

Palladion Software Suite Sequence Diagram Feature

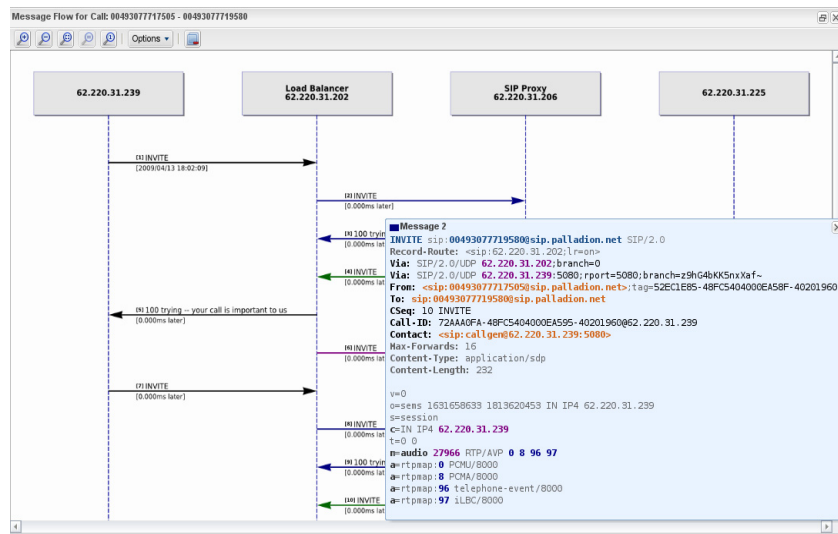


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Introduction

The sequence diagram feature is a powerful graphical call flow analysis tool integrated in the PALLADION NGN software suite.

Call flow diagrams are easily browse-able, the detail level of contained text information can be added and removed, and each protocol message will be opened automatically on mouse-over.

Multiple calls can be shown at the same time, and even compare individual protocol messages with feature syntax highlighting, for better readability. Every call is displayed with in-depth media quality information, both from PALLADION and from the end devices.

Getting started

Invoking the feature

The sequence diagram feature can be invoked from the Call Info window by clicking the Message flow button:

Call Info Window

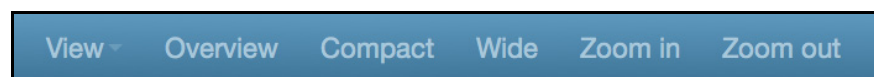


Message Flow Button

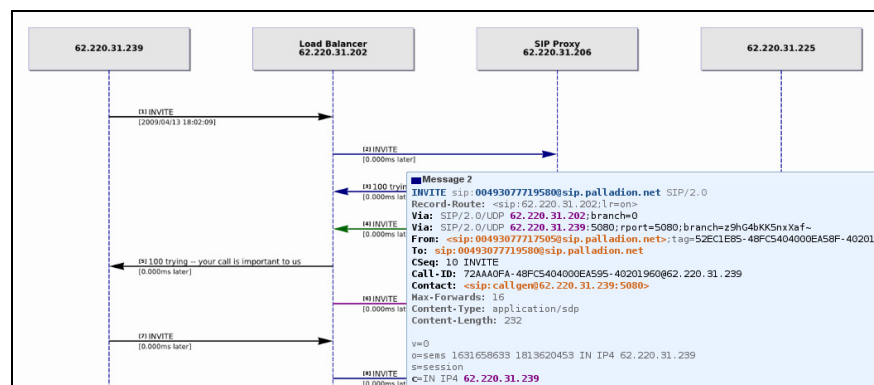


The Message flow window is opened as interactive HTML document in a separate browser window. The page is divided into a menu bar fixed on the top and the actual sequence diagram window underneath.

Menu Bar



Sequence Diagram Window



Note: If the page length exceeds the browser window height, scroll bars allow navigating through the entire page.

Sequence diagram window

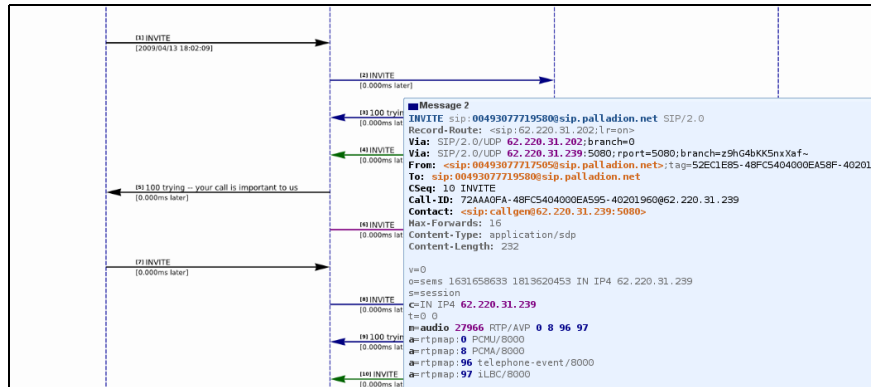
There are two main elements shown in this window: device boxes on top and message snippets underneath.

Note: The position of device boxes can be locked on top when checking the option [Pin Devices](#) in the [View](#) menu.

Device Boxes



Message Snippets

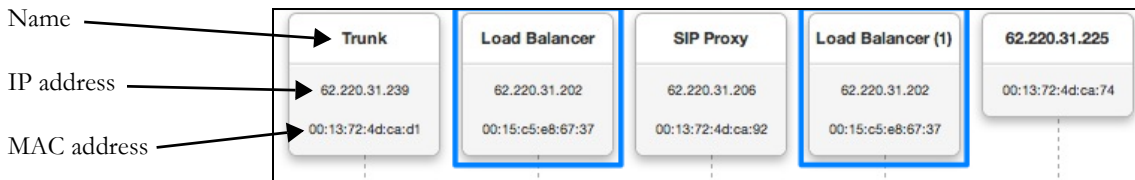


Note: The default arrangement of device boxes can be changed by clicking on the menu items [Overview](#), [Compact](#), or [Wide](#).

Device boxes

Device boxes are visual representations of network elements involved in VoIP call flows and therefore automatically detected when sending and/or receiving VoIP messages. Typical VoIP devices are phones, gateways, proxies, etc.

Device boxes are unambiguously labeled by the preassigned device name, its IP address, and its MAC address. If no device name was assigned the IP address is used instead.

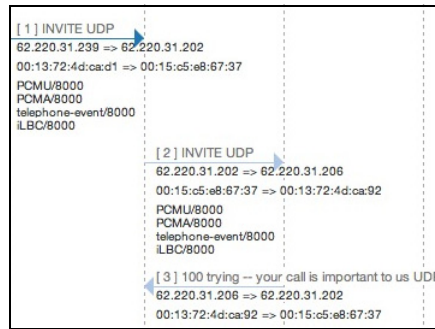


By default, device boxes may appear duplicated (see example above: Load Balancer). This intended behavior simplifies the readability of the message flow, i.e. message snippets are placed exactly between two device boundaries.

Note: This behavior can be switched off when unchecking the option [Unwind Messages](#) in the [View](#) menu.

Message snippets

Message snippets



Message snippets are simplified raw VoIP messages displayed as sequentially numbered text blocks.

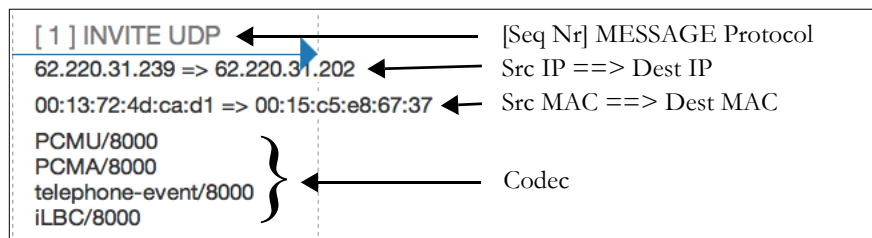
They are placed between device boundaries (vertical grid lines) in order to visualize the relationship between sending and receiving VoIP devices.

According to their chronological occurrence all message snippets are shown subsequently underneath each other.

Colored arrows inside each message snippet indicate the direction of the VoIP message flow, same colors identify messages which were sent and/or received by the same VoIP devices.

The following text fields of a message snippet are shown by default:

Text fields of a message snippet



Note: Text fields of message snippets can be hidden or shown using the options available in the [View](#) menu.

More detailed information can be obtained by placing the mouse over the first message snippet line which will open up a new window.

Example: SIP INVITE message with SDP header

Important message details are marked by distinct colors (feature syntax highlighting)

```
[ 11 ] INVITE sip:00493077714046@sip.palladion.net UDP
INVITE sip:00493077714046@sip.palladion.net SIP/2.0
Via: SIP/2.0/UDP 62.220.31.239:5080;branch=z9hG4bKyrnyzaVk
From: <sip:00493077711715@sip.palladion.net>;tag=30DC3203-48FC4D79000BDB1B-40201960
To: sip:00493077714046@sip.palladion.net
CSeq: 10 INVITE
Call-ID: 37D8C660-48FC4D79000BDB22-40201960@62.220.31.239
Contact: <sip:callgen@62.220.31.239:5080>
Max-Forwards: 70
Content-Type: application/sdp
Content-Length: 230

v=0
o=sems 236729245 971753769 IN IP4 62.220.31.239
s=session
c=IN IP4 62.220.31.239
t=0 0
m=audio 26724 RTP/AVP 0 8 96 97
a=rtpmap:0 PCMU/8000
a=rtpmap:8 PCMA/8000
a=rtpmap:96 telephone-event/8000
a=rtpmap:97 iLBC/8000
```

Menu settings

Menu Bar



Menu settings Overview, Compact, Wide, Zoom In, and Zoom Out can be used to change the arrangement of all device boxes and text sizes of all message snippets.

The View menu provides options to show or hide additional information in message snippets (Duplicates, URIs, Protocols, IPs, MACs, Codecs, and Absolute Time) and few others that influence device boxes as well (Pin Devices, Unwind Messages).



View menu

A pop-down menu with predefined checkboxes will be shown. The following menu items are available:



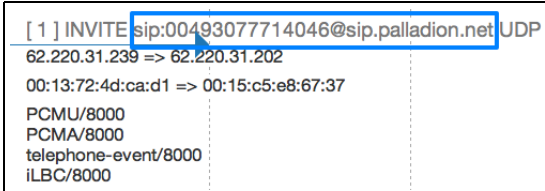
Duplicates

When checked (default), identical messages will be shown in the sequence diagram window. These are usually caused by the tapping devices, but can also indicate real problems in the network.



URIs

URIs (Unified Resource Identifier) are not shown by default. When checked, they will be shown in the first line of all message snippets, see example below. This option can be useful if the URI user and/or domain part contains helpful information, i.e. phone number, etc.

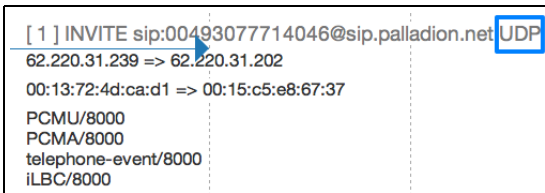


```
[ 1 ] INVITE sip:00493077714046@sip.palladion.net UDP
62.220.31.239 => 62.220.31.202
00:13:72:4d:ca:d1 => 00:15:c5:e8:67:37
PCMU/8000
PCMA/8000
telephone-event/8000
iLBC/8000
```

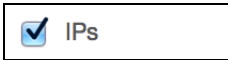


Protocols

When checked (default), the protocol used to transport the message will be shown in the first line of all message snippets, see example below. Typical values are UDP and TCP. This option can be used to solve general network problems.



```
[ 1 ] INVITE sip:00493077714046@sip.palladion.net UDP
62.220.31.239 => 62.220.31.202
00:13:72:4d:ca:d1 => 00:15:c5:e8:67:37
PCMU/8000
PCMA/8000
telephone-event/8000
iLBC/8000
```



IPs

When checked (default), the source IP addresses of the sending and the destination IP addresses of the receiving VoIP device will be shown in all message snippets, see example below. This option can be used to verify the correct IP routing between VoIP devices, also IP spoofing can be detected.

```
[ 1 ] INVITE sip:00493077714046@sip.palladion.net UDP
62.220.31.239 => 62.220.31.202
00:13:72:4d:ca:d1 => 00:15:c5:e8:67:37
PCMU/8000
PCMA/8000
telephone-event/8000
iLBC/8000
```



MACs

When checked (default), the source MAC addresses of the sending and destination MAC addresses of the receiving VoIP device will be shown in all message snippets, see example below. This option can be used to verify whether a VoIP device uses the correct network interface.

```
[ 1 ] INVITE sip:00493077714046@sip.palladion.net UDP
62.220.31.239 => 62.220.31.202
00:13:72:4d:ca:d1 => 00:15:c5:e8:67:37
PCMU/8000
PCMA/8000
telephone-event/8000
iLBC/8000
```



Codecs

When checked (default) and the raw VoIP message contains a SDP (Session Description Protocol) header, the codec information will be displayed in all message snippets, see example below. This is the case for messages establishing a media session, e.g. SIP INVITE.

```
[ 1 ] INVITE sip:00493077714046@sip.palladion.net UDP
62.220.31.239 => 62.220.31.202
00:13:72:4d:ca:d1 => 00:15:c5:e8:67:37
PCMU/8000
PCMA/8000
telephone-event/8000
iLBC/8000
```



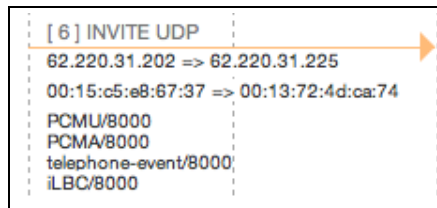
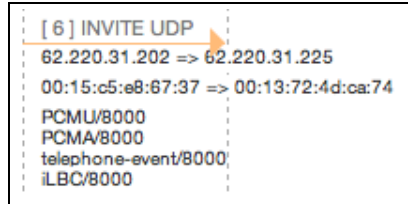
Absolute Time

When checked (default) and the VoIP message can be associated with a time stamp, the time information will be displayed in all message snippets. This option can be used to detect delays in VoIP environments.

Unwind Messages

Unwind Messages

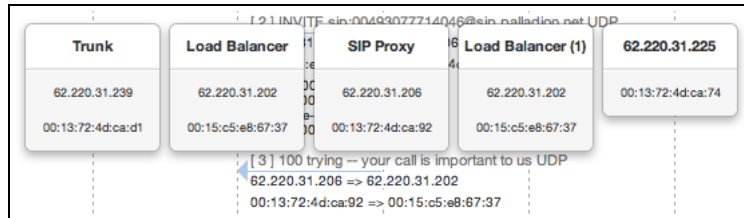
When checked (default), device boxes may appear duplicated. This intended behavior simplifies the readability of the VoIP message flow, i.e. message snippets are placed exactly between two device boundaries, see example below.



Pin Devices

Pin Devices

This option is not checked by default. When checked, device boxes will be locked on top of the message window. This option can be useful when scrolling through large pages or small browser windows respectively.



Overview

Overview menu

By selecting this menu item all device boxes will be rearranged to fit into the sequence diagram window.

Note: This option may have impact on readability, this can be changed by selecting the menu items Compact or Wide.

Compact

Compact menu

By selecting this menu item all device boxes will be rearranged to occupy the least possible space in the sequence diagram window.

Note: Some message snippets may overlap, this can be changed by selecting the menu items Overview or Wide.

Wide

Wide menu

By selecting this menu item all device boxes will be rearranged to provide a wider viewing experience. This option is recommended when using large displays.

Note: This option may clip content on small displays, this can be changed by selecting the menu items Overview or Compact

Zoom in

Zoom In menu

By selecting this menu item the text size of all message snippets in the sequence diagram window will be increased.

Zoom out

Zoom Out menu

By selecting this menu item the text size of all message snippets in the sequence diagram window will be decreased.