software for RC series products.

Who Should Read This Manual

This manual is a valuable reference for sales and marketing staff, after service staff and telecommunication network designers. For those who want to have an overview of the features, applications, structure and specifications of … device, this is also a recommended document.

Relevant Manuals

《Raisecom NView System User Manual》

《Raisecom Nview System Installation and Deployment Manual》

《… User Manual》

《… Commands Notebook》

Organization

This manual is an introduction of the main functions of … EMS. To have a quick grasp of the using of the EMS of … , please read this manual carefully. The manual is composed of the following chapters

Chapter 1 Overview

This chapter briefly introduces the basic function of …

Chapter 2 Configuration Management

This chapter mainly introduces the central site configuration management function of the ….

Chapter 3 Performance Management

This chapter focuses on performance management function of ….

Chapter 4 Device Maintenance Management

This chapter introduces the device maintenance management function of ….

Appendix A Alarm Type

The alarm types supported by ….

Compliance

The RC series products developed by Raisecom are strictly complied with the following standards as well as ITU-T, IEEE, IETF and related standards from other international telecommunication standard organizations:

YD/T900-1997 SDH Equipment Technical Requirements - Clock

YD/T973-1998 SDH 155Mb/s and 622Mb/s Technical conditions of optical transmitter module and receiver module

YD/T1017-1999 Network node interface for the Synchronous Digital Hierarchy (SDH)

YD/T1022-1999 Requirement of synchronous digital hierarchy (SDH) equipment function

YD/T1078-2000 SDH Transmission Network Technique Requirements-Interworking of Network Protection Architectures

YD/T1111.1-2001 Technical Requirements of SDH Optical Transmitter/Optical Receiver Modules——2.488320 Gb/s Optical Receiver Modules

YD/T1111.2- 2001 Technical Requirements of SHD Optical Transmitter/Optical Receiver Modules——2.488320 Gb/s Optical Transmitter Modules

YD/T1179- 2002 Technical Specification of Ethernet over SDH

G.703 Physical/electrical characteristics of hierarchical digital interfaces

G.704 Synchronous frame structures used at 1544, 6312, 2048, 8448 and 44 736 kbit/s hierarchical levels

G.707 Network node interface for the synchronous digital hierarchy (SDH)

G.774 Synchronous digital hierarchy (SDH) - Management information model for the network element view

G.781 Synchronization layer functions

G.783 Characteristics of synchronous digital hierarchy (SDH) equipment functional blocks

G.784 Synchronous digital hierarchy (SDH) management

G.803 Architecture of transport networks based on the synchronous digital hierarchy (SDH)

G.813 Timing characteristics of SDH equipment slave clocks (SEC)

G.823 The control of jitter and wander within digital networks which are based on the 2048 kbit/s hierarchy

G.825 The control of jitter and wander within digital networks which are based on the synchronous digital hierarchy (SDH)

G.826 End-to-end error performance parameters and objectives for international, constant bit-rate digital paths and connections

G.828 Error performance parameters and objectives for international, constant bit-rate synchronous digital paths

G.829 Error performance events for SDH multiplex and regenerator sections

G.831 Management capabilities of transport networks based on the synchronous digital hierarchy (SDH)

G.841 Types and characteristics of SDH network protection architectures

G.842 Interworking of SDH network protection architectures

G.957 Optical interfaces for equipments and systems relating to the synchronous digital hierarchy

G.691 Optical interfaces for single channel STM-64 and other SDH systems with optical amplifiers

G.664 Optical safety procedures and requirements for optical transport systems

I.731 ATM Types and general characteristics of ATM equipment

I.732 ATM Functional characteristics of ATM equipment

IEEE 802.1Q Virtual Local Area Networks (LANs)

IEEE 802.1p Traffic Class Expediting and Dynamic Multicast Filtering

IEEE 802.3 CSMA/CD Access Method and Physical Layer Instruction

Chapter 1 Link Aggregation Configuration Guide

1.1 Link aggregation function principle

Link aggregation is to combine several physical Ethernet port into a logical aggregation group. Use the upper class entity of link aggregation service to take the physical links in the same aggregation group as a logical link.

Link aggregation is able to make the aggregation member taking part in the out/in traffic to increase bandwidth. At the same time, the member ports of the same aggregation group will dynamically backup each other, which increases the connection stability.

This chapter, trunk configuration includes:

- ✧ Enable/disable link aggregation.
- ✧ Add/delete link aggregation group
- ✧ Set all the aggregation link load-sharing mode

1.2 Static aggregation function configuration

1.2.1 Static aggregation default configuration

Function	Default value
Link aggregation	On
Link aggregation group	Does not exist, manual configuration is needed
Load balancing mode	Source, destination MAC address logic OR result selects the transmission port

1.2.2 Configure static aggregation

1.2.2.4 Configure aggregation group and start link aggregation function

Follow the following step to configure link aggregation:

Step	Command	Description
1	config	Enter global configuration
2	**trunk group** *trunk-group-id portlist*	Add a aggregation group; trunk-group-id the created aggregation group number, range is 1-6; Portlist physical port number list, use ‘,’ and ‘-‘ to do multi-interface input
3	**trunk** {**enable**|**disable**}	Enable/disable link aggregation

4	**exit**	Quit global configuration mode and enter privileged EXEC mode
5	show trunk	Show if link aggregation is on, link aggregation load balancing mode, the group member port configured by all the aggregation groups and the effective member port

Use **no trunk group** *trunk-group-id* to delete the specified aggregation group;

In the same aggregation group, all the member ports that are able to share output/input load must be of the same configuration, which includes STP, QoS ,QinQ, VLAN, port attribution, MAC address learning, as is shown below:

Class	Contents
The same STP configuration	Port STP enable/disable state, link attribution that is connected with the port (port to port or not port to port), port path spending, STP priority, message sending out rate limit, configuring cycle protection or not, configuring root protection or not, edge port or not.
The same QoS configuration	Flow monitoring and shaping, jams avoidance, port traffic limit, SP line, WRR line attemperment.
The same QinQ configuration	Interface QinQ function on/off state, added outer layer VLAN Tag, the strategy of adding outer layer VLAN Tag that is different from inner layer VLAN ID.
The same VLAN configuration	The VLAN that is allowed to pass on the port, default VLAN ID of the port, the link type of the port (Trunk, Hybrid, Access), subnet VLAN configuration, protocol VLAN configuration, if there is Tag configuration in VLAN message.
The same port attribution	Whether to join isolate group, port rate, duplex mode, up/down state
The same MAC address learning	Whether to own MAC address learning

configuration	function, if the port has maximum learning MAC address limit, whether to continue transmitting and controlling when the MAC table is full.

1.2.2.2 Set load-sharing mode

Link aggregation has 6 load-sharing mode:

- **Smac** select transmission port according to source MAC address
- **Dmac** select transmission port according to destination MAC address
- **Axordmac** select transmission port according to source, destination MAC address logic OR result
- **Sip** select transmission port according to source IP address
- **Dip** select transmission port according to destination IP address
- **Sxordip** select transmission port according to source, destination IP address logic OR result

Step	Command	Description
1	**config**	Enter global configuration mode
2	**trunk loading-sharing mode** {**smac** | **dmac** | **sxordmac** | **sip** | **dip** | **sxordip**}	Configure all the link aggregation load-sharing mode
3	**exit**	Quit global configuration mode
4	**show trunk**	Show if link aggregation is on, link aggregation load-sharing mode, all the group member port of the current aggregation group and the effective member port.

Use **no trunk loading-sharing mode** to revert link aggregation load-sharing default mode.

⚠ Notice:

The command is supported by only a part of our equipments, follow the command manual for specific situation.

1.2.3 Monitoring and maintaining

Use **show** to look over link aggregation configuration

Command	Description
show trunk	Show if aggregation is enabled, link

	aggregation load-sharing balancing mode, all the group member port that is configured by aggregation group and the current effective member port.

Use **show trunk** to show if aggregation is enabled, link aggregation load-sharing balancing mode, all the group member port that is configured by aggregation group and the current effective member port. The current effective member port is the port list that the port state is UP in the configured group member ports. The example below is echo in the actual result:

Raisecom#show trunk

Trunk: Enable

Loading sharing mode: SXORDMAC

Loading sharing ticket algorithm: --

Trunk Group	Member Ports	Efficient Ports
3	1,4-6,8	1,4

1.2.4 Typical configuration example

1.2.4.1 Network requirement

SWA equipment use 4 ports aggregation to access SWB equipment, through which output/input load can be shared between the members. SWA access ports are port1~port 4.

1.2.4.2 Network structure

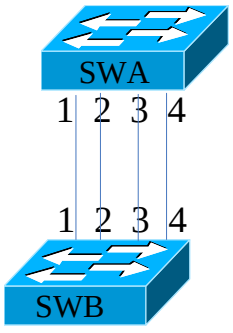

Fig 1 link aggregation network

1.2.4.3 Configuration step

⚠ Notice:

- The following steps list only the configuration to SWA; to SWB the same configuration is needed, so that link aggregation works.

1) Configure aggregation group, join the port into the aggregation group:

SWA#config

SWA(config)#trunk-group 1 1-4

SWA(config)#set succesfully!

2) Configure the load-sharing mode of trunk link aggregation

SWA(config)#**trunk loading-sharing mode smac**

SWA(config)#set succesfully!

3) enable link aggregation function

SWA(config)#trunk enable

SWA(config)#set succesfully!

SWA(config)#exit

SWA#show trunk

Trunk: Enable

Loading sharing mode: SMAC

Loading sharing ticket algorithm: --

Trunk Group	Member Ports	Efficient Ports
1	1-4	1-4

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