

Introduction

Ethernet Synchronous Message Channel (ESMC) is a logical communication channel which transmits Synchronous Status Message (SSM) information which is the quality level of the transmitting synchronous Ethernet Equipment Clock (EEC). ESMC support is based on the G.8264 specification. SyncESMC is the implementation of Synchronous Ethernet (Sync-E), according to ITU-T G.8264 (03/2018) and ITU-T G.781 (04/2020) standards.

Docker Image

```
docker pull syncmonk/syncesmc:v1.0-beta
```

Commands to run Docker Image

Launch the docker container

```
docker run --network host -v <local config file path>:/usr/bin/config.yml -  
itd syncmonk/syncesmc:v1.0-beta syncESMC -f config.yml
```

Get the shell for CLI

```
docker exec -it <container_name> /bin/bash
```

Docker snapshots

```
C:\Users>docker exec -it 241325d0c55f /bin/bash

SyncESMC

ESMC implementation as per ITU-T G.8264 (03/2018) and ITU-T G.781 (04/2020)
This is a beta-release and should be used for evaluation purpose only.
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syncESMC> show version
SyncMonk Technologies Private Limited
Copyright (c) 2022 by SyncMonk Technologies
SyncESMC(tm) Version v1.0_beta
Compiled Oct 13 2022 09:07:41
```

```
syncESMC> show running-config logging
```

logging	Value
logging_level	LOG_INFO
use_syslog	ENABLE
msg_tag	syncESMC
use_stdout	ENABLE

```
syncESMC> show running-config device
```

device	dev0
device_id	0
enable	ENABLE
source_select_mode	PRI0
network_option	OPTION_1
enhanced_esmc	DISABLE
holdover_ql	QL_Ssu_A
holdover_time	10
ql_mode	ENABLE
forced_ql_en	DISABLE
forced_ql	QL_DNU
ql_exact_match	ENABLE
num_accepted_ql	3
accepted_ql	['QL_SEC', 'QL_PRC', 'QL_Ssu_A']
rx_heartbeat_ms	1100
tx_heartbeat_ms	1000
clock_select_mode	1
clock_local_ql	QL_Ssu_B
squelch	DISABLE
wait_to_start	10
hardware_monitor_ms	2000
num_pg	0
max_in_ports_pg	0
max_out_pg	0

```
syncESMC> show running-config port
```

dev0/eth0	Config
enable	ENABLE
device_id	0
port_name	eth0
priority	1
input_mode	LINE
holdoff_time_ms	5000
wait_to_restore_time	10
pll_id	1
pll_input	1
clock_id	0
transmit_mode	RX_TX
input_ql	None
port_group	0

dev0/gnss0	Config
enable	ENABLE
device_id	0
port_name	gnss0
priority	2
input_mode	EXTERNAL
holdoff_time_ms	300
wait_to_restore_time	10
pll_id	1
pll_input	1
clock_id	0
transmit_mode	NONE
input_ql	QL_PRC
port_group	0

```
syncESMC> show clock state
```

Attribute	Status
clock_state	SYNCHRONIZED
gnss_clock	ENABLE
synchronized_port	gnss0
clock_source	SOURCE_GNSS
clock_ql	QL_PRC

```
syncESMC> show port state
```

Attribute	Status
port_name	eth0
link_state	LINK UP
source_state	READY
recovery_reasons	NO_RECOVERY
holdover_reason	NO_HOLDOVER
accepted_ssm_code	None
rx_pkt	0
tx_pkt	44
last_rx_ssm	None
last_tx_ssm	QL_PRC
rx_timestamp	0.0
hardware_events	None

Attribute	Status
port_name	gnss0
link_state	LINK UP
source_state	LOCKED
recovery_reasons	NO_RECOVERY
holdover_reason	NO_HOLDOVER
accepted_ssm_code	QL_PRC
rx_pkt	0
tx_pkt	0
last_rx_ssm	QL_PRC
last_tx_ssm	None
rx_timestamp	0.0
hardware_events	None

```
syncESMC> show log-messages all
[syncESMC][9506.533]:[INFO] [Logger configuration]
[syncESMC][9506.533]:[INFO] logging_level: 6
[syncESMC][9506.534]:[INFO] use_syslog: 1
[syncESMC][9506.534]:[INFO] message_tag: syncESMC
[syncESMC][9506.534]:[INFO] use_stdout: 1
[syncESMC][9506.534]:[INFO] [System configuration]
[syncESMC][9506.534]:[INFO] ptp_uds_address: /var/run/syncEsmcPTP
[syncESMC][9506.534]:[INFO] interval: 10
[syncESMC][9506.534]:[INFO] [Device configuration]
[syncESMC][9506.534]:[INFO] device: 0
[syncESMC][9506.535]:[INFO] device_enable: 1
[syncESMC][9506.535]:[INFO] source_sel_mode: PRIORITY
[syncESMC][9506.535]:[INFO] network_option: OPTION_1
[syncESMC][9506.535]:[INFO] enhanced_esmc: 0
[syncESMC][9506.535]:[INFO] holdover_q1: QL_SSU_A
[syncESMC][9506.535]:[INFO] holdover_time: 10
[syncESMC][9506.535]:[INFO] q1_mode: 1
[syncESMC][9506.535]:[INFO] forced_q1_en: 0
[syncESMC][9506.535]:[INFO] forced_q1: QL_DNU
[syncESMC][9506.535]:[INFO] q1_exact_match: 1
[syncESMC][9506.535]:[INFO] accepted_q1: QL_SEC
[syncESMC][9506.535]:[INFO] accepted_q1: QL_PRC
[syncESMC][9506.535]:[INFO] accepted_q1: QL_SSU_A
[syncESMC][9506.535]:[INFO] tx_heartbeat_ms: 1000
[syncESMC][9506.535]:[INFO] rx_heartbeat_ms: 1100
[syncESMC][9506.535]:[INFO] clock_sel_mode: PLL
[syncESMC][9506.535]:[INFO] clock_local_q1: QL_SSU_B
[syncESMC][9506.535]:[INFO] squelch: 0
[syncESMC][9506.535]:[INFO] wait_to_start: 10
[syncESMC][9506.535]:[INFO] hardware_monitor_ms: 2000
[syncESMC][9506.535]:[INFO] [device: 0] PLL initialized
[syncESMC][9506.535]:[INFO] [Port configuration]
[syncESMC][9506.535]:[INFO] [eth0]
[syncESMC][9506.535]:[INFO] device: 0
[syncESMC][9506.535]:[INFO] port_enable: 1
[syncESMC][9506.535]:[INFO] priority: 1
[syncESMC][9506.535]:[INFO] input_mode: LINE
[syncESMC][9506.535]:[INFO] holdoff_time_ms: 5000
[syncESMC][9506.535]:[INFO] wait_to_restore_time: 10
[syncESMC][9506.535]:[INFO] pll_id: 1
[syncESMC][9506.535]:[INFO] pll_input: 1
[syncESMC][9506.535]:[INFO] clock_id: 0
[syncESMC][9506.535]:[INFO] transmit_mode: RXTX
[syncESMC][9506.628]:[INFO] [eth0] Link UP
[syncESMC][9506.629]:[INFO] [gnss0]
[syncESMC][9506.629]:[INFO] device: 0
[syncESMC][9506.629]:[INFO] port_enable: 1
[syncESMC][9506.629]:[INFO] priority: 2
[syncESMC][9506.629]:[INFO] input_mode: EXTERNAL
[syncESMC][9506.629]:[INFO] holdoff_time_ms: 300
[syncESMC][9506.629]:[INFO] wait_to_restore_time: 10
[syncESMC][9506.629]:[INFO] pll_id: 1
[syncESMC][9506.629]:[INFO] pll_input: 1
[syncESMC][9506.629]:[INFO] clock_id: 0
[syncESMC][9506.629]:[INFO] input_q1: QL_PRC
```

Configuration files

a. SyncESMC Slave - Dual RXTX Ports

```
logging:
  logging_level: 6
  use_syslog: 1
  message_tag: syncESMC
  use_stdout: 1

system:
  ptp_uds_address: /var/run/syncEsmcPTP
  interval: 10

device:
  0:
    device_enable: 1
    source_sel_mode: AUTO
    network_option: OPTION_1
    enhanced_esmc: 0
    holdover_ql: QL_SSU_A
    holdover_time: 10
    ql_mode: 1
    forced_ql_en: 0
    forced_ql: QL_DNU
    ql_exact_match: 1
    accepted_ql:
      - QL_PRC
    tx_heartbeat_ms: 1000
    rx_heartbeat_ms: 1100
    clock_sel_mode: PLL
    clock_local_ql: QL_SSU_B
    squelch: 0
    wait_to_start: 10
    hardware_monitor_ms: 2000

port:
  0:
    enp0s8:
      port_enable: 1
      priority: 1
      input_mode: LINE
      holdoff_time_ms: 5000
      wait_to_restore_time: 10
      pll_id: 1
      pll_input: 1
      clock_id: 0
      transmit_mode: RXTX
    enp0s9:
      port_enable: 1
      priority: 2
      input_mode: LINE
      holdoff_time_ms: 5000
      wait_to_restore_time: 10
      pll_id: 1
      pll_input: 1
      clock_id: 0
      transmit_mode: RXTX
```

b. SyncESMC Master- TX Port + External GNSS Source)

```
logging:
  logging_level: 6
  use_syslog: 1
  message_tag: syncESMC
  use_stdout: 1
system:
  ptp_uds_address: /var/run/syncEsmcPTP
  interval: 10
device:
  0:
    device_enable: 1
    source_sel_mode: AUTO
    network_option: OPTION_1
    enhanced_esmc: 0
    holdover_ql: QL_SSU_A
    holdover_time: 10
    ql_mode: 1
    forced_ql_en: 0
    forced_ql: QL_DNU
    ql_exact_match: 1
    accepted_ql:
      - QL_PRC
    tx_heartbeat_ms: 1000
    rx_heartbeat_ms: 1100
    clock_sel_mode: PLL
    clock_local_ql: QL_PRC
    squelch: 0
    wait_to_start: 10
    hardware_monitor_ms: 2000
port:
  0:
    enp0s8:
      port_enable: 1
      priority: 1
      input_mode: LINE
      holdoff_time_ms: 5000
      wait_to_restore_time: 10
      pll_id: 1
      pll_input: 1
      clock_id: 0
      transmit_mode: TX
    gnss0:
      port_enable: 1
      priority: 2
      input_mode: EXTERNAL
      holdoff_time_ms: 300
      wait_to_restore_time: 10
      pll_id: 1
      pll_input: 1
      clock_id: 0
      input_ql: QL_PRC
```


c. SyncESMC RX TX port

```
logging:
  logging_level: 6
  use_syslog: 1
  message_tag: syncESMC
  use_stdout: 1
system:
  ptp_uds_address: /var/run/syncEsmcPTP
  interval: 10
device:
  0:
    device_enable: 1
    source_sel_mode: AUTO
    network_option: OPTION_1
    enhanced_esmc: 0
    holdover_ql: QL_SSU_A
    holdover_time: 10
    ql_mode: 1
    forced_ql_en: 0
    forced_ql: QL_DNU
    ql_exact_match: 1
    accepted_ql:
      - QL_PRC
    tx_heartbeat_ms: 1000
    rx_heartbeat_ms: 1100
    clock_sel_mode: PLL
    clock_local_ql: QL_PRC
    squelch: 0
    wait_to_start: 10
    hardware_monitor_ms: 2000
port:
  0:
    enp0s8:
      port_enable: 1
      priority: 1
      input_mode: LINE
      holdoff_time_ms: 5000
      wait_to_restore_time: 10
      pll_id: 1
      pll_input: 1
      clock_id: 0
      transmit_mode: RXTX
```

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