

AGGREGATE
BYTE TOTALS

ETHERNET-PREAMBLE (7 BYTES)	7
START-OF-FRAME (1 BYTE)	8
DESTINATION-MAC (6 BYTES)	14
SOURCE-MAC (6 BYTES)	20
IEEE-8021Q-VLAN (4 BYTES)	24
ETHERTYPE (2 BYTES)	26
IP HEADER (20 BYTES)	46
UDP HEADER (8 BYTES)	54

ICE-VRT-PACKET (1472 BYTES)																																
31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 09 08 07 06 05 04 03 02 01 00																																
HEADER	TYPE		C	T	RSV		TSI	TSF	COUNT				PACKET SIZE																			
	STREAM ID																															
CLASS	RSV				OUI																											
	INFORMATION-CLASS-CODE															PACKET-CLASS-CODE																
TIMETAG	INTEGER-SECONDS-TIMESTAMP																															
	FRACTIONAL-SECONDS-TIMESTAMP-MSB																															
	FRACTIONAL-SECONDS-TIMESTAMP-LSB																															
DATA	DATA PAYLOAD (1440 BYTES)																															
	11520	1-BIT VALUES																														
	5760	2-BIT VALUES																														
	3840	3-BIT VALUES																														
	2880	4-BIT VALUES																														
	2304	5-BIT VALUES																														
	1920	6-BIT VALUES																														
	1440	8-BIT VALUES																														
	1152	10-BIT VALUES																														
	960	12-BIT VALUES																														
	768	15-BIT VALUES																														
	720	16-BIT VALUES																														
	480	24-BIT VALUES																														
360	32-BIT VALUES																															
240	48-BIT VALUES																															
180	64-BIT VALUES																															
TRAILER	ENABLES															STATE-EVENT-INDICATORS										E	CONTEXT-PKT-CNT					
	31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 09 08 07 06 05 04 03 02 01 00																															

1526

ETHERNET-CRC (4 BYTES)	1530
INTERFRAME-GAP (5-12 BYTES)	1542

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ICE-VRT-PACKET (1472 BYTES)																															
31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 09 08 07 06 05 04 03 02 01 00																															
HEADER	0 0 0 1 1 1 RSV TSI TSF COUNT 0 0 0 0 0 0 0 1 0 1 1 1 0 0 0 0																														
STREAM	STREAM ID																														
CLASS	0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 1 0 0 1 1 0 1 0 1 1 1 0 1 1 1																														
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 RSV DIS																														
TIMETAG	INTEGER-SECONDS-TIMESTAMP																														
	FRACTIONAL-SECONDS-TIMESTAMP-MSB																														
	FRACTIONAL-SECONDS-TIMESTAMP-LSB																														

PRIMARY DATA PAYLOAD (1440 BYTES)																ALTERNATE DATA PAYLOAD (1024 BYTES)															
11520 1-BIT VALUES																2048 4-BIT VALUES															
5760 2-BIT VALUES																1024 8-BIT VALUES															
3840 3-BIT VALUES																512 16-BIT VALUES															
2880 4-BIT VALUES																															
2304 5-BIT VALUES																															
1920 6-BIT VALUES																															
1440 8-BIT VALUES																															
1152 10-BIT VALUES																															
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TRAILER	<i>ENABLES</i>																<i>STATE-EVENT-INDICATORS</i>																<i>E</i>	<i>CONTEXT-PKT-CNT</i>																1526
31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 09 08 07 06 05 04 03 02 01 00																																																		

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INTERFRAME-GAP (5-12 BYTES)	1542

MTU=1500 CONTAINS IP HEADER(20), UDP HEADER(8), and ICE-VRT-PACKET(1472)

ICE VRT Packet Description

The bitwise definition of the ICE VRT packet is shown in Figure 2 – ICE VRT Packet Definition. The packet definition specifies a default fixed-length VRT packet size of 1472 bytes. Using the VITA 49.0 definition of 32-bit words, each VRT packet contains the following fields: Header (1 word), Stream Identifier (1 word), Class Identifier (2 words), Timestamp (3 words), Payload (360 words), Trailer (1 word).

Each of these fields are mandatory for the ICE VRT packets. By requiring all eight words of the VRT header and trailer fields (Header, StreamID, ClassID, Timestamp, Trailer), and by carefully selecting the payload size to be 360 words, eight byte alignment is maintained. This alignment is critical to the throughput of network cards and DMA interfaces on modern COTS computers. (Non-aligned memory moves on modern CPU architectures are very inefficient and can introduce significant performance bottlenecks.)

ICE VRT Packet – Header

BITS	Field	Value	Description
31-28	Type	0x0001	IF Data Packet Type containing a Stream Identifier
27	C	0x1	Packet contains a Class Identifier
26	T	0x1	Packet contains a Trailer
25-24	RSV	N/A	Reserved
23-22	TSI	0xX	Packet contains a timestamp of type = {0x01, 0x10, 0x11}
21-20	TSF	0xX	Fractional timestamp of type = {0x01, 0x10, 0x11}
19-16	PKTCNT	0xX	Modulo-16 packet sequence counter
15-0	PKTSIZE	0x0170	VRT Header + 360 word payload

ICE VRT Packet – Stream Identifier

BITS	Field	Value	Description
31-0	Stream ID	0XXXXXXXX	Unique 32-bit stream identifier for each data stream

ICE VRT Packet – Class Identifier (Word 1)

BITS	Field	Value	Description
31-24	RSV	0x00	Reserved
23-0	OUI	0x104D77	IEEE Organizationally Unique Identifier for ICE

ICE VRT Packet – Class Identifier (Word 2)

BITS	Field	Value	Description
31-16	ICC	0x0000	Information Class Code
15-0	PCC	0XXXXX	Packet Class Code

ICE VRT Packet – Class Identifier (Word 2, PCC Breakout)

BITS	Field	Value	Description
15	Packing	0x1	Processor or link efficient packing
14-13	ComplexMode	0x0	Real, complex, polar data mode
12-8	DIF	0x0	Data Item Format (enumerated list from VITA 49.0 spec)
7-6	RSV	N/A	Reserved
5-0	DIS	0xX	Data Item Size (bits_per_item - 1)