Quarra Configuration Guide for AES67

OVERVIEW

There are three recommended features to support an AES67 network

1. IGMP Snooping
2. QoS
3. IEEE1588 PTP

AES67 NETWORK SUPPORT

Navigate to – “Configuration > IPMC > IGMP Snooping > Basic Configuration” and set the parameters shown below then click "Save".

IGMP Snooping Configuration

Global Configuration		
Snooping Enabled	☑	
Unregistered IPMCv4 Flooding Enabled	☐	
IGMP SSM Range	232.0.0.0	/ 8
Leave Proxy Enabled	☑	
Proxy Enabled	☑	

Port Related Configuration

Port	Router Port	Fast Leave	Throttling
*	☐	☐	<>
1	☐	☐	unlimited
2	☐	☐	unlimited
3	☐	☐	unlimited
4	☐	☐	unlimited
5	☐	☐	unlimited
6	☐	☐	unlimited
7	☐	☐	unlimited
8	☐	☐	unlimited
9	☐	☐	unlimited
10	☐	☐	unlimited

Navigate to – “Configuration > IPMC > IGMP Snooping > VLAN Configuration”. Click “Add new IGMP VLAN” and set the parameters shown below then click "Save".

IGMP Snooping VLAN Configuration

Start from VLAN 1 with 20 entries per page.

Delete	VLAN ID	Snooping Enabled	Querier Election	Querier Address	Compatibility	PRI	RV	QI (sec)	QRI (0.1 sec)	LLQI (0.1 sec)	URI (sec)
Delete	1	☑	☑	0.0.0.0	Forced IGMPv2	0	2	125	100	10	1

Add New IGMP VLAN

Save Reset

If more than one switch is used you will need to decide which one will act as Querier.

QoS

Navigate to – “Configuration > QoS > Port Classification” and set the parameters shown below then click "Save".

QoS Ingress Port Classification

Port	CoS	DPL	PCP	DEI	Tag Class.	DSCP Based	Address Mode
*	<>	<>	<>	<>		☑	<>
1	0	0	0	0	Disabled	☑	Source
2	0	0	0	0	Disabled	☑	Source
3	0	0	0	0	Disabled	☑	Source
4	0	0	0	0	Disabled	☑	Source
5	0	0	0	0	Disabled	☑	Source
6	0	0	0	0	Disabled	☑	Source
7	0	0	0	0	Disabled	☑	Source
8	0	0	0	0	Disabled	☑	Source
9	0	0	0	0	Disabled	☑	Source
10	0	0	0	0	Disabled	☑	Source

Save Reset

Navigate to – “Configuration > QoS > DSCP-Based QoS” and set the parameters shown below then click "Save".

33	☐	0	0
34 (AF41)	☑	4	0
35	☐	0	0
36 (AF42)	☐	0	0
37	☐	0	0
38 (AF43)	☐	0	0
39	☐	0	0
40 (CS5)	☐	0	0
41	☐	0	0
42	☐	0	0
43	☐	0	0
44	☐	0	0
45	☐	0	0
46 (EF)	☑	7	0

The default DSCP tags in AES67 for PTP and Audio(RTP) are 46(EF) for PTP and 34(AF41) for RTP audio. These values may vary or be configurable in various products so please check before configuring QoS.

AES67 recommends that PTP takes the highest QoS Class 7, we recommend moving the RTP audio up above general traffic at Class 0. In this example we have used Class 4.

You may have other traffic which requires QoS Classification but please reserve Class 7 for PTP Only.

IEEE1588 PTP TRANSPARENT CLOCK

Navigate to – “Configuration > PTP” then click “Add new PTP clock”. Set the parameters shown below then click "Save".

PTP External Clock Mode

One_PPS_Mode	Output
External Enable	False
Adjust Method	LTC frequency
Clock Frequency	1

PTP Clock Configuration

Delete	Clock Instance	Device Type	Profile
☐	0	E2eTransp	No Profile

Add New PTP Clock | Save | Reset

Click the “0” under Clock Instance. Select the ports required and other parameters outlined below. DSCP is set to "46" AES default. Click "Save" to set parameters.

PTP Clock's Configuration and Status

Clock Type and Profile

Clock Instance	Device Type	Profile	Apply Profile Defaults
0	E2eTransp	No Profile	n/a

Port Enable and Configuration

Port Enable										Configuration
1	2	3	4	5	6	7	8	9	10	Ports Configuration
☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	

Local Clock Current Time

PTP Time	Clock Adjustment method	Synchronize to System Clock
1970-01-01T00:12:54+00:00 302,928,080	Internal Timer	Synchronize to System Clock

Clock Current DataSet

stpRm	Offset From Master	Mean Path Delay
0	0.000,000,000	0.000,000,000

Clock Parent DataSet

Parent Port ID	Port	PStat	Var	Rate	GrandMaster ID	GrandMaster Clock Quality	Pri1	Pri2
00:50:c2:ff:fe:39:e6:8c	0	False	0	0	00:50:c2:ff:fe:39:e6:8c	Cl:251 Ac:Unknwn Va:65535	128	128

Clock Default DataSet

ClockId	Device Type	2 Step Flag	Ports	Clock Identity	Dom	Clock Quality
0	E2eTransp	False	10	00:50:c2:ff:fe:39:e6:8c	0	Cl:251 Ac:Unknwn Va:65535

Pri1	Pri2	Protocol	One-Way	VLAN Tag Enable	VID	PCP	DSCP
128	128	IPv4Multi	False	False	1	0	46

Clock Time Properties DataSet

UtcOffset	Valid	leap59	leap61	Time Trac	Freq Trac	ptp Time Scale	Time Source
0	False	False	False	False	False	True	160

Filter Parameters

Filter Type	Delay Filter	Period	Dist
Basic	6	1	2

Servo Parameters

Display	P-enable	I-enable	D-enable	'P' constant	'I' constant	'D' constant
False	True	True	True	3	80	40

IEEE1588 PTP BOUNDARY CLOCK CONFIGURATION

1) Navigate to – “Configuration > PTP” then click “Add new PTP clock”

PTP External Clock Mode

One_PPS_Mode	Output
External Enable	False
Adjust Method	LTC frequency
Clock Frequency	1

PTP Clock Configuration

Delete	Clock Instance	Device Type	Profile
	No Clock Instances Present		

Add New PTP Clock | Save | Reset

2) Select “Ord-bound” as below and then click “Save”

PTP External Clock Mode

One_PPS_Mode	Output
External Enable	False
Adjust Method	LTC frequency
Clock Frequency	1

PTP Clock Configuration

Delete	Clock Instance	Device Type	Profile
☐	0	Ord-Bound	No Profile

Add New PTP Clock | Save | Reset

3) Click the circled “0” (below "Clock Instance") to get to the main PTP configuration page. Change the settings below to meet your requirement. Example below for AES67. Click “Save” at the bottom of the page when complete.

PTP Clock's Configuration and Status

Clock Type and Profile

Clock Instance	Device Type	Profile	Apply Profile Defaults
0	Ord-Bound	No Profile	n/a

Port Enable and Configuration

Port Enable										Configuration
1	2	3	4	5	6	7	8	9	10	Ports Configuration >>>>>>
☑	☑	☑	☑	☑	☑	☑	☑	☐	☐	

4) Click on “Port Configuration” as shown below to get to the port settings, including message rates

Configuration
Ports Configuration

Local Clock Current Time

PTP Time	Clock Adjustment method	Synchronize to System Clock
1970-01-01T00:09:13+00:00 655,202,140	Internal Timer	Synchronize to System Clock

Clock Current DataSet

stpRm	Offset From Master	Mean Path Delay
0	0.000,000,000	0.000,000,000

Clock Parent DataSet

Parent Port ID	Port	PStat	Var	Rate	GrandMaster ID	GrandMaster Clock Quality	Pri1	Pri2
00:50:c2:ff:fe:39:e6:8c	0	False	0	0	00:50:c2:ff:fe:39:e6:8c	Cl:251 Ac:Unknwn Va:65535	128	128

Clock Default DataSet

ClockId	Device Type	2 Step Flag	Ports	Clock Identity	Dom	Clock Quality
0	Ord-Bound	True	10	00:50:c2:ff:fe:39:e6:8c	0	Cl:251 Ac:Unknwn Va:65535

Pri1	Pri2	Protocol	One-Way	VLAN Tag Enable	VID	PCP	DSCP
128	128	IPv4Multi	False	False	1	0	0

Clock Time Properties DataSet

UtcOffset	Valid	leap59	leap61	Time Trac	Freq Trac	ptp Time Scale	Time Source
37	False	False	False	False	False	True	160

Filter Parameters

Filter Type	Delay Filter	Period	Dist
Basic	6	1	2

Servo Parameters

Display	P-enable	I-enable	D-enable	'P' constant	'I' constant	'D' constant
False	True	True	True	3	80	40

Note: *Some GPS Grandmasters (GM’s) use a default UTC of “37”. GM’s with no GPS will likely use “0”. Please check with your GM provider to match settings.*

5) Edit the ports to meet your requirement (values in logarithmic scale).

"Anv" is announce rate.
"ATo" is announce timeout
"Syv" is Sync rate
"MPR" is Minimum Delay Request Interval

Log value	Message rate
2	4 sec or 1 message every 4 seconds
1	2 sec or 1 message every 2 seconds
0	1 sec or 1 message every second
-1	1/2 sec or 2 message every second
-2	1/4 sec or 4 message every second
-3	1/8 sec or 8 message every second

PTP Clock's Port Data Set Configuration

Port	Stat	MDR	PeerMeanPathDel	Anv	ATo	Syv	Dlm	MPR	Delay Asymmetry	Ingress Latency	Egress Latency	Version
1	mstr	3	0.000,000,000	1	3	-3	e2e	-3	0	0	0	2
2	dsbl	3	0.000,000,000	1	3	-3	e2e	-3	0	0	0	2
3	dsbl	3	0.000,000,000	1	3	-3	e2e	-3	0	0	0	2
4	dsbl	3	0.000,000,000	1	3	-3	e2e	-3	0	0	0	2
5	dsbl	3	0.000,000,000	1	3	-3	e2e	-3	0	0	0	2
6	dsbl	3	0.000,000,000	1	3	-3	e2e	-3	0	0	0	2
7	dsbl	3	0.000,000,000	1	3	-3	e2e	-3	0	0	0	2
8	dsbl	3	0.000,000,000	1	3	-3	e2e	-3	0	0	0	2

Save Reset

6) Click "Save"

7) To check the PTP setup go to "Monitor > PTP" and click on the Circled "0".

PTP External Clock Mode

One_PPS_Mode	Output
External Enable	False
Adjust Method	LTC frequency
Clock Frequency	1

PTP Clock Configuration

		Port List								
Inst	Device Type	1	2	3	4	5	6	7	8	9	10
0	Ord-Bound	v	v	v	v	v	v	v	v		

SAVING CONFIGURATION

Navigate to – "Maintenance > Configuration > Save Startup-config" then click "Save Configuration". This will save your profile to the boot memory, **failure to do this will result in the loss of configuration after a power cycle.**

Note: This document and associated profile is based on software version Quarra1G.3.65.1.2.

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