

EPIC

Generating New Profiles for ROHC

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IPR Statement

- This presentation may contain material covered by IPRs. Siemens has made provisions to enable the IETF to consider such material in standards discussions.
- Please see:
<http://www.ietf.org/ietf/IPR/SIEMENS-General>
- A reference implementation of EPIC is publicly available at:
<http://www.roke.co.uk/networks/epic/epic.html>

Compressing a New Protocol

Write inputset for new protocol

Field(s)	Encoding Method	Probability
Source Port Destination Port	STATIC	100%
RST Flag URG Flag	VALUE('0')	99.9%
	VALUE('1')	0.1%
Data Offset Sequence Number Ack Number	INFERRED	100%
Expected Payload Size	STATIC	99%
	WRITE(16,PAYLOAD,16)	1%

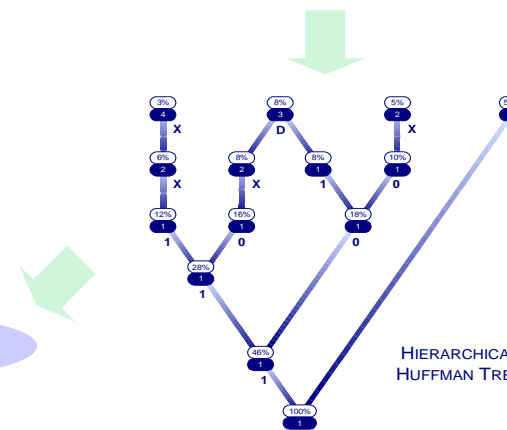
Combine with existing inputsets

Field(s)	Encoding Method	Probability
Source Port Destination Port	STATIC	100%
RST Flag URG Flag	VALUE('0')	99.9%
	VALUE('1')	0.1%
Data Offset Sequence Number Ack Number	INFERRED	100%
Expected Payload Size	STATIC	99%
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Build compressed header formats



Compress and decompress headers

Compressor

Decompressor

TCP Compression Requirements

- What are the goals for TCP compression?
- Bandwidth efficiency
 - SACK and Timestamp options
 - SYN/FIN flags
 - Acknowledgement packets
- Robustness
 - Scheme using link layer retransmission is mandatory
 - Scheme using built-in robustness would be useful
- Framework
 - TCP compression should fit into the ROHC framework
- TCP can be compressed using EPIC
 - Described in draft-ietf-rohc-tcp-epic-00.txt

TCP Compression Using EPIC

- Efficient compression of SACK, Timestamp, and SYN/FIN
- Customisable level of robustness
 - No need for separate compression schemes

Field(s)	Encoding Method	Probability
CRC	IRREGULAR(3)	99%
	IRREGULAR(7)	1%
Master Sequence Number	LSB(4,0)	99%
	LSB(7,112)	1%

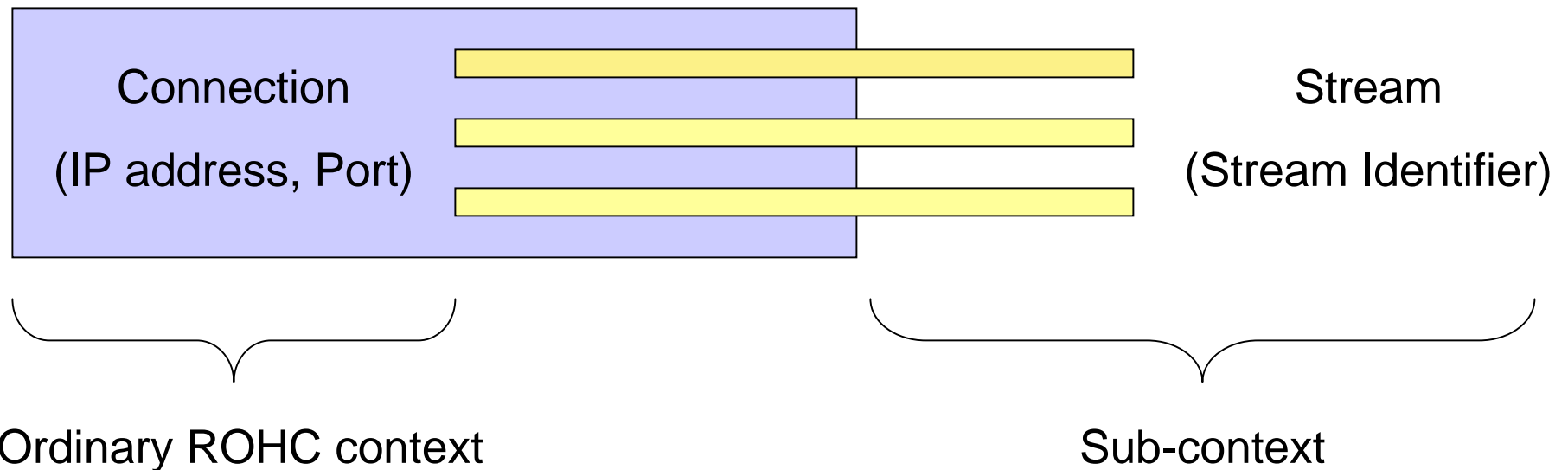
- Small average compressed header size
 - Most headers 1 byte + CID + TCP Checksum
 - Holds even for the robust version

SCTP Compression Requirements

- SCTP is important for the deployment of IP in new arenas
- Developed for signalling transport (but capable of other tasks)
- What are the goals for SCTP compression?
- Bandwidth efficiency
 - Compress most commonly used SCTP “chunks”
 - Handle special SCTP features (such as multi-streaming)
- Robustness
 - Link layer retransmission will usually provide robustness
 - However some robustness is useful to minimise delay
- SCTP can be compressed using EPIC
 - Described in draft-price-rohc-epic-sctp-00.txt

SCTP Compression Using EPIC

- Efficient compression of multiple SCTP streams
 - Uses the idea of a sub-context



- General fields are handled using shared ROHC context
- Stream-specific fields are handled using sub-contexts

Signalling Compression

- EPIC can be used to compress signalling messages
- Common fields should be identified and compressed
 - For SIP: From, To, Via, Call-ID, CSeq, Contact etc.
- EPIC can handle missing and out-of-order fields
 - Techniques developed for IP extension headers
 - Need a method to identify fields within a message
 - No problem for SIP (as fields are marked)
- Not all fields need to be handled
 - Can leave some uncompressed or even zipped

```
INVITE sip:UserB@there.com SIP/2.0
Via: SIP/2.0/UDP here.com:5060
From: BigGuy <sip:UserA@here.com>
To: LittleGuy <sip:UserB@there.com>
Call-ID: 12345601@here.com
CSeq: 1 INVITE
Contact: BigGuy <sip:UserA@here.com>
Content-Type: application/sdp
Content-Length: 147
```

Transparent 0 Byte Solution

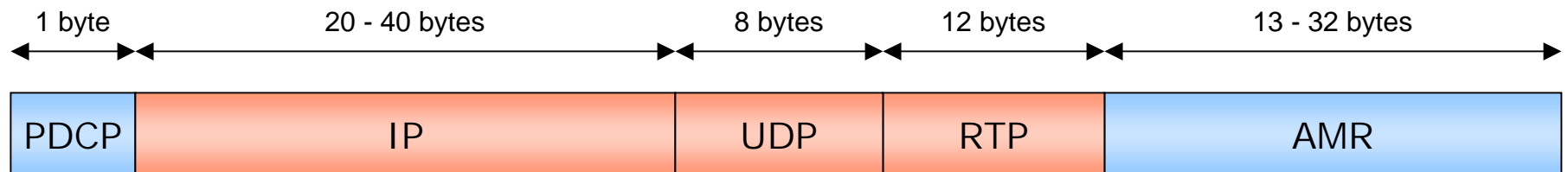
- EPIC can generate a 0 byte profile for RTP/UDP/IP
- Encoding must be added to infer the sequence number

Field(s)	Encoding Method	Probability
CRC	IRREGULAR(0)	99%
	IRREGULAR(3)	1%
Master Sequence Number	INFERRED	99%
	LSB(4,-1)	1%

- Compressed header formats are generated as normal
- Most probable header format is discarded
 - This is the 0 byte header
- Reuses base RTP/UDP/IP profile

All-Layer Compression

- All-layer compression increases bandwidth efficiency
 - Can enhance even a 0 byte solution
- Example protocol stack for 3G network with AMR codec
 - PDCP on the link layer (1 byte)
 - AMR payload encapsulation (1 byte)



- EPIC inputsets can be written by relevant standards bodies

