ZebOS-XP PTP SMI Reference

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Generated by Doxygen 1.6.1

Wed Dec 16 12:33:26 2015

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1.1 File List

Here is a list of all documented files with brief descriptions:

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File Documentation

2.1 smi_ptp.h File Reference

Provides APIs for the configuration and moniroting of Precision Time Protocol (PTP) implementation by ZebOS. `#include "smi_client.h"`

`#include "smi_ptp_msg.h"`

Functions

- s_int32_t smi_ptp_api_enable_bridge_global (struct smiclient_globals *azg, char *br_name)

  Enables PTP on a bridge.

- s_int32_t smi_ptp_api_disable_bridge_global (struct smiclient_globals *azg, char *br_name)

  Disables PTP on a bridge.

- int smi_ptp_api_create_clock (struct smiclient_globals *azg, char *br_name, u_int8_t clk_type, u_int8_t transport_type, u_int8_t delay_mechanism)

  Creates a PTP clock and specify clock states.

- s_int32_t smi_ptp_api_clock_slave_only_enable (struct smiclient_globals *azg, char *ifname)

  Enable salve-only mode for a clock.

- s_int32_t smi_ptp_api_clock_slave_only_disable (struct smiclient_globals *azg, char *ifname)

  Disable salve-only mode for a clock.

- int smi_ptp_api_set_clock_priority1 (struct smiclient_globals *azg, char *br_name, char *ifname, u_int8_t priority1)

Sets the priority1 value of the clock. PTP uses priority1 and priority2 values to determine the best master clock in a domain.

- int smi_ptp_api_set_clock_priority2 (struct smiclient_globals *azg, char *br_name, char *ifname, u_int8_t priority2)

  Sets the priority2 value of the clock. PTP uses priority1 and priority2 values to determine the best master clock in a domain.

- int smi_ptp_api_clock_port_create (struct smiclient_globals *azg, char *ifname, u_int8_t transport_type)

  Use this API to enable PTP on an interface.

- int smi_ptp_api_fault_recover (struct smiclient_globals *azg, char *ifname)

  Change the port state from faulty to listening.

- int smi_ptp_api_set_delay_req_interval (struct smiclient_globals *azg, char *ifname, u_int8_t delay_interval)

  Sets the propagation delay measuring interval.

- int smi_ptp_api_set_sync_interval (struct smiclient_globals *azg, char *ifname, s_int8_t sync_interval)

  Sets the mean time in seconds between clock synchronization messages. Master clocks transmit synchronization messages to their slaves. This value is the logarithm to the base 2 of the mean time in seconds between successive clock synchronization messages.

- int smi_ptp_api_set_qualification_timer (struct smiclient_globals *azg, char *ifname, s_int8_t qual_interval)

  Sets the number of announce intervals that a clock spends in the PRE_MASTER state allowing changes to propagate from possible masters visible from the port.

- int smi_ptp_api_set_announce_interval (struct smiclient_globals *azg, char *ifname, s_int8_t announce_interval)

  Sets the interval for announce messages with status and characterization information about the transmitting device. The receiver uses this information to determine the best master clock. This value is the logarithm to the base 2 of the mean time between successive announce messages.

- int smi_ptp_api_unicast_disable (struct smiclient_globals *azg, char *ifname)

  Disable PTP unicast on an interface.

- int smi_ptp_api_unicast_enable (struct smiclient_globals *azg, char *ifname, s_int16_t max_table_size)

  Enable PTP unicast on an interface.

- int smi_ptp_api_unicast_neighbor_add_ethernet (struct smiclient_globals *azg, char *ifname, char *addr)

  Add a unicast neighbor.

- int smi_ptp_api_unicast_neighbor_add_udpV4 (struct smiclient_globals *azg, char *ifname, char *addr)

  Add a unicast neighbor.

- int smi_ptp_api_unicast_neighbor_add_udpV6 (struct smiclient_globals *azg, char *ifname, char *addr)

  Add a unicast neighbor.

- int smi_ptp_api_unicast_neighbor_del_ethernet (struct smiclient_globals *azg, char *ifname, char *addr)

  Removes a unicast neighbor.

- int smi_ptp_api_unicast_neighbor_del_udpV4 (struct smiclient_globals *azg, char *ifname, char *addr)

  Removes a unicast neighbor.

- int smi_ptp_api_unicast_neighbor_del_udpV6 (struct smiclient_globals *azg, char *ifname, char *addr)

  Removes a unicast neighbor.

- int smi_ptp_api_unicast_neighbor_del_all (struct smiclient_globals *azg, char *ifname)

  Removes all unicast neighbor.

- int smi_ptp_delete_port_sdkapi (struct smiclient_globals *azg, char *ifname)

  Delete PTP on a particular interface.

- int smi_ptp_api_enable_syntonization (struct smiclient_globals *azg, u_int32_t sync_msg_count)

  Syntonize the clock which adjusts the local clock's signal to match the frequency of the master clock. Two clock's are syntonized if the duration of the second is same on both, which means the time as measured by each advances at the same rate.

- int smi_ptp_api_disable_syntonization (struct smiclient_globals *azg, u_int32_t sync_msg_coun)

  Disable syntonization.

2.1.1 Detailed Description

Provides APIs for the configuration and moniroting of Precision Time Protocol (PTP) implementation by ZebOS. Precision Time Protocol(PTP), as specified in IEEE standard 1588-2008, is a distributed protocol that specifies how real time clocks in the system synchronize with each other. PTP operates within a logical scope called a domain. The clocks are organized in a master-slave synchronization hierarchy. The grandmaster clock is at the top of the heirarchy and determines the reference time for the entire

system. Slaves use the timing information to adjust their clocks to match the time of their master in the heirarchy. Clocks are synchronized by exchanging messages.

2.1.2 Function Documentation

2.1.2.1 int smi_ptp_api_clock_port_create (struct smiclient_globals * *azg*, char * *ifname*, u_int8_t *transport_type*)

Use this API to enable PTP on an interface. smi_ptp_api_clock_port_create

Parameters:

← ***azg*** Pointer to the SMI client global structure

← ***ifname*** Interface name

← ***transport_type*** Transport Type, can be one of the following
0 - PTP_ETHER
1 - PTP_UDP_V4
2 - PTP_UDP_V6

Returns:

0 on success, -1 on error

2.1.2.2 s_int32_t smi_ptp_api_clock_slave_only_disable (struct smiclient_globals * *azg*, char * *ifname*)

Disable salve-only mode for a clock. smi_ptp_api_clock_slave_only_disable

Parameters:

← ***azg*** Pointer to the SMI client global structure

← ***ifname*** Interface name

Returns:

0 on success, -1 on error

2.1.2.3 s_int32_t smi_ptp_api_clock_slave_only_enable (struct smiclient_globals * *azg*, char * *ifname*)

Enable salve-only mode for a clock. smi_ptp_api_clock_slave_only_enable

Parameters:

← ***azg*** Pointer to the SMI client global structure

← ***ifname*** Interface name

Returns:

0 on success, -1 on error

2.1.2.4 int smi_ptp_api_create_clock (struct smiclient_globals * *azg*, char * *br_name*, u_int8_t *clk_type*, u_int8_t *transport_type*, u_int8_t *delay_mechanism*)

Creates a PTP clock and specify clock states. smi_ptp_api_create_clock

Parameters:

← ***azg*** Pointer to the SMI client global structure

← ***br_name*** Bridge name

← ***clk_type*** Clock Type, can be one of the following
0 - PTP_ORDINARY_CLOCK
1 - PTP_BOUNDARY_CLOCK
2 - PTP_TRANSPARENT_CLOCK

← ***transport_type*** Transport Type, can be one of the following
0 - PTP_ETHER
1 - PTP_UDP_V4
2 - PTP_UDP_V6

← ***delay_mechanism*** Propagation delay measuring option
1 - E2E
2 - P2P

Returns:

0 on success, -1 on error

2.1.2.5 s_int32_t smi_ptp_api_disable_bridge_global (struct smiclient_globals * *azg*, char * *br_name*)

Disables PTP on a bridge. smi_ptp_api_disable_bridge_global

Parameters:

← ***azg*** Pointer to the SMI client global structure

← ***br_name*** Bridge name on which PTP needs to be disabled

Returns:

0 on success, otherwise one of the following error codes
PTP_ERR_GENERIC
PTP_ERR_BRIDGE_NOT_FOUND PTP_ERR_PTP_NOT_ENABLED

2.1.2.6 int smi_ptp_api_disable_syntonization (struct smiclient_globals * *azg*, u_int32_t *sync_msg_coun*)

Disable syntonization. smi_ptp_api_disable_syntonization

Parameters:

← ***azg*** Pointer to the SMI client global structure

← ***sync_msg_count*** Number of sync messages after which syntonization is done. <50-500>

Returns:

0 on success, -1 on error

2.1.2.7 s_int32_t smi_ptp_api_enable_bridge_global (struct smiclient_globals * *azg*, char * *br_name*)

Enables PTP on a bridge. smi_ptp_api_enable_bridge_global

Parameters:

← ***azg*** Pointer to the SMI client global structure

br_name Bridge name on which PTP needs to be enabled

Returns:

0 on success, otherwise one of the following error codes
PTP_BRIDGE_NOT_FOUND
PTP_INTERFACE_NOT_FOUND
PTP_INTERFACE_ENABELED_NO_PORT_DATA
PTP_MEMORY_ALLOC
PTP_PORT_NOT_FOUND
PTP_CLOCK_NOT_FOUND

2.1.2.8 int smi_ptp_api_enable_syntonization (struct smiclient_globals * *azg*, u_int32_t *sync_msg_count*)

Syntonize the clock which adjusts the local clock's signal to match the frequency of the master clock. Two clock's are syntonized if the duration of the second is same on both, which means the time as measured by each advances at the same rate. smi_ptp_-api_enable_syntonization

Parameters:

← ***azg*** Pointer to the SMI client global structure

← ***sync_msg_count*** Number of sync messages after which syntonization is done. <50-500>

Returns:

0 on success, -1 on error

2.1.2.9 int smi_ptp_api_fault_recover (struct smiclient_globals * *azg*, char * *ifname*)

Change the port state from faulty to listening. smi_ptp_api_fault_recover

Parameters:

← ***azg*** Pointer to the SMI client global structure

← ***br_name*** Bridge name

← ***ifname*** Interface name

Returns:

0 on success, -1 on error

2.1.2.10 int smi_ptp_api_set_announce_interval (struct smiclient_globals * *azg*, char * *ifname*, s_int8_t *announce_interval*)

Sets the interval for announce messages with status and characterization information about the transmitting device. The receiver uses this information to determine the best master clock. This value is the logarithm to the base 2 of the mean time between successive announce messages. smi_ptp_api_set_announce_interval

Parameters:

← ***azg*** Pointer to the SMI client global structure

← ***ifname*** Interface name

← ***announce_interval*** the value of announce interval to be set

Returns:

0 on success, -1 on error

2.1.2.11 int smi_ptp_api_set_clock_priority1 (struct smiclient_globals * *azg*, char * *br_name*, char * *ifname*, u_int8_t *priority1*)

Sets the priority1 value of the clock. PTP uses priority1 and priority2 values to determine the best master clock in a domain. smi_ptp_api_set_clock_priority1

Parameters:

← ***azg*** Pointer to the SMI client global structure

← ***br_name*** Bridge name

← ***ifname*** Interface name

← ***priority1*** Priority1 value, <0-255>. Lower the value, higher the priority

Returns:

0 on success, -1 on error

2.1.2.12 int smi_ptp_api_set_clock_priority2 (struct smiclient_globals * *azg*, char * *br_name*, char * *ifname*, u_int8_t *priority2*)

Sets the priority2 value of the clock. PTP uses priority1 and priority2 values to determine the best master clock in a domain. smi_ptp_api_set_clock_priority2

Parameters:

← ***azg*** Pointer to the SMI client global structure

← ***br_name*** Bridge name

← ***ifname*** Interface name

← ***priority2*** Priority2 value, <0-255>. Lower the value, higher the priority.

Returns:

0 on success, -1 on error

2.1.2.13 int smi_ptp_api_set_delay_req_interval (struct smiclient_globals * *azg*, char * *ifname*, u_int8_t *delay_interval*)

Sets the propagation delay measuring interval. smi_ptp_api_set_delay_req_interval

Parameters:

← ***azg*** Pointer to the SMI client global structure

← ***ifname*** Interface name

← ***delay_interval*** Delay request interval in seconds, log base 2 <0-5>

Returns:

0 on success, -1 on error

2.1.2.14 int smi_ptp_api_set_qualification_timer (struct smiclient_globals * *azg*, char * *ifname*, s_int8_t *qual_interval*)

Sets the number of announce intervals that a clock spends in the PRE_MASTER state allowing changes to propagate from possible masters visible from the port. smi_ptp_api_set_qualification_timer

Parameters:

← ***azg*** Pointer to the SMI client global structure

← ***ifname*** Interface name

← ***qual_interval*** The value of qualification_interval to be set

Returns:

0 on success, -1 on error

2.1.2.15 int smi_ptp_api_set_sync_interval (struct smiclient_globals * *azg*, char * *ifname*, s_int8_t *sync_interval*)

Sets the mean time in seconds between clock synchronization messages. Master clocks transmit synchronization messages to their slaves. This value is the logarithm to the base 2 of the mean time in seconds between successive clock synchronization messages. smi_ptp_api_set_sync_interval

Parameters:

← ***azg*** Pointer to the SMI client global structure

← ***ifname*** Interface name

← ***sync_interval*** The value of synchronization interval in seconds to be set

Returns:

0 on success, -1 on error

2.1.2.16 int smi_ptp_api_unicast_disable (struct smiclient_globals * *azg*, char * *ifname*)

Disable PTP unicast on an interface. smi_ptp_api_unicast_disable

Parameters:

← ***azg*** Pointer to the SMI client global structure

← ***ifname*** Interface name

Returns:

0 on success, -1 on error

2.1.2.17 int smi_ptp_api_unicast_enable (struct smiclient_globals * *azg*, char * *ifname*, s_int16_t *max_table_size*)

Enable PTP unicast on an interface. smi_ptp_api_unicast_enable

Parameters:

← ***azg*** Pointer to the SMI client global structure

← ***ifname*** Interface name

← ***max_table_size*** Maximum size of the unicast neighbor table

Returns:

0 on success, -1 on error

2.1.2.18 int smi_ptp_api_unicast_neighbor_add_ethernet (struct smiclient_globals * *azg*, char * *ifname*, char * *addr*)

Add a unicast neighbor. smi_ptp_api_unicast_neighbor_add_ethernet

Parameters:

← ***azg*** Pointer to the SMI client global structure

← ***ifname*** Interface name

← ***addr*** Neighbor address to be added

Returns:

0 on success, -1 on error

2.1.2.19 int smi_ptp_api_unicast_neighbor_add_udpV4 (struct smiclient_globals * *azg*, char * *ifname*, char * *addr*)

Add a unicast neighbor. smi_ptp_api_unicast_neighbor_add_udpV4

Parameters:

← ***azg*** Pointer to the SMI client global structure

← ***ifname*** Interface name

← ***addr*** Neighbor address to be added

Returns:

0 on success, -1 on error

2.1.2.20 int smi_ptp_api_unicast_neighbor_add_udpV6 (struct smiclient_globals * *azg*, char * *ifname*, char * *addr*)

Add a unicast neighbor. smi_ptp_api_unicast_neighbor_add_udpV6

Parameters:

← ***azg*** Pointer to the SMI client global structure

← ***ifname*** Interface name

← ***addr*** Neighbor address to be added

Returns:

0 on success, -1 on error

2.1.2.21 int smi_ptp_api_unicast_neighbor_del_all (struct smiclient_globals * *azg*, char * *ifname*)

Removes all unicast neighbor. smi_ptp_api_unicast_neighbor_del_all

Parameters:

← ***azg*** Pointer to the SMI client global structure

← ***ifname*** Interface name

← ***addr*** Neighbor address to be removed

Returns:

0 on success, -1 on error

2.1.2.22 int smi_ptp_api_unicast_neighbor_del_ethernet (struct smiclient_globals * *azg*, char * *ifname*, char * *addr*)

Removes a unicast neighbor. smi_ptp_api_unicast_neighbor_del_ethernet

Parameters:

← ***azg*** Pointer to the SMI client global structure

← ***ifname*** Interface name

← ***addr*** Neighbor address to be removed

Returns:

0 on success, -1 on error

2.1.2.23 int smi_ptp_api_unicast_neighbor_del_udpV4 (struct smiclient_globals * *azg*, char * *ifname*, char * *addr*)

Removes a unicast neighbor. smi_ptp_api_unicast_neighbor_del_udpV4

Parameters:

← ***azg*** Pointer to the SMI client global structure

← ***ifname*** Interface name

← ***addr*** Neighbor address to be removed

Returns:

0 on success, -1 on error

2.1.2.24 int smi_ptp_api_unicast_neighbor_del_udpV6 (struct smiclient_globals * *azg*, char * *ifname*, char * *addr*)

Removes a unicast neighbor. smi_ptp_api_unicast_neighbor_del_udpV6

Parameters:

← ***azg*** Pointer to the SMI client global structure

← ***ifname*** Interface name

← ***addr*** Neighbor address to be removed

Returns:

0 on success, -1 on error

2.1.2.25 int smi_ptp_delete_port_sdkapi (struct smiclient_globals * *azg*, char * *ifname*)

Delete PTP on a particular interface. smi_ptp_delete_port_sdkapi

Parameters:

← ***azg*** Pointer to the SMI client global structure

← ***ifname*** Interface name

Returns:

0 on success, -1 on error

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