



Ethernet Packet Generator
Header Definitions
Version 1.0



APG4 APG8 APG200 APG208

Revision History

| Date | Version | Changes |
|----------------|---------|------------------------|
| 10 August 2016 | 1.0 | First customer release |

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Related Documentation

- [1] APG-GSG Axtrinet Getting Started Guide
- [2] APG-UG Axtrinet User Guide (including APG Control Interface)
- [3] APG-TCL-UG Axtrinet TCL API User Guide
- [4] APG-SW-TC Axtrinet APG Software License Terms And Conditions

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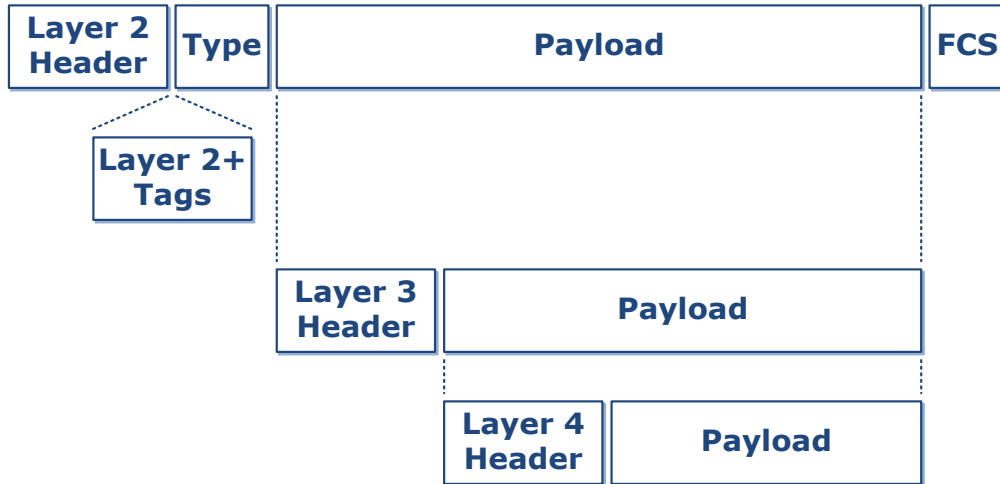
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1. INTRODUCTION

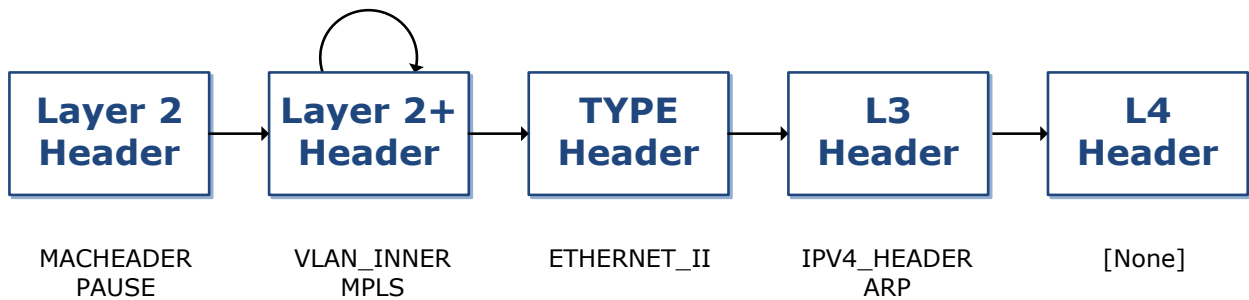
The Axtrinet Packet Generators use a header definition file (PINFO, provided as part of the installation) to determine the header types, fields and expected structure within the Ethernet packet.

In a valid Ethernet packet, the headers identify the Network Layers in the OSI Model.



1.1 SUPPORTED HEADERS

The following headers are supported by the APG Control Interface and APG TCL API:



1.2 HEADER STYLES

Each header variable has a STYLE that defines the format, minimum and maximum values.

The following styles are used:

| [STYLE] | Length | Min | Max |
|---------------------|----------|-------------|-------------------|
| MAC-ADDRESS | 17 chars | 0:0:0:0:0:0 | FF:FF:FF:FF:FF:FF |
| INT | Variable | 0 | |
| HEX2 | 1 byte | 0x0 | 0xFF |
| HEX4 | 2 bytes | 0x0 | 0xFFFF |
| HEX8 | 4 bytes | 0x0 | 0xFFFFFFFF |
| HEX2ARRAY | Variable | 0x0 | 0xFF |
| IPV4-ADDRESS | 4 bytes | 0.0.0.0 | 255.255.255.255 |

2. LAYER 2 HEADERS

2.1 MACHEADER

Editable →

| LABEL | DESCRIPTION | SIZE | STYLE | ED | DEFAULT | MODES | Default |
|-----------|-------------------------|---------|-------------|----|-------------|-----------------|---------|
| DA | MAC Destination Address | 6 bytes | mac-address | 1 | 0:0:0:0:0:0 | FIX INC DEC RND | FIX |
| SA | MAC Source Address | 6 bytes | mac-address | 1 | 0:0:0:0:0:0 | FIX INC DEC RND | FIX |

Where:
 FIX = Fixed
 INC = Incrementing
 DEC = Decrementing
 RND = Random

2.2 PAUSE

| LABEL | DESCRIPTION | SIZE | STYLE | ED | DEFAULT | MODES | Default |
|---------------|-------------------------|---------|-------------|----|---------------|-------|---------|
| DA | MAC Destination Address | 6 bytes | mac-address | 0 | 1:80:C2:0:0:1 | - | - |
| SA | MAC Source Address | 6 bytes | mac-address | 1 | 0:0:0:0:0:0 | - | - |
| TYPE | Ethertype | 2 bytes | hex4 | 0 | 0x8808 | - | - |
| OPCODE | Control Opcode | 2 bytes | hex4 | 0 | 0x0001 | - | - |
| QUANTA | Pause Quanta | 2 bytes | int | 1 | 0x0001 | - | - |

2.3 USERDEFINED

| LABEL | DESCRIPTION | SIZE | STYLE | ED | DEFAULT | MODES | Default |
|---------------|----------------------------------|---------|-----------|----|---------|-------|---------|
| LENGTH | Byte Length of User Defined Data | 2 bytes | int | 1 | 16 | - | - |
| DATA | Byte Data | LENGTH | hex2array | 1 | - | - | - |

2.4 USERDEFINED16

| LABEL | DESCRIPTION | SIZE | STYLE | ED | DEFAULT | MODES | Default |
|-------------|-------------|---------|-------|----|---------|-----------------|---------|
| DATA | Byte Data | 2 bytes | hex4 | 1 | - | FIX INC DEC RND | FIX |

3. LAYER 2+ HEADERS

3.1 VLAN_INNER

| LABEL | DESCRIPTION | SIZE | STYLE | ED | DEFAULT | MODES | Default |
|--------------------|----------------------------|---------|-------|----|---------|-----------------|---------|
| PROTOCOL_ID | Protocol ID | 2 bytes | HEX4 | 0 | 0x8100 | - | - |
| PRIORITY | User Priority | 3 bits | INT | 1 | 0 | - | - |
| CFI | Canonical Format Indicator | 1 bit | INT | 1 | 0 | - | - |
| VID | VLAN Identifier | 12 bits | INT | 1 | 1 | FIX INC DEC RND | FIX |

3.2 MPLS

| LABEL | DESCRIPTION | SIZE | STYLE | ED | DEFAULT | MODES | Default |
|--------------|-----------------|---------|-------|----|---------|-------|---------|
| LABEL | Label value | 20 bits | int | 1 | 16 | - | - |
| TC | Traffic Class | 3 bits | int | 1 | 0 | - | - |
| S | Bottom of Stack | 1 bit | int | 1 | 1 | - | - |
| TTL | Time to Live | 1 byte | int | 1 | 64 | - | - |

3.3 USERDEFINED

| LABEL | DESCRIPTION | SIZE | STYLE | ED | DEFAULT | MODES | Default |
|---------------|----------------------------------|---------|-----------|----|---------|-------|---------|
| LENGTH | Byte Length of User Defined Data | 2 bytes | int | 1 | 16 | - | - |
| DATA | Byte Data | LENGTH | hex2array | 1 | - | - | - |

3.4 USERDEFINED16

| LABEL | DESCRIPTION | SIZE | STYLE | ED | DEFAULT | MODES | Default |
|-------------|-------------|---------|-------|----|---------|-----------------|---------|
| DATA | Byte Data | 2 bytes | hex4 | 1 | - | FIX INC DEC RND | FIX |

4. TYPE

4.1 ETHERNET-II

| LABEL | DESCRIPTION | SIZE | STYLE | ED | DEFAULT | MODES | Default |
|------------------|--------------------------|---------|-------|----|---------|-------|---------|
| ETHERTYPE | Encapsulated protocol ID | 2 bytes | hex4 | 1 | 0x800 | - | - |

5. LAYER 3 HEADERS

5.1 IPV4_HEADER

| LABEL | DESCRIPTION | SIZE | STYLE | ED | DEFAULT | MODES | Default |
|------------------------|------------------------|---------|--------------|----|---------|-------|---------|
| VERSION | Version Field | 4 bits | int | 0 | 4 | - | - |
| IHL | Internet Header Length | 4 bits | int | 0 | 5 | - | - |
| TOS | Type of Service | 8 bits | int | 1 | 0 | - | - |
| TOTAL_LEN | Total IP Packet Length | 2 bytes | int | 0 | 0 | - | - |
| IDENTIFICATION | Identification Field | 2 bytes | int | 0 | 0 | - | - |
| FLAGS | Fragment Flags | 3 bits | int | 0 | 0 | - | - |
| FRAGMENT_OFFSET | Fragment Offset | 13 bits | int | 0 | 0 | - | - |
| TTL | Time to Live | 1 byte | int | 0 | 0 | - | - |
| PROTOCOL | IP Protocol Number | 1 byte | hex2 | 0 | 0x00 | - | - |
| HEADER_CSUM | Header Checksum | 2 bytes | hex4 | 0 | 0x0000 | - | - |
| SOURCE | Source IP Address | 4 bytes | ipv4-address | 1 | 0.0.0.0 | - | - |
| DESTINATION | Destination IP Address | 4 bytes | ipv4-address | 1 | 0.0.0.0 | - | - |

5.2 ARP_HEADER

| LABEL | DESCRIPTION | SIZE | STYLE | ED | DEFAULT | MODES | Default |
|------------------|-------------------------|---------|--------------|----|---------|-----------------|---------|
| HTYPE | Header Type | 2 bytes | hex4 | 0 | 0x1 | - | - |
| PTYPE | Protocol Type | 2 bytes | hex4 | 0 | 0x0800 | - | - |
| HLEN | Header Length | 1 byte | hex2 | 0 | 0x6 | - | - |
| PLEN | Protocol Length | 1 byte | hex2 | 0 | 0x4 | - | - |
| OPERATION | Operation | 2 bytes | int | 1 | 1 | - | - |
| SHA | Sender Header Address | 6 bytes | mac-address | 1 | 0 | FIX INC DEC RND | FIX |
| SPA | Sender Protocol Address | 4 bytes | ipv4-address | 1 | 0 0 0 0 | FIX INC DEC RND | FIX |
| THA | Target Protocol Header | 6 bytes | mac-address | 1 | 0 | FIX INC DEC RND | FIX |
| TPA | Target Protocol Address | 4 bytes | ipv4-address | 1 | 0 0 0 0 | FIX INC DEC RND | FIX |

5.3 USERDEFINED

| LABEL | DESCRIPTION | SIZE | STYLE | ED | DEFAULT | MODES | Default |
|---------------|----------------------------------|---------|-----------|----|---------|-------|---------|
| LENGTH | Byte Length of User Defined Data | 2 bytes | int | 1 | 16 | - | - |
| DATA | Byte Data | LENGTH | hex2array | 1 | - | - | - |

5.4 USERDEFINED16

| LABEL | DESCRIPTION | SIZE | STYLE | ED | DEFAULT | MODES | Default |
|-------------|-------------|---------|-------|----|---------|-----------------|---------|
| DATA | Byte Data | 2 bytes | hex4 | 1 | - | FIX INC DEC RND | FIX |

6. LAYER 4 HEADERS

6.1 USERDEFINED

| LABEL | DESCRIPTION | SIZE | STYLE | ED | DEFAULT | MODES | Default |
|---------------|----------------------------------|---------|-----------|----|---------|-------|---------|
| LENGTH | Byte Length of User Defined Data | 2 bytes | int | 1 | 16 | - | - |
| DATA | Byte Data | LENGTH | hex2array | 1 | - | - | - |

6.2 USERDEFINED16

| LABEL | DESCRIPTION | SIZE | STYLE | ED | DEFAULT | MODES | Default |
|-------------|-------------|---------|-------|----|---------|-----------------|---------|
| DATA | Byte Data | 2 bytes | hex4 | 1 | - | FIX INC DEC RND | FIX |

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The logo for AXTRINET, featuring a stylized 'A' with a dot and 'X' followed by the word 'TRINET' in a clean, sans-serif font.

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