GETTING STARTED WITH THE ZTC COMMANDS

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SECURE CONNECTIONS
FOR A SMARTER WORLD

GETTING STARTED WITH THE ZTC COMMANDS

1. ZTC commands
2. Adding ZTC support to a project
3. What is Test Tool?
4. Using ZTC commands
5. Configuring ZTC

ZTC COMMANDS

Introduction

- The ZigBee Test Client (ZTC) diagnostic tool allows extensive testing of the BeeStack protocol layer interfaces and for communication with a Host processor when using the BeeStack Black Box application.

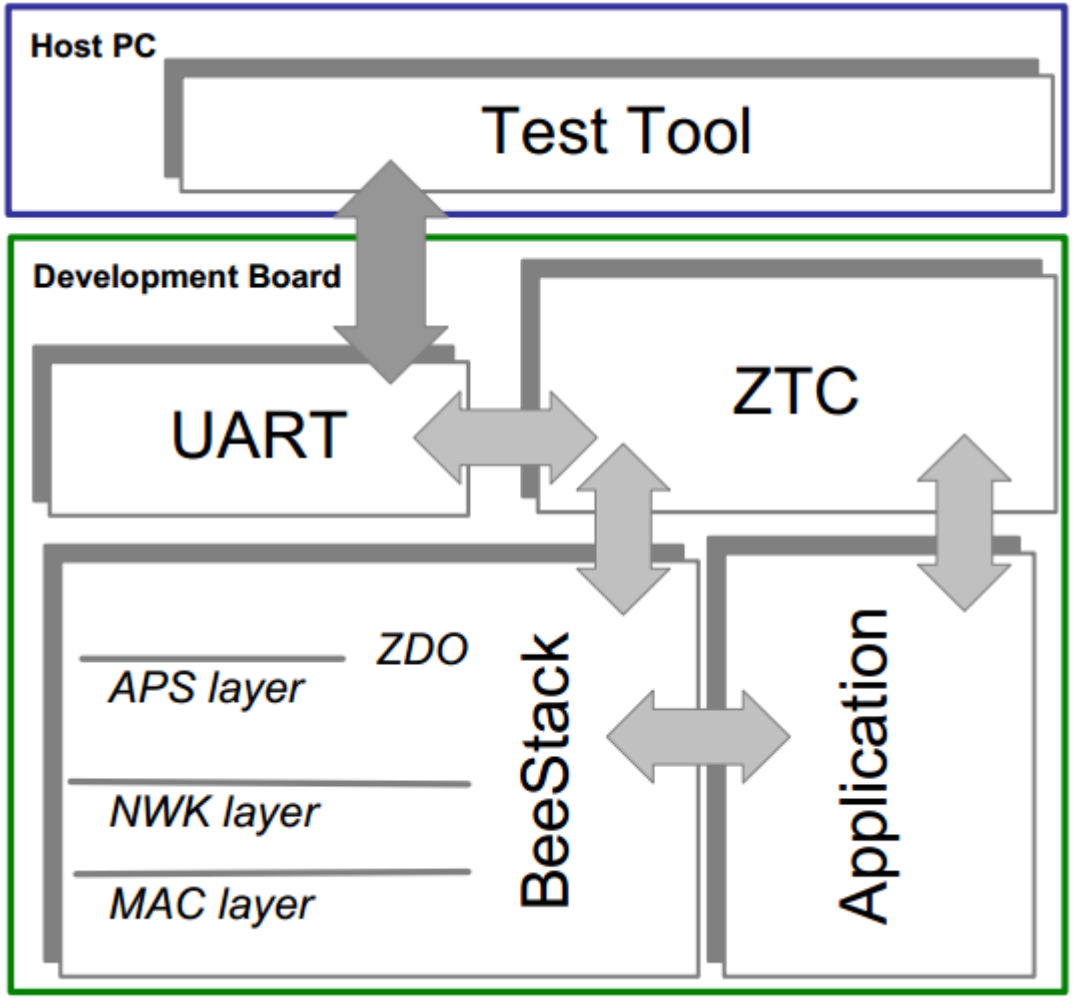
Introduction

- With the Test Tool software and ZTC, a user can start a ZigBee network, join devices to the network, and run any of the over 300 commands to test the BeeStack application services and interfaces.
- For more information consult the BeeStack BlackBox ZigBee Test Client (ZTC) Reference Manual.

BeeStack BlackBox ZTC Architecture

- The ZTC is a small application running separated of each layer in the stack, whether that node is a ZigBee Coordinator (ZC), ZigBee Router (ZR), ZigBee end device (ZED) or Combo.(Zx).
- The host PC or host processor is connected to the device under test (DUT) through USB, UART, RS-232 cable or I2C (depending on the board type) in serial mode.
- The device can then be controlled by API calls generated by the host to test the interfaces between BeeStack layers or implement a ZigBee application on the host CPU using the BeeStack Black Box Application.

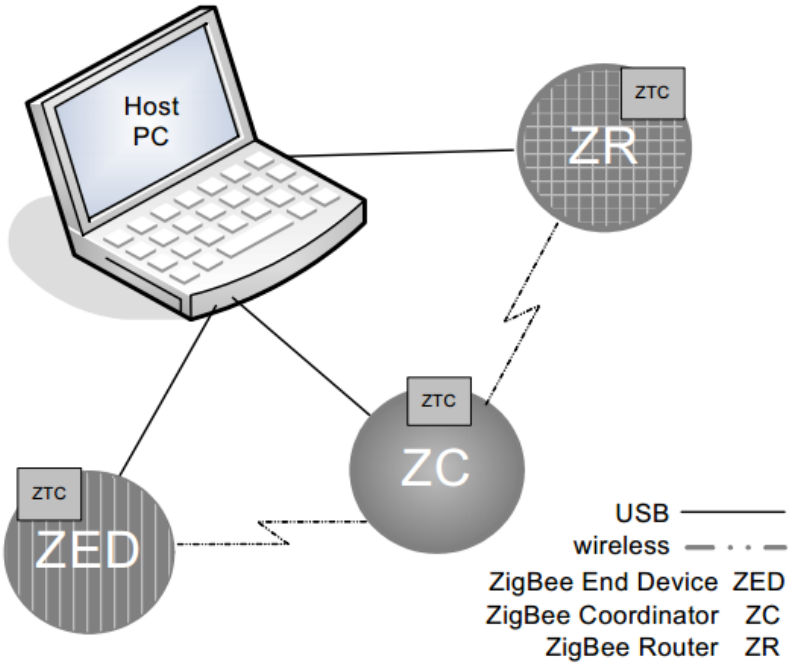
BeeStack BlackBox ZTC Architecture



ZTC Design Architecture

Typical ZigBee Test Network

- A typical test network includes the host PC, one development board acting as a ZigBee coordinator, and one or more additional boards acting as ZigBee end devices and routers.



Typical BeeStack BlackBox ZigBee Test Client Setup

Making new ZTC commands

- BeeKit development allows users to modify the Test Tool for new applications.
- For more information consult the BeeStack BlackBox ZigBee Test Client (ZTC) Reference Manual chapter 3 “Making New ZTC Commands”.

ZTC frame format

All communication with the ZTC protocol can be accomplished using two interfaces:

- A three wire UART connection (RX,TX and flow control from ZigBee chipset to PC)
- A three wire I2C connection (Two I2C pins and a data available pin)

For communication between upper (host) and lower (embedded) software. The data frame consists of a data field, augmented with a header containing the opcode and length field. The same format is used in both directions.

ZTC frame format

Byte:	0	1	2	3...(n+3)
	Opcode group	Opcode	Length	Data
Size:	1	1	1	n

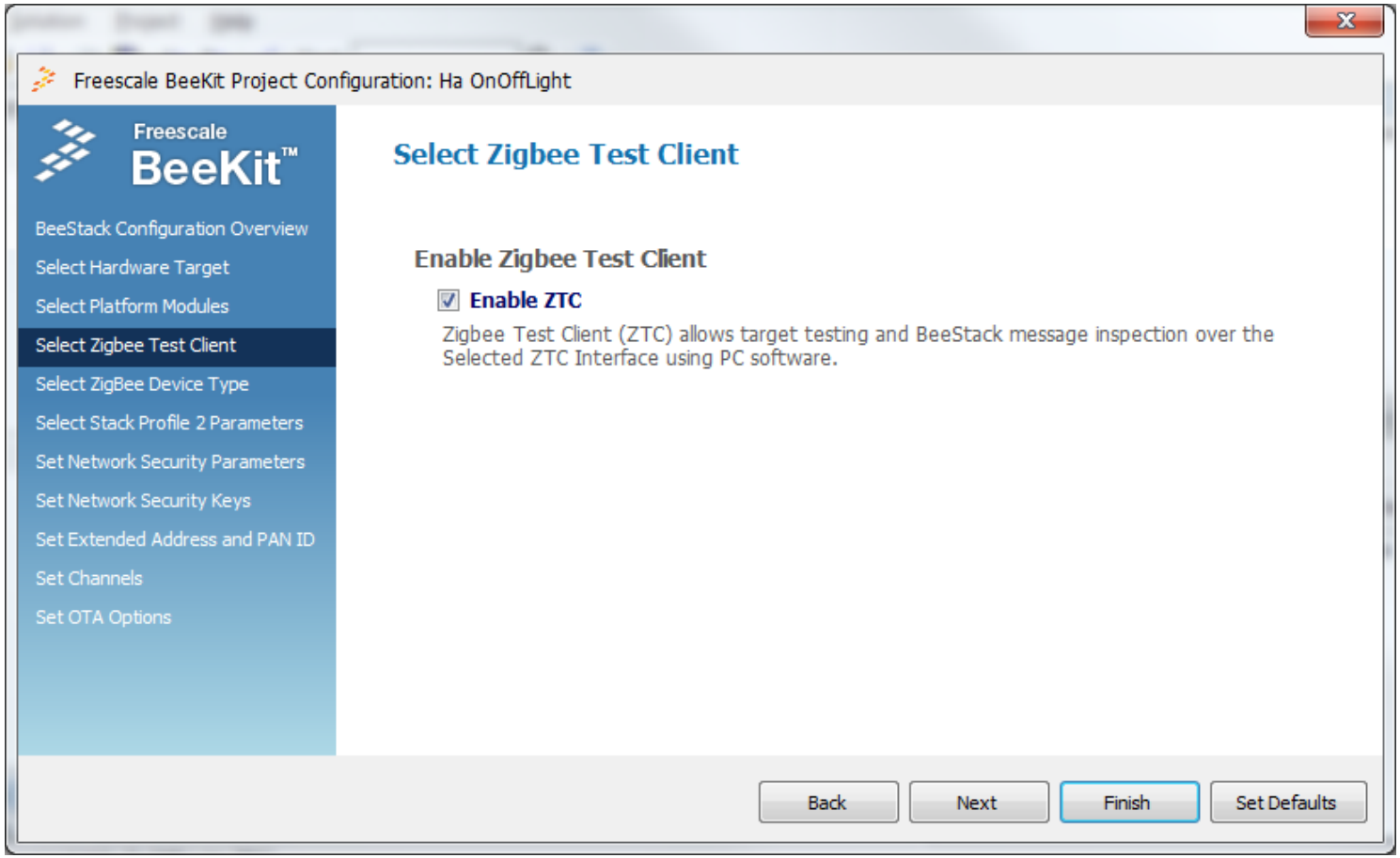
Data Format

- Byte 0 — Opcode group
- Byte 1 — Opcode
- Byte 2 — Length of data field (excluding header)
- Byte 3 to (n+3) — Data, including timestamps where applicable

ADDING ZTC SUPPORT TO A PROJECT

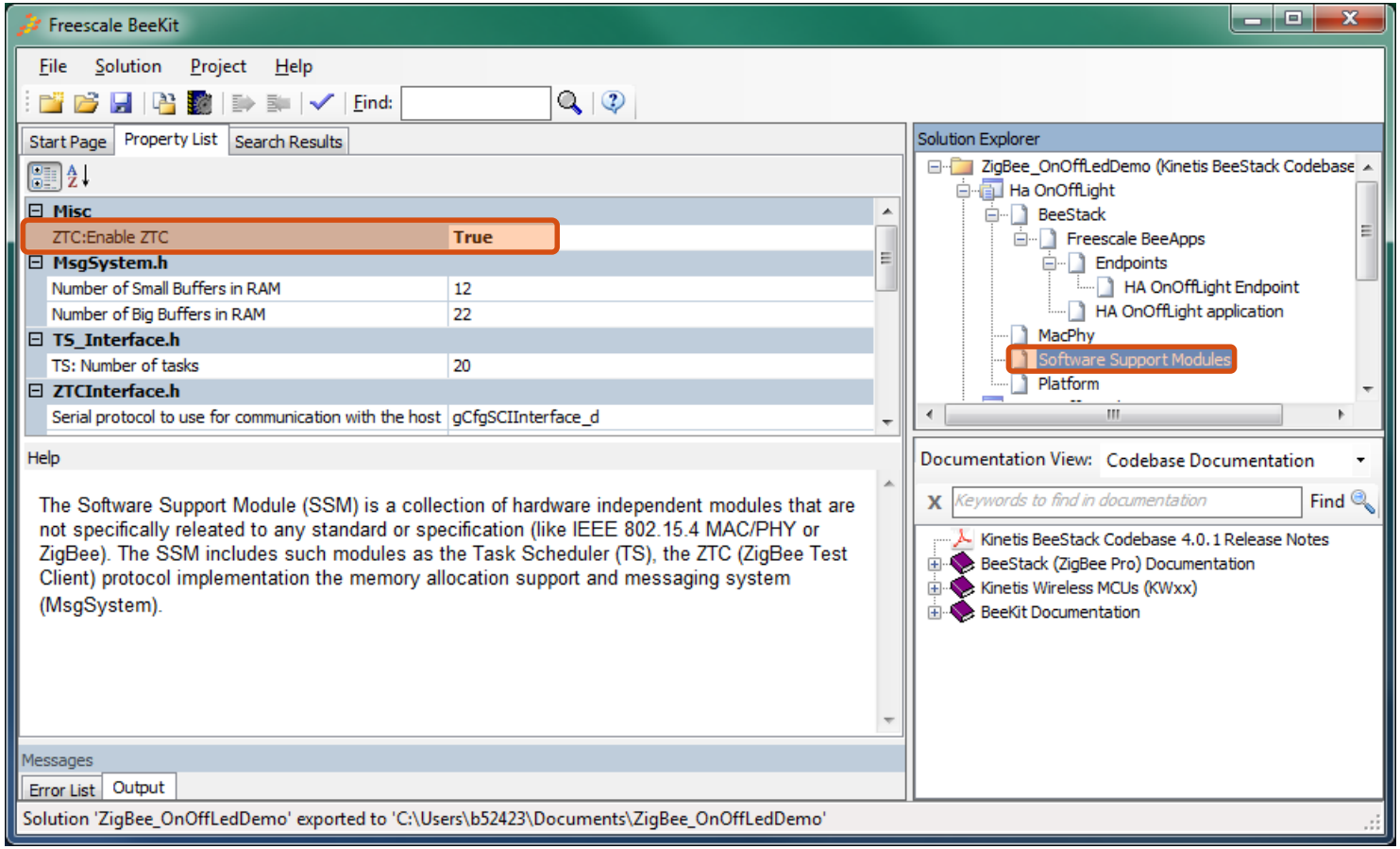
Adding ZTC support

- The ZTC module is disabled by default. It can be enabled in BeeKit by selecting the **Enable ZTC** option in the new project's wizard.



Adding ZTC support

- If the project is already created, the option **ZTC: Enable ZTC** under the **Software Support Modules** view enables this capability.



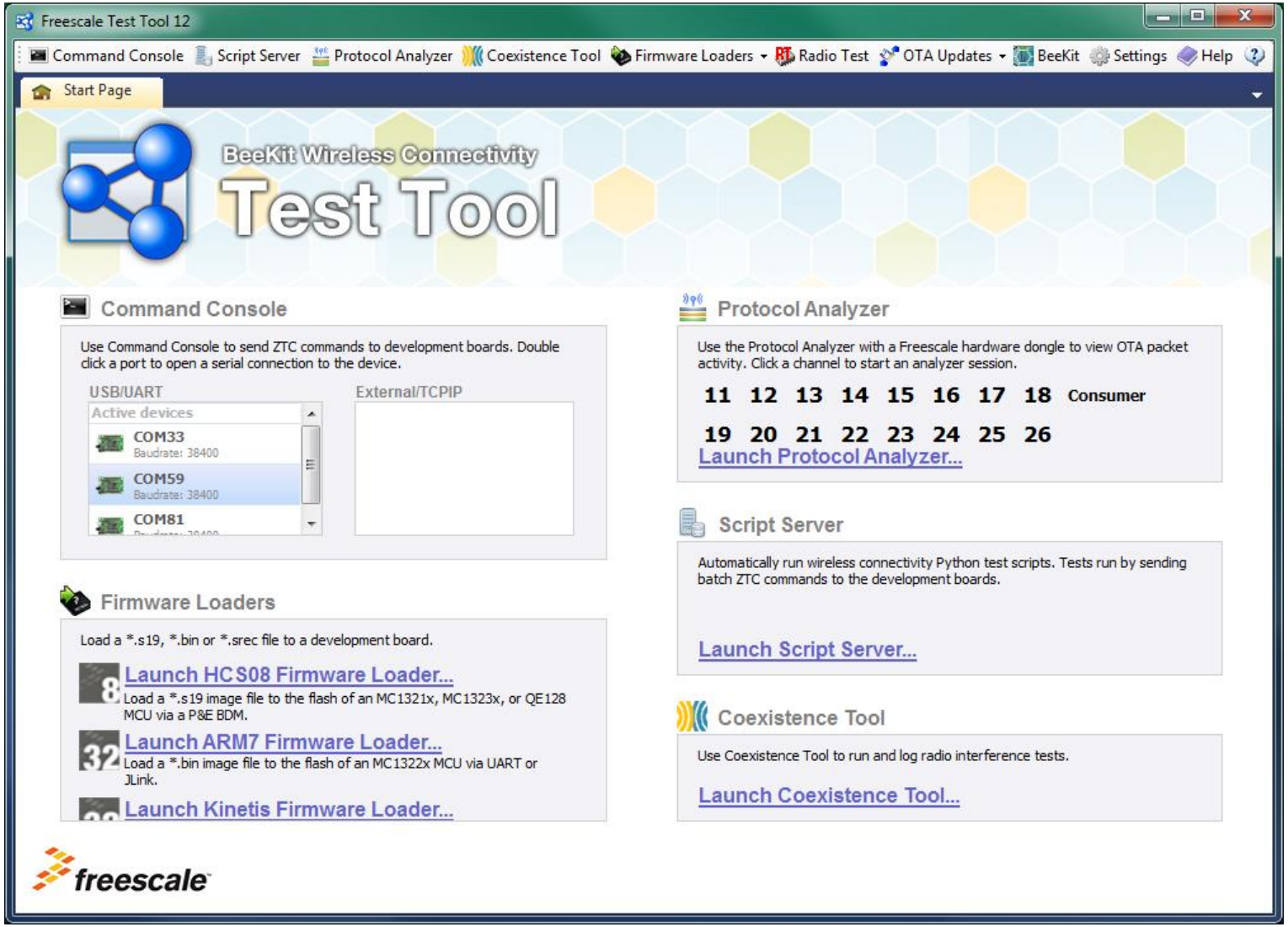
WHAT IS TEST TOOL?

What is Test Tool?

- Test Tool for Connectivity Products is a set of graphical user interface modules and applications for testing and deploying Kinetis W wireless applications.
- Test Tool for Connectivity Products includes the following applications:
  - Command Console
  - Kinetis-W and MC132xx Firmware Loaders
  - Script Server
  - Protocol Analyzer
  - Radio Test
  - Radio Coexistence Test
  - Over-the-Air Updates (OTA)

https://www.nxp.com/webapp/Download?colCode=TESTTOOL_SETUP&appType=license&location=null&Parent_nodeId=1337784350592688295514&Parent_pageType=product

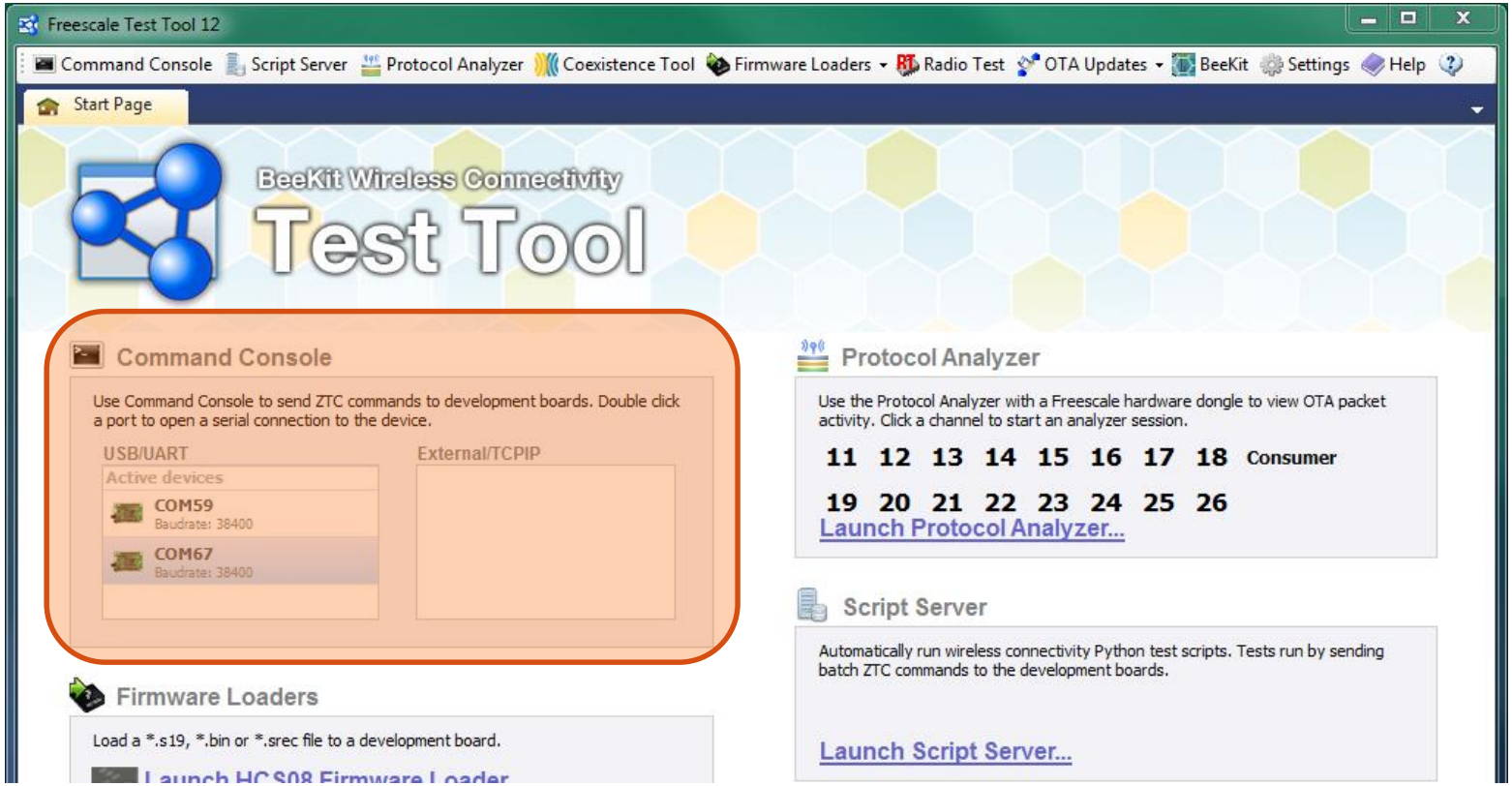
Test Tool interface



USING ZTC COMMANDS

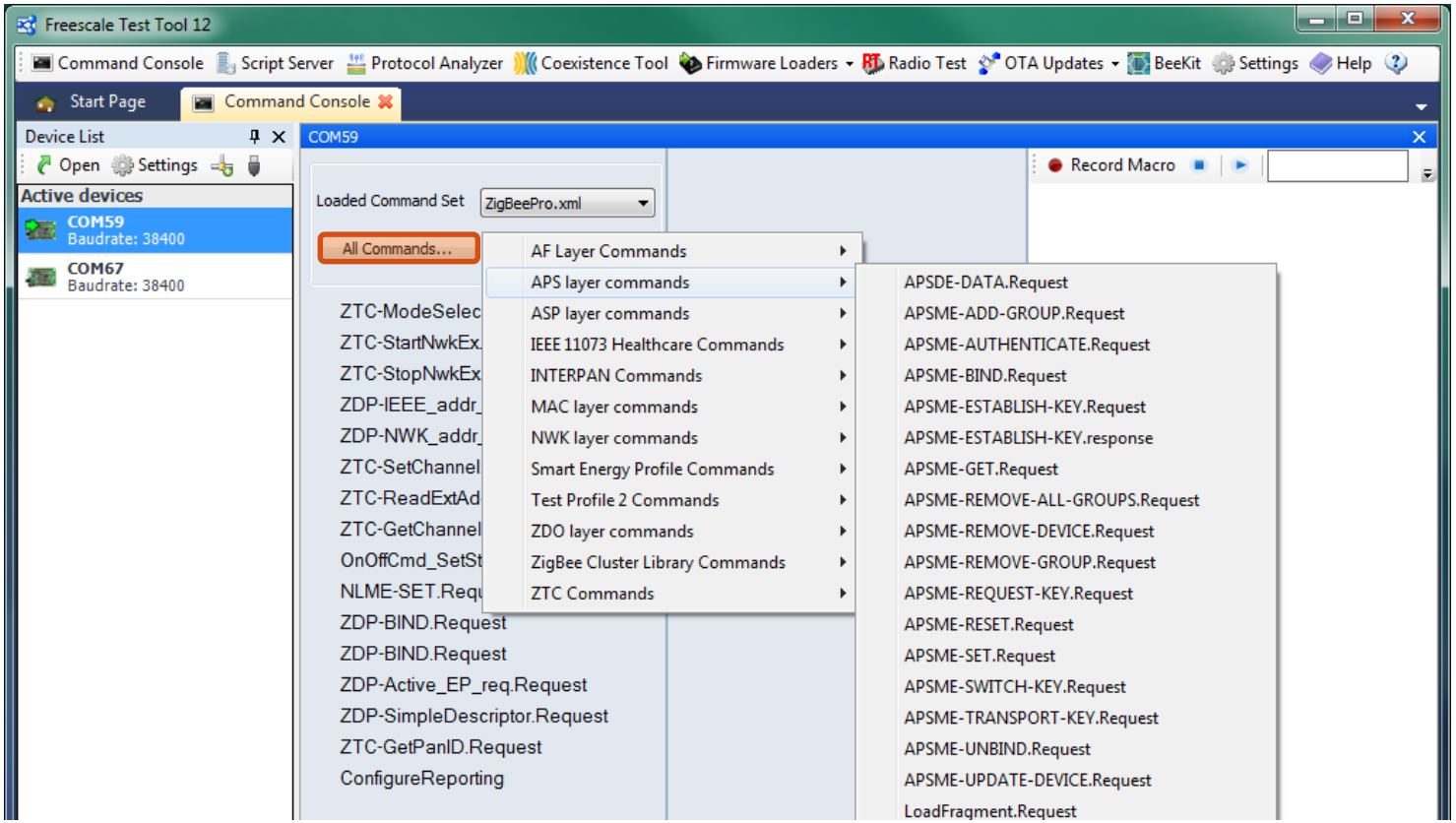
Command console

- The development boards connected to the host PC appears in the command console view. Just double click over the desired device to test.



Command console

- The **Command Console** view is open. Choose a command by pressing the **All Commands…** button and then the desired command.



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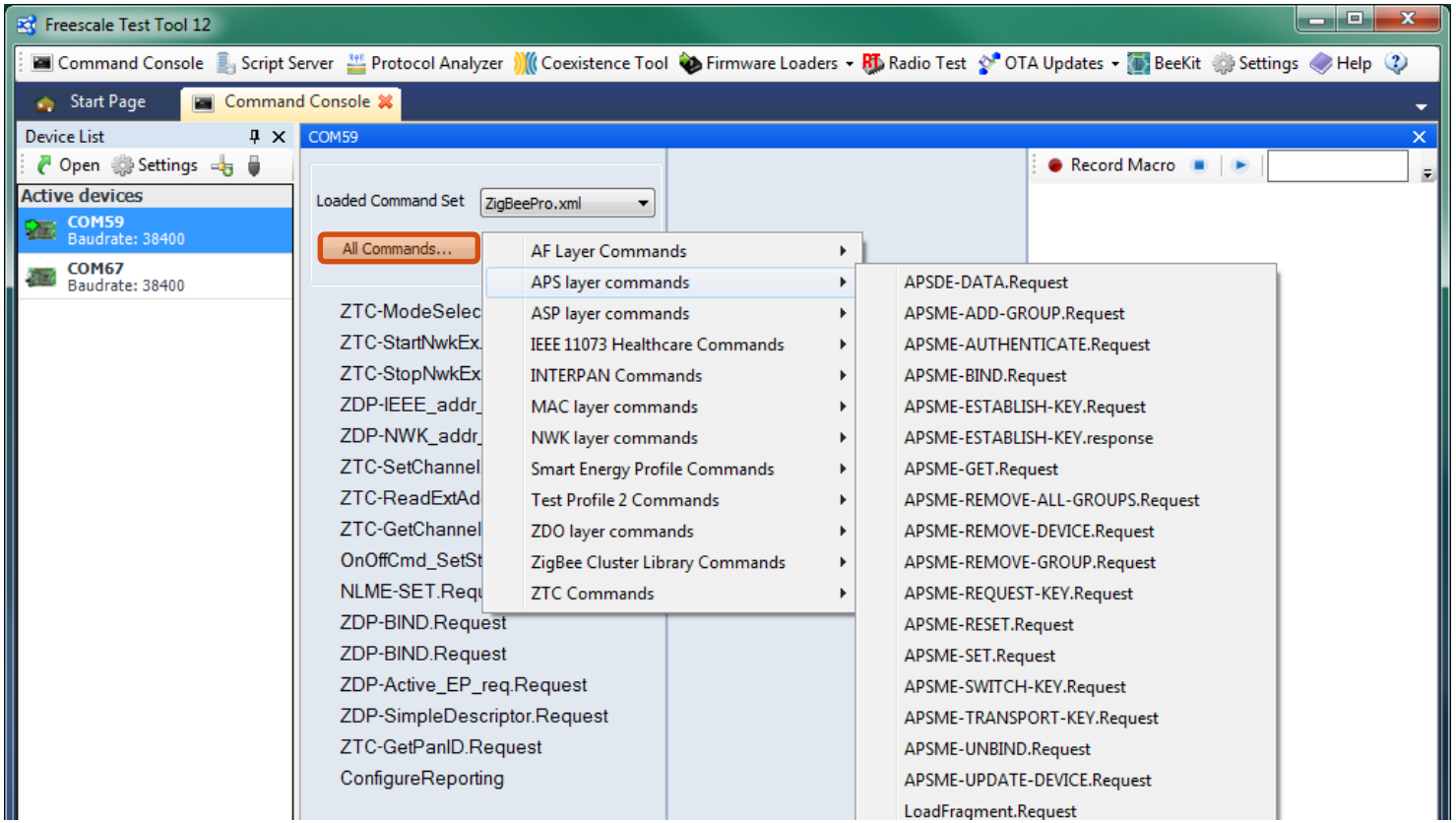
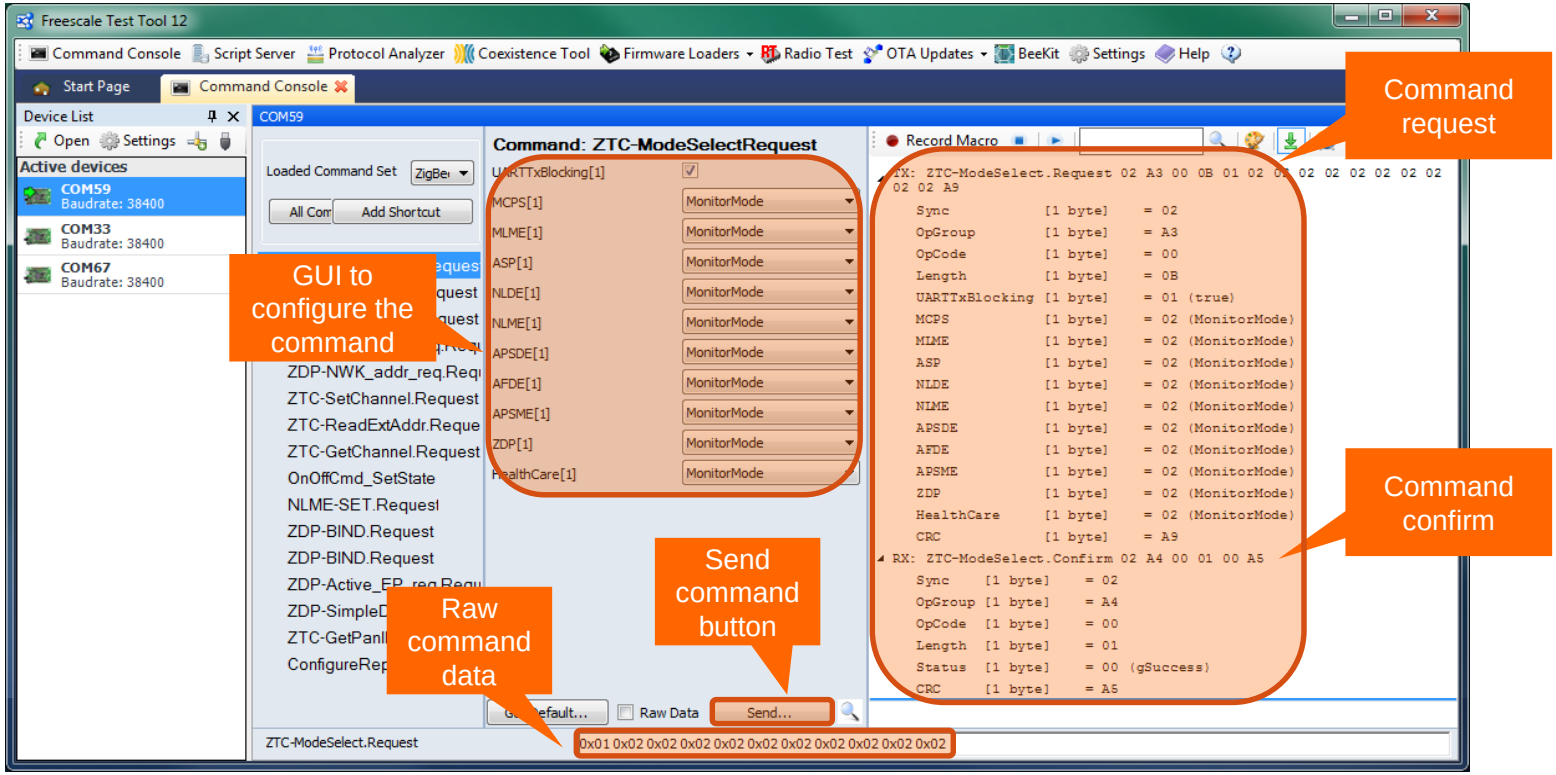


CONFIGURING ZTC

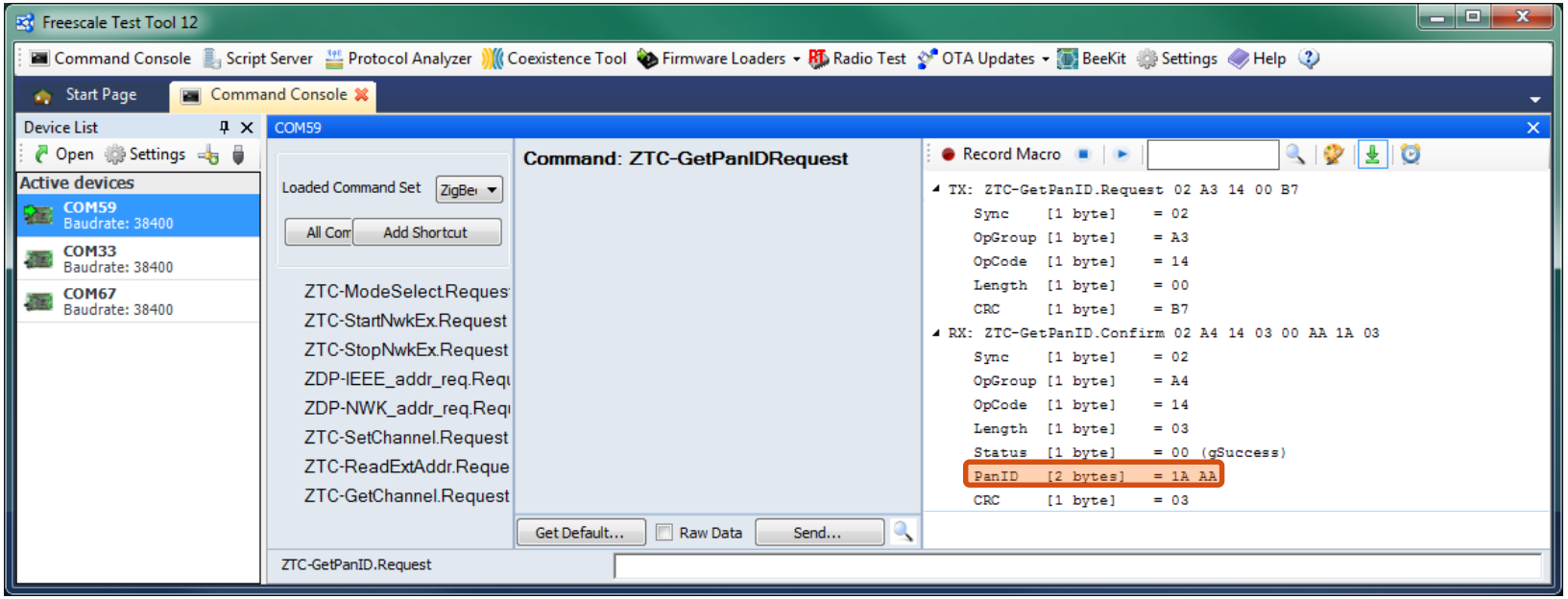
Activating layers monitoring

- The monitored layers are configurable through the **ZTC-ModeSelectRequest** command. By selecting this command, an API is opened to select the layers that want to be monitored. After press the **Send…** button a request and a confirm are generated.



Testing with some commands

- It is time to test some commands. The **ZTC-GetPanIDRequest** command requests the device's PAN ID. The PAN ID is obtained in the command confirm.



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