



3GPP TSG CT4 Meeting #68bis
Bratislava, Slovakia; 13th – 17th April 2015

Source: Alcatel-Lucent
Title: DISC: WebRTC gateway - High-level stage 3 overview

C4-150423

H.248 WebRTC gateway

High-level **stage 3** overview

(Framework of **H.248 packages & SDP elements**)

Background

To do:

- update 29.334 Rel-13 towards a complete "H.248 IMS-WebRTC gateway" function
- ⇒ new "**H.248 Iq profile version 4**"
(NOTE: 29.334 Rel-12 = Iq v3)
- ⇒ addition of
 - 1. **H.248 packages** for WebRTC data service
 - 2. **SDP elements** for WebRTC data service

3GPP TS **29.334** V13.1.0 (2015-03)

Technical Specification

3rd Generation Partnership Project;
Technical Specification Group Core Network and Terminals;
IMS Application Level Gateway (IMS-ALG) – IMS Access
Gateway (IMS-AGW);
Iq Interface;
Stage 3
(Release 13)



Purpose & Scope

The real core of any "H.248 interface" specification could be reduced to the **set of supported H.248 packages** of the H.248 profile used in network operation. The set of profile-specific H.248 packages characterizes actually almost completely the stage 3 solution.

The purpose of this discussion document is to provide a bottom-up approach by trying to look already at the possible final solution, i.e., how finally a **3GPP Rel-13 H.248 IMS-WebRTC gateway** could look like from **H.248 packages perspective**.

Thus, the primary question would be what would be finally the required **set of H.248 packages** which by itself constitute "H.248 WebRTC gateway" solutions?

Such a "vision" is feasible since all required building blocks (= H.248 packages) are in the meanwhile identified, already specified or close to finalization (as part of correspondent ITU-T H.248 work items). There isn't any known gap, which would further delay the completion of a WebRTC gateway specification.

We would conclude sufficient technical stability in order to advance 29.334 towards a complete "H.248 IMS-WebRTC gateway" solution, knowing that some referred ITU-T H.248.x-Recs and IETF "SDP" docs are still in draft state, but technically already mature.

It should be emphasized again that this DISC doc is per se **informative only** and not proposing to bypass the usual stage 2 process. The required stage 3 CRs will be still the result of the usual stage 2 (23.334) agreements.

Stage 3 "H.248 WebRTC gateway"

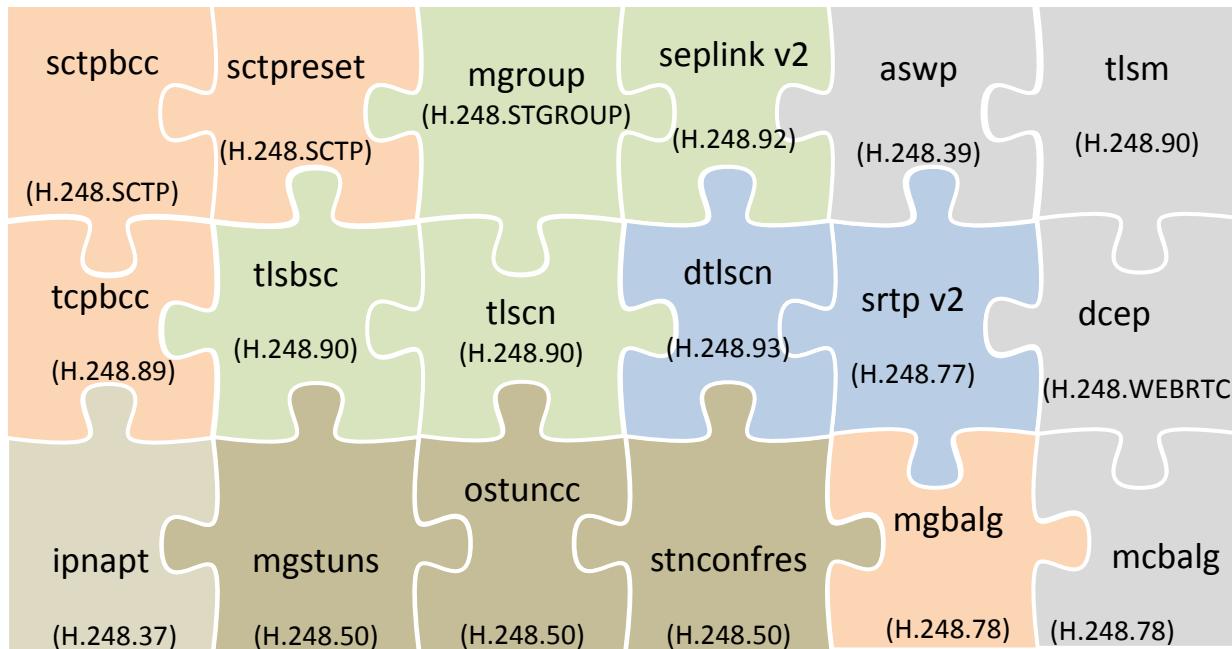
Signalling elements Part I: "H.248 packages"

NOTE: readers should be familiar with the latest ITU-T Draft Recommendations

- H.248.50 (rev), H.248.SCTP, H.248.STGROUP, H.248.WEBRTC
apart from published Recs
- H.248.37, H.248.39, H.248.77, H.248.78, H.248.89, H.248.90, H.248.92, H.248.93

H.248 WebRTC gateway: Stage 3 solution – Landscape of H.248 Packages

Complete solution (for WebRTC audio, video & data):

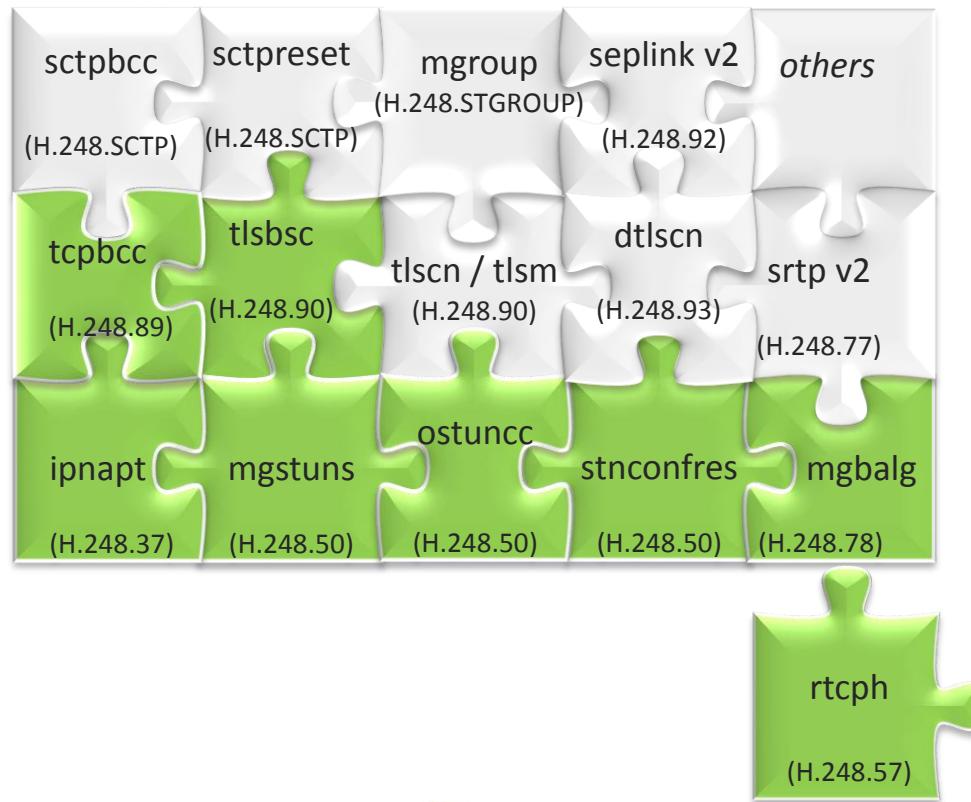


... the various service areas are explained at the next slides ...

H.248 WebRTC gateway: Stage 3 solution – Landscape of H.248 Packages

Status stage 3 (29.334 H.248 Iq profile):

- H.248 packages already supported in 3GPP Rel-12

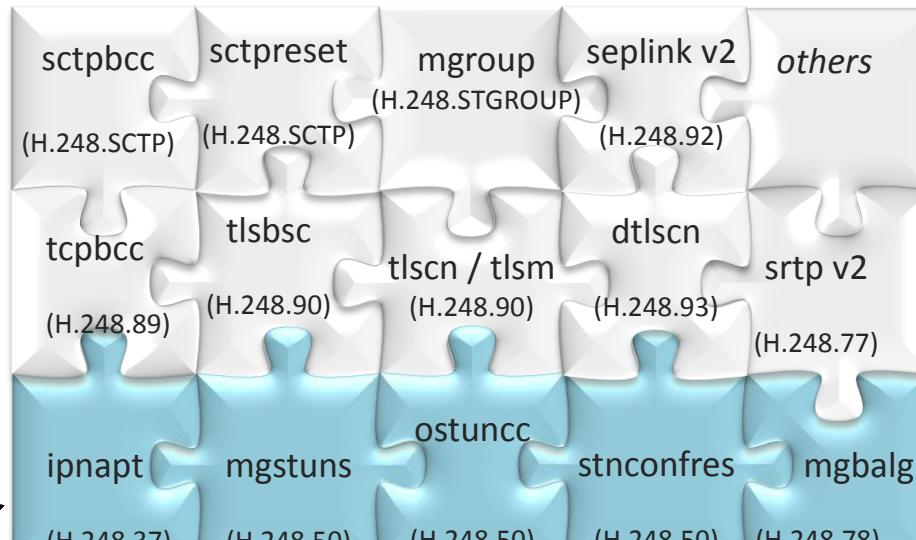


WebRTC building blocks added as part of work items:

- MEDIASEC (SDES SRTP)
- eMEDIASEC (DTLS, TLS, NAT-T for TCP, MSRP IWF)
- IMS_WebRTC_Rel12 (ICE/STUN for UDP (& TCP))
- RTCP-MUX (possible future RTP / RTCP transport multiplexing in IMS-WebRTC)

H.248 WebRTC gateway: Stage 3 solution – Landscape of H.248 Packages

Reminder: capabilities related to **NAT traversal support**:



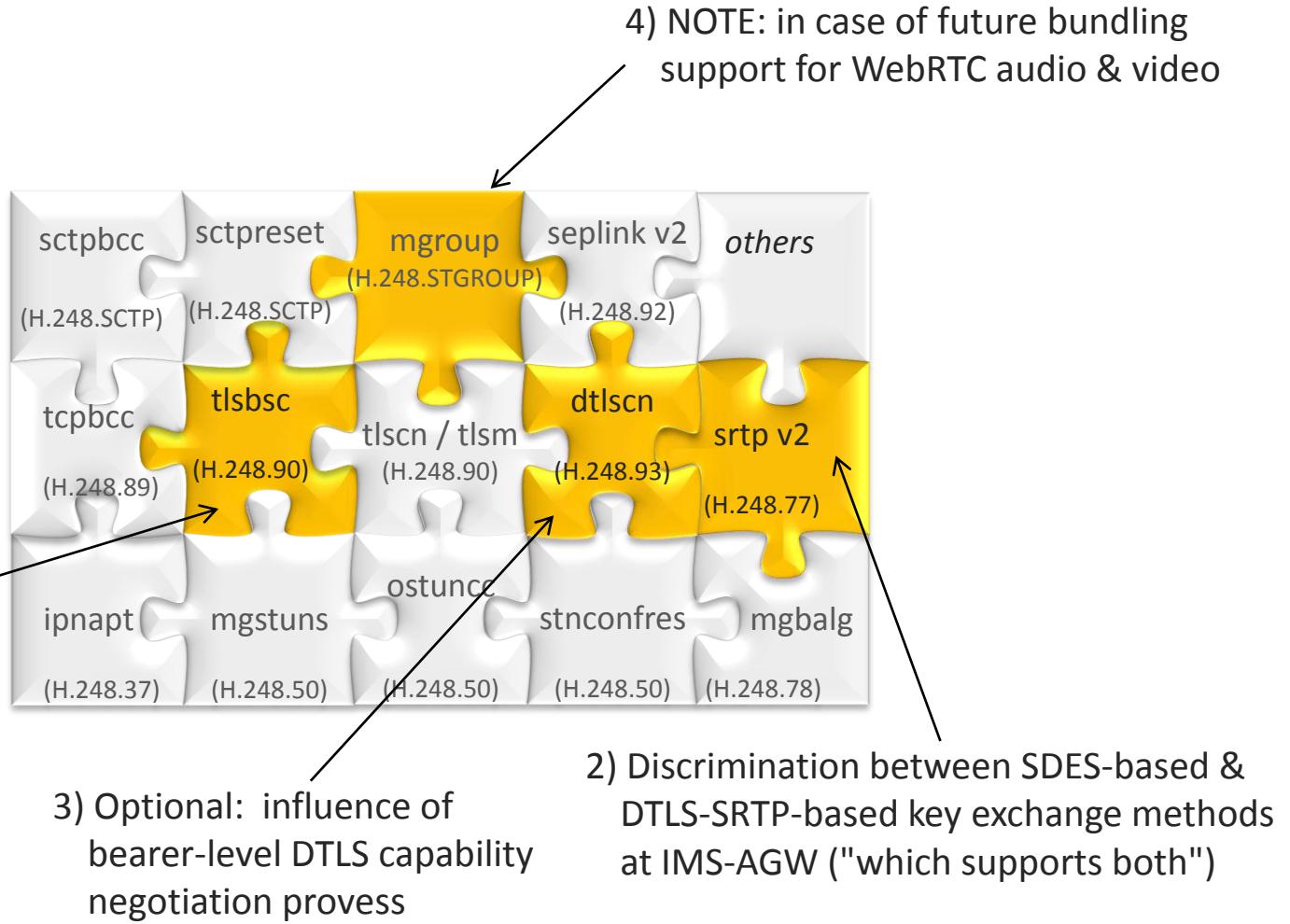
1) L4 NAT-T: Latching of IP transport addresses

2) L4 NAT-T: ICE/STUN
2.1) for UDP
2.2) for TCP (to be checked)

3) L4+ NAT-T: Bearer level application level gateway (for e.g. MSRP)

H.248 WebRTC gateway: Stage 3 solution – Landscape of H.248 Packages

Reminder: dedicated capabilities required for WebRTC **audio & video**:

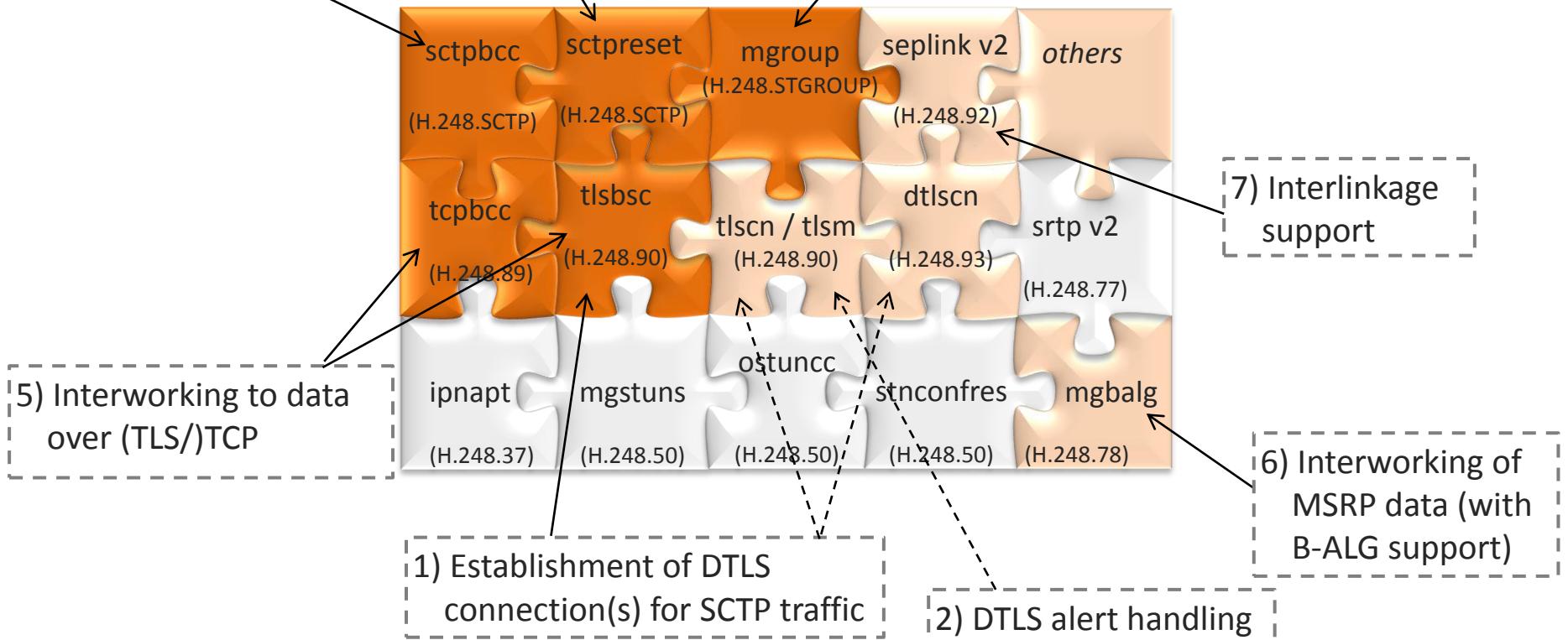


H.248 WebRTC gateway: Stage 3 solution – Landscape of H.248 Packages

New: dedicated capabilities required for WebRTC data:

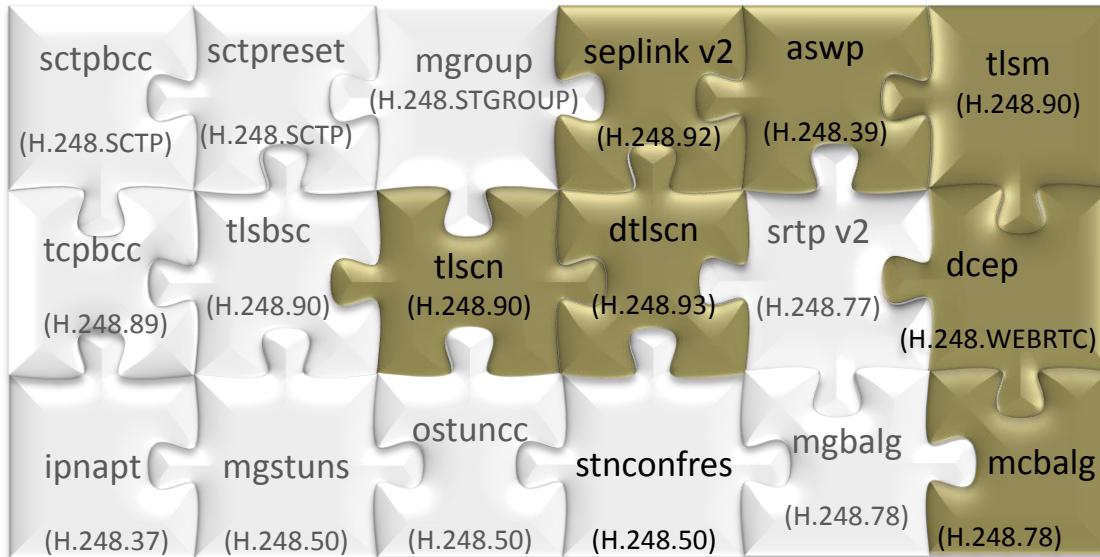
- 3) Establishment & release of
- SCTP association
- SCTP streams

- 4) Stream grouping for
a) SCTP stream demultiplexing
b) optional separation of SCTP association and DTLS connection
c) optional separation of L4 in order to isolate ICE/STUN procedures



H.248 WebRTC gateway: Stage 3 solution – Landscape of H.248 Packages

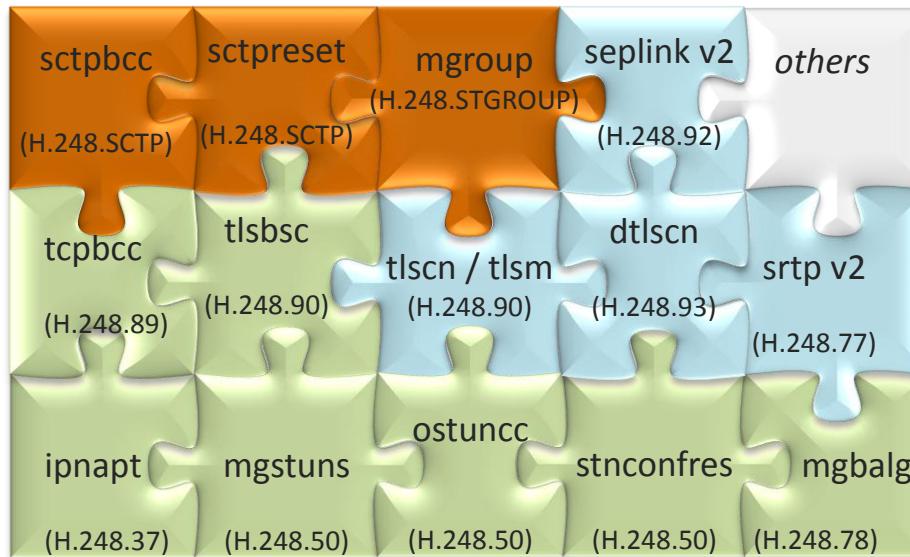
Capabilities which allow *enhanced gateway services* support
(-> optional / out of scope of Rel-13):



H.248 WebRTC gateway: Stage 3 solution – Landscape of H.248 Packages

Stage 3 (29.334 H.248 Iq profile): H.248 packages

- already supported in 3GPP Rel-12
- to do in Rel-13: mandatory / optional for WebRTC data



Stage 3 "H.248 WebRTC gateway"

Signalling elements Part II: "SDP elements for H.248 – WebRTC data channels"

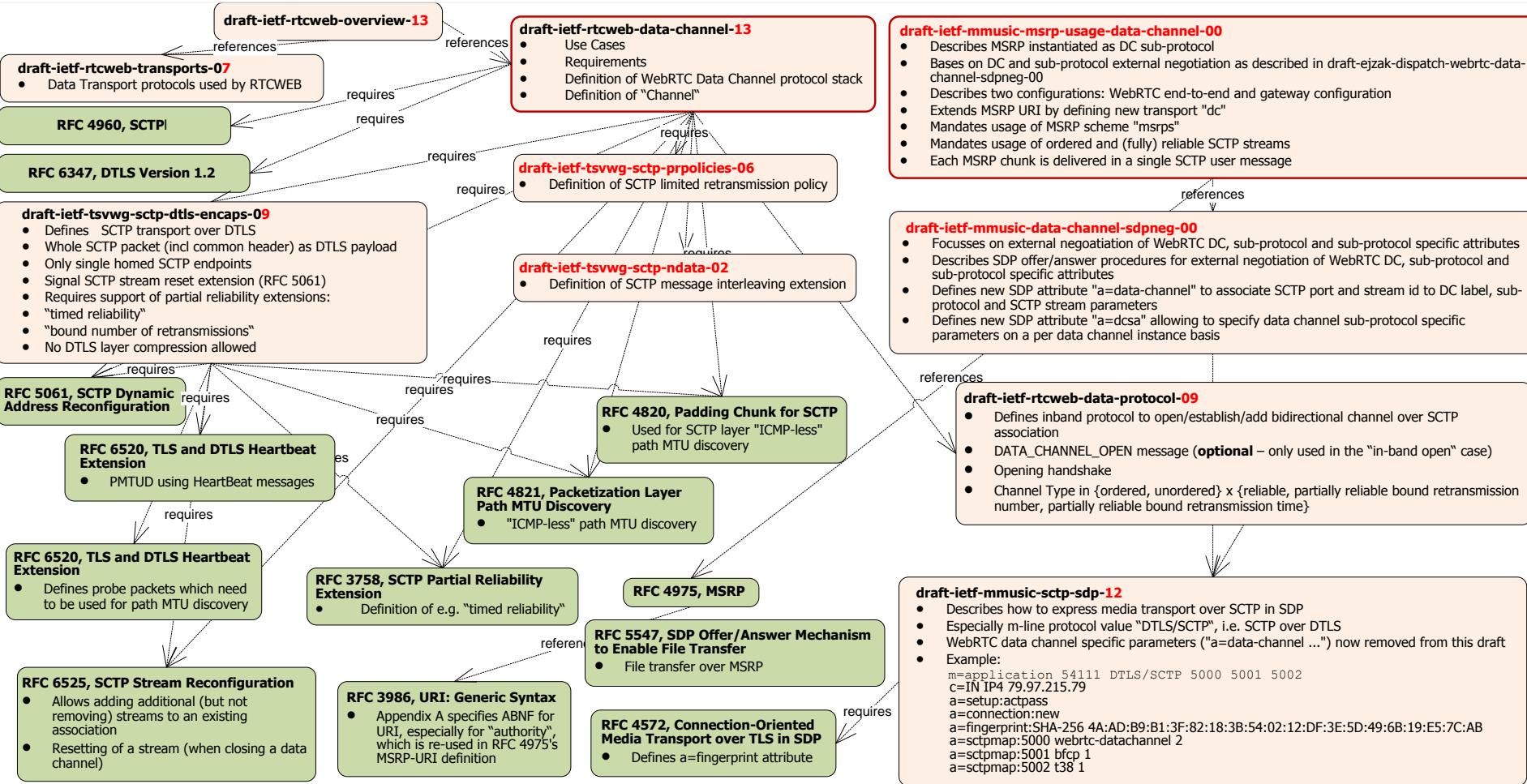
NOTE: readers should be familiar with the latest IETF drafts

- MMUSIC: draft-ietf-mmusic-sctp-sdp, draft-ietf-mmusic-data-channel-sdpneg, draft-ietf-mmusic-msrp-usage-data-channel

background:

- RTCWEB: draft-ietf-rtcweb-data-channel (, & draft-ietf-rtcweb-data-protocol)
- TSVWG: draft-ietf-tsvwg-sctp-dtls-encaps, draft-ietf-tsvwg-sctp-prpolicies, draft-ietf-tsvwg-sctp-ndata

H.248 WebRTC gateway: Stage 3 solution – Landscape of SDP elements for WebRTC data



Summary & conclusions

Conclusions – H.248 packages for WebRTC gateways

(1/5)

Generic packages (i.e., IMS-AGW in general "border gateway" role):

= 29.334, clause 5.14.1 "Mandatory packages"

Required for
3GPP WebRTC GWs.
Already supported.

	Mandatory Packages:		
	Package Name	PackageID	Version
1	IP NAPT traversal (H.248.37)	ipnapt, (0x0099)	1
2	Generic (H.248.1, Annex E.1)	g, (0x0001)	1
3	Base root (H.248.1, Annex E.2)	root, (0x0051)	2
4	Gate management (H.248.43)	gm, (0x008c)	2
5	Traffic management (H.248.53)	tman, (0x008d)	1
6	IP Domain Connection (H.248.41)	ipdc, (0x009d)	1
7	Hanging Termination Detection (H.248.36)	hangterm, (0x0098)	1
8	Diffserv (H.248.52)	ds, (0x008b)	2
9	RTP Control Protocol (H.248.57)	rtcp, (0x00b5)	1

Conclusions – H.248 packages for WebRTC gateways

Service-specific packages (i.e., IMS-AGW provides IMS service or/and operation specific support):

= 29.334, clause 5.14.1 "Optional packages"

Optional Packages:					Required for
	Package Name	PackageID	Vers.	Support dependent on:	WebRTC
10	Inactivity Timer (H.248.14)	it, (0x0045)	1	MGC polling by MG. Only applicable for UDP transport.	-
11	Media Gateway Overload Control (H.248.11)	ocp, (0x0051)	1	Support of message throttling, based on rate limitation, from MGC towards MG.	-
12	Media GW Resource Congestion Handling Package (H.248.10)	chp, (0x0029)	1	Support of message throttling, based on percentage limitation, from MGC towards MG.	-
13	IP realm availability (H.248.41)	ipra (0x00e0)	1	Support of mechanisms allowing the MGC to discover the IP realms that are available at the MG at a certain time and allowing the MG to inform the MGC about any changes in the availability of realms.	-
14	Application Data Inactivity Detection (H.248.40)	adid (0x009c)	1	MGC requires to be explicitly informed of a cessation of an application data flow.	-
15	Explicit Congestion Notification for RTP-over-UDP Support (H.248.82)	ecnrous (0x010b)	1	Support of Transparent forwarding of ECN packets	ffs
16	MG Act-as STUN Server (H.248.50)	mgastuns (0x00c2)	1	Support of incoming STUN connectivity checks. Applicable for ICE lite and full ICE	Yes (NAT-T)
17	Originate STUN Continuity Check (H.248.50)	ostuncc (0x00c3)	1	Support of originating STUN connectivity checks Only applicable for full ICE	Yes (NAT-T)

Required for
3GPP WebRTC GWs.
In scope of Rel-13.

Conclusions – H.248 packages for WebRTC gateways

(3/5)

Service-specific packages (i.e., IMS-AGW provides IMS service or/and operation specific support):

= 29.334, clause 5.14.1 "Optional packages"

Optional Packages:					Required for
	Package Name	PackageID	Vers.	Support dependent on:	WebRTC
18	TCP basic connection control (H.248.89)	tcpbcc, (0x0115)	1	Support of state-aware TCP handling (TCP proxy mode) (NOTE: Stateless TCP handling (i.e. TCP relay and TCP merge mode) are solely based on SDP indication (thus, package-less) according to H.248.84, clause 13.).	Yes (Data IWF to TCP)
19	TLS basic session control (H.248.90)	tlsbsc, (0x0117)	1	Support of a) TCP-based media using TLS or b) UDP-based media using DTLS.	Yes (DTLS; Data IWF to TLS)
20	Stream endpoint interlinkage (H.248.92)	seplink, (0x011b)	2	Support of state-aware TCP handling (TCP proxy mode) and of Forward Incoming TCP Connection Establishment Requests Indicator.	Yes (interlinkage)
21	MG located Bearer Level ALG (H.248.78)	mgbalg (0x011d)	1	Support of a bearer level application gateway (B-ALG) function for application-aware MSRP interworking.	Yes (NAT-T)
22	STUN Consent Freshness (H.248.50)	stnconfres (0x0120)	1	Support of STUN usage for consent freshness procedures. Applicable for full ICE.	Yes (NAT-T)
23	Secure RTP (H.248.77)	srtpp, (0x0107)	2 (!)	Indication of SRTP key exchange method ("DTLS-SRTP" for WebRTC domain, "SDES" for non-WebRTC domain)	Yes (generic)

Required for
3GPP WebRTC GWs.
In scope of Rel-13.

(4/5)

Conclusions – H.248 packages for WebRTC gateways

Service-specific packages (i.e., IMS-AGW provides IMS service or/and operation specific support):

= 29.334, clause 5.14.1 "Optional packages"

Optional Packages:					Required for
	Package Name	PackageID	Vers.	Support dependent on:	WebRTC
24	SCTP basic connection control (H.248.SCTP)	sctpbcc, (0x0121)	1	Support of WebRTC data services: control of establishment and release of SCTP associations, and the allocation of local SCTP stream identifiers	Yes (Data)
25	SCTP Re-configuration Stream reset (H.248.SCTP)	sctppreset, (0x0122)	1	Support of WebRTC data services: control of SCTP stream reset ("release") procedure	Yes (Data)
26	Media grouping (H.248.STGROUP)	mgroup, (0x011f)	1	Support of WebRTC: a) multiplexing as part of WebRTC data stack; b) multiplexing in case of bundled WebRTC audio & video (out of scope of Rel-13)	Yes (generic)

Unconfirmed (yet) for
 3GPP WebRTC GWs.
 Out of scope of Rel-13.

Conclusions – H.248 packages for WebRTC gateways (5/5)

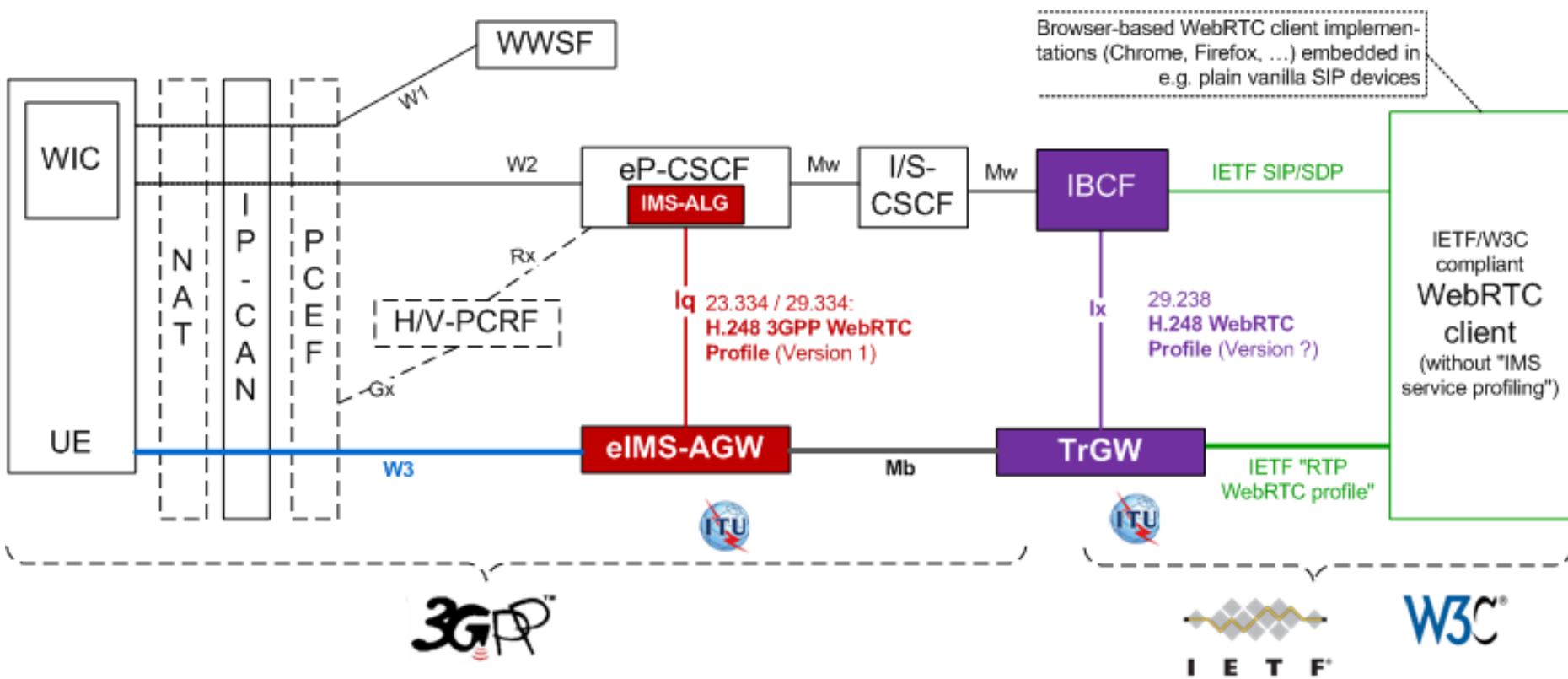
Service-specific packages (i.e., IMS-AGW provides IMS service or/and operation specific support):
 = 29.334, clause 5.14.1 "Optional packages"

Optional Packages:					Required for
	Package Name	PackageID	Vers.	Support dependent on:	WebRTC
27	Data Channel Establishment Protocol Support (H.248.WEBRTC)	dcep, (0x0124)	1	WebRTC gateway with WebRTC data services support and a WebRTC network domain using "in-band"-based DC control (NOTE: out of scope of 3GPP IMS-WebRTC domains, but might be used by non-3GPP WebRTC domains, i.e. a requirement for the IBCF/TrGW as WebRTC GW)	ffs
28	MGC Controlled Bearer Level ALG (H.248.78)	mcbalg, (0x0108)	2		ffs
29	TLS capability negotiation (H.248.90)	tlscn, (0x0118)	1	MGC influenced DTLS capability negotiation procedures for DTLS sessions/connections: a) for DTLS-SRTP key exchange b) for DTLS-based SCTP transport (NOTE: out of scope of 3GPP IMS-WebRTC domains in case of a single, unambiguous DTLS domain profile (see also clause 14.2/H.248.90))	ffs
30	DTLS extended capabilities (H.248.93)	dtlscn, (0x011e)	1		ffs
31	TLS session maintenance (H.248.90)	tlsm, (0x0119)	1	Handling of DTLS error alerts (not DTLS closure alert) in order to avoid undetermined states of "H.248 WebRTC termination".	ffs
32	Advanced SDP Wildcarding (H.248.39)	aswp, (0x011c)	1	Simplified handling of DTLS authentication related signall. at H.248 interface ("wildcarding SDP a=fingerprint"). The benefit is conditional, see Appendix I/H.248.39.	ffs

Backup

Extended reference model for "H.248 IMS WebRTC gateways"

Reminder: only *Iq* is in scope of CT4 WebRTC work items!



WebRTC gateway – Status of IMS WebRTC CT4 work:

H.248. WebRTC gateway (eIMS-AGW / eIMS-ALG): Supported capabilities (in Rel-12):	
1	ICE/STUN for UDP
2	ICE/STUN for TCP (audio & video only)
3	STUN Consent Freshness
4	UDP- & TCP-based transport of audio & video
5	End-to-access-edge security (SRTP) with DTLS-SRTP based key management
6	Audio transcoding (to/from OPUS)
7	optional Video transcoding

Reminder: preliminary,
high-level analysis end
of Rel-12 (2014-11).

WebRTC data channels:

The following items have not been sufficiently studied by CT4.

H.248. WebRTC gateway (eIMS-AGW / eIMS-ALG): Open items:		Potential Dependencies to other SDOs:	
		IETF	ITU-T
1	Binding of bearer-level SCTP streams (data channels) to call-level WebRTC data applications	Yes (draft-ejzak-mmusic-data-channel-sdpneg-02)	Yes (H.248.SCTP, H.248.STGROUP)
2	Vertical protocol stack separation in "Data channels" and common transport "SCTP/DTLS/UDP/IP"	No	Yes (H.248.STGROUP)
3	Handling of SCTP association (for multiple data channels)	Yes (draft sctp-sdp)	Yes (H.248.SCTP)
4	H.248 Context internal interconnection of data channels between WebRTC and non-WebRTC domain	No	Yes (H.248.STGROUP)

Reminder: preliminary,
high-level analysis end
of Rel-12 (2014-11).

End