SecureFast VLAN InterSwitch Message Protocol

ISMP Message Formats

09 September 1998

Abstract

The InterSwitch Message protocol (ISMP) provides a consistent method of encapsulating and transmitting control messages exchanged between switches to create and maintain the databases and provide other control services and functionality required by the SecureFast VLAN (SFVLAN) product.

Table of Contents

1. Introduction

The InterSwitch Message protocol (ISMP) provides a consistent method of encapsulating and transmitting control messages exchanged between switches to create and maintain the databases and provide other control services and functionality required by the SecureFast VLAN (SFVLAN) product.

This document describes the ISMP message formats used by SFVLAN, up to and including version 1.8.

Note

This document does not describe the functionality of the ISMP Interswitch messages. It contains the message formats only.

2. General Packet Structure

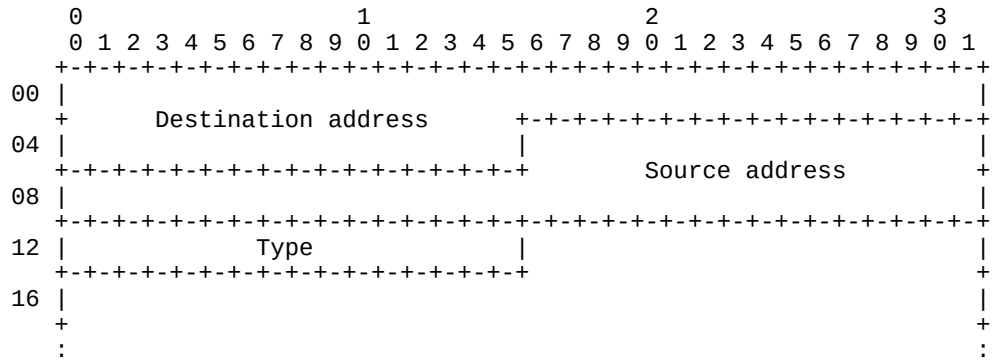
ISMP packets are of variable length and have the following general structure:

- Frame header
- ISMP packet header
- ISMP message body

Each of these packet segments is discussed separately in the following subsections.

2.1 Frame Header

ISMP packets are encapsulated within an IEEE 802-compliant frame using a standard header as shown below:



Destination address

This 6-octet field contains the Media Access Control (MAC) address of the packet destination. Except where otherwise noted, this field contains the multicast address of the control channel over which all switches in the fabric receive ISMP packets -- a value of 01-00-1D-00-00-00.

Source address

Except where otherwise noted, this 6-octet field contains the physical (MAC) address of the switch originating the ISMP packet.

Type

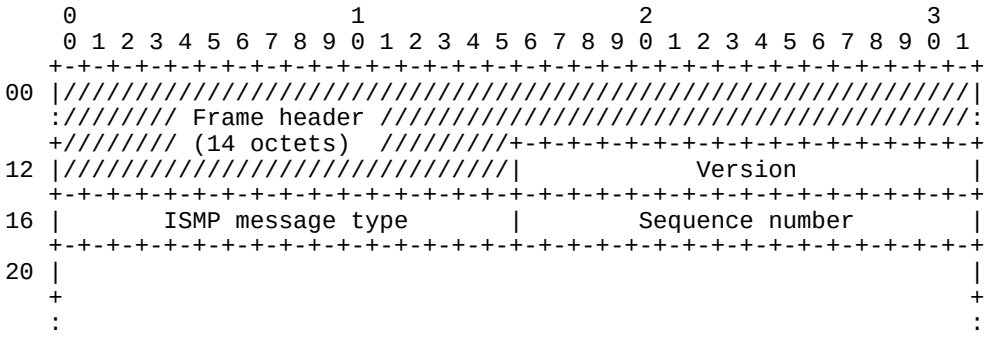
This 2-octet field identifies the type of data carried within the frame. Except where otherwise noted, the type field of the frame header contains a value 0x81FD.

2.2 ISMP Packet Header

There are two versions of the ISMP packet header in use by the SecureFast VLAN product.

2.2.1 Version 2

The version 2 ISMP packet header consists of 6 octets, as shown below:



Frame header

This 14-octet field contains the frame header.

Version

This 2-octet field contains the version number of the InterSwitch Message packet header. This section describes version 2 of the ISMP packet header.

ISMP message type

This 2-octet field contains a value indicating which type of ISMP message is contained within the message body. The following table lists the ISMP messages that use the version 2 packet header, along with the message type of each message and the section within this document that describes the message in detail:

Interswitch Message Name	Type	Description
Link State message	3	See note below
BPDU message	4	Section 4
Remote Blocking message	4	Section 5
Resolve message	5	Section 6
New User message	5	Section 7
Tag-Based Flood message	7	Section 8
Tap/Untap message	8	Section 9
Redundant Access Keepalive message	10	Section 10

Note

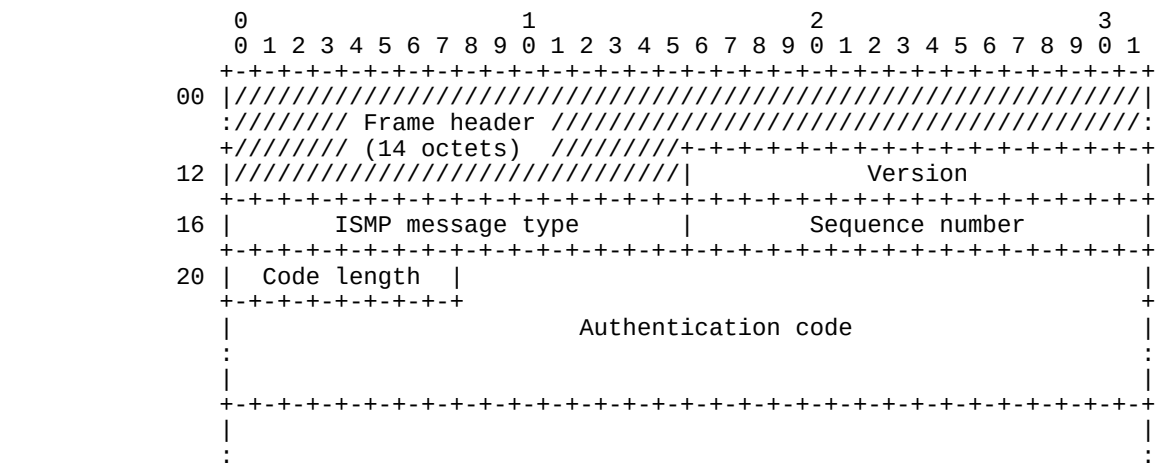
The Link State messages used by the VLS Protocol are not described in this document. For a detailed description of these messages, see "VLS Protocol Specification," L. Kane, et. al., 1998.

Sequence number

This 2-octet field contains an internally generated sequence number used by the various protocol handlers for internal synchronization of messages.

2.2.2 Version 3

The version 3 ISMP packet header consists of a variable number of octets, as shown below:



Frame header

This 14-octet field contains the frame header.

Version

This 2-octet field contains the version number of the InterSwitch Message packet header. This section describes version 3 of the ISMP packet header.

ISMP message type

This 2-octet field contains a value indicating which type of ISMP message is contained within the message body. Currently, only the Interswitch Keepalive message uses the version 3 packet header. It has a message type of 2 and is described in detail in Section 3.

Sequence number

This 2-octet field contains an internally generated sequence number used by the various protocol handlers for internal synchronization of messages.

Code length

This 1-octet field contains the number of octets in the Authentication code field of the message.

Authentication code

This variable-length field contains an encoded value used for authentication of the ISMP message.

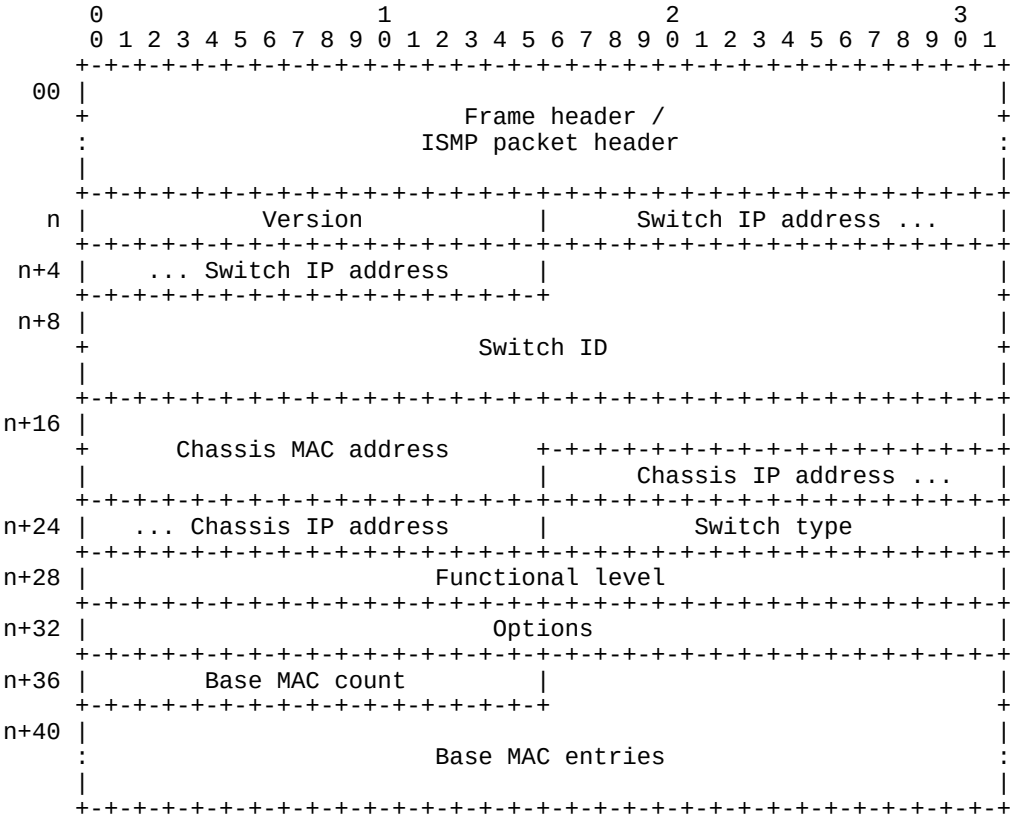
2.3 ISMP Message Body

The ISMP message body is a variable-length field containing the actual data of the ISMP message. The length and content of this field are determined by the value found in the message type field.

See the following sections for the exact format of each message type.

3. Interswitch Keepalive Message

The Interswitch Keepalive message consists of a variable number of octets, as shown below:



n = 21 + length of the authentication code of the packet

Frame header/ISMP packet header

This variable-length field contains the frame header and the ISMP version 3 packet header.

- The frame header type field contains a value of 0x81FD.
- The ISMP message type contains a value of 10.

Version

This 2-octet field contains the version number of the message type. This section describes version 4 of the Interswitch Keepalive message.

Switch IP address

This 4-octet field contains the Internet Protocol (IP) address of the sending switch.

Switch ID

This 10-octet field contains the internal ISMP identifier of the sending switch. The identifier is generated by the sending switch and consists of the 6-octet physical (MAC) address of the switch, followed by a 4-octet value containing the logical port number over which the switch sent the packet.

Chassis MAC

This 6-octet field contains the physical (MAC) address of the chassis of the sending switch.

Chassis IP address

This 4-octet field contains the Internet Protocol (IP) address of the switch chassis.

Switch type

This 2-octet field contains the type of the switch. Currently, the only value recognized here is as follows:

```
2   The switch is an SFVLAN switch.
```

Functional level

This 4-octet field contains the functional level of the sending switch, as determined by the version level of the SecureFast VLAN software under which this switch is operating. Valid values are as follows:

```
1   The switch is running a version of SFVLAN prior to version 1.8.
2   The switch is running SFVLAN version 1.8 or greater.
```

Options

This 4-octet field contains a bit map specifying the features of the switch. Bit assignments are as follows:

```
1       (unused)
2       The switch is a VLAN switch.
4       The switch has link state capability.
8       The switch has loop-free flood path capability.
16      The switch has resolve capability.
32      (unused)
64      The switch has tag-based flood capability.
128     The switch has tap capability.
256     The switch has message connection capability.
512     The switch has redundant access capability.
1024    The switch is an isolated switch.
4096    The switch is an uplink.  (V1.8 only)
8192    The switch is an uplink to core.  (V1.8 only)
16384   The port is an uplink port.  (V1.8 only)
32768   The port is an uplink flood port.  (V1.8 only)
```

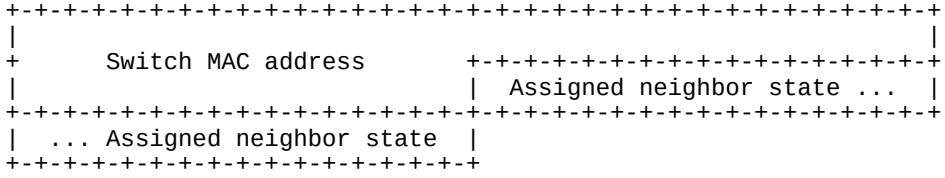
Base MAC count

This 2-octet field contains the number of entries in the list of Base MAC entries.

Base MAC entries

This variable-length field contains a list of entries for all neighboring switches that the sending switch has previously discovered on the port over which the message was sent. The number of entries is found in the Base MAC count field.

Each MAC entry is 10 octets long, structured as follows:



Switch MAC address

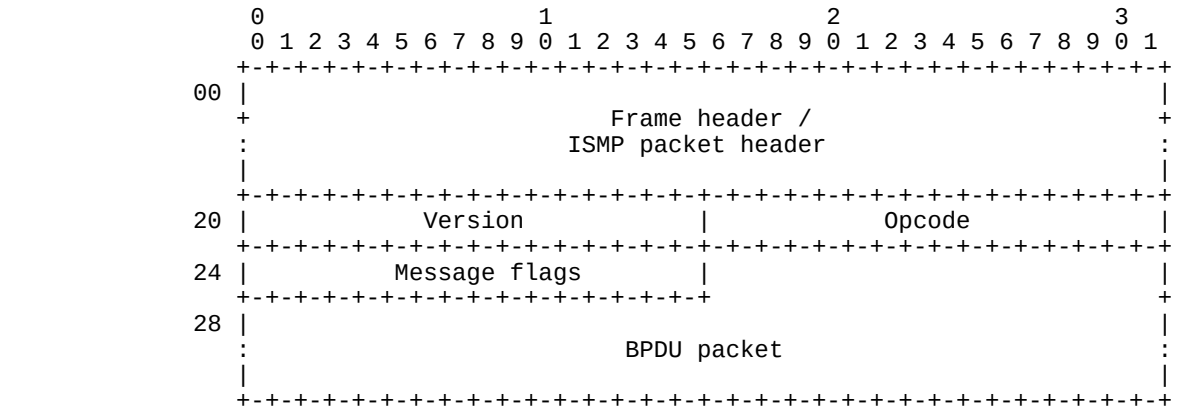
This 6-octet field contains the base MAC address of the neighboring switch.

Assigned neighbor state

This 4-octet field contains the assigned state of the neighboring switch as perceived by the sending switch. Currently, the only valid value here is 3, indicating a state of Network.

4. Interswitch BPDU Message

The Interswitch BPDU message consists of a variable number of octets, as shown below:



Frame header/ISMP packet header

This 20-octet field contains the frame header and the ISMP version 2 packet header.

- The frame header type field contains a value of 0x81FD.
- The ISMP message type contains a value of 4.

Version

This 2-octet field contains the version number of the message type. This section describes version 1 of the Interswitch BPDU message.

Opcode

This 2-octet field contains the operation type of the message. For an Interswitch BPDU message, the value should be 1.

Message flags

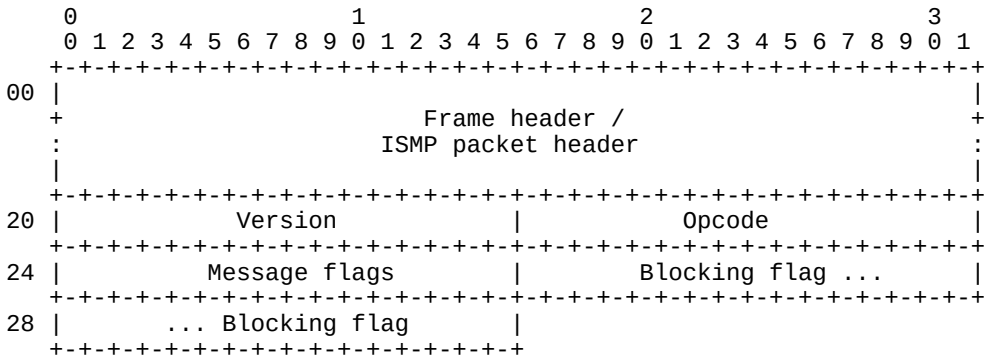
This 2-octet field is currently unused. It is reserved for future use.

BPDU packet

This variable-length field contains an IEEE-compliant 802.2 Bridge Protocol Data Unit. See "IEEE Standard 802.1d -- 1990" for a detailed description of the contents of this field.

5. Interswitch Remote Blocking Message

The Interswitch Remote Blocking message consists of 30 octets, as shown below:



Frame header/ISMP packet header

This 20-octet field contains the frame header and the ISMP version 2 packet header.

- The frame header type field contains a value of 0x81FD.
- The ISMP message type contains a value of 4.

Version

This 2-octet field contains the version number of the message type. This section describes version 1 of the Interswitch Remote Blocking Message.

Opcode

This 2-octet field contains the operation type of the message. Valid values are as follows:

```
2   Enable/disable remote blocking
3   Acknowledge previously received Remote Blocking message
```

Message flags

This 2-octet field is currently unused. It is reserved for future use.

Blocking flag

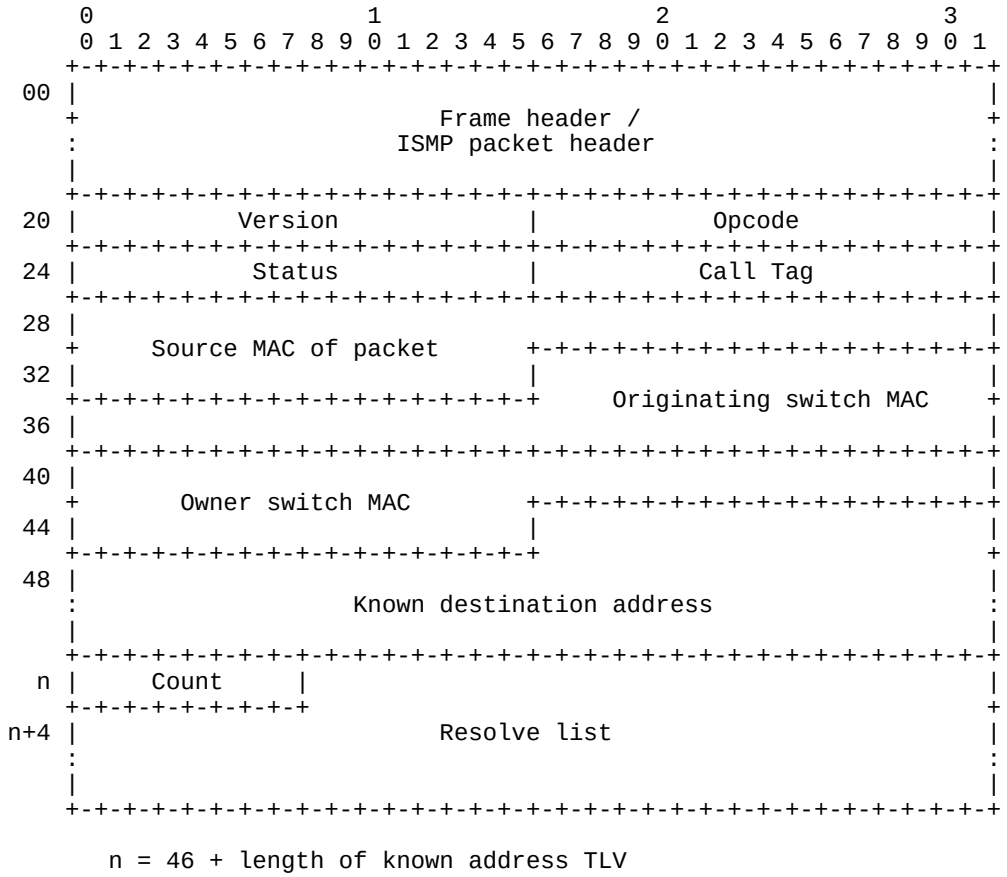
This 4-octet field contains a flag indicating the state of remote blocking on the link over which the message was received. A value of 1 indicates remote blocking is on and no undirected ISMP messages should be sent over the link. A value of 0 indicates remote blocking is off. This flag is irrelevant if the operation type (Opcode) of the message has a value of 3.

6. Interswitch Resolve Message

There are two versions of the Interswitch Resolve message used by the SecureFast VLAN product.

6.1 Prior to Version 1.8

The Interswitch Resolve message used by SFVLAN prior to version 1.8 consists of a variable number of octets, as shown below:



n = 46 + length of known address TLV

In the following description of the message fields, the term "originating" switch refers to the switch that issued the original Interswitch Resolve request. The term "owner" switch refers to that switch to which the destination endstation is attached. And the term "responding" switch refers to either the "owner" switch or to a switch at the end of the switch flood path that does not own the endstation but issues an Interswitch Resolve response because it has no downstream neighbors.

With the exception of the resolve list (which has a different size and format in a Resolve response message), all fields of an Interswitch Resolve message are allocated by the originating switch, and unless otherwise noted below, are written by the originating switch.

Frame header/ISMP packet header

This 20-octet field contains the frame header and the ISMP version 2 packet header.

- The frame header type field contains a value of 0x81FD.
- The ISMP message type contains a value of 5.

Version

This 2-octet field contains the version number of the message type. This section describes version 1 of the Interswitch Resolve message.

Opcode

This 2-octet field contains the operation code of the message. Valid values are as follows:

```
1    The message is a Resolve request.
2    The message is a Resolve response.
3    (unused in Resolve messages)
4    (unused in Resolve messages)
```

The originating switch writes a value of 1 to this field, while the responding switch writes a value of 2.

Status

This 2-octet field contains the status of a Resolve response message. Valid values are as follows:

```
0    The Resolve request succeeded (ResolveAck).
1    (unused)
2    The Resolve request failed (Unknown).
```

This field is written by the responding switch.

Call tag

This 2-octet field contains the call tag of the endstation packet for which this Resolve request is issued. The call tag is a 16-bit value (generated by the originating switch) that uniquely identifies the packet.

Source MAC of packet

This 6-octet field contains the physical (MAC) address of the endstation that originated the packet identified by the call tag.

Originating switch MAC

This 6-octet field contains the physical (MAC) address of the switch that issued the original Resolve request.

Owner switch MAC

This 6-octet field contains the physical (MAC) address of the switch to which the destination endstation is attached -- that is, the switch that was able to resolve the requested addressing information. This field is written by the owner switch.

If the status of the response is Unknown, this field is irrelevant.

Known destination address

This variable-length field contains the known attribute of the destination endstation address. This address is stored in Tag/Length/Value format.

Count

This 1-octet field contains the number of address attributes requested or returned. This is the number of items in the resolve list.

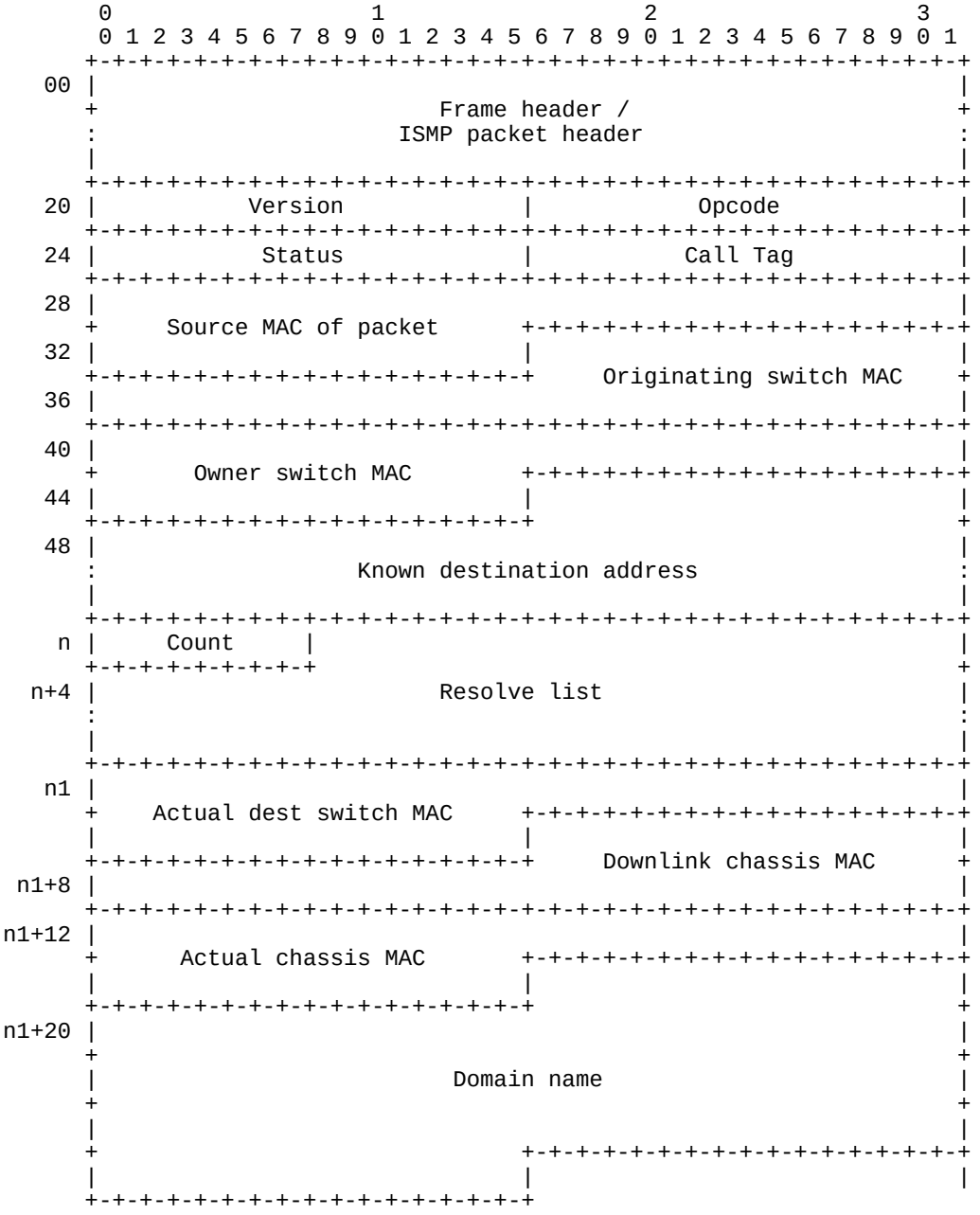
Resolve list

This variable-length field contains a list of the address attributes either requested by the originating switch or returned by the owner switch. Note that in a Resolve request message, this list contains only the tags of the requested address attributes. On the other hand, a Resolve response message with a status of ResolveAck contains the full TLV of each resolved address attribute. The number of entries in the list is specified in the count field.

In an Interswitch Resolve response message, this field is irrelevant if the status of the response is Unknown.

6.2 Version 1.8

The Interswitch Resolve message used by SFVLAN version 1.8 consists of a variable number of octets, as shown below:



In the following description of the message fields, the term "originating" switch refers to the switch that issued the original Interswitch Resolve request. The term "owner" switch refers to that switch to which the destination endstation is attached. And the term "responding" switch refers to either the "owner" switch or to a switch at the end of

the switch flood path that does not own the endstation but issues an Interswitch Resolve response because it has no downstream neighbors.

With the exception of the resolve list (which has a different size and format in a Resolve response message) and the four fields following the resolve list, all fields of an Interswitch Resolve message are allocated by the originating switch, and unless otherwise noted below, are written by the originating switch.

Frame header/ISMP packet header

This 20-octet field contains the frame header and the ISMP version 2 packet header.

- The frame header type field contains a value of 0x81FD.
- The ISMP message type contains a value of 5.

Version

This 2-octet field contains the version number of the message type. This section describes version 3 of the Interswitch Resolve message.

Opcode

This 2-octet field contains the operation code of the message. Valid values are as follows:

```
1    The message is a Resolve request.
2    The message is a Resolve response.
3    (unused in Resolve messages)
4    (unused in Resolve messages)
```

The originating switch writes a value of 1 to this field, while the responding switch writes a value of 2.

Status

This 2-octet field contains the status of a Resolve response message. Valid values are as follows:

```
0    The Resolve request succeeded (ResolveAck).
1    (unused)
2    The Resolve request failed (Unknown).
```

This field is written by the responding switch.

Call tag

This 2-octet field contains the call tag of the endstation packet for which this Resolve request is issued. The call tag is a 16-bit value (generated by the originating switch) that uniquely identifies the packet.

Source MAC of packet

This 6-octet field contains the physical (MAC) address of the endstation that originated the packet identified by the call tag.

Originating switch MAC

This 6-octet field contains the physical (MAC) address of the switch that issued the original Resolve request.

Owner switch MAC

This 6-octet field contains the physical (MAC) address of the switch to which the destination endstation is attached -- that is, the switch that was able to resolve the requested addressing information. This field is written by the owner switch.

If the status of the response is Unknown, this field is irrelevant.

Known destination address

This variable-length field contains the known attribute of the destination endstation address. This address is stored in Tag/Length/Value format.

Count

This 1-octet field contains the number of address attributes requested or returned. This is the number of items in the resolve list.

Resolve list

This variable-length field contains a list of the address attributes either requested by the originating switch or returned by the owner switch. Note that in a Resolve request message, this list contains only the tags of the requested address attributes. On the other hand, a Resolve response message with a status of ResolveAck contains the full TLV of each resolved address attribute. The number of entries in the list is specified in the count field.

In an Interswitch Resolve response message, this field is irrelevant if the status of the response is Unknown.

Actual destination switch MAC

This 6-octet field contains the physical (MAC) address of the actual switch within the chassis to which the endstation is attached. If the status of the response is Unknown, this field is irrelevant.

Downlink chassis MAC

This 6-octet field contains the physical (MAC) address of the downlink chassis. If the status of the response is Unknown, this field is irrelevant.

Actual chassis MAC

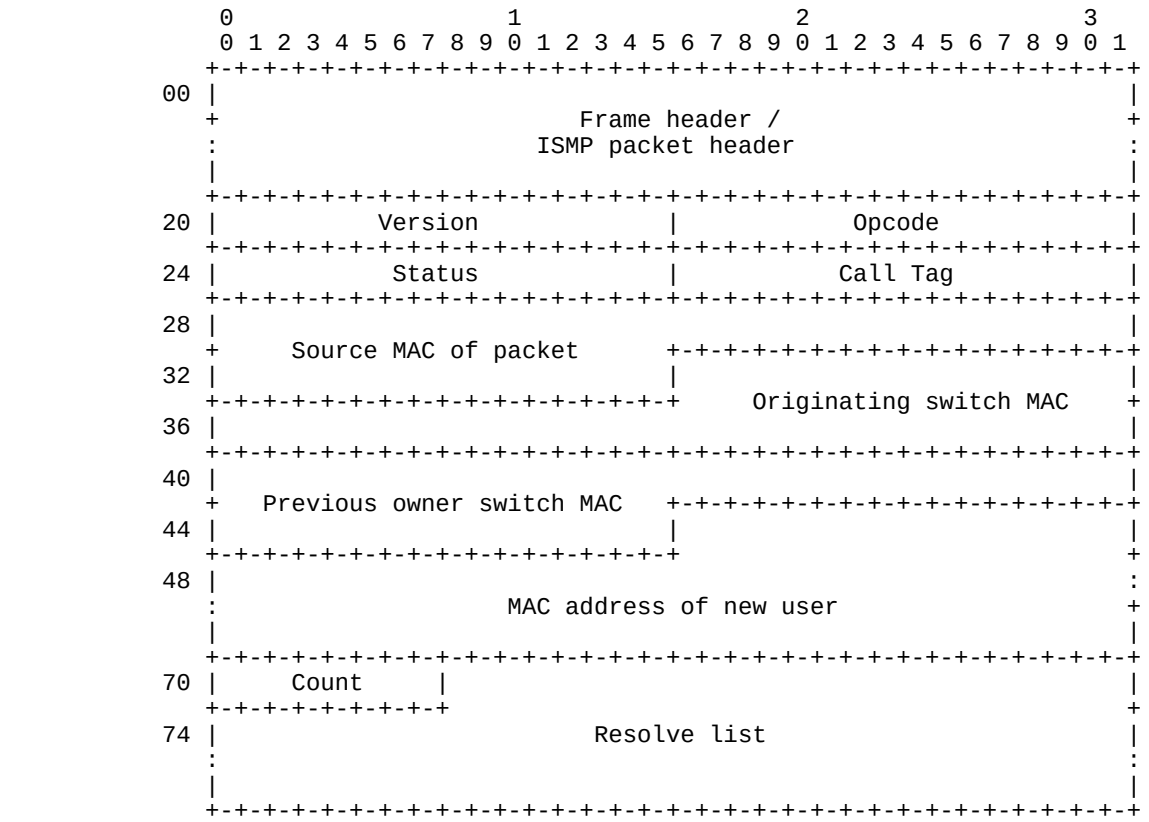
This 6-octet field contains the physical (MAC) address of the uplink chassis. If the status of the response is Unknown, this field is irrelevant.

Domain name

This 16-octet field contains the ASCII name of the domain. If the status of the response is Unknown, this field is irrelevant.

7. Interswitch New User Message

The Interswitch New User message consists of a variable number of octets, as shown below:



In the following description of the message fields, the term "originating" switch refers to the switch that issued the original Interswitch New User request. The term "previous owner" switch refers to that switch to which the endstation was previously attached. And the term "responding" switch refers to either the "previous owner" switch or to a switch at the end of the switch flood path that did not own the endstation but issues an Interswitch New User response because it has no downstream neighbors.

With the exception of the resolve list, all fields of an Interswitch New User message are allocated by the originating switch, and unless otherwise noted below, are written by the originating switch.

Frame header/ISMP packet header

This 20-octet field contains the frame header and the ISMP version 2 packet header.

- The frame header type field contains a value of 0x81FD.
- The ISMP message type contains a value of 5.

Version

This 2-octet field contains the version number of the message type. This section describes version 1 of the Interswitch New User message.

Opcode

This 2-octet field contains the operation code of the message. Valid values are as follows:

```
1    (unused in a New User message)
2    (unused in a New User message)
3    The message is a New User request.
4    The message is a New User response.
```

The originating switch writes a value of 3 to this field, while the responding switch writes a value of 4.

Status

This 2-octet field contains the status of a New User response message. Valid values are as follows:

```
0    VLAN resolution successful (NewUserAck)
1    (unused)
2    VLAN resolution unsuccessful (NewUserUnknown)
```

This field is written by the responding switch.

Call tag

This 2-octet field contains the call tag of the endstation packet for which this New User request is issued. The call tag is a 16-bit value (generated by the originating switch) that uniquely identifies the packet that caused the switch to identify the endstation as a new user.

Source MAC of packet

This 6-octet field contains the physical (MAC) address of the endstation that originated the packet identified by the call tag.

Originating switch MAC

This 6-octet field contains the physical (MAC) address of the switch that issued the original New User request.

Previous owner switch MAC

This 6-octet field contains the physical (MAC) address of the switch to which the endstation was previously attached -- that is, the switch that was able to resolve the VLAN information. This field is written by the previous owner switch.

If the status of the response is Unknown, this field is irrelevant.

MAC address of new user

This 24-octet field contains the physical (MAC) address of the new user endstation, stored in Tag/Length/Value format.

Count

This 1-octet field contains the number of VLAN identifiers returned. This is the number of items in the resolve list. This field is written by the previous owner switch.

If the status of the response is Unknown, this field and the resolve list are irrelevant.

Resolve list

This variable-length field contains a list of the VLAN identifiers of all static VLANs to which the endstation belongs, stored in Tag/Length/Value format. The number of entries in the list is specified in the count field. This list is written by the previous owner switch.

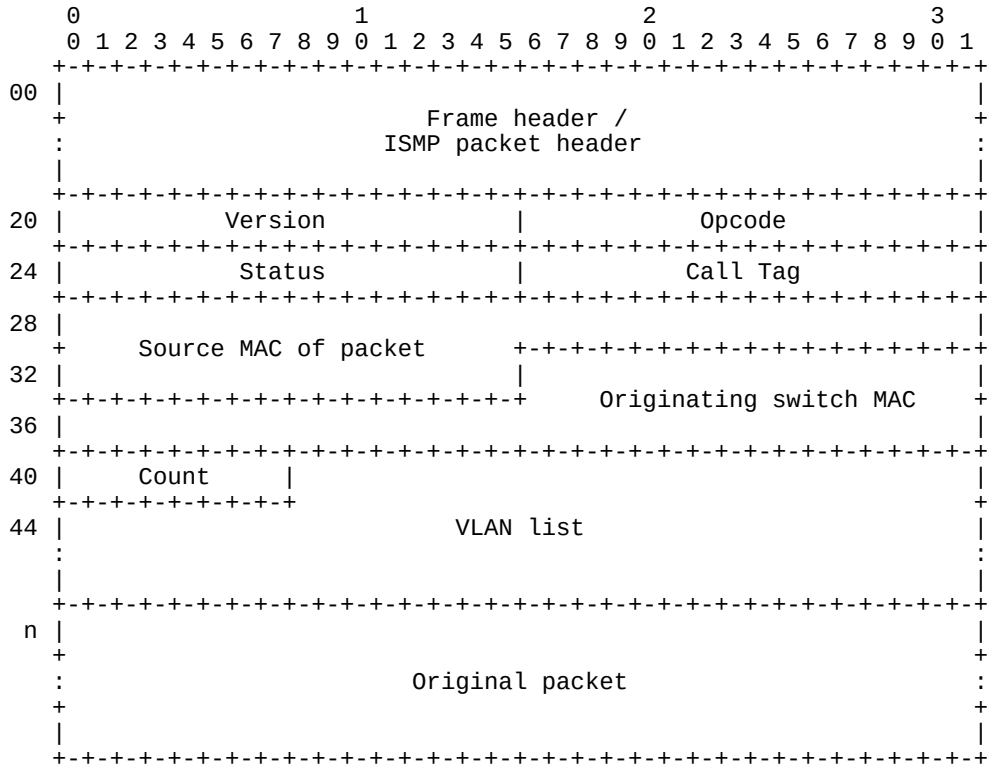
If the status of the response is Unknown, this field is irrelevant.

8. Interswitch Tag-Based Flood Message

There are two versions of the Interswitch Tag-Based Flood message used by the SecureFast VLAN product.

8.1 Prior to Version 1.8

The Interswitch Tag-Based Flood message used by SFVLAN prior to version 1.8 consists of a variable number of octets, as shown below:



n = 41 + length of VLAN list

Frame header/ISMP packet header

This 20-octet field contains the frame header and the ISMP version 2 packet header.

- The frame header type field contains a value of 0x81FD.
- The ISMP message type contains a value of 7.

Version

This 2-octet field contains the version number of the message type. This section describes version 1 of the Interswitch Tag-Based Flood message.

Opcode

This 2-octet field contains the operation code of the message. The value here should be 1, indicating the message is a flood request.

Status

This 2-octet field is currently unused. It is reserved for future use.

Call tag

This 2-octet field contains the call tag of the endstation packet encapsulated within this tag-based flood message. The call tag is a 16-bit value (generated by the originating switch) that uniquely identifies the packet.

Source MAC of packet

This 6-octet field contains the physical (MAC) address of the endstation that originated the packet identified by the call tag.

Originating switch MAC

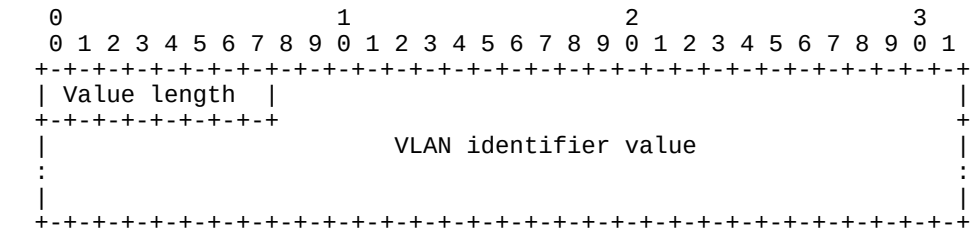
This 6-octet field contains the physical (MAC) address of the switch that issued the original tag-based flooded message.

Count

This 1-octet field contains the number of VLAN identifiers included in the VLAN list.

VLAN list

This variable-length field contains a list of the VLAN identifiers of all VLANs to which the source endstation belongs. Each entry in this list has the following format:



The 1-octet value length field contains the length of the VLAN identifier. VLAN identifiers can be from 1 to 16 characters long.

Original packet

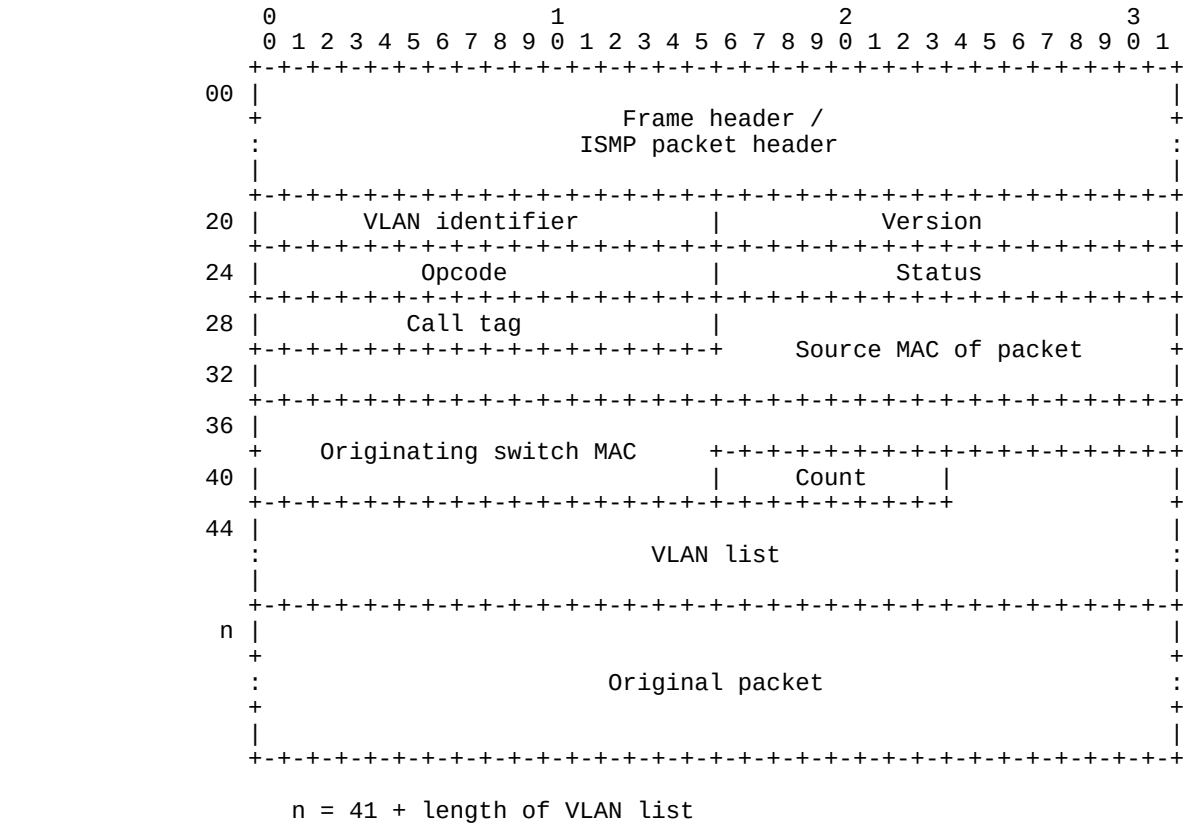
This variable-length field contains the original packet as sent by the source endstation.

8.2 Version 1.8

The Interswitch Tag-Based Flood message used by SFVLAN version 1.8 consists of a variable number of octets, as shown below:

Note

SFVLAN version 1.8 also recognizes the Interswitch Tag-Based Flood message as described in Section 8.1.



Frame header/ISMP packet header

This 20-octet field contains the frame header and the ISMP version 2 packet header.

- The frame header source address contains a value of 02-00-1D-00-xx-yy, where xx-yy is a value set by the VLAN Manager application to tag the frame header with the VLAN identifier. This value ranges from 2 to 4095. For example, a value of 100 would be set as 00-64.
- The frame header type field contains a value of 0x81FF. Note that this differs from all other ISMP messages.
- The ISMP message type contains a value of 7.

VLAN identifier

This 2-octet field contains the VLAN identifier of the packet source.

Version

This 2-octet field contains the version number of the message type. This section describes version 2 of the Interswitch Tag-Based Flood message.

Opcode

This 2-octet field contains the operation code of the message. Valid values here are as follows:

```
1   The message is a flood request.  The original packet is complete
    within this message.

2   The message is a fragmented flood request.  The first portion of
    the original packet is contained in this message.

3   The message is a fragmented flood request.  The second portion of
    the original packet is contained in this message.
```

Status

This 2-octet field is currently unused. It is reserved for future use.

Call tag

This 2-octet field contains the call tag of the endstation packet encapsulated within this tag-based flood message. The call tag is a 16-bit value (generated by the originating switch) that uniquely identifies the packet.

Source MAC of packet

This 6-octet field contains the physical (MAC) address of the endstation that originated the packet identified by the call tag.

Originating switch MAC

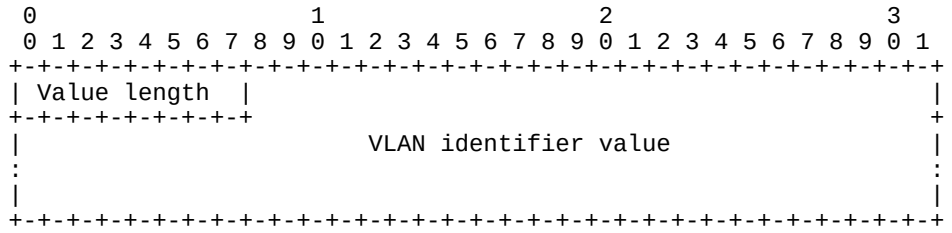
This 6-octet field contains the physical (MAC) address of the switch that issued the original tag-based flooded message.

Count

This 1-octet field contains the number of VLAN identifiers included in the VLAN list.

VLAN list

This variable-length field contains a list of the VLAN identifiers of all VLANs to which the source endstation belongs. Each entry in this list has the following format:



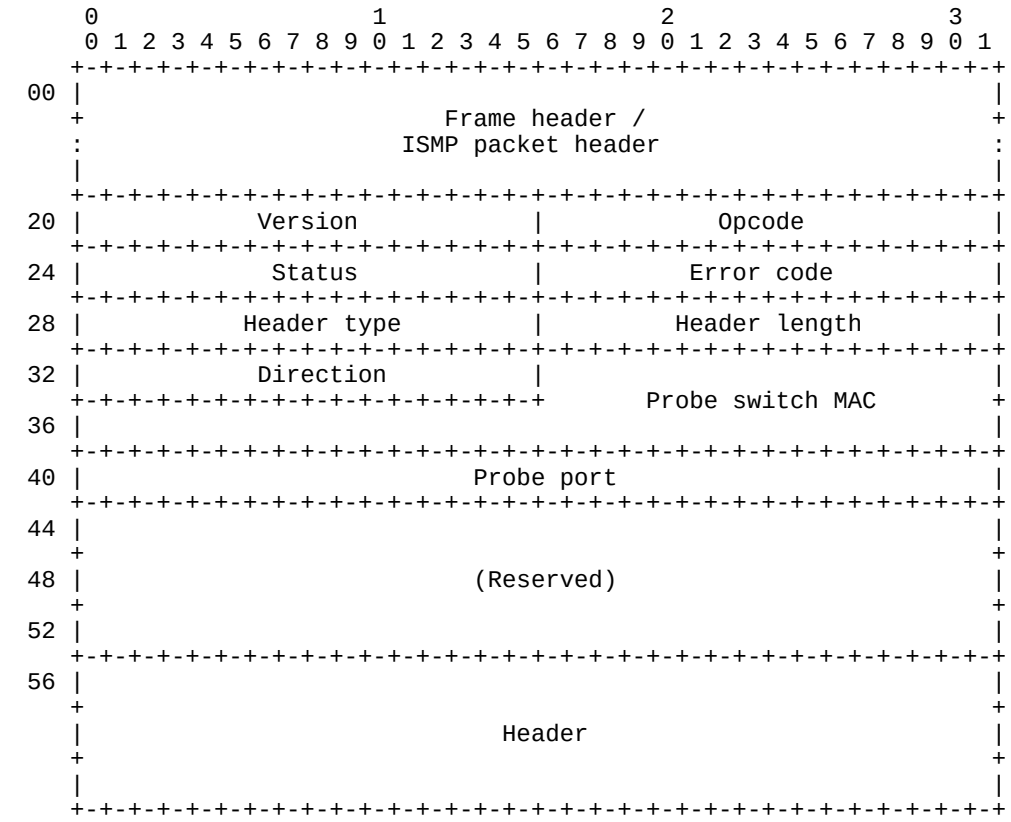
The 1-octet value length field contains the length of the VLAN identifier. VLAN identifiers can be from 1 to 16 characters long.

Original packet

This variable-length field contains the original packet as sent by the source endstation.

9. Interswitch Tap/Untap Message

The Interswitch Tap/Untap message consists of a variable number of octets, as shown below:



Frame header/ISMP packet header

This 20-octet field contains the frame header and the ISMP version 2 packet header.

- The frame header type field contains a value of 0x81FD.
- The ISMP message type contains a value of 8.

Version

This 2-octet field contains the version number of the message type. This section describes version 1 of the Interswitch Tap/Untap message.

Opcode

This 2-octet field contains the operation type of the message. Valid values are as follows:

```
1  The message is a Tap request.
2  The message is a Tap response.
3  The message is an Untap request.
4  The message is an Untap response.
```

Status

This 2-octet field contains the current status of the tap request. Valid values are as follows:

```
1   Switch must disable outport on untap. (DisableOutport)
2   Switch must keep outports on untap. (KeepOutport)
3   Probe not found this leg of spanning tree. (ProbeNotFound)
4   Still searching for probe switch. (OutportDecisionUnknown)
5   Unassigned. (StatusUnassigned)
6   (reserved)
7   (reserved)
8   (reserved)
9   (reserved)
```

Error code

This 2-octet field contains the response message error code of the requested operation. Valid values are as follows:

```
1   Operation successful. (NoError)
2   No response heard from downstream neighbor. (Timeout)
3   Port does not exist on probe switch. (BadPort)
4   Message invalid. (InvalidMessage)
5   Version number invalid. (IncompatibleVersions)
```

Header type

This 2-octet field contains the type of information contained in the header field. Currently, valid values are as follows:

```
1   (reserved)
2   Header contains destination and source endstation MAC
        addresses.
```

Header length

This 2-octet field contains the length of the header field. Currently, this field always contains a value of 12.

Direction

This 2-octet field contains a value indicating the type of tap. Valid values are as follows:

```
1   (reserved)
2   Tap is bi-directional and data should be captured flowing
        in either direction over the connection.
3   Tap is uni-directional and data should be captured only
        when it flows from the source to the destination.
```

Probe switch MAC

This 6-octet field contains the physical (MAC) address of the switch to which the probe is attached.

Probe port

This 4-octet field contains the logical port number (on the probe switch) to which the probe is attached.

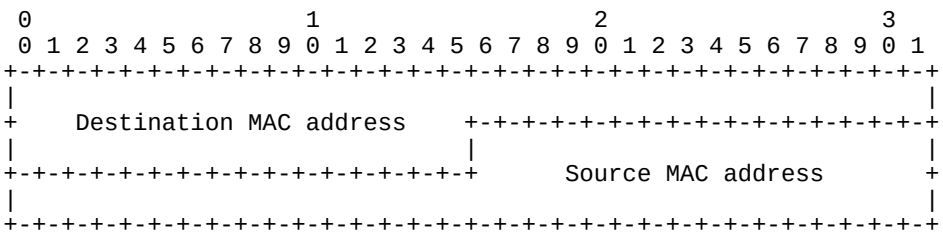
Reserved

These 12 octets are reserved.

Header

This variable-length field contains the header that identifies the connection being tapped. The length of the header is stored in the length field.

Currently, this field is 12 octets long and contains the 6-octet physical address of the connection's destination endstation, followed by the 6-octet physical address of the connection's source endstation, as shown below:

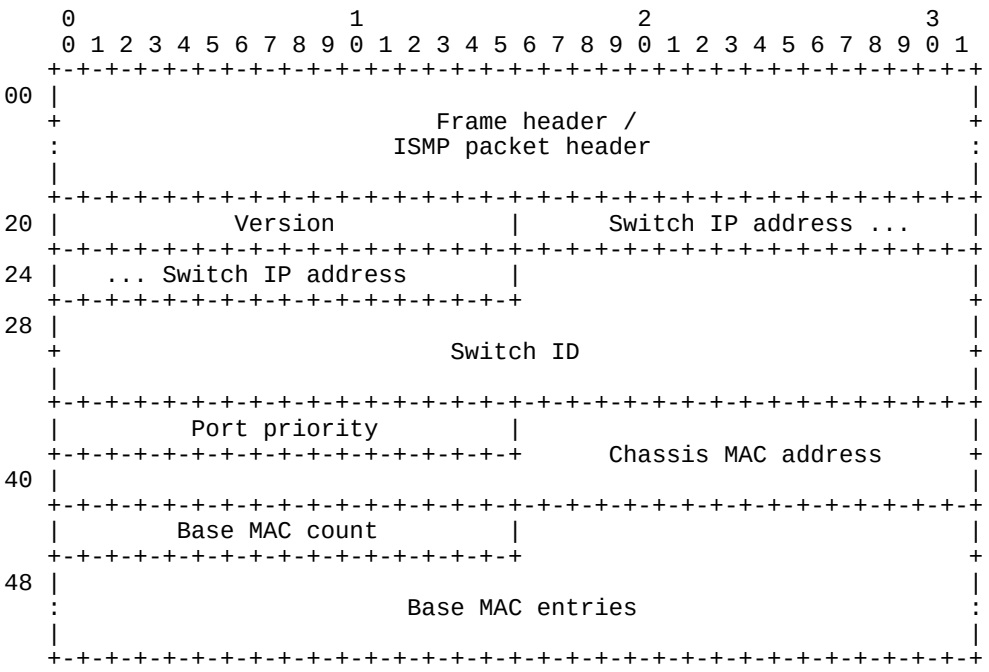


10. Interswitch Redundant Access Keepalive Message

There are two versions of the Interswitch Redundant Access (RA) Keepalive message used by the SecureFast VLAN product.

10.1 Prior to Version 1.8

The Interswitch Redundant Access (RA) Keepalive message used by SFVLAN prior to version 1.8 consists of a variable number of octets, as shown below:



Frame header/ISMP packet header

This 20-octet field contains the frame header and the ISMP version 2 packet header.

- The frame header type field contains a value of 0x81FD.
- The ISMP message type contains a value of 10.

Version

This 2-octet field contains the version number of the message type. This section describes version 1 of the Interswitch RA Keepalive message.

Switch IP address

This 4-octet field contains the Internet Protocol (IP) address of the sending switch.

Switch ID

This 10-octet field contains the internal ISMP identifier of the sending switch. The identifier is generated by the sending switch and consists of the 6-octet physical (MAC) address of the switch, followed by a 4-octet value containing the logical port number over which the switch sent the packet.

Port priority

This 2-octet field contains the assigned priority for the port. Valid values range from 1 to 64. The switch on the port with the higher priority becomes the primary switch, while the switch on the port with the lower priority becomes the standby switch.

Chassis MAC

This 6-octet field contains the physical (MAC) address of the chassis of the sending switch.

Base MAC count

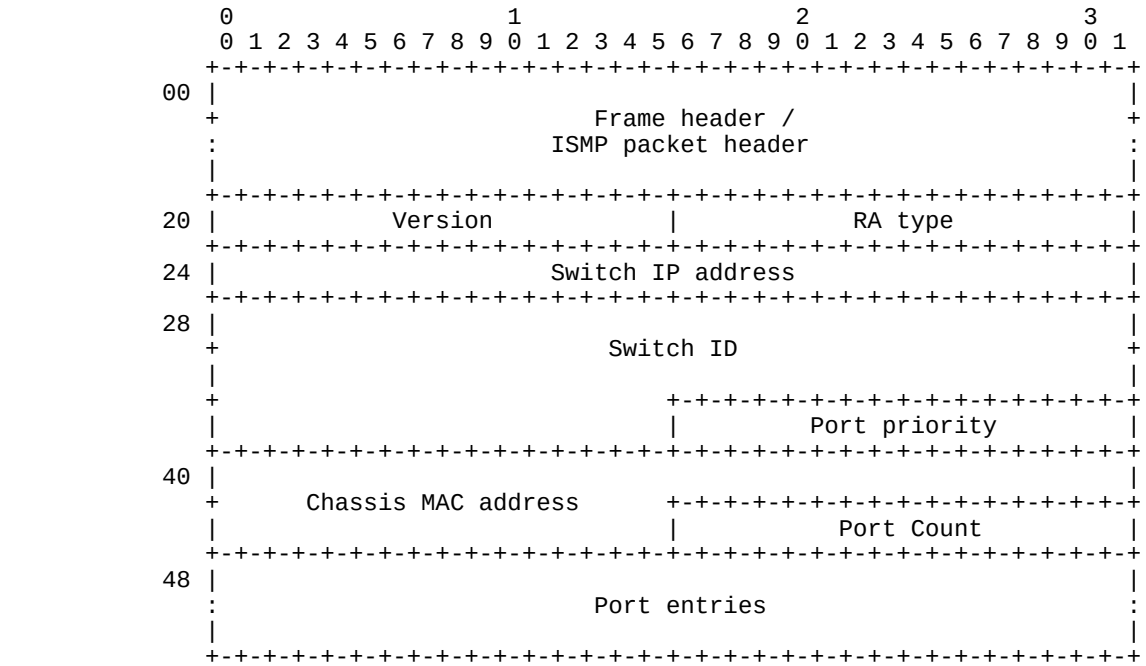
This 2-octet field contains the number of entries in the list of base MAC addresses.

Base MAC entries

This variable-length field contains a list of 6-octet MAC addresses, one for each neighbor discovered on the port. The number of entries in the list is found in the base MAC count field.

10.2 Version 1.8

The Interswitch Redundant Access (RA) Keepalive message used by SFVLAN version 1.8 consists of a variable number of octets, as shown below:



Frame header/ISMP packet header

This 20-octet field contains the frame header and the ISMP version 2 packet header.

- The destination address field contains the base MAC address of the neighbor.
- The frame header type field contains a value of 0x81FD.
- The ISMP message type contains a value of 10.

Version

This 2-octet field contains the version number of the message type. This section describes version 2 of the Interswitch RA Keepalive message.

RA type

This 2-octet field contains the type of redundant access connection. Valid values are as follows:

```
1   The connection is via the front panel (RA port)
2   The connection is via the network
```

Switch IP address

This 4-octet field contains the Internet Protocol (IP) address of the sending switch.

Switch ID

This 10-octet field contains the internal ISMP identifier of the sending switch. The identifier is generated by the sending switch and consists of the 6-octet physical (MAC) address of the switch, followed by a 4-octet value containing the logical port number over which the switch sent the packet.

Port priority

This 2-octet field contains the assigned priority for the RA port. Valid values range from 1 to 64. The switch on the port with the higher priority becomes the primary switch, while the switch on the port with the lower priority becomes the standby switch.

This field is not used if the RA type is network.

Chassis MAC

This 6-octet field contains the physical (MAC) address of the chassis of the sending switch.

Count

This 2-octet field contains the number of entries in the list of Port entries.

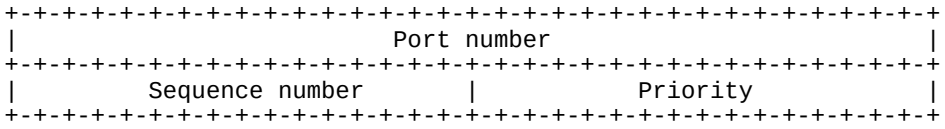
Port entries

This variable-length field contains a list of neighbor entries. The number of entries is found in the Count field.

The format of each entry is determined by the RA type.

- For an RA type of 1 (front panel), each entry contains the 6-octet MAC address of each neighbor discovered on the port.

- For an RA type of 2 (network) each entry is 8 octets long, structured as follows:



Port number

This 4-octet field contains the port number of the neighbor switch's RA port.

Sequence number

This 2-octet field contains a sequence number used for synchronization.

Priority

This 2-octet field contains the assigned priority for the neighbor switch's RA port. Valid values range from 1 to 64. The switch on the port with the higher priority becomes the primary switch, while the switch on the port with the lower priority becomes the standby switch.