TEXAS INSTRUMENTS

Application Note:

Upgrading To Z-Stack v2.0.0

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1.0	Initial release.	03/03/2008

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1. Purpose

This document describes considerations to make when upgrading to Texas Instruments Z-Stack™ version v2.0.0, discussing changes made since the v1.4.3 release of Z-Stack. Primarily, changes have been made to support the ZigBee 2007 specification, including the introduction of ZigBee-Pro. This document discusses changes to the "core" (***ZStack-platform-2.0.0.exe***) and the "full" (***ZStack-platform-2.0.0-1.2.0.exe***) packages, where *platform* refers to CC2430 or EXP461x.

2. Details of Changes

2.1 Support For ZigBee 2007 Specification

Z-Stack has been modified to comply with the new ZigBee 2007 Specification. Significant features that were added to this specification include PanID Conflict Resolution, Frequency Agility, and Fragmentation. Normal ZigBee devices (non-Pro) are built using the same sample applications and configuration settings as found in Z-Stack v1.4.3.

2.2 Support For ZigBee-Pro

Z-Stack has been enhanced to provide new features used for ZigBee-Pro, such as Stochastic Addressing, Many-To-One Routing, Multicast. Existing sample application project files have been modified to add configurations for ZigBee-Pro devices. ZigBee-Pro configurations are identical to their non-Pro counterparts, except for addition of the ZIGBEEPRO compile option and associated libraries. *Note: ZigBee-Pro is not available on the CC2430 platform.*

2.3 Monitor-Test Redesign

The Monitor-Test (MT) component of Z-Stack has been redesigned to present the code in a more modular fashion. In addition to increasing the ease-of-use, this change results in a code size reduction. Note that previous versions of Z-Tool will not work with these MT changes. Install the "full" version of Z-Stack to get the latest version of Z-Tool.

2.4 OSAL_Clock Added

A new OSAL module, OSAL_Clock, was added to provide accurate time keeping (1-second resolution) based on the MAC's 320 μ-second clock tick. See the OSAL API document for details. *Note: this feature does not maintain time for sleeping devices.*

2.5 Changes to Installed Files

Refer to the tables in Sections 2.5.1 and 2.5.2 for file changes to the "core" and "full" installers, respectively. Pay particular attention to items with **NEW** or **REMOVED** in the **Change** column. Folder updates are indicated when there is no entry in the **File** column. Changes to project files (*.ewp and *.ewd) can be made with the IDE or by editing the project files directly. These tables contain entries for all Z-Stack releases – the applicable platform(s) are shown in the **Platform** column.

2.5.1 Changes to "Core" Installed Files

The following "core" Z-Stack files have been changed since the v1.4.3 release:

File	Location	Platform	Change
hal_adc.h	…\Components\hal\include	All	Modified
hal_mcu.h	…\Components\hal\target\CC2430BB	CC2430	Modified
hal_mcu.h	…\Components\hal\target\CC2430DB	CC2430	Modified
hal_mcu.h	…\Components\hal\target\CC2430EB	CC2430	Modified
hal_mcu.h	…\Components\hal\target\EXP461x	EXP461x	Modified
mac_mcu.c	…\Components\mac\low_level\srf03\single_chip	CC2430	Modified
mac_mcu.h	…\Components\mac\low_level\srf03\single_chip	CC2430	Modified
mac_mcu_timer.c	…\Components\mac\low_level\srf03\dual_chip	CC2420	Modified
mac_mcu_timer.h	…\Components\mac\low_level\srf03\dual_chip	CC2420	Modified
DebugTrace.c	…\Components\mt	All	Modified
DebugTrace.h	…\Components\mt	All	Modified

MT.c	…\Components\mt	All	**NEW**
MT.h	…\Components\mt	All	**NEW**
MT_AF.c	…\Components\mt	All	Modified
MT_AF.h	…\Components\mt	All	Modified
MT_APP.c	…\Components\mt	All	**NEW**
MT_APP.h	…\Components\mt	All	**NEW**
MT_APS.c	…\Components\mt	All	**REMOVED**
MT_APS.h	…\Components\mt	All	**REMOVED**
MT_DEBUG.c	…\Components\mt	All	**NEW**
MT_DEBUG.h	…\Components\mt	All	**NEW**
MT_MAC.c	…\Components\mt	All	Modified
MT_MAC.h	…\Components\mt	All	Modified
MT_NWK.c	…\Components\mt	All	Modified
MT_NWK.h	…\Components\mt	All	Modified
MT_RPC.h	…\Components\mt	All	**NEW**
MT_SAPI.c	…\Components\mt	All	Modified
MT_SAPI.h	…\Components\mt	All	Modified
MT_SYS.c	…\Components\mt	All	**NEW**
MT_SYS.h	…\Components\mt	All	**NEW**
MT_TASK.c	…\Components\mt	All	**NEW**
MT_TASK.h	…\Components\mt	All	**NEW**
MT_UART.c	…\Components\mt	All	**NEW**
MT_UART.h	…\Components\mt	All	**NEW**
MT_UTIL.c	…\Components\mt	All	**NEW**
MT_UTIL.h	…\Components\mt	All	**NEW**
MT_VERSION.c	…\Components\mt	All	**NEW**
MT_VERSION.h	…\Components\mt	All	**NEW**
MT_ZDO.c	…\Components\mt	All	Modified
MT_ZDO.h	…\Components\mt	All	Modified
MTEL.c	…\Components\mt	All	**REMOVED**
MTEL.h	…\Components\mt	All	**REMOVED**
SPIMgr.c	…\Components\mt	All	**REMOVED**
SPIMgr.h	…\Components\mt	All	**REMOVED**
OSAL.c	…\Components\osal\common	All	Modified
OSAL_Clock.c	…\Components\osal\common	All	**NEW**
OSAL_Tasks.c	…\Components\osal\common	All	**REMOVED**
OSAL.h	…\Components\osal\include	All	Modified
OSAL_Clock.h	…\Components\osal\include	All	**NEW**
ZComDef.h	…\Components\osal\include	All	Modified
AF.c	…\Components\stack\af	All	Modified
AF.h	…\Components\stack\af	All	Modified
APS.h	…\Components\stack\nwk	All	Modified
APSMEDE.h	…\Components\stack\nwk	All	Modified
nwk.h	…\Components\stack\nwk	All	Modified
nwk_globals.c	…\Components\stack\nwk	All	Modified
nwk_globals.h	…\Components\stack\nwk	All	Modified
nwk_util.h	…\Components\stack\nwk	All	Modified
ZGlobals.c	…\Components\stack\sys	All	Modified
ZGlobals.h	…\Components\stack\sys	All	Modified
ZDApp.c	…\Components\stack\zdo	All	Modified
ZDApp.h	…\Components\stack\zdo	All	Modified
ZDConfig.c	…\Components\stack\zdo	All	Modified
ZDConfig.h	…\Components\stack\zdo	All	Modified
ZDNwkMgr.c	…\Components\stack\zdo	All	**NEW**

ZDNwkMgr.h	…\Components\stack\zdo	All	**NEW**
ZDObject.c	…\Components\stack\zdo	All	Modified
ZDProfile.c	…\Components\stack\zdo	All	Modified
ZDSecMgr.c	…\Components\stack\zdo	All	Modified
ZDSecMgr.h	…\Components\stack\zdo	All	Modified
ZMAC.h	…\Components\stack\zmac	All	Modified
zmac_cb.c	…\Components\stack\zmac\f8w	All	Modified
zmac.c	…\Components\stack\zmac\f8w	All	Modified
OSAL API	…\Documents	All	Modified
Upgrading To Z-Stack v2.0.0	…\Documents	All	**NEW**
Z-Stack API	…\Documents	All	Modified
Z-Stack Developer's Guide	…\Documents	All	Modified
Z-Stack User's Guide	…\Documents	All	Modified
EndDevice4618.lib	…\Projects\zstack\Libraries\EXP461x\bin	EXP461x	Modified
EndDevice4618-Pro.lib	…\Projects\zstack\Libraries\EXP461x\bin	EXP461x	**NEW**
EndDevice4618MT.lib	…\Projects\zstack\Libraries\EXP461x\bin	EXP461x	Modified
EndDevice4618MT-Pro.lib	…\Projects\zstack\Libraries\EXP461x\bin	EXP461x	**NEW**
EndDevice4619.lib	…\Projects\zstack\Libraries\EXP461x\bin	EXP461x	Modified
EndDevice4619MT.lib	…\Projects\zstack\Libraries\EXP461x\bin	EXP461x	Modified
Router4618.lib	…\Projects\zstack\Libraries\EXP461x\bin	EXP461x	Modified
Router4618-Pro.lib	…\Projects\zstack\Libraries\EXP461x\bin	EXP461x	**NEW**
Router4618MT.lib	…\Projects\zstack\Libraries\EXP461x\bin	EXP461x	Modified
Router4618MT-Pro.lib	…\Projects\zstack\Libraries\EXP461x\bin	EXP461x	**NEW**
Router4619.lib	…\Projects\zstack\Libraries\EXP461x\bin	EXP461x	Modified
Router4619MT.lib	…\Projects\zstack\Libraries\EXP461x\bin	EXP461x	Modified
Security4618.lib	…\Projects\zstack\Libraries\EXP461x\bin	EXP461x	Modified
Security4618-Pro.lib	…\Projects\zstack\Libraries\EXP461x\bin	EXP461x	**NEW**
Security4619.lib	…\Projects\zstack\Libraries\EXP461x\bin	EXP461x	Modified
EndDevice.lib	…\Projects\zstack\Libraries\ TI2430DB\bin	CC2430	Modified
EndDeviceMt.lib	…\Projects\zstack\Libraries\ TI2430DB\bin	CC2430	Modified
Router4618.lib	…\Projects\zstack\Libraries\ TI2430DB\bin	CC2430	Modified
Router4618Mt.lib	…\Projects\zstack\Libraries\ TI2430DB\bin	CC2430	Modified
Security.lib	…\Projects\zstack\Libraries\ TI2430DB\bin	CC2430	Modified
TIMAC- CC2430.lib	…\Projects\zstack\Libraries\TIMAC\bin	CC2430	Modified
TIMAC- MSP4618.lib	…\Projects\zstack\Libraries\TIMAC\bin	EXP461x	Modified
TIMAC- MSP4619.lib	…\Projects\zstack\Libraries\TIMAC\bin	EXP461x	Modified
SampleApp.ewp	…\Projects\zstack\Samples\SampleApp\CC2430DB	CC2430	Modified
SampleApp.ewd	…\Projects\zstack\Samples\SampleApp\EXP461x\EXP4618	EXP461x	Modified
SampleApp.ewp	…\Projects\zstack\Samples\SampleApp\EXP461x\EXP4618	EXP461x	Modified
SampleApp.eww	…\Projects\zstack\Samples\SampleApp\EXP461x\EXP4618	EXP461x	Modified
SampleApp.ewd	…\Projects\zstack\Samples\SampleApp\EXP461x\EXP4619	EXP461x	Modified
SampleApp.ewp	…\Projects\zstack\Samples\SampleApp\EXP461x\EXP4619	EXP461x	Modified
SampleApp.eww	…\Projects\zstack\Samples\SampleApp\EXP461x\EXP4619	EXP461x	Modified
SampleApp.c	…\Projects\zstack\Samples\SampleApp\EXP461x\Source	All	Modified
OSAL_SampleApp.c	…\Projects\zstack\Samples\SampleApp\Source	All	Modified
SampleApp.c	…\Projects\zstack\Samples\SampleApp\Source	All	Modified
f8wConfig.cfg	…\Projects\zstack\Tools\CC2430DB	CC2430	Modified
f8w2430.xcl	…\Projects\zstack\Tools\CC2430DB	CC2430	Modified
f8wConfig.cfg	…\Projects\zstack\Tools\EXP4618	EXP461x	Modified
OnBoard.c	…\Projects\zstack\Tools\ZMain	All	Modified
OnBoard.c	…\Projects\zstack\Tools\ZMain	All	Modified
ZMain.c	…\Projects\zstack\Tools\ZMain	All	Modified

2.5.2 Changes to "Full" Installed Files

In addition to the "core" installer file changes listed in Section 2.5.1, the following Z-Stack "full" installer files have been changed since the v1.4.3 release:

File	Location	Platform	Change
MT_SAPI.c	…\Components\mt	All	Modified
sapi.c	…\Components\stack\sapi	All	Modified
sapi.h	…\Components\stack\sapi	All	Modified
zcl.c	…\Components\stack\zcl	All	Modified
zcl.h	…\Components\stack\zcl	All	Modified
zcl_general.c	…\Components\stack\zcl	All	Modified
zcl_general.h	…\Components\stack\zcl	All	Modified
zcl_hvac.c	…\Components\stack\zcl	All	Modified
SampleLight.ewp	…\Projects\zstack\HomeAutomation\SampleLight\CC2430DB	CC2430	Modified
SampleLight.ewd	…\Projects\zstack\HomeAutomation\SampleLight\EXP4618	EXP461x	Modified
SampleLight.ewp	…\Projects\zstack\HomeAutomation\SampleLight\EXP4618	EXP461x	Modified
SampleLight.eww	…\Projects\zstack\HomeAutomation\SampleLight\EXP4618	EXP461x	Modified
OSAL_SampleLight.c	…\Projects\zstack\HomeAutomation\SampleLight\Source	All	Modified
zcl_samplelight.c	…\Projects\zstack\HomeAutomation\SampleLight\Source	All	Modified
zcl_samplelight_data.c	…\Projects\zstack\HomeAutomation\SampleLight\Source	All	Modified
SampleSwitch.ewp	…\Projects\zstack\HomeAutomation\SampleSwitch\CC2430DB	CC2430	Modified
SampleSwitch.ewd	…\Projects\zstack\HomeAutomation\SampleSwitch\EXP4618	EXP461x	Modified
SampleSwitch.ewp	…\Projects\zstack\HomeAutomation\SampleSwitch\EXP4618	EXP461x	Modified
SampleSwitch.eww	…\Projects\zstack\HomeAutomation\SampleSwitch\EXP4618	EXP461x	Modified
OSAL_SampleSw.c	…\Projects\zstack\HomeAutomation\SampleSwitch\Source	All	Modified
zcl_samplesw.c	…\Projects\zstack\HomeAutomation\SampleSwitch\Source	All	Modified
zcl_samplesw_data.c	…\Projects\zstack\HomeAutomation\SampleSwitch\Source	All	Modified
GenericApp.ewp	…\Projects\zstack\Samples\GenericApp\CC2430DB	CC2430	Modified
GenericApp.ewd	…\Projects\zstack\Samples\GenericApp\EXP4618	EXP461x	Modified
GenericApp.ewp	…\Projects\zstack\Samples\GenericApp\EXP4618	EXP461x	Modified
GenericApp.eww	…\Projects\zstack\Samples\GenericApp\EXP4618	EXP461x	Modified
OSAL_GenericApp.c	…\Projects\zstack\Samples\GenericApp\Source	All	Modified
SimpleApp.ewd	…\Projects\zstack\Samples\SimpleApp\CC2430DB	CC2430	Modified
SimpleApp.ewp	…\Projects\zstack\Samples\SimpleApp\CC2430DB	CC2430	Modified
SimpleApp.eww	…\Projects\zstack\Samples\SimpleApp\CC2430DB	CC2430	Modified
SimpleApp.ewd	…\Projects\zstack\Samples\SimpleApp\EXP4618	EXP461x	Modified
SimpleApp.ewp	…\Projects\zstack\Samples\SimpleApp\EXP4618	EXP461x	Modified
SimpleApp.eww	…\Projects\zstack\Samples\SimpleApp\EXP4618	EXP461x	Modified
f8wZCL.cfg	…\Projects\zstack\Tools\CC2430DB	CC2430	Modified
SerialApp.ewp	…\Projects\zstack\Utilities\SerialApp\CC2430DB	CC2430	Modified
SerialApp.ewd	…\Projects\zstack\Utilities\SerialApp\EXP4618	EXP461x	Modified
SerialApp.ewp	…\Projects\zstack\Utilities\SerialApp\EXP4618	EXP461x	Modified
SerialApp.eww	…\Projects\zstack\Utilities\SerialApp\EXP4618	EXP461x	Modified
OSAL_SerialApp.c	…\Projects\zstack\Utilities\SerialApp\Source	All	Modified
TransmitApp.ewp	…\Projects\zstack\Utilities\Transmit\CC2430DB	CC2430	Modified
TransmitApp.ewd	…\Projects\zstack\Utilities\Transmit\EXP4618	EXP461x	Modified
TransmitApp.ewp	…\Projects\zstack\Utilities\Transmit\EXP4618	EXP461x	Modified
TransmitApp.eww	…\Projects\zstack\Utilities\Transmit\EXP4618	EXP461x	Modified
OSAL_TransmitApp.c	…\Projects\zstack\Utilities\Transmit\Source	All	Modified
TransmitApp.c	…\Projects\zstack\Utilities\Transmit\Source	All	Modified
TI.CommonLib.dll	…\Tools\Z-Tool	All	**NEW**
TI.Config.xml	…\Tools\Z-Tool	All	Modified
TI.ZCmdMatchings.dll	…\Tools\Z-Tool	All	Modified

TI.ZPI.dll	…\Tools\Z-Tool	All	Modified
TI.ZPI.xml	…\Tools\Z-Tool	All	Modified
TI.ZPortLib.dll	…\Tools\Z-Tool	All	**NEW**
TI.ZScript.dll	…\Tools\Z-Tool	All	Modified
TI.ZStack.CommonLib.dll	…\Tools\Z-Tool	All	**REMOVED**
TI.ZStack.ZPortLib.dll	…\Tools\Z-Tool	All	**REMOVED**
ZPI Help.chm	…\Tools\Z-Tool	All	Modified
Z-Tool 2.0.exe	…\Tools\Z-Tool	All	Modified
Z-ToolHelp.chm	…\Tools\Z-Tool	All	Modified