# SteelCentral™ NetShark Filters Guide

**Version 10.0 and later**

**August  2014**

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# About this guide

## Scope

This guide explains the structure and syntax of Riverbed® SteelCentral™ NetShark filters (formerly called Cascade Pilot filters), which are used by Riverbed® SteelCentral™ Packet Analyzer (formerly Cascade Pilot). It describes several commonly used filters, and provides information on using all of the SteelCentral NetShark filters—hundreds of them.

## Audience

This guide assumes that you are an experienced network administrator and have a basic familiarity with the SteelCentral Packet Analyzer.

## Software version note

The NetShark filter syntax and many of the filter names changed when version 10.0 of the NetShark and Packet Analyzer was released. In this guide the information on filters and filter syntax describes the version 10.0-and-later filters. An appendix near the back of this guide provides information on updating version 9.x-and-earlier filters to version 10.0-and-later filters.

## Related information

For more information on the use of NetShark filters in Packet Analyzer, refer to the "Filtering" section of the *SteelCentral Packet Analyzer Reference Manual*.

# NetShark filter syntax

NetShark filters, as used in Packet Analyzer, allow you to filter out extraneous data from samples of network traffic and concentrate on the data of interest.

## How the filters work

For example, if you had this view of network traffic in Packet Analyzer…

…and you wanted to look only at email traffic, you could apply the filter

```
generic.application = "Email"
```

to the data set. This would limit the view to email packets, and the result would be:

NetShark filtering works by evaluating each packet in the data set against the filter. If the result for a packet is true, the packet is retained for display in the filtered view; if it is false, the packet is discarded from the data points that make up the view. In the example above, discarding the non-email packets and rescaling the remaining data make the pattern of email activity stand out much more clearly.

(For details on how to apply filters in Packet Analyzer, see the "Filtering" chapter in the *SteelCentral Packet Analyzer Reference Manual*.)

## Filter syntax

***Note:*** *The information in this section describes the filter syntax for version 10.0 and later of NetShark and Packet Analyzer products. Version 9.6-and-earlier filters do not work on version 10.0-and-later NetShark and Packet Analyzer products. For information on converting version 9.6-and-earlier filters to version 10.0 syntax, refer to Appendix: Migrating old filters at the back of this guide.*

NetShark filters are composed of **expressions** containing one or more **comparisons** combined or modified with Boolean operators.

A **comparison** has a syntax of:

```
field OPERATOR "value"
```

where:

- **field** is case sensitive and indicates the attribute or characteristic of the data that is being compared. The Filters panel in Packet Analyzer shows all the available fields.
- **OPERATOR** can be:

| Symbol | Meaning |
|---|---|
| **=** | equal to |
| **<** | less than |

| | |
|---|---|
| **`>`** | greater then |
| **`!=`** | not equal to |
| **`<=`** | less than or equal to |
| **`>=`** | greater than or equal to |
| **`contains`** | contains |

- **`value`** specifies the data value for the comparison. The value must be enclosed in quotation marks, and no space is allowed between the quotation mark and the value.

An **expression** may be a single **comparison** or may group multiple comparisons as:

```
comparison BOOLEAN comparison
```

where `BOOLEAN` can be:

| Symbol | Meaning |
|---|---|
| \| | or |
| & | and |

A comparison may be negated using the ! operator, and comparisons can be grouped using parentheses.

*Example filters:*

```
generic.application = "Web"

(ip.src = "63.147.82.80") & (ip.dst = "192.168.77.10")

http.uri contains "google.com" & !(tcp.server_port = "80" | tcp.server_port =
"8080")
```

# Short list of useful filters

The next several sections list commonly used Packet Analyzer filters, grouped as follows:

- Generic
- Ethernet
- IP
- TCP / UDP
- HTTP
- 802.11
- VoIP

A brief explanation and an example accompany each filter.

## Generic filters

**`generic.application`**

This expression depends on a set of customizable parameters that associate a list of ports/protocols to a common name such as “Web” or “Email” for frequently used filters. This allows filters to be more flexible and compact. The associations are contained in the `proto-groups` configuration file, described in the "Protocol groups file" section below.

For instance, the `proto-groups` file associates the common name "Web" with TCP ports 80 (HTTP), 8080 (HTTP), and 443 (HTTPS). Thus, using the `generic.application` filter with a value of "Web" matches all packets communicating on any of those ports.

Note that you should use caution if you want to match specific numbered ports, as the common names such as “Web” or “Email” are likely to combine multiple port numbers to make a broad match.

*Example:*

```
generic.application = “Web”
```

## Ethernet filters

**`mac.address`**

`(mac.src)`

`(mac.dst)`

This expression allows you to filter on Ethernet host (MAC) addresses. Using `mac.address` selects the packets if either the source or the destination matches the value. Replace the field `mac.address` with the expressions in parentheses if you are interested only in packets coming from a specific source MAC address or going to a specific destination MAC address.

*Example:*

```
mac.src = "00:1d:6a:b8:a6:3f"
```

**`mac.vendor`**

`(mac.src_vendor)`

`(mac.dst_vendor)`

This expression allows you to filter on a vendor name, which can be useful if a vendor is associated with more than one MAC address range. Refer to the "Manufacturers file" section for more information.

Using `mac.vendor` selects the packets if either the source or the destination matches the value. Replace `mac.vendor` with one of the expressions in parentheses if you are interested only in packets coming from a specific source vendor or going to a specific destination vendor.

*Allowed values:* Allowed vendor names are stored in a file called `manuf` in the directory `\server\configuration` of the Packet Analyzer installation. Refer to the "Manufacturers file" section for more information.

*Example:*

```
mac.src_vendor = "Cisco-Link"
```

**`mac.vendor_with_mac`**

`(mac.src_vendor_with_mac)`

`(mac.dst_vendor_with_mac)`

This expression allows you to filter on a string defined as a vendor name, combined with the last 3 bytes of the MAC address. Using `mac.vendor_with_mac` selects the packets if either the source or the destination matches the value. Replace the field `mac.vendor_with_mac` with one of the expressions in parentheses if you are interested only in packets coming from a specific source MAC address or going to a specific destination MAC address.

*Allowed values:* Allowed vendor names are stored in a file called `manuf` in the directory `\server\configuration` of the Packet Analyzer installation. Refer to the “Manufacturers file” section for more information. The vendor name represents the first 3 bytes of the MAC address; you add the last 3 bytes, using the format “`<vendor_name>_xx:xx:xx`”, where `xx` represents a byte in a MAC address.

*Example:*

```
mac.src_vendor_with_mac = "Cisco-Link_0c:08:78"
```

**`mac.protocol_type_name`**

This expression allows you to filter on the specified protocol at the network layer.

*Allowed values:* `Unknown`, `IP`, `IPv6`, `ARP`, `RARP`, `XEROX`, `DLOG`, `X.75`, `NBS`, `ECMA`, `Chaosnet`, `X.25`, `AARP`, `EAPS`, `IPX`, `SNMP`, `MPCP`, `PPP`, `GSMP`, `MPLS`, `MPLS`, `PPPoE`, `EAPOL`, `AoE`, `LWAPP`, `LLDP`, `WSMP`

*Example:*

```
mac.protocol_type_name = "IP"
```

**`mac.dst_delivery_type`**

`(mac.src_delivery_type)`

This filter selects the type of delivery used for the MAC layer transmission. Destination or source can be specified.

*Allowed values:* `Broadcast`, `Multicast`, `Unicast`

*Example:*

```
mac.dst_delivery_type = "Multicast"
```

**`mac.vlan_id`**

This expression allows you to filter on the VLAN Identifier.

*Example:*

```
mac.vlan_id = "1"
```

## IP filters

**`ip.address`**

`(ip.src)`

`(ip.dst)`

This expression allows you to filter on a host IP address or name. Replace `ip.address` with one of the expressions in parentheses if you are interested only in an IP source or destination address or name.

*Example:*

```
ip.src = "74.125.155.103"
```

**`ip.dst_delivery_type`**

This expression allows you to filter on IP "`Unicast`", "`Broadcast`", and "`Multicast`".

Allowed values: `Broadcast`, `Multicast`, `Unicast`

*Example:*

```
ip.dst_delivery_type = "Unicast"
```

**ip.protocol_name**

This expression allows you to filter on the specified protocol at the transport layer contained in the IP protocol.

Allowed values: TCP, UDP, ICMP, HOPOPT, IGMP, GGP, IP, ST, CBT, EGP, IGP, BBN-RCC-MON, NVP-II, PUP, ARGUS, EMCON, XNET, CHAOS, MUX, DCN-MEAS, HMP, PRM, XNS-IDP, TRUNK-1, TRUNK-2, LEAF-1, LEAF-2, RDP, IRTP, ISO-TP4, NETBLT, MFE-NSP, MERIT-INP, DCCP, 3PC, IDPR, XTP, DDP, IDPR-CMTP, TP++, IL, IPv6 SDRP, IPv6-Route, IPv6-Frag, IDRP, RSVP, GRE, DSR, BNA, ESP, AH, I-NLSP, SWIPE, NARP, MOBILE, TLSP, SKIP, IPv6-ICMP, IPv6-NoNxt, IPv6-Opts, CFTP, SAT-EXPAK, KRYPTOLAN, RVD, IPPC, SAT-MON, VISA, IPCV, CPNX, CPHB, WSN, PVP, BR-SAT-MON, SUN-ND, WB-MON, WB-EXPAK, ISO-IP, VMTP, SECURE-VMTP, VINES, TTP, NSFNET-IGP, DGP, TCF, EIGRP, OSPFIGP, Sprite-RPC, LARP, MTP, AX.25, IPIP, MICP, SCC-SP, ETHERIP, ENCAP, GMTP, IFMP, PNNI, PIM, ARIS, SCPS, QNX, A/N, IPComp, SNP, Compaq-Peer, IPX-in-IP, VRRP, PGM, L2TP, DDX, IATP, STP, SRP, UTI, SMP,SM, PTP, ISIS, FIRE, CRTP, CRUDP, SSCOPMCE, IPLT, SPS, PIPE, SCTP, FC, RSVP-E2E-IGNORE, Mobility Header, UDPLite, MPLS-in-IP

*Example:*

```
(ip.protocol_name = "TCP") or (ip.protocol_name = "UDP")
```

**ip.c_net**

(ip:src_c_net)

(ip:dst_c_net)

This filter allows you to filter on traffic coming or going to an IP Class C source or destination subnet. The expressions in parentheses allow you to filter only source subnets or only destination subnets.

*Example:*

```
ip.c_net = "192.168.77.0"
```

**ip.domain**

(ip.src_domain)

(ip.dst_domain)

This filter allows you to filter on traffic coming from or going to a selected Internet Domain. It is possible to specify only source or destination with using one of the expressions in parentheses.

*Example:*

```
ip.domain = "1e100.net"
```

**ip.country**

(ip.src_country)

(ip.dst_country)

This filter selects the source and destination country based on a GeoIP lookup. Use one of the expressions in parentheses to select only source or destination.

*Example:*

```
ip.dst_country = "Russian Federation"
```

**ip.src_internal**

(ip.dst_internal)

This filter allows specifying the IP address of the source (destination) interface if the host is in the internal net. To get all the traffic coming from (or going to) an external host use the expression "Remote".

*Example:*

```
ip.src_internal = "Remote"
```

**ip.is_fragmented_str**

This expression allows selecting between "Fragmented" and "Not Fragmented" traffic.

*Example:*

```
ip.is_fragmented_str = "Fragmented"
```

**`ip.time_to_live`**

This filter specifies the maximum time (in seconds) that a datagram is allowed to survive.

*Example:*

```
ip.time_to_live = "53"
```

## TCP/UDP filters

**`tcp.port_pair`**

This expression allows you to filter on a TCP port number.

*Example:*

```
tcp.port_pair = "80"
```

**`tcp.identification_port_name`**

This expression allows you to use strings such as "`pop3s`" instead of port numbers to filter on TCP ports.

Allowed values are contained in the port-numbers file, described above in the “Port numbers file” section.

*Example:*

```
tcp.identification_port_name = "pop3s"
```

**`tcp.flags`**

This filter allows filtering packets according to TCP flags.

*Allowed values:* `SYN`, `FIN`, `RST`, `PSH`, `ACK`, `URG`, `No Flags` or any combination, e.g. `SYN-ACK`, `PSH-ACK`

*Example:*

```
tcp.flags = "PSH-ACK"
```

### `tcp.error_type`

This filter allows selecting packets according to TCP errors.

*Allowed values:* `Retransmissions`, `Timeouts`, `Out of Order`, `Lost Segments`, `Duplicate Acks`, `Zero Windows`, `Resets`

*Example:*

```
tcp.error_type = "Resets"
```

### `tcp.server_ip`

This filter allows selecting packets specifying the IP address of the hosts that receive TCP connections.

*Example:*

```
tcp.server_ip = "87.255.33.136"
```

### `tcp.client_ip`

This filter allows selecting packets specifying the IP address of the hosts that start TCP connections.

*Example:*

```
tcp.client_ip = "192.168.77.115"
```

### `udp.port_pair`

This expression allows you to filter on UDP port numbers.

*Example:*

```
udp.port_pair = "19543"
```

**`udp.identification_port_name`**

This expression allows you to use strings such as "`DNS`" instead of port numbers to filter on UDP ports.

*Example:*

```
udp.identification_port_name = "DNS"
```

## HTTP filters

**`http.uri`**

This expression allows you to filter on all or part of the URI.

*Example:*

```
http.uri contains "1A8928AF6E4E4255BBECE04056B00DA038/TC2.pdb"
```

**`http.host`**

This expression allows you to filter on the Host name in the http header.

*Example:*

```
http.host contains "youtube"
```

**`http.path`**

This expression allows you to filter on the HTTP resource path and name.

*Example:*

```
http.path contains "/books?id=Vi05"
```

**`http.method`**

This expression allows you to filter on the HTTP request type.

*Allowed values:* `GET`, `POST`, `HEAD`, `PUT`, `DELETE`, `TRACE`, `OPTIONS`, `CONNECT`

Example:

```
http.method = "GET"
```

### http.content_type

This expression allows you to filter on the HTTP content type.

*Allowed values:* Any of the http mime types. See http://www.iana.org/assignments/media-types.

*Example:*

```
http.content_type contains "image"
```

### http.status_code

This expression allows you to filter on the status code, as listed in http://en.wikipedia.org/wiki/List_of_HTTP_status_codes.

*Example:*

```
http.status_code = "200"
```

## 802.11 filters

### wlan_link.channel

This expression allows you to filter on packets using 802.11 channel representation strings such as `BG 001`, `BG 002` ...

Allowed values: `<BG | A | N | Nhigh | NLow> space <3 digits channel number>`

*Example:*

```
wlan_link.channel = "BG 002"
```

### wlan_link.channel_frequency

This expression allows you to filter on packets using 802.11 channel frequency in MHz (`2412`, `2417` ...)

*Example:*

```
wlan_link.channel_frequency = "2447"
```

**`wlan.bssid.essid`**

This expression allows you to filter on packets using the Extended Service Set IDentifier (ESSID) string.

*Example:*

```
wlan.bssid.essid = "Riverbed_WIFI"
```

**`wlan.frame_control.src_type`**

`(wlan.frame_control.dst_type)`

This expression allows you to filter on source (destination) wireless nodes according to their function as access points (AP) or stations (STA).

Allowed values: `AP`, `STA`

*Example:*

```
wlan.frame_control.src_type = "AP"
```

**`wlan_link.channel_designator_per_station`**

This expression allows you to filter on the string of the channel type designator.

Allowed values: For PPI valid values are `A`, `B`, `G`, `N`; for Radiotap valid values are `A`, `B`, `G`.

*Example:*

```
wlan_link.channel_designator_per_station = "B"
```

**`wlan.frame_control.protection_type_ap`**

This filter allows you to select the type of encryption used based on the AP to which the client is associated.

Allowed values: `Unknown`, `WEP`, `WPA [TKIP]`, `WPA2 [CCMP]`, `None`

*Example:*

```
wlan.frame_control.protection_type_ap = "WPA [TKIP]"
```

**wlan.frame_control.type_name**

This expression allows you to filter on the string of the frame type.

Allowed values: `Management`, `Control`, `Data`, `Reserved`

*Example:*

```
wlan.frame_control.type_name = "Data"
```

**wlan.frame_control.type_subtype_name**

This expression allows you to filter on the string of the frame type/subtype.

Allowed values: `Association request`, `Association response`, `Reassociation request`, `Reassociation response`, `Probe request`, `Probe response`, `Beacon`, `ATIM`, `Disassociation`, `Authentication`, `Deauthentication`, `Action`, `Action No Ack`, `Control Wrapper`, `Block Ack Request (BlockAckReq)`, `Block Ack (BlockAck)`, `PS-Poll`, `RTS`, `CTS`, `ACK`, `CF-End`, `CF-End + CF-Ack`, `Data`, `Data + CF-Ack`, `Data + CF-Poll`, `Data + CF-Ack + CF-Poll`, `Null (no data)`, `CF-Ack (no data)`, `CF-Poll (no data)`, `CF-Ack + CF-Poll (no data)`, `QoS Data`, `QoS Data + CF-Ack`, `QoS Data + CF-Poll`, `QoS Data + CF-Ack + CF-Poll`, `QoS Null (no data)`, `QoS CF-Poll (no data)`, `QoS CF-Ack + CF-Poll (no data)`

*Example:*

```
wlan.frame_control.type_subtype_name = "ACK"
```

## VoIP filters

**voip.user_number**

`(voip.caller_number)`

`(voip.receiver_number)`

This expression allows filtering on the phone number of the caller or the receiver of the VoIP call. `voip.user_number` is used to filter if either the caller OR the receiver matches the specified phone number. Use one of the expressions in parentheses to select the caller or the receiver separately.

*Example:*

```
voip.user_number = "15023591801"
```

**`voip.user_ip`**

`(voip.caller_ip)`

`(voip.receiver_ip)`

This expression allows selecting caller or receiver IP address. Use one of the expressions in parentheses to select caller or receiver separately.

*Example:*

```
voip.caller_ip = "192.168.77.27"
```

**`voip.call_id`**

This expression can be used to filter the Call-ID of a call.

*Example:*

```
voip.call_id = "7603a6824759d0f8366970ae6ba3c4c9@192.168.77.27"
```

**`voip.final_status`**

This expression can be used to filter on the state of a terminated call.

*Allowed values:* `Canceled`, `Rejected`, `Completed`, `TimeOut`

*Example:*

```
voip.final_status = "Completed"
```

**`voip.protocol`**

This expression can be used to filter on the protocol used during the call (SIP or H.323).

*Allowed values:* `SIP`, `H.323`

*Example:*

```
voip.protocol = "SIP"
```

# Configuration files

There are a few configuration files that the Packet Analyzer and NetShark software may use when applying filters:

- port numbers file—associates a TCP or UDP port number with a well known protocol name
- protocol groups file—groups related protocols together
- manufacturers file—associates the first half of a MAC address with a device's manufacturer

## Port numbers file

The port numbers file associates TCP/UDP ports with well-known protocol names. This lets you create more meaningful expressions in Packet Analyzer filters:

*Typical entry in port numbers file:*

```
ftp-data    20/tcp    File Transfer [Default Data]
ftp-data    20/udp    File Transfer [Default Data]
```

*Typical filter:*

```
tcp.identification_port_name = "ftp-data"
```

## Protocol groups file

The protocol groups file groups together different ports/protocols and associates them with a single value, allowing you to use a simple expression to filter more than one item at a time. For example, the file defines the Email group as:

```
# Email
Email     25/tcp      SMTP
Email     465/tcp     Secure SMTP
Email     587/tcp     SMTP
Email     110/tcp     POP3
Email     995/tcp     POP3 over SSL
Email     143/tcp     IMAP
Email     585/tcp     Secure IMAP
Email     993/tcp     IMAP over SSL
Email     119/tcp     NNTP
```

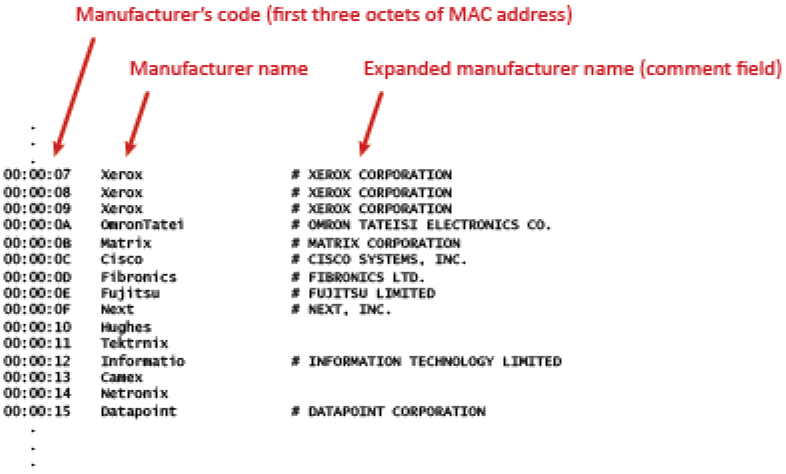
This definition allows you to filter all of the above protocols with a single string. For example:

```
generic.application = “Email”
```

finds all packets of any of the Email protocols.

## Manufacturers file

This file lists ranges of MAC addresses and tells what manufacturer is associated with each range. A typical section of the file looks like this:


Manufacturer's code (first three octets of MAC address)
Manufacturer name
Expanded manufacturer name (comment field)

```
   .
   .
   .
00:00:07   Xerox              # XEROX CORPORATION
00:00:08   Xerox              # XEROX CORPORATION
00:00:09   Xerox              # XEROX CORPORATION
00:00:0A   OmronTatei         # OMRON TATEISI ELECTRONICS CO.
00:00:0B   Matrix             # MATRIX CORPORATION
00:00:0C   Cisco              # CISCO SYSTEMS, INC.
00:00:0D   Fibronics          # FIBRONICS LTD.
00:00:0E   Fujitsu            # FUJITSU LIMITED
00:00:0F   Next               # NEXT, INC.
00:00:10   Hughes
00:00:11   Tektrnix
00:00:12   Informatio         # INFORMATION TECHNOLOGY LIMITED
00:00:13   Camex
00:00:14   Netronix
00:00:15   Datapoint          # DATAPOINT CORPORATION
   .
   .
   .
```

This lets you make a more readable filter by using the manufacturer name instead of the first three MAC octets.

*Example:*

Since the entry for Riverbed Technology in the manufacturers file is:

```
00:0E:B6 RiverbedTe    # Riverbed Technology, Inc.
```

you can use the filter:

```
mac.vendor = "RiverbedTe"
```

to find all packets coming from or going to equipment manufactured by Riverbed Technology, Inc. (that is, packets with 00:0E:B6 as the first 3 octets of the MAC address).

The manufacturer name must be spelled exactly the same as it appears in the file. For instance, if the filter in the example above used a value of "`Riverbed`" it would not find any packets.

### Multiple address ranges

If the same manufacturer name is associated with multiple MAC address ranges, the filters find packets with addresses in all those ranges. For example, a manufacturer name of `Xerox` matches manufacturer codes of `00:00:07`, `00:00:08`, and `00:00:09` (as indicated in the listing above), and several others.

### Multiple manufacturer names

Filters use the information exactly as it appears in the file. For example, the listings in the file for equipment made by Intel Corporation may carry a manufacturer name of either `Intel` or `IntelCorpo`. A filter using "`Intel`" as the manufacturer name would find only packets with MAC addresses associated with `Intel`; it would not find packets with MAC addresses associated with `IntelCorpo`. To find all packets associated with equipment manufactured by Intel you would have to use two filters, one with each name. (Alternatively, you could make a single filter that combined both filters with a Boolean OR.)

### Contract manufacturers

Filtering with a network equipment vendor's name may not show all traffic to or from equipment that carries that vendor's brand. When a vendor has its equipment manufactured by a contract manufacturer, the equipment may have a MAC address associated with the contract manufacturer, not the vendor.

### Location of the file

The manufacturers file is the Wireshark `manuf` file, which is maintained by the Wireshark organization. It is stored on your local system as:

```
C:\Users\<user>\AppData\Roaming\Riverbed\SteelCentral Packet
Analyzer\<version>\server\configuration\manuf
```

where `<user>` is the name of the system user who installed Packet Analyzer and `<version>` is the version number of the software.

## Modifying configuration files

You can modify the port numbers and protocol groups files described above to suit your purposes. Generally you will not need to modify the port numbers file, as it is based on standard assignments of port numbers used throughout the networking industry.

If you modify the protocol groups file, note that any port/protocol can belong to only one group. If a port/protocol is assigned to more than one group, only the first assignment in the file will be valid.

### Location of the files on the local system

If you wish to modify the configuration files, use the port numbers and protocol groups files that are stored on your local system (the system that runs Packet Analyzer) as:

- `port-numbers`
- `proto-groups`

in the folder:

```
    C:\Users\<user>\AppData\Roaming\Riverbed\ SteelCentral Packet Analyzer
    \<version>\server\configuration
```

where `<user>` is the name of the system user who installed Packet Analyzer and `<version>` is the version number of the software. You can find the correct version number by opening Packet Analyzer and clicking the green "i" button in the upper right corner of the screen; the version number will be listed as the "internal build" on the About dialog.

Note that copies of the `port-numbers` and `proto-groups` files were stored under the `C:\Program Files (x86)` file structure during installation. Those files are used to restore the defaults; do ***not*** modify them.

## Configuration files on NetShark appliances

The configuration files on the local system, described above, affect only the filtering that is performed on the local system—that is, on:

- devices that are in or connected directly to the local system
- files that are stored on the local system or on networked drives mapped to the local system

The configuration files on the local system do not affect filtering on remote NetShark or NetShark virtual edition products—that is, on:

- capture jobs running on those appliances
- capture files stored on those appliances

Remote appliances run their own copies of the Packet Analyzer server software, and use their own copies of the configuration files when performing filtering operations.

**Important:** If you modify the configuration files, make sure that you modify the files on each of the remote appliances as well as the files on your local system. On the appliances, the configuration files are located as follows:

- port numbers file—In the appliance's web interface, go to `Settings > Port/Protocol Names (Port Definitions` in version 10.5 and greater`).`
- protocol groups file—In the appliance's web interface, go to `Settings > Port/Protocol Groups (Port Group Definitions` in version 10.5 and greater`).`
- manufacturers file—Not modifiable on the system.

# Appendix: Migrating old filters

The 10.0 release of the Packet Analyzer and NetShark software introduced changes to the filters:

- The filter syntax changed (the extractor was incorporated into the field):

| | **Syntax** | **Example** |
|---|---|---|
| **Old:** | `extractor::id OPERATOR "value"` | `ip::ip.str = "10.5.3.17"` |
| **New:** | `field OPERATOR "value"` | `ip.address = "10.5.3.17"` |

- Many of the filter names changed.
- The name of the filtering scheme changed from "Cascade Pilot filters" to "NetShark filters".

As a result, old (9.x-and-earlier) filters do not work with new (10.0-and-later) software, and vice versa.

If you have custom filters that you want migrate from the old form to the new form, the information in the sections below will help. These sections are arranged alphabetically by extractor name, and within each section the field IDs are alphabetized. Each entry shows:

**`old_filter -> new_filter`**
description of filter

(If the value for `new_filter` is "N/A", there is no new equivalent for the old filter.)

Substitute the new filter for the old filter, and the filter is ready to use with 10.0-and-later versions of Packet Analyzer software and NetShark appliances.

Click one of these links to go to the section corresponding to your filter's extractor:

- arp::
- cws::
- dns::
- fix::
- generic::
- http::
- icmp::
- ieee80211::
- ip::

## arp::

**`arp::bits -> arp.bits`**
Bit count of ARP packets

**`arp::bytes -> arp.bytes`**
Byte count of ARP packets

**`arp::class.str -> arp.class_name`**
ARP packet class (ARP, RARP, or INARP)

**`arp::destination_hardware_address -> arp.src_hw_address.delivery_type`**
Delivery type used for the hardware layer transmission

**`arp::destination_hardware_address.delivery_type.str -> arp.dst_hw_address.delivery_type`**
Delivery type used for the hardware layer transmission

**`arp::destination_hardware_address.vendor.str -> arp.dst_hw_address`**
Hardware address of the receiving host

**`arp::destination_hardware_address.vendor_with_mac.str -> arp.dst_hw_address.vendor`**
Hardware address vendor of the receiving host

**`arp::gratuitous_arp -> arp.is_gratuitous`**
Indicates if a particular ARP request is gratuitous, meaning the source and destination protocol addresses are the same.

**`arp::gratuitous_arp.str -> arp.is_gratuitous_str`**
Indicates if a particular ARP request is gratuitous, meaning the source and destination protocol addresses are the same.

**`arp::hardware_address_len -> arp.hardware_address_len`**
Length of the hardware address

**`arp::hardware_type -> arp.hardware_type`**
Hardware type code (e.g. 1)

**`arp::hardware_type.str -> arp.hardware_type_name`**
Hardware type string (e.g. Ethernet)

**`arp::packets -> arp.packets`**
Packet count of ARP packets

**`arp::protocol_address_len -> arp.protocol_address_len`**
Length of the protocol address

**`arp::protocol_type -> arp.protocol_type`**
Protocol type code (e.g. 0x0800)

**`arp::protocol_type.str -> arp.protocol_type_name`**
Protocol type string (e.g. IP)

**`arp::source_hardware_address -> arp.src_hw_address`**
Hardware address of the transmitting host

**`arp::source_hardware_address.delivery_type.str -> arp.dst_hw_address.vendor_with_mac`**
Hardware address and vendor of the receiving host

**`arp::source_hardware_address.vendor.str -> arp.src_hw_address.vendor`**
Hardware address vendor of the transmitting host

**`arp::source_hardware_address.vendor_with_mac.str -> arp.src_hw_address.vendor_with_mac`**
Hardware address and vendor of the transmitting host

**`arp::type -> arp.type`**
ARP packet type code

**`arp::type.str -> arp.type_name`**
ARP packet type string

## cws::

**`cws::dhcp.relayed.str -> dhcp.is_relayed_str`**
Description of the DHCP traffic (Relayed or Not Relayed)

## dns::

**`dns::is_authenticated_data -> dns.is_authenticated_data`**
Indication of whether the data in the response has been verified or otherwise meets the local security policy of the issuing server

**`dns::is_authoritative -> dns.is_authoritative`**
Indication of whether the sending server is an authority for the domain name requested

**`dns::is_query -> dns.is_query`**
Indication of whether the packet is a query

**`dns::is_recursion_available -> dns.is_recursion_available`**
Indication of whether the sending server supports recursive queries

**`dns::is_recursion_desired -> dns.is_recursion_requested`**
Indicates the sending client supports recursion and desires it.

**`dns::is_response -> dns.is_response`**
Indication of whether the packet is a response

**`dns::is_truncated -> dns.is_truncated`**
Indication of whether only the first 512 bytes of the response was returned

**`dns::number_of_additional_rrs -> dns.response.additional_rrs`**
The number of additional Resource Records (RRs) present in a packet.

**`dns::number_of_answer_rrs -> dns.response.answer_rrs`**
The number of answer Resource Records (RRs) present in a packet.

**`dns::number_of_authority_rrs -> dns.response.authority_rrs`**
The number of authority Resource Records (RRs) present in a packet.

**`dns::number_of_queries -> dns.query.count`**
The number of queries present in a packet.

**`dns::opcode -> dns.opcode`**
Type of DNS packet

**`dns::opcode.str -> dns.opcode_name`**
Description of DNS packet type

**`dns::response_time -> dns.response_time`**
Time that elapsed from when the request was issued to when the response is received

**`dns::response_time.category.str -> dns.response_time_range`**
Time range that elapsed from when the request was issued to when the response is received

**`dns::return_code -> dns.status_code`**
The return code for the DNS Query/Response.

**`dns::return_code.str -> dns.status_code_name`**
The return code string for the DNS Query/Response.

**`dns::return_code.tfs -> dns.is_success`**
Indication of whether the return code for the DNS Query/Response is success

**`dns::return_code.tfs.str -> dns.is_success_str`**
Description of the return code for the DNS Query/Response (Success or Failure)

**`dns::transaction_id -> dns.transaction_id`**
The session identifier for this packet

## fix::

**`fix::alloc_account -> fix.alloc_account`**
Sub-account mnemonic

**`fix::alloc_status -> fix.alloc_status`**
Identifies status of allocation (e.g. '3')

**`fix::alloc_status.name -> fix.alloc_status_name`**
Identifies status of allocation (e.g. 'received')

**`fix::alloc_type -> fix.alloc_type`**
Allocation type or purpose of an allocation message (e.g. '9')

**`fix::alloc_type.name -> fix.alloc_type_name`**
Allocation type or purpose of an allocation message (e.g. 'Accept')

**`fix::bw -> fix.message_bits`**
Number of bits used by the current message

**`fix::bw.bytes -> fix.message_bytes`**
Number of bytes used by the current message

**`fix::cl_ord_id -> fix.cl_ord_id`**
Order ID generated locally by the client, not necesarily unique in a multi-client environment

**`fix::error.count -> fix.type_errors`**
Number of FIX errors of a given type.

**`fix::error.count.total -> fix.errors`**
Number of FIX errors

**`fix::error.type.str -> fix.error_type`**
Type of the FIX error as a string

**`fix::exec_type -> fix.exec_type`**
Describes the specific Execution Report (e.g. '4 - Canceled')

**`fix::is_fix -> fix.is_fix`**
Indication of whether the current packet contains FIX traffic

**`fix::message.category -> fix.message_category`**
FIX Message type (e.g. ProgramTrading)

**`fix::message.count -> fix.messages`**
FIX Message count

**`fix::message.type -> fix.message_type`**
FIX Message type (e.g. NewOrderList)

**`fix::network.rtt -> fix.round_trip_time`**
Client to server round trip time

**`fix::normalized.srt -> fix.service_response_time`**
Delay between the order placement and execution report

**`fix::ord_id -> fix.order_id`**
Order ID

**`fix::ord_id.grid -> fix.order_id`**
Order ID (Used for grid, set also empty value)

**`fix::ord_qty -> fix.order_qty`**
Order quantity

**`fix::ord_status -> fix.ord_status`**
Order status code (e.g. 0)

**`fix::ord_status.name -> fix.ord_status_name`**
Order status returned only for the response (e.g. New)

**`fix::ord_type -> fix.ord_type`**
Order type code (e.g. '2 - Limit')

**`fix::packets -> fix.packets`**
Number of packets carrying FIX traffic

**`fix::price -> fix.price`**
Price per unit of quantity (e.g. per share)

**`fix::sender.compid -> fix.sender_compid`**
Sender Firm ID

**`fix::sender.locationid -> fix.sender_locationid`**
Sender Location ID

**`fix::sender.subid -> fix.sender_subid`**
Specific Sender ID

**`fix::seqnum -> fix.seqnum`**
Message sequence number

**`fix::seqnum_error_count -> fix.seqnum_errors`**
Ammount of messages with a sequence number that is lower than expected

**`fix::seqnum_gap_count -> fix.seqnum_gaps`**
Ammount of messages with a sequence number that is higher than expected

**`fix::seqnum_reset_count -> fix.seqnum_resets`**
Ammount of sequence reset messages

**`fix::side -> fix.side`**
Side code of order (e.g. '2 - Sell')

**`fix::symbol -> fix.symbol`**
Common, 'human understood' representation of the security

**`fix::target.compid -> fix.target_compid`**
Target Firm ID

**`fix::target.locationid -> fix.target_locationid`**
Target Location ID

**`fix::target.subid -> fix.target_subid`**
Target Specific ID

**`fix::transaction.time -> fix.transaction_time`**
SRT or Network RTT, depending on the value of transaction.time.type

**`fix::transaction.time.type -> fix.transaction_time_category`**
String that distinguishes between the Network RTT and the SRT

**`fix::unfulfilled_order.count -> fix.unfulfilled_orders`**
Number of unfulfilled orders.

## generic::

**`generic::absolute_pktnum -> generic.absolute_pktnum`**
Absolute packet number including those dropped by filters (but not including those dropped by BPF filters)

**`generic::absolute_pktnum.every_10 -> N/A`**
The absolute packet number, regardless of how many packets were dropped by filters. Note: packets dropped with BPF filters are not counted in this value

**generic::absolute_pktnum.every_100 -> N/A**
The absolute packet number, regardless of how many packets were dropped by filters. Note: packets dropped with BPF filters are not counted in this value

**generic::absolute_pktnum.every_1000 -> N/A**
The absolute packet number, regardless of how many packets were dropped by filters. Note: packets dropped with BPF filters are not counted in this value

**generic::absolute_pktnum.every_10000 -> N/A**
The absolute packet number, regardless of how many packets were dropped by filters. Note: packets dropped with BPF filters are not counted in this value

**generic::absolute_pktnum.every_100000 -> N/A**
The absolute packet number, regardless of how many packets were dropped by filters. Note: packets dropped with BPF filters are not counted in this value

**generic::absolute_pktnum.every_1000000 -> N/A**
The absolute packet number, regardless of how many packets were dropped by filters. Note: packets dropped with BPF filters are not counted in this value

**generic::application.str -> generic.application**
Traffic type classification (e.g. 'Email' or 'Web')

**generic::bits -> generic.bits**
Bit Count

**generic::buffer.arrival.time -> N/A**
Estimated arrival time of buffer to the receiving host.

**generic::buffer.departure.time -> N/A**
Estimated departure time of buffer from the sending host.

**generic::bytes -> generic.bytes**
Byte Count

**generic::bytes_normalized -> generic.bytes_normalized**
Byte count normalized with a minimum length of 60

**generic::counter.double -> generic.packets_float**
Packet Count as a floating point number (used for time averaging)

**generic::empty_string.str -> generic.empty_string.str**
empty constant string that can be used to add a dimension in cube configurations that have only values

**generic::end.time.hints -> message.end_time**
Last packet timestamp of the stream.

**generic::end.time.unprocessed -> message.end_time_estimate**
Estimated arrival time of packet to the receiving host

**generic::fcs_error -> generic.fcs_error**
FCS error code

**generic::fcs_error.str -> generic.fcs_error_description**
FCS error description

**generic::hour -> N/A**
Numeric value that ranges from 0 to 24.

**generic::ignored.str -> generic.empty_string.str**
This field can be used to fill a dimension with a value that will be ignored by the chart

**`generic::max_microburst_bits_100ms -> generic.max_microburst_100ms.bits`**
Maximum bit count in a 100ms interval

**`generic::max_microburst_bits_10ms -> generic.max_microburst_10ms.bits`**
Maximum bit count in a 10ms interval

**`generic::max_microburst_bits_1ms -> generic.max_microburst_1ms.bits`**
Maximum bit count in a 1ms interval

**`generic::max_microburst_bytes_100ms -> generic.max_microburst_100ms.bytes`**
Maximum byte count in a 100ms interval

**`generic::max_microburst_bytes_10ms -> generic.max_microburst_10ms.bytes`**
Maximum byte count in a 10ms interval

**`generic::max_microburst_bytes_1ms -> generic.max_microburst_1ms.bytes`**
Maximum byte count in a 1ms interval

**`generic::max_microburst_packets_100ms -> generic.max_microburst_100ms.packets`**
Maximum packet count in a 100ms interval

**`generic::max_microburst_packets_10ms -> generic.max_microburst_10ms.packets`**
Maximum packet count in a 10ms interval

**`generic::max_microburst_packets_1ms -> generic.max_microburst_1ms.packets`**
Maximum packet count in a 1ms interval

**`generic::minute -> N/A`**
Numeric value that ranges from 0 to 59.

**`generic::month -> N/A`**
Numeric value that ranges from 1 to 12.

**`generic::packet_length_category -> generic.packet_length_range`**
Packet length range

**`generic::packets -> generic.packets`**
Packet Count

**`generic::protocol.str -> generic.protocol`**
Protocol classification based on the IP protocol, TCP port or UDP port

**`generic::relative_pktnum -> generic.relative_pktnum`**
Packet number ignoring those dropped by filters

**`generic::segment.end.time -> message.segment.end_time`**
Estimated arrival time of the segment if the destination is an endpoint, capture time if the destination is a capture point

**`generic::segment.start.time -> message.segment.start_time`**
Estimated departure time of the segment if the source is an endpoint, capture time if the source is a capture point

**`generic::start.time.hints -> message.start_time`**
First packet timestamp of the stream

**`generic::start.time.unprocessed -> message.start_time_estimate`**
Estimated departure time of packet from the sending host

**`generic::start_time_long -> generic.start_time`**
Initial capture time expressed as a 64-bit value in nano seconds.

**`generic::test.delay -> generic.test_delay`**
This field can be used to slow down the view processing by adding a sleep during the view processing

**`generic::time_from_first -> generic.relative_time`**
Delta from the first packet in the capture.

**`generic::time_long -> generic.absolute_time`**
Packet time expressed as a 64-bit value in nano seconds.

**`generic::time_sec -> generic.absolute_time_seconds`**
Packet UTC time expressed in seconds from january 1st 1970 as a 32-bit value.

**`generic::total_bits -> generic.total_bits`**
Bit count including any pseudo header such as Radiotap or PPI

**`generic::total_bytes -> generic.total_bytes`**
Byte count including any pseudo header such as Radiotap or PPI

**`generic::total_packet_length_category -> N/A`**
Packet length including any pseudo header such as Radiotap or PPI

**`generic::week_of_the_year -> N/A`**
Numeric value that ranges from 0 to 53.

**`generic::weekday -> N/A`**
Text value that ranges from Monday to Sunday.

**`generic::wire_bits -> generic.wire_bits`**
Bit count including Ethernet overhead (i.e. preamble + packet + CRC + inter frame gap)

**`generic::wire_bytes -> generic.wire_bytes`**
Byte count including Ethernet overhead (i.e. preamble + packet + CRC + inter frame gap)

**`generic::wire_overhead_bits -> generic.wire_overhead_bits`**
Bit count of the overhead used by the Ethernet protocol (i.e. preamble + CRC + inter frame gap)

**`generic::wire_overhead_bytes -> generic.wire_overhead_bytes`**
Byte count of the overhead used by the Ethernet protocol (i.e. preamble + CRC + inter frame gap)

## http::

**`http::answered.request.count -> http.answered_requests`**
The number of HTTP requests that received a well-formed answer from the server.

**`http::bot.name.str -> http.bot_name`**
Client browser model and version, only if the client is a bot

**`http::browser.str -> http.browser`**
Client browser model and version

**`http::content.length -> http.content_length`**
HTTP content length

**`http::content.type -> http.content_type`**
HTTP content type

**`http::encryption.type.str -> http.scheme`**
Type of web traffic (http, https...)

**`http::full.object.time -> http.object_transfer_time`**
Time to transfer an object (html page, image...), from the beginning of the request to the end of a response

**`http::host -> http.host`**
Host name in the http header

**`http::method -> http.method`**
HTTP request type (GET, POST, etc.)

**`http::object.download.rate -> http.object_transfer_rate`**
The rate at which an object (html page, image...), has been downloaded, dividing the object size by the transaction time (time of the request beginning to time of the response end)

**`http::object.len -> http.object_length`**
Length of the http object, in bytes. This is different from the HTTP Content Length because this length is calculate by observing the packets and not retrieved from the http header. Therefore, it returns the size of chunked encoded objects as well

**`http::parameters -> http.parameters`**
HTTP resource parameters

**`http::referer -> http.referer`**
Referer host name in the http request

**`http::request.count -> http.requests`**
The number of HTTP requests.

**`http::request.duration.time -> http.duration`**
Request duration measured from the first to the last packet seen for a request

**`http::request.start.absolute.time -> http.start_time`**
Time of the first request packet

**`http::resource -> http.path`**
HTTP resource path and name

**`http::resource.no.param -> http.path_no_param`**
HTTP resource path and name without variable parameters

**`http::status.code -> http.status_code`**
HTTP Status Code

**`http::status.code.str -> http.status_description`**
Human readable version of the HTTP status code

**`http::uri -> http.uri`**
HTTP Request URI

**`http::uri.no.param -> http.uri_no_param`**
HTTP Request URI Without Variable Parameters

**`http::user.agent -> http.user_agent`**
HTTP user agent

# icmp::

**`icmp::bits -> N/A`**
ICMP Bit Count, size in bits of the whole packet containing ICMP

**`icmp::bytes -> N/A`**
ICMP Byte Count, size in bytes of the whole packet containing ICMP

**`icmp::checksum -> icmp.checksum`**
Checksum of the ICMP header and payload

**`icmp::code -> icmp.code`**
Code of ICMP message

**`icmp::code.str -> icmp.code_name`**
Description of the code of ICMP message (e.g. Source Route Failed)

**`icmp::dest_unreachable.code -> icmp.dest_unreachable.code`**
Destination unreachable code of the error

**`icmp::dest_unreachable.code.str -> icmp.dest_unreachable.code_description`**
Description of destination unreachable code error

**`icmp::dest_unreachable.next_mtu -> icmp.dest_unreachable.next_mtu`**
Next-Hop MTU

**`icmp::echo_reply.identifier -> icmp.echo_reply.identifier`**
Echo reply identifier

**`icmp::echo_reply.response_time -> icmp.echo_reply.response_time`**
Time that elapsed from when the request was issued to when the response is received

**`icmp::echo_reply.response_time.category.str -> icmp.echo_reply.response_time_range`**
Time category that elapsed from when the request was issued to when the response is received

**`icmp::echo_reply.seq_num -> icmp.echo_reply.seqnum`**
Used to match echo request with the desired reply.

**`icmp::echo_request.identifier -> icmp.echo_request.identifier`**
Echo request identifier

**`icmp::echo_request.seq_num -> icmp.echo_request.seqnum`**
Used to match echo request with the desired reply.

**`icmp::packets -> N/A`**
ICMP packet count

**`icmp::time_exceeded.code -> icmp.time_exceeded.code`**
Time exceeded code of the error

**`icmp::time_exceeded.code.str -> icmp.time_exceeded.code_name`**
Description of time exceeded code error

**`icmp::type -> icmp.type`**
Type of ICMP message

**`icmp::type.str -> icmp.type_name`**
Description of the type of ICMP message (e.g. Echo reply)

## ieee80211::

**`ieee80211::bits.retransmitted -> wlan.retransmitted_bits`**
Retransmitted bits

**`ieee80211::bssid.essid.str -> wlan.bssid.essid`**
ESSID string.

**`ieee80211::bssid.essid.str.data -> N/A`**
ESSID string, but only for data frames.

**`ieee80211::bssid.essid_dirty.str -> N/A`**
ESSID string only for those packets that are on the wrong channel. Unless used for debug purposes bssid.essid should be used.

**`ieee80211::bssid.essid_pure.str -> N/A`**
ESSID string whether or not it is bound to the AP's channel.

**`ieee80211::bssid.str -> wlan.bssid`**
BSSID MAC address string.

**`ieee80211::bssid.vendor.str -> wlan.bssid.vendor`**
BSSID vendor name string.

**`ieee80211::bssid.vendor_with_mac.str -> wlan.bssid.vendor_with_mac`**
BSSID vendor name with last 3 bytes of the MAC address.

**`ieee80211::bytes.retransmitted -> wlan.retransmitted_bytes`**
Retransmitted bytes

**`ieee80211::channel.is_correct -> wlan.is_correct_channel`**
Determines if the packet was captured on the correct channel, or if it has strayed to a neighboring channel.

**`ieee80211::channel.stray -> wlan.channel_stray`**
The number of channels that a packet has strayed from the channel from which it was transmitted. A positive result indicates the receive channel was above the intended channel.

**`ieee80211::channel.usage -> wlan.channel_usage`**
The usage of a channel in percent.

**`ieee80211::filter_bpf_mac_convo.str -> N/A`**
The BPF filter for the MAC conversation.

**`ieee80211::fragment_number -> wlan.fragment_number`**
The fragment number of this 802.11 frame.

**`ieee80211::frame_control.association_failed -> wlan.is_association_failed`**
Determines if the current packet is a Failed Association Response

**`ieee80211::frame_control.authentication_failed -> wlan.is_authentication_failed`**
Determines if the current packet is a Failed Authentication

**`ieee80211::frame_control.control_retry -> wlan.frame_control.control_retry`**
Resent frame

**`ieee80211::frame_control.control_retry.str -> wlan.frame_control.control_retry_str`**
Resent frame

**`ieee80211::frame_control.control_retry.text.str -> wlan.frame_control.control_retry_type`**
Retransmission Type

**ieee80211::frame_control.destination_type.str -> wlan.frame_control.dst_type**
The type, AP or STA, that the destination wireless node represents.

**ieee80211::frame_control.from_ds -> wlan.frame_control.from_ds**
Frame originated from the Distribution System (DS)

**ieee80211::frame_control.more_data -> wlan.frame_control.more_data**
More data

**ieee80211::frame_control.more_fragments -> wlan.frame_control.more_fragments**
More fragments

**ieee80211::frame_control.order_ht_control -> wlan.frame_control.order_ht_control**
Order or presence of HT Control field.

**ieee80211::frame_control.power_management -> wlan.frame_control.power_management**
Power Management

**ieee80211::frame_control.protected_frame -> wlan.frame_control.protected_frame**
Encrypted frame

**ieee80211::frame_control.protected_frame.str -> N/A**
Encrypted frame

**ieee80211::frame_control.protection_type.str -> wlan.frame_control.protection_type**
The type of encryption used

**ieee80211::frame_control.protection_type_simple.str -> wlan.frame_control.protection_type_ap**
The type of encryption used based on the AP to which the client is associated.

**ieee80211::frame_control.protocol_version -> wlan.frame_control.protocol_version**
Protocol Version

**ieee80211::frame_control.source_type.custom.str -> wlan.frame_control.src_type_custom**
The type, AP, STA, or Probing, that the originating wireless node represents.

**ieee80211::frame_control.source_type.str -> wlan.frame_control.src_type**
The type, AP or STA, that the originating wireless node represents.

**ieee80211::frame_control.subtype -> wlan.frame_control.subtype**
Frame Subtype

**ieee80211::frame_control.subtype.authentication.count.double -> wlan.authentication_packets**
Determines if the current packet is an authentication

**ieee80211::frame_control.subtype.deauthentication.count.double -> wlan.deauthentication_packets**
Determines if the current packet is a deauthention

**ieee80211::frame_control.to_ds -> wlan.frame_control.to_ds**
Frame destined for the Distribution System (DS)

**ieee80211::frame_control.to_from_ds.str -> wlan.frame_control.to_from_ds**
Frame direction description

**ieee80211::frame_control.type -> wlan.frame_control.type**
Frame Type

**ieee80211::frame_control.type.str -> wlan.frame_control.type_name**
Frame Type String

**ieee80211::frame_control.type_subtype.is_association_request -> wlan.association_packets**
Determines if the current packet is an Association Request

**ieee80211::frame_control.type_subtype.is_authentication -> wlan.is_authentication**
Determines if the current packet is an authentication

**ieee80211::frame_control.type_subtype.is_deauthentication -> wlan.is_deauthentication**
Determines if the current packet is a deauthention

**ieee80211::frame_control.type_subtype.is_disassociation -> wlan.disassociation_packets**
Determines if the current packet is a Disassociation

**ieee80211::frame_control.type_subtype.is_disassociation.str -> wlan.is_disassociation_str**
Determines if the current packet is a Disassociation

**ieee80211::frame_control.type_subtype.is_probe_request -> wlan.is_probe_request**
Determines if the current packet is a Probe Request

**ieee80211::frame_control.type_subtype.is_probe_request.str -> wlan.is_probe_request_str**
Determines if the current packet is a Probe Request

**ieee80211::frame_control.type_subtype.is_reassociation_request -> wlan.reassociation_packets**
Determines if the current packet is a Reassociation Request

**ieee80211::frame_control.type_subtype.str -> wlan.frame_control.type_subtype_name**
Frame Type/Subtype String

**ieee80211::info_fields.channel -> wlan.info_fields.channel**
Channel

**ieee80211::info_fields.extended_supported_rates.str -> wlan.info_fields.extended_supported_rates**
Extended Supported Rates

**ieee80211::info_fields.ht_capabilities.ampdu_parameters.max_length -> wlan.info_fields.ht_capabilities.ampdu_max_length**
A-MPDU Parameters - Maximum Length

**ieee80211::info_fields.ht_capabilities.ampdu_parameters.mpdu_density.str -> wlan.info_fields.ht_capabilities.ampdu_mpdu_density**
A-MPDU Parameters - MPDU Density

**ieee80211::info_fields.ht_capabilities.info.40mhz.str -> wlan.info_fields.ht_capabilities.40mhz**
Capabilities Information - 40MHz channels allowed

**ieee80211::info_fields.ht_capabilities.info.amsdu_length.str -> wlan.info_fields.ht_capabilities.amsdu_length**
Capabilities Information - Maximum A-MSDU Length

**ieee80211::info_fields.ht_capabilities.info.delayed_block_ack.str -> wlan.info_fields.ht_capabilities.delayed_block_ack**
Capabilities Information - Delayed Block Ack supported

**ieee80211::info_fields.ht_capabilities.info.greenfield.str -> wlan.info_fields.ht_capabilities.greenfield**

Capabilities Information - Greenfield Support

**ieee80211::info_fields.ht_capabilities.info.psmp.str -> wlan.info_fields.ht_capabilities.psmp**

Capabilities Information - Power Save Multi-Poll (PSMP) supported

**ieee80211::info_fields.ht_capabilities.info.sgi_20mhz.str -> wlan.info_fields.ht_capabilities.sgi_20mhz**

Capabilities Information - Short GI at 20MHz supported

**ieee80211::info_fields.ht_capabilities.info.sgi_40mhz.str -> wlan.info_fields.ht_capabilities.sgi_40mhz**

Capabilities Information - Short GI at 40MHz supported

**ieee80211::info_fields.ht_capabilities.info.supported_width.str -> wlan.info_fields.ht_capabilities.supported_width**

Capabilities Information - Supported Channel Width

**ieee80211::info_fields.ssid.str -> wlan.info_fields.ssid**

SSID

**ieee80211::info_fields.supported_rates.str -> wlan.info_fields.supported_rates**

Supported Rates

**ieee80211::packets.retransmitted -> wlan.retransmitted_packets**

Retransmitted packets

**ieee80211::roaming.end.bssid.str -> wlan.roaming.end_bssid**

BSSID of the AP that the roaming station joined.

**ieee80211::roaming.end.channel.str -> wlan.roaming.end_channel**

The channel where a station was when it finished a roaming operation.

**ieee80211::roaming.end.pktnum -> wlan.roaming.end_pktnum**

The packet number in the original trace file where a station ends a roaming operation.

**ieee80211::roaming.end.time -> wlan.roaming.end_time**

The time when a station ends a roaming operation.

**ieee80211::roaming.is_first_roaming_pkt -> wlan.roaming.is_first_roaming_pkt**

Determines if the packet is the first packet of a roaming operation.

**ieee80211::roaming.start.bssid.str -> wlan.roaming.start_bssid**

BSSID of the AP that the roaming station left.

**ieee80211::roaming.start.channel.str -> wlan.roaming.start_channel**

The channel where a station was when it started a roaming operation.

**ieee80211::roaming.start.pktnum** -> **wlan.roaming.start_pktnum**

The packet number in the original trace file where a station starts a roaming operation.

**ieee80211::roaming.start.time -> wlan.roaming.start_time**

The time when a station starts a roaming operation.

**ieee80211::roaming.time -> wlan.roaming.time**

The time a station takes to roam.

**ieee80211::sequence_number -> wlan.sequence_number**

The sequence number of this 802.11 frame.

## ip::

**`ip::a_net.str -> ip.a_net`**
IP Class A (/8) source or destination subnet

**`ip::application.clientserver.str -> ip.clientserver_application`**
TCP port converted into a traffic type string (e.g. 'Email' or 'Web'), but only for applications that are client/server (i.e.: no instant messaging)

**`ip::b_net.str -> ip.b_net`**
IP Class B (/16) source or destination subnet

**`ip::bits -> ip.bits`**
Number of bits

**`ip::bytes -> ip.bytes`**
Number of bytes

**`ip::c_net.str -> ip.c_net`**
IP Class C (/24) source or destination subnet

**`ip::data.direction.str -> ip.direction`**
Direction of the packet 'Inbound' (external sender, local receiver), 'Outbound' (local sender, external receiver) or 'Internal' (local sender, local receiver)

**`ip::destination_a_net.str -> ip.dst_a_net`**
Destination Class A (/8) Subnet

**`ip::destination_b_net.str -> ip.dst_b_net`**
Destination Class B (/16) Subnet

**`ip::destination_c_net.str -> ip.dst_c_net`**
Destination Class C (/24) Subnet

**`ip::destination_ip.country.geoip -> ip.dst_country`**
Destination Country Based on a GeoIP lookup

**`ip::destination_ip.delivery_type.str -> ip.dst_delivery_type`**
Description of the delivery type (Unicast, Broadcast, Multicast, Source-Specific Multicast or GLOP)

**`ip::destination_ip.internal.str -> ip.dst_internal`**
IP address of the destination interface if the host is in the internal net, otherwise 'Remote'

**`ip::destination_ip.is_private -> ip.dst_is_private`**
Indication of whether the IP address of the destination interface is private

**`ip::destination_ip.local.str -> ip.dst_local`**
Description of the destination IP location (Local or Remote)

**`ip::destination_ip.str -> ip.dst`**
IP address of the destination interface

**`ip::destination_mac.masked.str -> N/A`**
Destination MAC address string, masked to show 'n.a.' in case the address is not local.

**`ip::destination_mac.vendor.masked.str -> N/A`**
Destination vendor name string, masked to show 'n.a.' in case the address is not local.

**`ip::dscp -> ip.dscp`**
Differentiated service code point

**`ip::dscp.str -> ip.dscp_name`**
Description of the differentiated service code point

**`ip::flags.dont_fragment -> ip.flags.dont_fragment`**
Indication of whether the IP Don't Fragment flag is set

**`ip::flags.more_fragments -> ip.flags.more_fragments`**
Indication of whether the IP More fragments flag is set

**`ip::fragment_offset -> ip.flags.fragment_offset`**
Position of the fragment in the total datagram measured in 64 bit units

**`ip::fragmented_traffic -> ip.is_fragmented_str`**
Description of the packet by fragmentation status (Fragmented or Not Fragmented)

**`ip::header_checksum -> ip.header_checksum`**
Checksum of just the IP header itself

**`ip::header_checksum.valid -> ip.header_checksum_valid`**
Indication of whether the checksum is valid

**`ip::header_checksum.valid.str -> N/A`**
The validity of the checksum.

**`ip::header_length -> ip.header_length`**
Length of the header in 32 bit words

**`ip::id -> ip.id`**
Unique identifier for this datagram

**`ip::ip.country.geoip -> ip.country`**
Source and Destination Country Based on a GeoIP lookup

**`ip::ip.local.str -> ip.address_local`**
Description of the IP addresses of the source and destination interfaces location (Local or Remote)

**`ip::ip.str -> ip.address`**
Source or Destination IP address

**`ip::is.clientserver.application -> ip.is_clientserver_application`**
Indication of whether the packet contains a client/server application traffic (e.g. email, web, database)

**`ip::local.bits -> N/A`**
counts IP bits that are local (i.e. both the source and the destination are inside the subnet)

**`ip::local.bytes -> N/A`**
counts IP bytes that are local (i.e. both the source and the destination are inside the subnet)

**`ip::lower_ip.str -> ip.lower_ip`**
IP address of the lower host

**`ip::mac.masked.str -> N/A`**
Source and Destination MAC address string, masked to show 'n.a.' in case the address is not local.

**`ip::mac.vendor.masked.str -> N/A`**
Source and Destination vendor name string, masked to show 'n.a.' in case the address is not local.

**`ip::nflows -> ip.nflows`**
Number of unique flows

**`ip::packets -> ip.packets`**
Number of packets

**ip::protocol -> ip.protocol**
Protocol type

**ip::protocol.str -> ip.protocol_name**
Name of the protocol type (e.g. TCP)

**ip::remote.bits -> N/A**
counts IP bits that are with remote locations (i.e. either the source or the destination are outside the subnet)

**ip::remote.bytes -> N/A**
counts IP bytes that are with remote locations (i.e. either the source or the destination are outside the subnet)

**ip::source_a_net.str -> ip.src_a_net**
Source Class A (/8) Subnet

**ip::source_b_net.str -> ip.src_b_net**
Source Class B (/16) Subnet

**ip::source_c_net.str -> ip.src_c_net**
Source Class C (/24) Subnet

**ip::source_ip.country.geoip -> ip.src_country**
Source Country Based on a GeoIP lookup

**ip::source_ip.internal.str -> ip.src_internal**
IP address of the source host if the host is in the internal net, otherwise 'Remote'

**ip::source_ip.is_private -> ip.src_is_private**
Indication of whether the IP address of the source host is private

**ip::source_ip.local.str -> ip.src_local**
Description of the source IP location (Local or Remote)

**ip::source_ip.str -> ip.src**
IP address of the source host

**ip::source_mac.masked.str -> N/A**
Source MAC address string, masked to show 'n.a.' in case the address is not local.

**ip::source_mac.vendor.masked.str -> N/A**
Source vendor name string, masked to show 'n.a.' in case the address is not local.

**ip::time_to_live -> ip.time_to_live**
Maximum time in seconds that a datagram will be allowed to survive

**ip::tos.delay -> ip.tos.delay**
Indication of whether the IP TOS Minimize delay flag is set

**ip::tos.delay.str -> N/A**
Minimize delay

**ip::tos.monetary_cost -> ip.tos.monetary_cost**
Indication of whether the IP TOS Minimize monetary cost flag is set

**ip::tos.monetary_cost.str -> N/A**
Minimize monetary cost

**ip::tos.precedence -> ip.tos.precedence**
Indication of whether the IP TOS Precedence flag is set

**`ip::tos.precedence.str -> N/A`**
Precedence specified for the datagram.

**`ip::tos.reliability -> ip.tos.reliability`**
Indication of whether the IP TOS Maximize reliability flag is set

**`ip::tos.reliability.str -> N/A`**
Maximize reliability

**`ip::tos_throughput -> ip.tos_throughput`**
Indication of whether the IP TOS Maximize throughput flag is set

**`ip::tos_throughput.str -> N/A`**
Maximize throughput

**`ip::total_length -> ip.total_length`**
Length of the datagram in bytes

**`ip::transport.destination_port -> ip.transport.dst_port`**
Trasnport protocol (TCP/UDP) destination port

**`ip::transport.port -> ip.transport.port`**
TCP/UDP both source and destination port

**`ip::transport.source_port -> ip.transport.src_port`**
Trasnport protocol (TCP/UDP) source port

**`ip::transport_payload_length.bits -> ip.transport.payload_length_bits`**
Length of the TCP or UDP payload in bits

**`ip::transport_payload_length.bytes -> ip.transport.payload_length_bytes`**
Length of the TCP or UDP payload in bytes

**`ip::upper_ip.str -> ip.upper_ip`**
IP address of the upper host

**`ip::version -> ip.version`**
Format of the IP header (e.g.)

**`ip::version.str -> ip.version_name`**
Format of the IP header (e.g. IP)

## ipres::

**`ipres::country.str -> N/A`**
Country obtained from the internet domain.

**`ipres::destination_country.str -> N/A`**
Destination country obtained from the internet domain.

**`ipres::destination_domain.str -> ip.dst_domain`**
Destination Internet domain

**`ipres::domain.str -> ip.domain`**
Internet Domain

**`ipres::source_country.str -> N/A`**
Source country obtained from the internet domain.

**`ipres::source_domain.str -> ip.src_domain`**
Source Internet domain

## mac::

**`mac::arp.str -> mac.is_arp_str`**
Description of the traffic class (ARP, RARP or Not ARP)

**`mac::broadcast_bytes -> mac.broadcast_bytes`**
Number of Broadcast Bytes

**`mac::broadcast_count -> N/A`**
Number of Broadcast Packets.

**`mac::broadcast_packets -> mac.broadcast_packets`**
Number of Broadcast Packets

**`mac::destination_mac.delivery_type.str -> mac.dst_delivery_type`**
Type of delivery used the destination for the MAC layer transmission

**`mac::destination_mac.str -> mac.dst`**
Destination MAC address string

**`mac::destination_mac.vendor.str -> mac.dst_vendor`**
Destination vendor name

**`mac::destination_mac.vendor_with_mac.str -> mac.dst_vendor_with_mac`**
Destination vendor name with last 3 bytes of the MAC address

**`mac::ip.version.str -> mac.ip_version`**
IP Version

**`mac::local.str -> mac.is_local_str`**
Description of the traffic location (Local -both the source and the destination are inside the subnet- or Remote -either the source or the destination are inside the subnet-)

**`mac::mac.str -> mac.address`**
Source and Destination MAC address

**`mac::mac.vendor.str -> mac.vendor`**
Source and Destination vendor name string

**`mac::mac.vendor_with_mac.str -> mac.vendor_with_mac`**
Source and Destination vendor name with last 3 bytes of the MAC addresses

**`mac::mpls.label -> mac.mpls_label`**
MPLS label

**`mac::mpls.str -> mac.is_mpls_str`**
MPLS vs. other

**`mac::mpls.tc -> mac.mpls_traffic_class`**
MPLS Traffic Class

**`mac::multicast_bytes -> mac.multicast_bytes`**
Number of Multicast Bytes

**`mac::multicast_count -> N/A`**
Number of Multicast Packets.

**`mac::multicast_packets -> mac.multicast_packets`**
Number of Multicast Packets

**`mac::protocol_type -> mac.protocol_type`**
Protocol Type

**`mac::protocol_type.str -> mac.protocol_type_name`**
Description of the protocol type

**`mac::source_mac.delivery_type.str -> mac.src_delivery_type`**
Type of delivery used by the source for the MAC layer transmission

**`mac::source_mac.str -> mac.src`**
Source MAC address

**`mac::source_mac.vendor.str -> mac.src_vendor`**
Source vendor name

**`mac::source_mac.vendor_with_mac.str -> mac.src_vendor_with_mac`**
Source vendor name with last 3 bytes of the MAC address

**`mac::station_number -> mac.stations`**
Number of MAC transmitting or receiving endpoints.

**`mac::vlan.id -> mac.vlan_id`**
VLAN Identifier

**`mac::vlan.pri -> mac.vlan_priority`**
802.1p CoS (0 to 7, 0 best-effort and 7 real-time)

## multi_segment::

**`multi_segment::capture_point -> multi_segment.capture_point`**
Capture Point Index

**`multi_segment::capture_point.dst -> multi_segment.capture_point_dst`**
Destination Capture Index

**`multi_segment::capture_point.src -> multi_segment.capture_point_src`**
Source Capture Index

**`multi_segment::delay -> multi_segment.delay`**
Segment delay

**`multi_segment::dropped -> multi_segment.dropped`**
Segment dropped packets

**`multi_segment::dropped.grid -> multi_segment.dropped`**
Segment dropped packets

**`multi_segment::out_of_order -> N/A`**
Segment out of order packets

**`multi_segment::out_of_order.grid -> N/A`**
Segment out of order packets

**`multi_segment::reference.dscp -> multi_segment.reference_dscp`**
DSCP of the reference packet

**multi_segment::reference.dscp.str -> multi_segment.reference_dscp_name**
DSCP description of the reference packet

**multi_segment::rtt.owd -> multi_segment.round_trip_time**
Segment TCP Round Trip Time computed using the one way delay in the two directions

**multi_segment::tcp.connection.duration.time -> multi_segment.tcp_connection.duration**
TCP connection duration, considering the first packet seen among all the capture points

**multi_segment::tcp.cp.count -> multi_segment.tcp_connection.capture_points**
Count of the current number of CP, to have an updated value use the MAX computation in the extractor

**multi_segment::tcp.first.conn.bits -> multi_segment.tcp_connection.normalized_bits**
Number of bits normalized using the first CP in wich the TCP connection is seen

**multi_segment::tcp.first.conn.bytes -> multi_segment.tcp_connection.normalized_bytes**
Number of byte normalized using the first CP in wich the TCP connection is seen

**multi_segment::tcp.first.conn.packets -> multi_segment.tcp_connection.normalized_packets**
Number of packets normalized using the first CP in wich the TCP connection is seen

**multi_segment::tcp.start.absolute.time -> multi_segment.tcp_connection.start_time**
TCP connection start time, timestamp of the first packet seen among all the capture points

**multi_segment::tcp.start.time -> N/A**
TCP connection start time, considering the first packet seen in all the CPs

## pseudo::

**pseudo::80211_common.bits.invalid -> wlan_link.invalid_bits**
Invalid Bits

**pseudo::80211_common.bytes.invalid -> wlan_link.invalid_bytes**
Invalid Bytes

**pseudo::80211_common.channel.freq -> wlan_link.channel_frequency**
PPI 802.11 Common / Radiotap - Channel Frequency (2412, 2417, ...)

**pseudo::80211_common.channel.number -> wlan_link.channel_number**
PPI 802.11 Common / Radiotap - Channel Number (001, 002, ...)

**pseudo::80211_common.channel.str -> wlan_link.channel**
PPI 802.11 Common / Radiotap - Channel Representation String (BG 001, BG 002, ...)

**pseudo::80211_common.channel.type -> wlan_link.channel_type**
PPI 802.11 Common / Radiotap - Channel Type

**pseudo::80211_common.channel.type.2ghz -> wlan_link.channel_2ghz**
PPI 802.11 Common / Radiotap - Channel Type - 2 GHz

**pseudo::80211_common.channel.type.5ghz -> wlan_link.channel_5ghz**
PPI 802.11 Common / Radiotap - Channel Type - 5 GHz

**pseudo::80211_common.channel.type.cck -> wlan_link.channel_cck**
PPI 802.11 Common / Radiotap - Channel Type - CCK

**pseudo::80211_common.channel.type.designator.str -> wlan_link.channel_designator**
PPI 802.11 Common / Radiotap - Channel Type Designator String. For PPI valid values are 'A', 'B', 'G', 'N' for Radiotap valid values are 'A', 'B', 'G'

**pseudo::80211_common.channel.type.designator_per_station.str -> wlan_link.channel_designator_per_station**
PPI 802.11 Common / Radiotap - Channel Type Designator String match for each station. For PPI valid values are 'A', 'B', 'G', 'N' for Radiotap valid values are 'A', 'B', 'G'

**pseudo::80211_common.channel.type.dynamic -> wlan_link.channel_dynamic**
PPI 802.11 Common / Radiotap - Channel Type - Dynamic

**pseudo::80211_common.channel.type.freq_band.str -> wlan_link.channel_freq_band**
PPI 802.11 Common / Radiotap - Channel Type - Frequency band string

**pseudo::80211_common.channel.type.gfsk -> wlan_link.channel_gfsk**
PPI 802.11 Common / Radiotap - Channel Type - GFSK

**pseudo::80211_common.channel.type.ofdm -> wlan_link.channel_ofdm**
PPI 802.11 Common / Radiotap - Channel Type - OFDM

**pseudo::80211_common.channel.type.passive -> wlan_link.channel_passive**
PPI 802.11 Common / Radiotap - Channel Type - Passive

**pseudo::80211_common.channel.type.str -> wlan_link.channel_type_name**
PPI 802.11 Common / Radiotap - Channel Type Summary String

**pseudo::80211_common.channel.type.turbo -> wlan_link.channel_turbo**
PPI 802.11 Common / Radiotap - Channel Type - Turbo

**pseudo::80211_common.channel_complete.str -> wlan_link.channel_description**
PPI 802.11 Common / Radiotap - Complete Channel Representation String (2412 MHz [BG 001], 2417 MHz [BG 002], ...)

**pseudo::80211_common.fhss.hopset -> wlan_link.fhss.hopset**
PPI 802.11 Common / Radiotap - Frequency Hopping Spread Spectrum (FHSS) hopset

**pseudo::80211_common.fhss.pattern -> wlan_link.fhss.pattern**
PPI 802.11 Common / Radiotap - Frequency Hopping Spread Spectrum (FHSS) pattern

**pseudo::80211_common.flags -> wlan_link.flags**
PPI 802.11 Common - Flags

**pseudo::80211_common.flags.fcs_invalid -> wlan_link.flags.fcs_invalid**
PPI 802.11 Common / Radiotap - Invalid FCS Invalid Packets

**pseudo::80211_common.flags.fcs_invalid.str -> N/A**
PPI 802.11 Common / Radiotap - FCS Invalid [String]

**pseudo::80211_common.flags.fcs_present -> wlan_link.flags.fcs_present**
PPI 802.11n Common / Radiotap - FCS Present

**pseudo::80211_common.flags.fcs_present.str -> N/A**
PPI 802.11n Common / Radiotap - FCS Present [String]

**pseudo::80211_common.flags.phy_error -> wlan_link.flags.phy_error**
PPI 802.11n Common - PHY Error

**pseudo::80211_common.flags.phy_error.str -> N/A**
PPI 802.11n Common - PHY Error [String]

**pseudo::80211_common.flags.tsf_units -> wlan_link.flags.tsf_units**
PPI 802.11n Common / Radiotap - Timing Synchronization Function (TSF) Units

**pseudo::80211_common.flags.tsf_units.str -> N/A**
PPI 802.11n Common / Radiotap - Timing Synchronization Function (TSF) Units [String]

**pseudo::80211_common.noise -> wlan_link.noise**
PPI 802.11 Common / Radiotap - RF Noise

**pseudo::80211_common.rate -> wlan_link.rate**
PPI 802.11 Common / Radiotap - Rate

**pseudo::80211_common.signal -> wlan_link.signal**
PPI 802.11 Common / Radiotap - RF Signal

**pseudo::80211_common.timer -> wlan_link.timer**
PPI 802.11 Common / Radiotap - Timing Synchronization Function (TSF) Timer

**pseudo::80211_common.timer.absolute_delta -> wlan_link.timer_absolute_delta**
PPI 802.11 Common / Radiotap - Timing Synchronization Function (TSF) Timer Absolute Delta

**pseudo::80211_common.timer.delta -> wlan_link.timer_delta**
PPI 802.11 Common / Radiotap - Timing Synchronization Function (TSF) Timer Delta

**pseudo::80211n_mac.ampdu_id -> wlan_link.80211n_mac.ampdu_id**
PPI 802.11n MAC - A-MPDU ID

**pseudo::80211n_mac.flags -> wlan_link.80211n_mac.flags**
PPI 802.11n MAC - Flags

**pseudo::80211n_mac.flags.aggregate -> wlan_link.80211n_mac.flags.aggregate**
PPI 802.11n MAC - Flags - Aggregate

**pseudo::80211n_mac.flags.aggregate.str -> N/A**
PPI 802.11n MAC - Flags - Aggregate String

**pseudo::80211n_mac.flags.dup_rx -> wlan_link.80211n_mac.flags.dup_rx**
PPI 802.11n MAC - Flags - Duplicate RX

**pseudo::80211n_mac.flags.dup_rx.str -> N/A**
PPI 802.11n MAC - Flags - Duplicate RX String

**pseudo::80211n_mac.flags.error_following -> wlan_link.80211n_mac.flags.error_following**
PPI 802.11n MAC - Flags - Aggregate delimiter CRC error after this frame

**pseudo::80211n_mac.flags.error_following.str -> N/A**
PPI 802.11n MAC - Flags - Aggregate delimiter CRC error after this frame string

**pseudo::80211n_mac.flags.greenfield -> wlan_link.80211n_mac.flags.greenfield**
PPI 802.11n MAC - Flags - Greenfield

**pseudo::80211n_mac.flags.greenfield.str -> N/A**
PPI 802.11n MAC - Flags - Greenfield String

**pseudo::80211n_mac.flags.more_aggregates -> wlan_link.80211n_mac.flags.more_aggregates**
PPI 802.11n MAC - Flags - More Aggregates

**pseudo::80211n_mac.flags.more_aggregates.str -> N/A**
PPI 802.11n MAC - Flags - More Aggregates String

**pseudo::80211n_mac.flags.sgi -> wlan_link.80211n_mac.flags.sgi**

PPI 802.11n MAC - Flags - SGI

**pseudo::80211n_mac.flags.sgi.str -> N/A**

PPI 802.11n MAC - Flags - SGI String

**pseudo::80211n_mac.flags.width -> wlan_link.80211n_mac.flags.width**

PPI 802.11n MAC - Flags - Width

**pseudo::80211n_mac.flags.width.str -> N/A**

PPI 802.11n MAC - Flags - Width String

**pseudo::80211n_mac.num_delim -> wlan_link.80211n_mac.num_delim**

PPI 802.11n MAC - Number of Delimiters

**pseudo::80211n_mac_phy.ampdu_id -> wlan_link.80211n_mac_phy.ampdu_id**

PPI 802.11n MAC+PHY - A-MPDU ID

**pseudo::80211n_mac_phy.combined_rssi -> wlan_link.80211n_mac_phy.combined_rssi**

PPI 802.11n MAC+PHY - Combined RSSI

**pseudo::80211n_mac_phy.ctrl.rssi.ant0 -> wlan_link.80211n_mac_phy.ctrl_rssi_ant0**

PPI 802.11n MAC+PHY - Control Channel: RSSI Antenna 0

**pseudo::80211n_mac_phy.ctrl.rssi.ant1 -> wlan_link.80211n_mac_phy.ctrl_rssi_ant1**

PPI 802.11n MAC+PHY - Control Channel: RSSI Antenna 1

**pseudo::80211n_mac_phy.ctrl.rssi.ant2 -> wlan_link.80211n_mac_phy.ctrl_rssi_ant2**

PPI 802.11n MAC+PHY - Control Channel: RSSI Antenna 2

**pseudo::80211n_mac_phy.ctrl.rssi.ant3 -> wlan_link.80211n_mac_phy.ctrl_rssi_ant3**

PPI 802.11n MAC+PHY - Control Channel: RSSI Antenna 3

**pseudo::80211n_mac_phy.evm.chain0 -> wlan_link.80211n_mac_phy.evm_chain0**

PPI 802.11n MAC+PHY - Error Vector Magnitude (EVM): Chain 0

**pseudo::80211n_mac_phy.evm.chain1 -> wlan_link.80211n_mac_phy.evm_chain1**

PPI 802.11n MAC+PHY - Error Vector Magnitude (EVM): Chain 1

**pseudo::80211n_mac_phy.evm.chain2 -> wlan_link.80211n_mac_phy.evm_chain2**

PPI 802.11n MAC+PHY - Error Vector Magnitude (EVM): Chain 2

**pseudo::80211n_mac_phy.evm.chain3 -> wlan_link.80211n_mac_phy.evm_chain3**

PPI 802.11n MAC+PHY - Error Vector Magnitude (EVM): Chain 3

**pseudo::80211n_mac_phy.ext.channel.freq -> wlan_link.80211n_mac_phy.ext_channel.freq**

PPI 802.11n MAC+PHY - Extension Channel Frequency

**pseudo::80211n_mac_phy.ext.channel.number -> wlan_link.80211n_mac_phy.ext_channel.number**

PPI 802.11n MAC+PHY - Extension Channel Number

**pseudo::80211n_mac_phy.ext.channel.string -> wlan_link.80211n_mac_phy.ext_channel**

PPI 802.11n MAC+PHY - Extension Channel Representation String

**pseudo::80211n_mac_phy.ext.channel.type -> wlan_link.80211n_mac_phy.ext_channel.type**

PPI 802.11n MAC+PHY - Extension Channel Type

**pseudo::80211n_mac_phy.ext.channel.type.2ghz -> wlan_link.80211n_mac_phy.ext_channel.type_2ghz**

PPI 802.11n MAC+PHY - Extension Channel Type - 2 GHz

**pseudo::80211n_mac_phy.ext.channel.type.5ghz -> wlan_link.80211n_mac_phy.ext_channel.type_5ghz**
PPI 802.11n MAC+PHY - Extension Channel Type - 5 GHz

**pseudo::80211n_mac_phy.ext.channel.type.cck -> wlan_link.80211n_mac_phy.ext_channel.type_cck**
PPI 802.11n MAC+PHY - Extension Channel Type - CCK

**pseudo::80211n_mac_phy.ext.channel.type.dynamic -> wlan_link.80211n_mac_phy.ext_channel.type_dynamic**
PPI 802.11n MAC+PHY - Extension Channel Type - Dynamic

**pseudo::80211n_mac_phy.ext.channel.type.gfsk -> wlan_link.80211n_mac_phy.ext_channel.type_gfsk**
PPI 802.11n MAC+PHY - Extension Channel Type - GFSK

**pseudo::80211n_mac_phy.ext.channel.type.ofdm -> wlan_link.80211n_mac_phy.ext_channel.type_ofdm**
PPI 802.11n MAC+PHY - Extension Channel Type - OFDM

**pseudo::80211n_mac_phy.ext.channel.type.passive -> wlan_link.80211n_mac_phy.ext_channel.type_passive**
PPI 802.11n MAC+PHY - Extension Channel Type - Passive

**pseudo::80211n_mac_phy.ext.channel.type.str -> wlan_link.80211n_mac_phy.ext_channel.type_name**
PPI 802.11n MAC+PHY - Extension Channel Type Summary String

**pseudo::80211n_mac_phy.ext.channel.type.turbo -> wlan_link.80211n_mac_phy.ext_channel.type_turbo**
PPI 802.11n MAC+PHY - Extension Channel Type - Turbo

**pseudo::80211n_mac_phy.ext.channel_complete.str -> wlan_link.80211n_mac_phy.ext_channel.complete**
PPI 802.11n MAC+PHY - Complete Extension Channel Representation String

**pseudo::80211n_mac_phy.ext.rssi.ant0 -> wlan_link.80211n_mac_phy.ext_rssi_ant0**
PPI 802.11n MAC+PHY - Extension Channel: RSSI Antenna 0

**pseudo::80211n_mac_phy.ext.rssi.ant1 -> wlan_link.80211n_mac_phy.ext_rssi_ant1**
PPI 802.11n MAC+PHY - Extension Channel: RSSI Antenna 1

**pseudo::80211n_mac_phy.ext.rssi.ant2 -> wlan_link.80211n_mac_phy.ext_rssi_ant2**
PPI 802.11n MAC+PHY - Extension Channel: RSSI Antenna 2

**pseudo::80211n_mac_phy.ext.rssi.ant3 -> wlan_link.80211n_mac_phy.ext_rssi_ant3**
PPI 802.11n MAC+PHY - Extension Channel: RSSI Antenna 3

**pseudo::80211n_mac_phy.flags -> wlan_link.80211n_mac_phy.flags**
PPI 802.11n MAC+PHY - Flags

**pseudo::80211n_mac_phy.flags.aggregate -> wlan_link.80211n_mac_phy.flags.aggregate**
PPI 802.11n MAC+PHY - Flags - Aggregate

**pseudo::80211n_mac_phy.flags.aggregate.str -> N/A**
PPI 802.11n MAC+PHY - Flags - Aggregate String

**pseudo::80211n_mac_phy.flags.dup_rx -> wlan_link.80211n_mac_phy.flags.dup_rx**
PPI 802.11n MAC+PHY - Flags - Duplicate RX

**pseudo::80211n_mac_phy.flags.dup_rx.str -> N/A**
PPI 802.11n MAC+PHY - Flags - Duplicate RX String

**pseudo::80211n_mac_phy.flags.error_following -> wlan_link.80211n_mac_phy.flags.error_following**
PPI 802.11n MAC+PHY - Flags - Aggregate delimiter CRC error after this frame

**pseudo::80211n_mac_phy.flags.error_following.str -> N/A**
PPI 802.11n MAC+PHY - Flags - Aggregate delimiter CRC error after this frame string

**pseudo::80211n_mac_phy.flags.greenfield -> wlan_link.80211n_mac_phy.flags.greenfield**
PPI 802.11n MAC+PHY - Flags - Greenfield

**pseudo::80211n_mac_phy.flags.greenfield.str -> N/A**
PPI 802.11n MAC+PHY - Flags - Greenfield String

**pseudo::80211n_mac_phy.flags.more_aggregates -> wlan_link.80211n_mac_phy.flags.more_aggregates**
PPI 802.11n MAC+PHY - Flags - More Aggregates

**pseudo::80211n_mac_phy.flags.more_aggregates.str -> N/A**
PPI 802.11n MAC+PHY - Flags - More Aggregates String

**pseudo::80211n_mac_phy.flags.sgi -> wlan_link.80211n_mac_phy.flags.sgi**
PPI 802.11n MAC+PHY - Flags - SGI

**pseudo::80211n_mac_phy.flags.sgi.str -> N/A**
PPI 802.11n MAC+PHY - Flags - SGI String

**pseudo::80211n_mac_phy.flags.width -> wlan_link.80211n_mac_phy.flags.width**
PPI 802.11n MAC+PHY - Flags - Width

**pseudo::80211n_mac_phy.flags.width.str -> N/A**
PPI 802.11n MAC+PHY - Flags - Width String

**pseudo::80211n_mac_phy.mcs -> wlan_link.80211n_mac_phy.mcs**
PPI 802.11n MAC+PHY - MCS

**pseudo::80211n_mac_phy.noise.ant0 -> wlan_link.80211n_mac_phy.noise_ant0**
PPI 802.11n MAC+PHY - Noise: Antenna 0

**pseudo::80211n_mac_phy.noise.ant1 -> wlan_link.80211n_mac_phy.noise_ant1**
PPI 802.11n MAC+PHY - Noise: Antenna 1

**pseudo::80211n_mac_phy.noise.ant2 -> wlan_link.80211n_mac_phy.noise_ant2**
PPI 802.11n MAC+PHY - Noise: Antenna 2

**pseudo::80211n_mac_phy.noise.ant3 -> wlan_link.80211n_mac_phy.noise_ant3**
PPI 802.11n MAC+PHY - Noise: Antenna 3

**pseudo::80211n_mac_phy.num_delim -> wlan_link.80211n_mac_phy.num_delim**
PPI 802.11n MAC+PHY - Number of Delimiters

**pseudo::80211n_mac_phy.num_streams -> wlan_link.80211n_mac_phy.num_streams**
PPI 802.11n MAC+PHY - Number of Streams

**pseudo::80211n_mac_phy.signal.ant0 -> wlan_link.80211n_mac_phy.signal_ant0**
PPI 802.11n MAC+PHY - Signal: Antenna 0

**pseudo::80211n_mac_phy.signal.ant1 -> wlan_link.80211n_mac_phy.signal_ant1**
PPI 802.11n MAC+PHY - Signal: Antenna 1

**pseudo::80211n_mac_phy.signal.ant2 -> wlan_link.80211n_mac_phy.signal_ant2**
PPI 802.11n MAC+PHY - Signal: Antenna 2

**`pseudo::80211n_mac_phy.signal.ant3 -> wlan_link.80211n_mac_phy.signal_ant3`**
PPI 802.11n MAC+PHY - Signal: Antenna 3

**`pseudo::channel.usage -> wlan_link.channel_usage`**
The amount of time the channel is actually being used.

**`pseudo::channel.usage.index -> wlan_link.channel_usage_index`**
The percent of the channel time used.

**`pseudo::dlt -> wlan_link.dlt`**
PPI / Radiotap DLT

**`pseudo::flags -> wlan_link.flags`**
PPI Flags

**`pseudo::flags.32bit_aligned -> N/A`**
PPI Flags - 32-bit Aligned

**`pseudo::flags.32bit_aligned.str -> N/A`**
PPI Flags - 32-bit Aligned [String]

**`pseudo::length -> wlan_link.length`**
PPI / Radiotap Header Length

**`pseudo::payload_length -> wlan_link.payload_length`**
Length of the payload contained within PPI not including the FCS, if present

**`pseudo::type.str -> wlan_link.type`**
Pseudo Header Type

**`pseudo::version -> wlan_link.version`**
PPI / Radiotap Version

## rios::

**`rios::csh_sport_id -> rios.csh_sport_id`**
Steelhead internal identifier

**`rios::is_sh_inner -> rios.is_sh_inner`**
Indication of whether the current packet contains Steelhead inner traffic

**`rios::outer_client_ip.str -> rios.outer_client_ip`**
Client IP address for this proxied connection

**`rios::outer_client_port -> rios.outer_client_port`**
Client TCP port for this proxied connection

**`rios::outer_server_ip.str -> rios.outer_server_ip`**
Server IP address for this proxied connection

**`rios::outer_server_port -> rios.outer_server_port`**
Server TCP port for this proxied connection

**`rios::protocol_id -> rios.protocol_id`**
Steelhead internal protocol identifier

# rtp::

`rtp::rtp.codec -> rtp.codec`
Description of the RTP codec

# sip::

`sip::call_id -> sip.call_id`
Call-ID header field, it uniquely identifies a particular invitation or all registrations of a particular client

`sip::contact -> sip.contact`
Contact header field value, it provides a URI whose meaning depends on the type of request or response it is in

`sip::cseq -> sip.cseq`
CSeq header field, it contains a single decimal sequence number and the request method

`sip::from -> sip.from`
Source address of a SIP Packet

`sip::from.display_name -> sip.from_display_name`
Display name of FROM field

`sip::from.number -> sip.from_number`
Phone Number of FROM field

`sip::is_request -> sip.is_request`
Indication of whether the current packet is a SIP request message

`sip::is_response -> sip.is_response`
Indication of whether the current packet is a SIP response message

`sip::message_type_str -> sip.message_type`
Description of the SIP message type (method for the request, status for the response)

`sip::reply_to -> sip.reply_to`
Reply-To header field, it contains a logical return URI that may be different from the From header field

`sip::request_method_str -> sip.request_method`
Description of the request method

`sip::response_class_str -> sip.response_class`
Response class description

`sip::response_status_str -> sip.response_status`
Description of the response status

`sip::to -> sip.to`
To header field, it specifies the logical recipient of the request

`sip::to.display_name -> sip.to_display_name`
The optional display-name is meant to be rendered by a human-user interface

`sip::to.number -> sip.to_number`
Phone Number of TO field

**`sip::user_agent -> sip.user_agent`**
User-Agent header field, it contains information about the User Agent Client originating the request

## sql::

**`sql::db -> sql.default_db`**
Default DB Name

**`sql::error_code -> sql.error_code`**
Error Code

**`sql::error_count -> sql.errors`**
Number of error within the current message

**`sql::error_desc -> sql.error_description`**
Code description for MySQL or Class description for MSSQL

**`sql::error_msg -> sql.error_message`**
Error Message

**`sql::ip.client -> sql.client_ip`**
IP Address of the SQL Client

**`sql::ip.server -> sql.server_ip`**
IP Address of the SQL Server

**`sql::is_sql -> sql.is_sql`**
Indication of whether the contains SQL traffic

**`sql::is_sql_end -> sql.is_message_end`**
Indication of whether the current packet is the last of a SQL request/response message

**`sql::is_sql_error -> sql.is_error`**
Indication of whether the current packet is a SQL Error Message

**`sql::overhead.str -> sql.traffic_type`**
Description of the SQL traffic type (Overhead or Data)

**`sql::protocol -> sql.protocol`**
Protocol Name (MySQL, MSSQL)

**`sql::query.count.grid -> sql.requests`**
Number of query messages

**`sql::query.count.res.grid -> sql.responses`**
Number of query messages with received response

**`sql::query.data_transfer_time -> sql.data_transfer_time`**
Query Data Transfer Time request and response data

**`sql::query.data_transfer_time.grid -> sql.data_transfer_time`**
Query Data Transfer Time request and response data

**`sql::query.db -> sql.db`**
DB Name of the query if specified in the statement, default db otherwise

**`sql::query.db.grid -> sql.db`**
DB Name of the query if specified in the statement, default db otherwise

**`sql::query.duration -> sql.duration`**
Duration of the query from the request to the last packet of the response message

**`sql::query.duration.grid -> sql.duration`**
Duration of the query from the request to the last packet of the response message

**`sql::query.id.grid -> sql.start_time`**
Start time of the query corresponding to the timestamp of the first request packet

**`sql::query.network_delay -> sql.round_trip_time`**
Network Round Trip Time at request time

**`sql::query.operation -> sql.operation`**
Description of the query operation (e.g. SELECT, UPDATE, ...)

**`sql::query.operation.grid -> sql.operation`**
Description of the query operation (e.g. SELECT, UPDATE, ...)

**`sql::query.performance -> N/A`**
Performance (Service Response Time, Network RTT, Response Network Time)

**`sql::query.performance.str -> N/A`**
Performance Description (Service Response Time, Network RTT, Response Network Time)

**`sql::query.response_time -> sql.response_network_time`**
Response Network Time of the query

**`sql::query.result.grid -> sql.result`**
Result of the query (NoResponse = 0, Success = 1, Error = 2)

**`sql::query.server_delay -> sql.service_response_time`**
Service Response Time of the query

**`sql::query.start_time.grid -> sql.start_time`**
Start time of the query corresponding to the timestamp of the first request packet

**`sql::query.table -> sql.table`**
Table Name of the statement (for SELECT could be JOIN of tables)

**`sql::query.table.grid -> sql.table`**
Table Name of the statement (for SELECT could be JOIN of tables)

**`sql::query.text.grid -> sql.text`**
Statement of the query

**`sql::query_bits -> generic.bits`**
Bit Count

**`sql::query_bytes -> generic.bytes`**
Byte Count

**`sql::query_count -> sql.requests`**
Number of query messages

**`sql::query_pkts -> generic.packets`**
Packet Count

**`sql::sql_bits -> generic.bits`**
Bit Count

**`sql::sql_packets -> generic.packets`**
Packet Count

**`sql::stmt_count -> sql.requests`**
Number of statements within a query message

**`sql::user -> sql.user`**
SQL User

## tcp::

**`tcp::ack_number -> tcp.is_ack`**
If the ACK flag is set then this field is the next segment that the sender is expecting to receive

**`tcp::bits -> tcp.bits`**
Number of bits, size in bits of the whole packet containing TCP

**`tcp::bytes -> tcp.bytes`**
Number of bytes, size in bytes of the whole packet containing TCP

**`tcp::checksum -> tcp.checksum`**
Checksum of the datagram

**`tcp::checksum.valid -> tcp.is_checksum_valid`**
The validity of the checksum

**`tcp::checksum.valid.str -> N/A`**
The validity of the checksum

**`tcp::control.ack -> tcp.flags.ack`**
Controls whether or not the 'Acknowledgement Number' field is valid

**`tcp::control.fin -> tcp.flags.fin`**
Signals the end of data

**`tcp::control.push -> tcp.flags.push`**
Push flag

**`tcp::control.reset -> tcp.flags.reset`**
Signals connection reset

**`tcp::control.syn -> tcp.flags.syn`**
Signals to synchronize the sequence numbers

**`tcp::control.urgent -> tcp.flags.urgent`**
Controls whether or not the 'Urgent Pointer' field is valid

**`tcp::destination_port -> tcp.dst_port`**
Destination Port

**`tcp::destination_port.str -> tcp.dst_port_name`**
The service name usually associated with the given port number

**`tcp::ecn.cwr -> tcp.ecn.cwr`**
CWR

**`tcp::ecn.echo -> tcp.ecn.echo`**
Echo

**`tcp::ecn.ns -> tcp.ecn.ns`**
Signaling with Nonces.

**tcp::flags.str -> tcp.flags**
Description of the TCP flags of the packet (SYN-ACK)

**tcp::header_length -> tcp.header_length**
Length of the TCP header in 32 bit words

**tcp::identification_port -> tcp.identification_port**
Identification Port

**tcp::identification_port.group.str -> tcp.protocol_group**
The type of traffic usually associated with the given port number or group of port numbers

**tcp::identification_port.str -> tcp.identification_port_name**
Service name usually associated with the given port number

**tcp::lower_port -> tcp.lower_port**
Lower Port

**tcp::packets -> tcp.packets**
Number of packets

**tcp::payload_length.bits -> tcp.payload_bits**
The length of the TCP payload in bits

**tcp::payload_length.bytes -> tcp.payload_bytes**
The length of the TCP payload in bytes

**tcp::payload_range.str -> N/A**
test

**tcp::port -> tcp.port_pair**
TCP Source or Destination Port

**tcp::ports -> tcp.port_pair**
Both source and destination ports

**tcp::proto.str -> tcp.protocol**
Service name usually associated with the given port number and the port number

**tcp::reset.destination_ip.str -> N/A**
The receivers of TCP reset packets

**tcp::reset.source_ip.str -> N/A**
The senders of TCP reset packets

**tcp::sequence_number -> tcp.sequence_number**
Sequence number of the first byte in this payload

**tcp::source_port -> tcp.src_port**
Source Port

**tcp::source_port.str -> tcp.src_port_name**
Service name usually associated with the given port number

**tcp::upper_port -> tcp.upper_port**
Upper Port

**tcp::urgent_pointer -> tcp.urgent_pointer**
Contains the sequence number of the last byte in a block of urgent data

**tcp::window.zero -> tcp.window_zero**
Number of times the window size is zero

**tcp::window.zero.destination_ip.str -> N/A**
The receivers of zero window packets

**tcp::window.zero.source_ip.str -> N/A**
The senders of zero window packets

# tcp_state::

**tcp_state::bits.client.to.server -> tcp.client_to_server_bits**
Number of bits sent from the clients to the servers

**tcp_state::bits.server.to.client -> tcp.server_to_client_bits**
Number of bits sent from the servers to the clients

**tcp_state::buffer.arrival.time -> N/A**
Estimated time the just sent TCP buffer reaches the destination host.

**tcp_state::buffer.departure.time -> N/A**
Estimated time the just sent TCP buffer has left the sender.

**tcp_state::buffers -> N/A**
The number of buffers sent over TCP connections

**tcp_state::bytes.client.to.server -> tcp.client_to_server_bytes**
Number of bytes sent from the clients to the servers

**tcp_state::bytes.server.to.client -> tcp.server_to_client_bytes**
Number of bytes sent from the servers to the clients

**tcp_state::client.address -> tcp.client_ip**
IP address of the hosts that start TCP connections

**tcp_state::client.country.geoip -> tcp.client_country**
Country of the TCP client based on a GeoIP lookup.

**tcp_state::client.port -> tcp.client_port**
TCP port of the hosts that start TCP connections

**tcp_state::client.window -> tcp.client_window**
Size in bytes that the TCP client will accept

**tcp_state::clientserver.direction.str -> tcp.direction**
TCP data direction (client-server or server-client)

**tcp_state::connection.aborted.count -> tcp.aborted_connections**
The number of TCP connections that were reset by one of the endpoints

**tcp_state::connection.attempt.count -> tcp.connection_attempts**
The number of TCP SYN packets

**tcp_state::connection.duration.time -> tcp.connection_duration**
Connection duration measured from the first to the last packet seen for a connection

**tcp_state::connection.event.type.direction.str -> tcp.event_type_direction**
Description of the connection event type (Open, Closed, Refused, Aborted). Open events contain the direction (Inbound, Outbound or Internal)

**tcp_state::connection.event.type.str -> tcp.event_type**
Description of the connection event type (Open, Closed, Refused, Aborted)

**`tcp_state::connection.open.count -> tcp.open_connections`**
The number of TCP connections that succesfully finish the three way handshake

**`tcp_state::connection.open.incoming.count -> tcp.open_connections_incoming`**
The number of TCP connections that succesfully finish the three way handshake

**`tcp_state::connection.open.internal.count -> tcp.open_connections_internal`**
The number of TCP connections that succesfully finish the three way handshake

**`tcp_state::connection.open.outgoing.count -> tcp.open_connections_outgoing`**
The number of TCP connections that succesfully finish the three way handshake

**`tcp_state::connection.refused.count -> tcp.refused_connections`**
The number of TCP connections that failed during the three way handshake

**`tcp_state::connection.start.absolute.time -> tcp.connection_start_time`**
Time of the first packet seen for a connection

**`tcp_state::continuative.round.trip.time -> tcp.continuous_round_trip_time`**
Round Trip Time, reported for each packet of the connection

**`tcp_state::destination.confidence -> N/A`**
How precise the timestamps for the specified destination IP address are, based on the observation of the round trip time during the three way handshake.

**`tcp_state::error.dst -> tcp.error_dst`**
Addresses of the hosts that are destinations of TCP errors

**`tcp_state::error.src -> tcp.error_src`**
Addresses of the hosts that are sources of TCP errors

**`tcp_state::error.type.str -> tcp.error_type`**
Type of TCP error as a string. Can be one of the following: Retransmissions, Timeouts, Out of Order, Lost Segments, Duplicate Acks, Zero Windows, Resets

**`tcp_state::external.round.trip.time -> tcp.round_trip_time_external`**
Round Trip Time experienced by the hosts in the local network when they communicate with hosts outside the local network

**`tcp_state::external.service.response.time -> tcp.service_response_time_external`**
Service Response Time experienced by the hosts in the local network when they communicate with hosts outside the local network

**`tcp_state::is.connection.attempt -> tcp.is_connection_attempt`**
Indication of whether the packet is a connection attempt

**`tcp_state::local.client.address -> tcp.local_client_ip`**
IP address of the local hosts (i.e. hosts in the local subnet) that start TCP connections

**`tcp_state::local.round.trip.time -> tcp.round_trip_time_local`**
Round Trip Time experienced by the hosts in the local network when they communicate with hosts inside the local network

**`tcp_state::local.server.address -> tcp.local_server_ip`**
IP address of the local hosts (i.e. hosts in the local subnet) that receive TCP connections

**`tcp_state::local.service.response.time -> tcp.service_response_time_local`**
Service Response Time experienced by the hosts in the local network when they communicate with hosts inside the local network

**`tcp_state::num.acked.missing.segments -> tcp.missing_segment_acks`**
Number of TCP ACKed Missing Segments

**`tcp_state::num.duplicate.acks -> tcp.duplicate_acks`**
Number of TCP duplicate acknowledges

**`tcp_state::num.errors -> tcp.errors`**
Count of the following TCP errors: retransmissions, timeouts, out of order segments, lost segments, duplicate acks, zero windows, resets

**`tcp_state::num.lost -> tcp.lost_segments`**
Number of TCP lost segments

**`tcp_state::num.out.of.order -> tcp.out_of_order_segments`**
Number of TCP out of order segments

**`tcp_state::num.request -> tcp.requests`**
Number of Requests

**`tcp_state::num.request.double -> tcp.requests`**
Number of Requests to the Server as a Floating Point Number

**`tcp_state::num.reset.connection.attempts -> tcp.resets`**
Number of TCP reset connection attempts

**`tcp_state::num.retransmissions -> tcp.retransmissions`**
Number of TCP Retransmissions

**`tcp_state::num.timeouts -> tcp.timeouts`**
Number of TCP timeouts

**`tcp_state::packets.client.to.server -> tcp.client_to_server_packets`**
Number of packets sent from the clients to the servers

**`tcp_state::packets.server.to.client -> tcp.server_to_client_packets`**
Number of packets sent from the servers to the clients

**`tcp_state::request.network.time -> tcp.request_network_time`**
Request Network Time

**`tcp_state::response.network.time -> tcp.response_network_time`**
Response Network Time

**`tcp_state::retransmission.dst -> N/A`**
Addresses of the hosts that receive TCP Retransmissions

**`tcp_state::retransmission.src -> N/A`**
Addresses of the hosts that perform TCP Retransmissions

**`tcp_state::round.trip.time -> tcp.round_trip_time`**
Round Trip Time

**`tcp_state::segment.arrival.time -> N/A`**
Estimated time the TCP segment reaches the destination host. This time is calculated using the RTT of the TCP connection.

**`tcp_state::segment.departure.time -> N/A`**
Estimated time the TCP segment leaves the sender host. This time is calculated using the RTT of the TCP connection.

**`tcp_state::server.address -> tcp.server_ip`**
IP address of the hosts that receive TCP connections

**`tcp_state::server.country.geoip -> tcp.server_country`**
Country of the TCP server based on a GeoIP lookup.

**`tcp_state::server.port -> tcp.server_port`**
TCP port of the hosts that receive TCP connections

**`tcp_state::server.window -> tcp.server_window`**
Size in bytes that the TCP server will accept

**`tcp_state::service.response.time -> tcp.service_response_time`**
Service Response Time

**`tcp_state::source.confidence -> N/A`**
How precise the timestamps for the specified source IP address are, based on the observation of the round trip time during the three way handshake.

**`tcp_state::transaction.detail.str -> N/A`**
Transaction Timing detail

**`tcp_state::transaction.detail.time -> N/A`**
Transaction Timing detail

**`tcp_state::transaction.total.time -> tcp.transaction_total_time`**
Total Transaction Time

**`tcp_state::transfer_rate.double -> N/A`**
TCP segment rransfer rate in bytes per second.

**`tcp_state::window -> tcp.window`**
Size in bytes that the sender will accept

## udp::

**`udp::bits -> udp.bits`**
Number of bits, size in bits of the whole packet containing UDP

**`udp::bytes -> udp.bytes`**
Number of bytes, size in bytes of the whole packet containing UDP

**`udp::checksum -> udp.checksum`**
Checksum of the datagram

**`udp::checksum.valid -> udp.is_checksum_valid`**
The validity of the checksum

**`udp::checksum.valid.str -> N/A`**
The validity of the checksum

**`udp::destination_port -> udp.dst_port`**
Destination Port

**`udp::destination_port.str -> udp.dst_port_name`**
The service name usually associated with the given port number

**`udp::identification_port -> udp.identification_port`**
Identification Port

**`udp::identification_port.str -> udp.identification_port_name`**
Service name usually associated with the given port number

**`udp::length -> udp.length`**
Length of the UDP header plus payload

**`udp::packets -> udp.packets`**
Number of packets

**`udp::payload_length.bits -> udp.payload_bits`**
The length of the UDP payload in bits.

**`udp::payload_length.bytes -> udp.payload_bytes`**
The length of the UDP payload in bytes.

**`udp::port -> udp.port_pair`**
UDP Source or Destination Port

**`udp::proto.str -> udp.protocol`**
Service name usually associated with the given port number and the port number

**`udp::source_port -> udp.src_port`**
Source Port

**`udp::source_port.str -> udp.src_port_name`**
Service name usually associated with the given port number

## voip::

**`voip::call.answered.count -> voip.answered_calls`**
Counts the number of answered calls (double for over time)

**`voip::call.arrival.time -> N/A`**
The arrival time of a VoIP or RTP packet.

**`voip::call.asr.completed.failed.str -> voip.asr_completion`**
Completed or Failed Calls

**`voip::call.asr.str -> voip.asr`**
Description of the ASR (Answered or Attempted)

**`voip::call.asr.value -> voip.asr_ratio`**
Answer/Seizure Ratio for all the calls

**`voip::call.attempted.count -> voip.attempted_calls`**
Counts the number of attempted calls

**`voip::call.attempted.count.double -> voip.attempted_calls_float`**
Counts the number of attempted calls (double for over time)

**`voip::call.call_id -> voip.call_id`**
Call-ID

**`voip::call.caller.ip.str -> voip.caller_ip`**
IP address of the Caller

**`voip::call.caller.name.str -> voip.caller_name`**
Caller Name

**`voip::call.caller.number.str -> voip.caller_number`**
Caller Phone Number

**`voip::call.caller.rtp.stream.jitter.distribution -> voip.rtp.caller_jitter_distribution`**
RTP caller stream Jitter Distribution (e.g. 20-40)

**voip::call.completed.count.double -> voip.completed_calls_float**

The number of completed calls (double for over time)

**voip::call.departure.time -> N/A**

The departure time of a VoIP or RTP packet.

**voip::call.duration -> voip.duration**

Call duration, computed per packet

**voip::call.end.cause.code.str -> voip.end_cause_code**

Description of the end cause code ( e.g. CANCEL, BYE, 4xx, 5xx, 6xx/H.323, not available, ...)

**voip::call.end.duration -> voip.final_duration**

Call duration computed at the call end

**voip::call.end.status.str -> voip.final_status**

A call can terminate because has been completed, rejected or canceled by the called

**voip::call.end.time -> voip.end_time**

Time the call ended

**voip::call.failed.count -> voip.failed_calls**

Counts the number of failed calls

**voip::call.failed.count.double -> voip.failed_calls_float**

Counts the number of failed calls (double for over time)

**voip::call.has_early_stream -> voip.early_streams**

Cumulative number of early streams

**voip::call.payload.type.str -> N/A**

The payload type of an individual VoIP or RTP packet.

**voip::call.post.dial.delay -> voip.post_dial_delay**

Call Post Dial Delay

**voip::call.post.dial.delay.grid -> voip.post_dial_delay**

Call Post Dial Delay

**voip::call.receiver.ip.str -> voip.receiver_ip**

IP address of the Receiver

**voip::call.receiver.name.str -> voip.receiver_name**

Receiver Name

**voip::call.receiver.number.str -> voip.receiver_number**

Receiver Phone Number

**voip::call.receiver.rtp.stream.jitter.distribution -> voip.rtp.receiver_jitter_distribution**

RTP receiver stream Jitter Distribution (e.g. 20-40)

**voip::call.rtp.is_early_stream -> N/A**

The RTP Stream is an early stream

**voip::call.rtp.stream.caller.to.receiver -> voip.rtp.caller_to_receiver**

Indication of whether the RTP stream is from the caller to the receiver

**voip::call.rtp.stream.delta -> voip.rtp.delta**

Delta RTP stream Jitter

**voip::call.rtp.stream.delta.grid -> voip.rtp.delta**

Delta RTP stream Jitter

**`voip::call.rtp.stream.ip.dst.str -> voip.rtp.dst_ip`**

RTP stream destination IP address

**`voip::call.rtp.stream.ip.src.str -> voip.rtp.src_ip`**

RTP stream source IP address

**`voip::call.rtp.stream.jitter -> voip.rtp.jitter`**

RTP stream Jitter

**`voip::call.rtp.stream.jitter.grid -> voip.rtp.jitter`**

RTP stream Jitter

**`voip::call.rtp.stream.lost_packets -> voip.rtp.lost_packets`**

Number of packets that have never been received for an RTP stream

**`voip::call.rtp.stream.lost_packets.grid -> voip.rtp.lost_packets`**

Number of packets that have never been received for an RTP stream

**`voip::call.rtp.stream.mos -> voip.rtp.mos`**

RTP stream MOS

**`voip::call.rtp.stream.mos.grid -> voip.rtp.mos`**

RTP stream MOS

**`voip::call.rtp.stream.out_of_order_packets -> voip.rtp.out_of_order_packets`**

Number of out of order RTP packets

**`voip::call.rtp.stream.out_of_order_packets.grid -> voip.rtp.out_of_order_packets`**

Number of out of order RTP packets

**`voip::call.rtp.stream.payload.type.str -> voip.rtp.payload_type`**

Description of the RTP stream payload type (e.g. PCMU)

**`voip::call.rtp.stream.port.dst -> voip.rtp.dst_port`**

RTP stream destination port

**`voip::call.rtp.stream.port.src -> voip.rtp.src_port`**

RTP stream source port

**`voip::call.rtp.stream.rfactor -> voip.rtp.rfactor`**

RTP stream R-Factor

**`voip::call.rtp.stream.rfactor.grid -> voip.rtp.rfactor`**

RTP stream R-Factor

**`voip::call.rtp.stream.ssrc.str -> voip.rtp.ssrc`**

RTP stream Synchronization source

**`voip::call.sip.seer.value -> voip.sip.seer_ratio`**

Session Establishment Effectiveness Ratio for all the SIP ended calls

**`voip::call.start.time -> voip.start_time`**

Time the call started

**`voip::call.traffic.type.str -> voip.traffic_type`**

VoIP call traffic type (H.323, SIP, Skinny, RTP or Other)

**`voip::call.user.ip.str -> voip.user_ip`**

Caller or Receiver IP address

**`voip::call.user.name.str -> voip.user_name`**

Name of the Caller and the Receiver

**voip::call.user.number.str -> voip.user_number**
Phone Number of the Caller and the Receiver

**voip::call.voip.protocol -> voip.protocol**
Call VoIP Protocol

**voip::packets.double -> voip.packets_float**
Number of VoIP packets (float for avg computation)

## ws::

The **ws::** filters use Wireshark fields. If **xxx** represents the Wireshark field, the general conversion from 9.x-and-earlier filters to 10.0-and-later filters is:

```
ws::xxx -> ws.xxx
```

In addition, some NetShark fields equivalent to Wireshark ones (**ws::**) have been added:

**ws::bootp.hw.mac_addr -> dhcp.client_mac**
**ws::bootp.ip.your -> dhcp.client_ip**
**ws::dns.qry.name -> dns.query.name**