IMT Atlantique
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École Mines-Télécom

Travaux Dirigés (TD)

6LoWPAN: Compression Examples
RFC 6282

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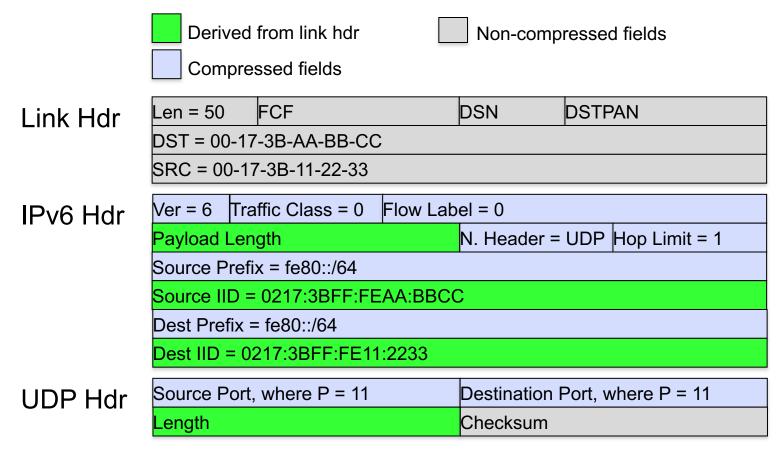web: www.georgiospapadopoulos.com
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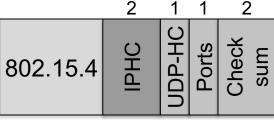youtube: www.youtube.com/c/gzpapadopoulos

Example 1

Legend:
- 🟩 Derived from link hdr
- ⬜ Non-compressed fields
- 🟦 Compressed fields

Link Hdr

Len = 50	FCF	DSN	DSTPAN
DST = 00-17-3B-AA-BB-CC			
SRC = 00-17-3B-11-22-33			

IPv6 Hdr

Ver = 6	Traffic Class = 0	Flow Label = 0	
Payload Length		N. Header = UDP	Hop Limit = 1
Source Prefix = fe80::/64			
Source IID = 0217:3BFF:FEAA:BBCC			
Dest Prefix = fe80::/64			
Dest IID = 0217:3BFF:FE11:2233			

UDP Hdr

Source Port, where P = 11	Destination Port, where P = 11
Length	Checksum

Example 1: Link-local Unicast

Derived from link hdr		Non-compressed fields
Compressed fields		

Link Hdr

Len = 50	FCF	DSN	DSTPAN
DST = 00-17-3B-AA-BB-CC			
SRC = 00-17-3B-11-22-33			

IPv6 Hdr

Ver = 6	Traffic Class = 0	Flow Label = 0
Payload Length	N. Header = UDP	Hop Limit = 1
Source Prefix = fe80::/64		
Source IID = 0217:3BFF:FEAA:BBCC		
Dest Prefix = fe80::/64		
Dest IID = 0217:3BFF:FE11:2233		

UDP Hdr

Source Port, where P = 11	Destination Port, where P = 11
Length	Checksum

	2	1	1	2
802.15.4	IPHC	UDP-HC	Ports	Check sum

48-byte UDP/IPv6 Hdr➔ 6 bytes

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Example 2

	Derived from link hdr		Non-compressed fields
	Compressed fields		Derived from context

Link Hdr

Len = 50	FCF	DSN	DSTPAN
DST = 00-17-3B-00-AA-BB-CC-DD			
SRC = 00-17-3B-00-11-22-33-44			

IPv6 Hdr

Ver = 6	Traffic Class = 0	Flow Label = 0	
Payload Length		N. Header = UDP	Hop Limit = 23
Source Prefix = 2001:5a8:4:3721::/112			
Source IID = 0000:00ff:fe00:1234			
Dest Prefix = 2001:5a8:4:3721::/112			
Dest IID = 0000:00ff:fe00:ABCD			

UDP Hdr

Source Port, where P = 11	Destination Port, where P = 11
Length	Checksum

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Example 2: Global Unicast

🟩 Derived from link hdr	⬜ Non-compressed fields
🟦 Compressed fields	⬜ Derived from context

Link Hdr

Len = 50	FCF	DSN	DSTPAN
DST = 00-17-3B-00-AA-BB-CC-DD			
SRC = 00-17-3B-00-11-22-33-44			

IPv6 Hdr

Ver = 6	Traffic Class = 0	Flow Label = 0	
Payload Length		N. Header = UDP	Hop Limit = 23
Source Prefix = 2001:5a8:4:3721::/112			
Source IID = 0000:00ff:fe00:1234			
Dest Prefix = 2001:5a8:4:3721::/112			
Dest IID = 0000:00ff:fe00:ABCD			

UDP Hdr

Source Port, where P = 11	Destination Port, where P = 11
Length	Checksum

	2	1	1	2	2	1	1	2
802.15.4	IPHC	CID	Hop Limit	Source Addr	Dest. Addr	UDP-HC	Ports	Check sum

48-byte UDP/IPv6 Hdr
➔ 12 bytes

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Example 3

🟩 Derived from link hdr	⬜ Non-compressed fields
🟦 Compressed fields	

Link Hdr

Len = 50	FCF	DSN	DSTPAN
DST = 00-17-3B-AA-BB-CC			
SRC = 00-17-3B-11-22-33			

IPv6 Hdr

Ver = 6	Traffic Class = 0	Flow Label = 0	
Payload Length		N. Header = UDP	Hop Limit = 255
Source Prefix = fe80::/64			
Source IID = 0217:3BFF:FEAA:BBCC			
Dest Prefix = ff02::12			

UDP Hdr

Source Port, where P = 11	Destination Port, where P = 11
Length	Checksum

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Example 3: Link-local Multicast

Derived from link hdr **Non-compressed fields**

Compressed fields

Link Hdr

Len = 50	FCF	DSN	DSTPAN

DST = 00-17-3B-AA-BB-CC

SRC = 00-17-3B-11-22-33

IPv6 Hdr

Ver = 6	Traffic Class = 0	Flow Label = 0

Payload Length	N. Header = UDP	Hop Limit = 255

Source Prefix = fe80::/64

Source IID = 0217:3BFF:FEAA:BBCC

Dest Prefix = ff02::12

UDP Hdr

Source Port, where P = 11	Destination Port, where P = 11

Length	Checksum

2 1 1 1 2

| 802.15.4 | IPHC | Group ID | UDP-HC | Ports | Check sum |

48-byte UDP/IPv6 Hdr➔ 7 bytes

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Example 4

6 Version	**e0** Traffic Class	**00** Flow Label	
Payload Length **03 1a**	Next Header **11**	Hop Limit **56**	

Source Address

fe80::c001:1dff:fee0:0

Destination Address

ff02::2

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Example 4: Link-local Multicast

Version **6**	Traffic Class **e0**	Flow Label **00**		
Payload Length **03 1a**		Next Header **11**	Hop Limit **56**	
Source Address fe80::c001:1dff:fee0:0				
Destination Address ff02::2				

0	1	2	3	4	5	6	7
011			TF **10**		NH **1**	IID **00**	
CID **0**	SAC **0**	SAM **11**		TC **1**	DAC **0**	DAM **11**	
IPv6 Header fields … **E0 56 02**							

- *Compressed Header = 2 bytes*
- *IPv6 Header fields = 3 bytes*

Compression Result:
from 40 Bytes to 5 Bytes

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Example 5

| Derived from link hdr | Non-compressed fields |
| Compressed fields | Derived from context |

Link Hdr

Len = 50	FCF	DSN	DSTPAN
DST = 00-17-3B-00-AA-BB-CC-DD			
SRC = 00-17-3B-00-11-22-33-44			

IPv6 Hdr

Ver = 6	Traffic Class = 0	Flow Label = 0	
Payload Length		N. Header = UDP	Hop Limit = 64
Source Prefix = 2001:5a8:4:3721::/64			
Source IID = 0000:8a2e:0370:7334			
Dest Prefix = 2001:5a8:4:3721::/112			
Dest IID = 0000:00ff:fe00:ABCD			

UDP Hdr

Source Port	Destination Port
Length	Checksum

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Example 5

🟩 Derived from link hdr		⬜ Non-compressed fields	
🟦 Compressed fields		⬜ Derived from context	

Link Hdr

Len = 50	FCF	DSN	DSTPAN
DST = 00-17-3B-00-AA-BB-CC-DD			
SRC = 00-17-3B-00-11-22-33-44			

IPv6 Hdr

Ver = 6	Traffic Class = 0	Flow Label = 0	
Payload Length		N. Header = UDP	Hop Limit = 64
Source Prefix = 2001:5a8:4:3721::/64			
Source IID = 0000:8a2e:0370:7334			
Dest Prefix = 2001:5a8:4:3721::/112			
Dest IID = 0000:00ff:fe00:ABCD			

UDP Hdr

Source Port	Destination Port
Length	Checksum

	2	1	8	2	1	2	2
802.15.4	IPHC	CID	Source Addr	Dest. Addr	UDP-HC	Source Port	Source Port

48-byte
UDP/IPv6 Hdr
➔ 18 bytes

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6LoWPAN:
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