

Intel[®] 6300ESB I/O Controller Watchdog Timer Driver Specification

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Introduction

This document covers the Intel® 6300ESB I/O Controller Watchdog Timer Driver. A basic familiarity with Windows device driver concepts is assumed. The Intel Watchdog Timer (WDT) driver is a kernel mode driver designed run on Microsoft Windows NT*, Windows 2000* and Windows XP* platforms and provide OS base control of the CICH2 Watchdog Timer device. In the event of a lockup condition, the watchdog device can signal the platform using an interrupt mechanism or, if necessary, reboot the platform.

Scope

This specification describes the WDT Driver Architecture and IOCTL device codes that are used to control the driver from a user mode program. This document will describe how the watchdog device is integrated into the following components and operating systems:

- Intel I/O Control Hub (CICH2) based chipsets.
- Microsoft Windows 2000 and Microsoft Windows XP families.

Supporting Documents

- *Windows XP 2600 DDK*
- *Windows Platform SDK*
- *Intel wdt api.DOC*

Interface of Driver

The device driver has a named device object that can be accessed through the symbolic link "\.\\SAWD1". Applications can access the driver by first obtaining a device handle, by calling *CreateFile()* with the file name "\.\\SAWD1". This will cause the symbolic link to be accessed and cause an IRP to be passed to the driver. On success, the handle can be used with *DeviceIoControl()* to direct IOCTL calls to the driver.

The driver supports the following IOCTLs, which are accessed in the IRP_MJ_DEVICE_CONTROL dispatch handler.

IOCTL_ENABLE_WDT	Start timer counting down
IOCTL_DISABLE_WDT	Stop timer from counting down
IOCTL_LOAD_COUNTER	Load the counters
IOCTL_PING_THE_WDT	Ping the Timer to prevent timeout
IOCTL_SET_PRESEALAR	Select presecalar to use
IOCTL_READ_DOWN_COUNTER	Read current count in down counter
IOCTL_SET_EXTERNAL_OUT	Enable/disable the output pin if Stage 2 times out
IOCTL_LOCK_DEVICE	Lock WDT to prevent changes
IOCTL_ROUTE_INTERRUPT	Select how the Stage 1 interrupt will be handled.
IOCTL_WRITE_CONFIG	Low-level configuration control
IOCTL_USER_HANDLE	Obtain kernel pointer to user-mode event handle.
IOCTL_INTR_CONNECT	Manually connect driver to interrupt logic



IOCTL_GET_STATUS	Return misc. device status bits
IOCTL_SET_MODE	Select either Watchdog or Free running timer
IOCTL_GET_TIMEOUT_STATUS	Check if Timeout occurred

IWDTLIB.DLL Interface

The IWDTLIB.DLL is a dynamic link library packaged with the Watchdog driver that provides a high-level interface to control the Watchdog driver from a Windows ring 3 application. The import library IWDTLIB.LIB is provided to link the DLL to a user application. In addition, the header file wdt.h is also provided.

The following APIs can be imported into your application. Refer to Intelwdt api. for full details on the use of the IWDTLIB library and coding examples.

WDT_IMPORT HANDLE	WdtInitLibrary(PWDT);
WDT_IMPORT HANDLE	WdtGetDeviceHandle();
WDT_IMPORT HANDLE	WdtGetStatus(HANDLE <i>wdHandle</i> , SAWD_CTRL *);
WDT_IMPORT ULONG	WdtGetDriverVersion(HANDLE);
WDT_IMPORT ULONG	WdtGetLibraryVersion(VOID);
WDT_IMPORT BOOL	WdtGetCapabilities(HANDLE);
WDT_IMPORT BOOL	WdtSetPreloadValues(HANDLE,WDT);
WDT_IMPORT BOOL	WdtPing(HANDLE,ULONG);
WDT_IMPORT BOOL	WdtEnable(HANDLE, bool);
WDT_IMPORT BOOL	WdtLockDevice(HANDLE);
WDT_IMPORT BOOL	WdtStageOneNotify(HANDLE, SIFUNCTPTR);
WDT_IMPORT BOOL	WdtCancelNotify();
WDT_IMPORT int	WdtCheckTimeOutStatus(HANDLE, BOOL);
WDT_IMPORT BOOL	WdtSetPrescaler(HANDLE, ULONG);
WDT_IMPORT BOOL	WdtRouteInterrupt(HANDLE, ULONG);
WDT_IMPORT BOOL	WdtSetMode(HANDLE <i>xhndFile</i> , ULONG);
WDT_IMPORT BOOL	WdtSetOutputEnable(HANDLE, ULONG);

The following structure is used to communicate data from user mode applications to the kernel mode driver.

```
typedef struct _SAWD_CTRL {
    HANDLE          UserEvent; // Handle to a Ring 3 user event
    unsigned long   Version; // version of interface used
    unsigned long   Flags; // flags defined below
    unsigned long   Preload1; // Preload register # 1
    unsigned long   Preload2; // Preload Register # 2
    unsigned long   DownCount; // Holds current down count
    unsigned long   ConfigReg; // 16-bit Configuration register
}
```



```

unsigned short    DeviceStatus; // store device status bits
unsigned short    ReloadReg; // 16-bit reload register
unsigned short    LockReg; // 8-bit Lock register
unsigned long     InterruptCount; // Count of times the stage 1 interrupt has occurred

unsigned short    IRQ;
short             BusType;
unsigned short    BusNumber;

unsigned short    IrqOffset;

} SAWD_CTRL,      *PSAWD_CTRL;

```

Installing the Watchdog Driver

Install the watchdog timer driver using the method described in the release notes documentation file.