



Perytons™ Protocol Analyzers - Time View

Background

802.15.4/ZigBee/6LoWPAN and Bluetooth Low Energy (Bluetooth Smart) wireless as well as narrow-band PLC wire-line networks such as PRIME, usually comprise of several devices that communicate with each other over a specified communications medium. In some of the protocols, each network has a unique ID (PAN ID) and each station (device) has its own unique Device ID or specific addressing methods. Several networks may coexist in the same proximity, sharing the same environment (as with the Power Line in PLC networks or a single RF channel in the wireless case) or using different or multiple RF channels when dealing with wireless networks.

For increased efficiency, a network coordinator station may transmit a repetitive beacon, or predefined parameters in the protocol may define special time or channel change time slots for the different network members' transmissions.

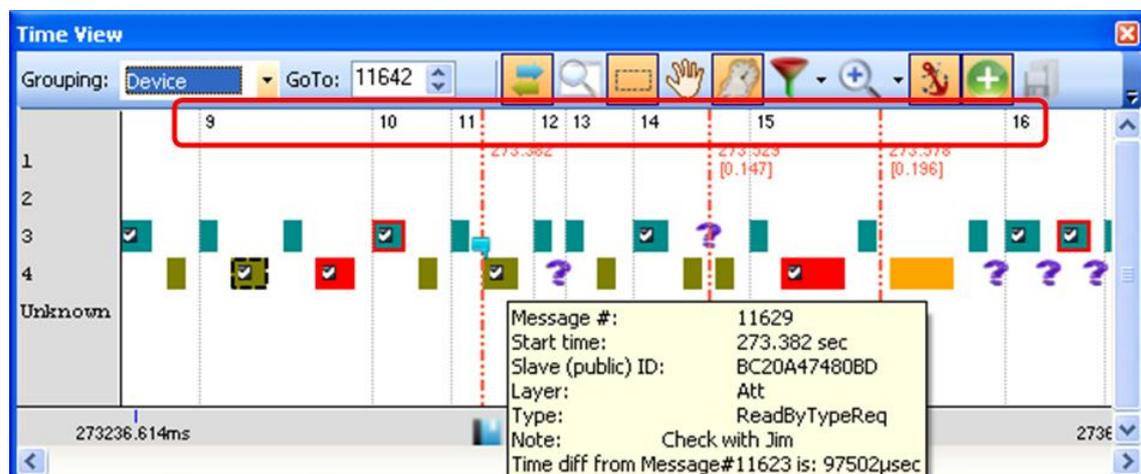
Additionally each of the network devices may transmit messages in the different protocol layers, etc.

One thing is obvious, as wireless and wire-line network protocols evolve, the time-related events become more difficult to analyze by just going over a list of messages with the content (or even time stamp) of each of the messages.

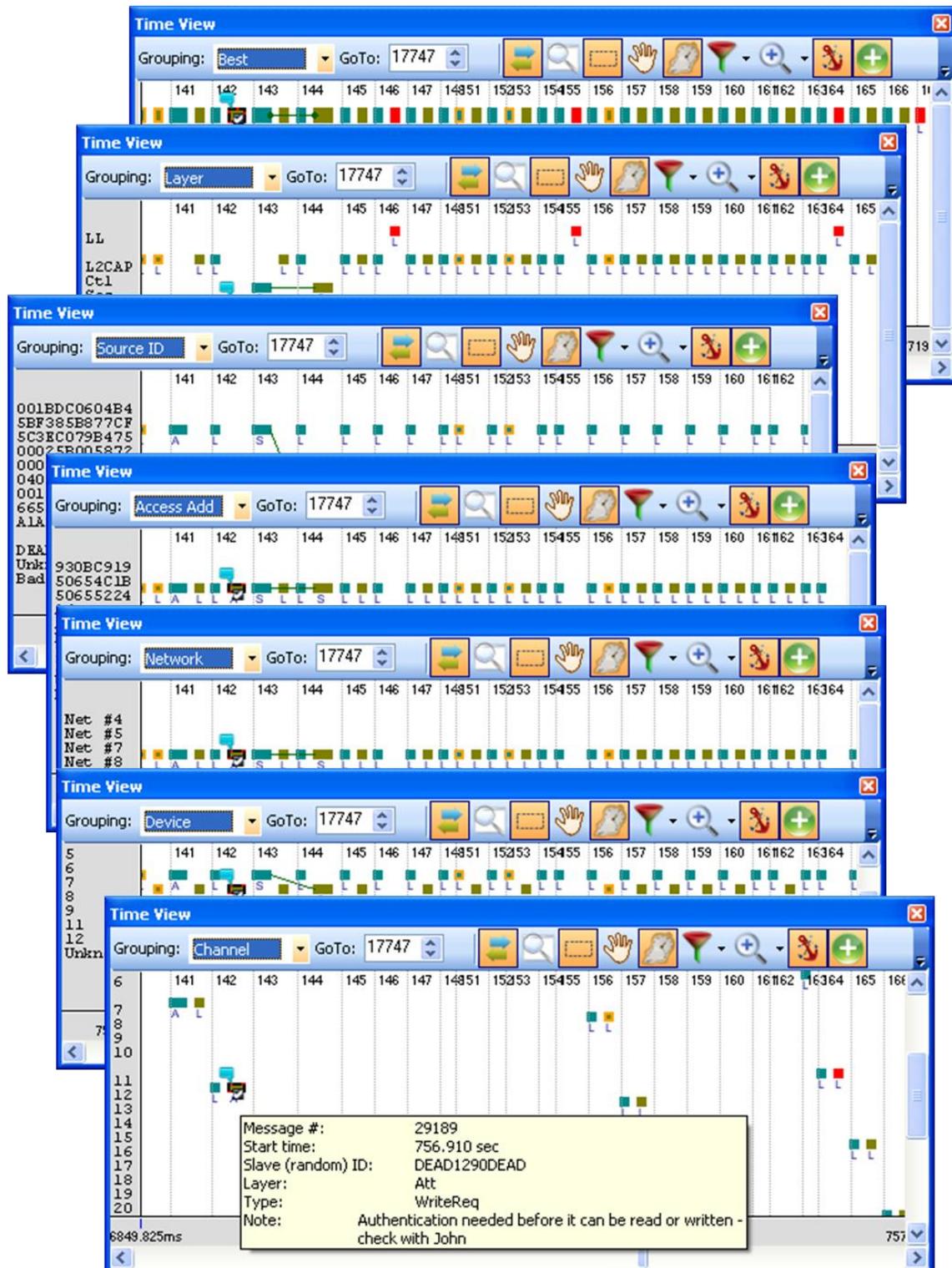
The Perytons™ Protocol Analyzers Time-View window

The Perytons™ Protocol Analyzers provide a unique Time View window that displays color coded messages in a two dimensional grid. In a beacon or time-slotted network, gridlines are displayed together with their received or expected allocation (for protocols with beacon transmissions or time-slot calculation respectively), for both uplink and downlink messages.

The detection of devices transmitting out of the allocated slots as well as additional time related phenomena and measurements, becomes easy.



The grid's vertical axis can be used to group messages by different parameters like channel (for wireless networks), source ID, IP address, Protocol Layer, PAN or SubNetwork ID and more and the user can select to temporary hide specific messages from view based on any of the selected parameters:



The image displays seven overlapping 'Time View' windows from the Perytons Protocol Analyzer, each showing a different grouping method for messages. The windows are arranged vertically, with the top window showing 'Best' grouping and the bottom window showing 'Channel' grouping. Each window has a 'GoTo: 17747' field and a toolbar with various icons. The messages are represented by colored bars on a timeline, with some messages having small icons above them. The bottom window shows a detailed view of a message with the following information:

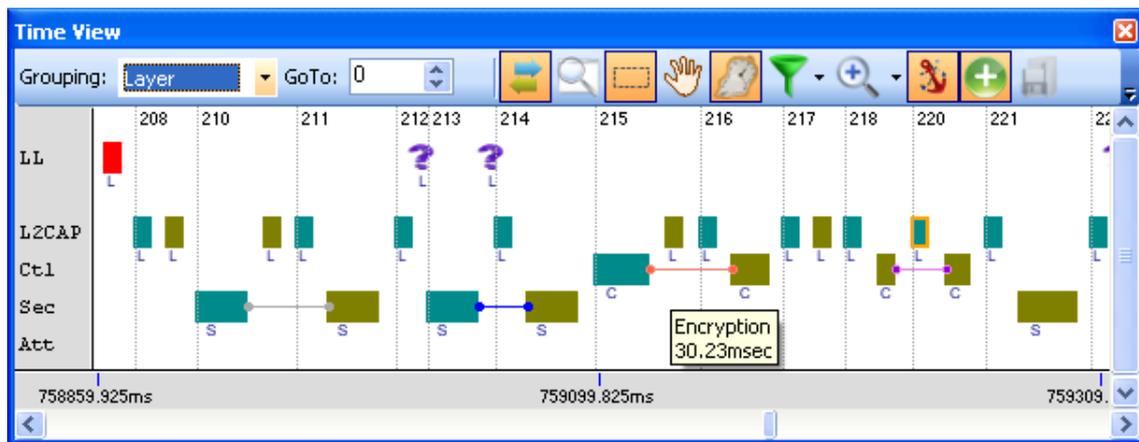
Message #:	29189
Start time:	756.910 sec
Slave (random) ID:	DEAD1290DEAD
Layer:	Att
Type:	WriteReq
Note:	Authentication needed before it can be read or written - check with John

Each message includes a letter initial showing its protocol layer and when hovering over it, a tooltip with basic message information (like message type and layer, its time and delta from the previously selected message, User Defined note, etc.), shows.

For easy understanding of processes and transactions, related messages (such as message-ack, association request-response, ping, pairing, etc.) are automatically connected by the analyzer with lines. Line color is determined by the connection type (colors and other default settings can be easily changed according to user preference).

The user can attach a text note to any selected message and set time bookmarks at desired points of interest in the time axis to enable easy measurement and sharing of time related events and scenarios with colleagues.

Pointing on a connection with the mouse shows the connection type as well as transaction latency on a dedicated tooltip:



The Perytons™ Protocol Analyzer Time View window is synchronized with the other windows, a fact that enables quick and thorough analysis and debugging of the network from a wide range of different perspectives.