



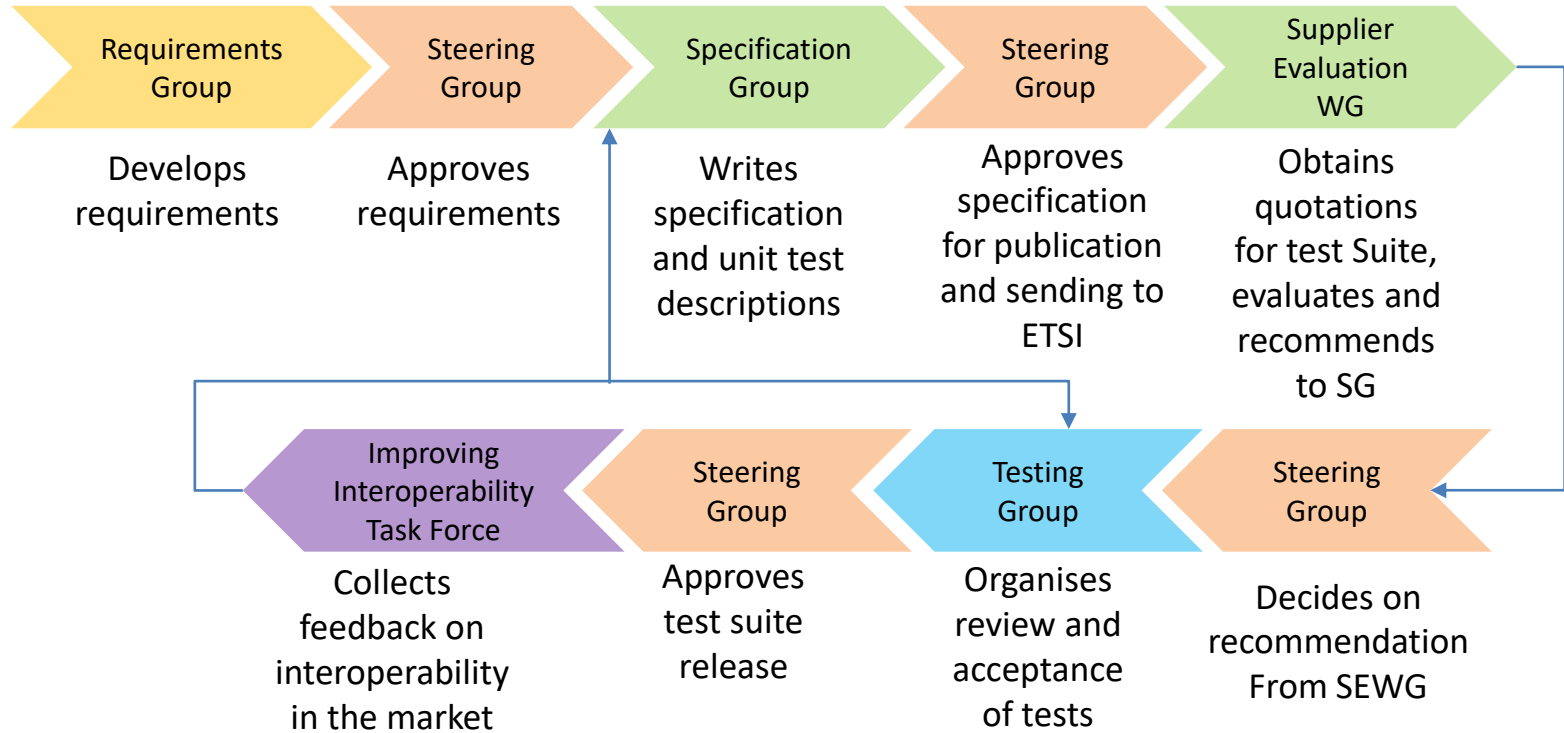
Update on our Specifications and Related Activities

Jon Piesing

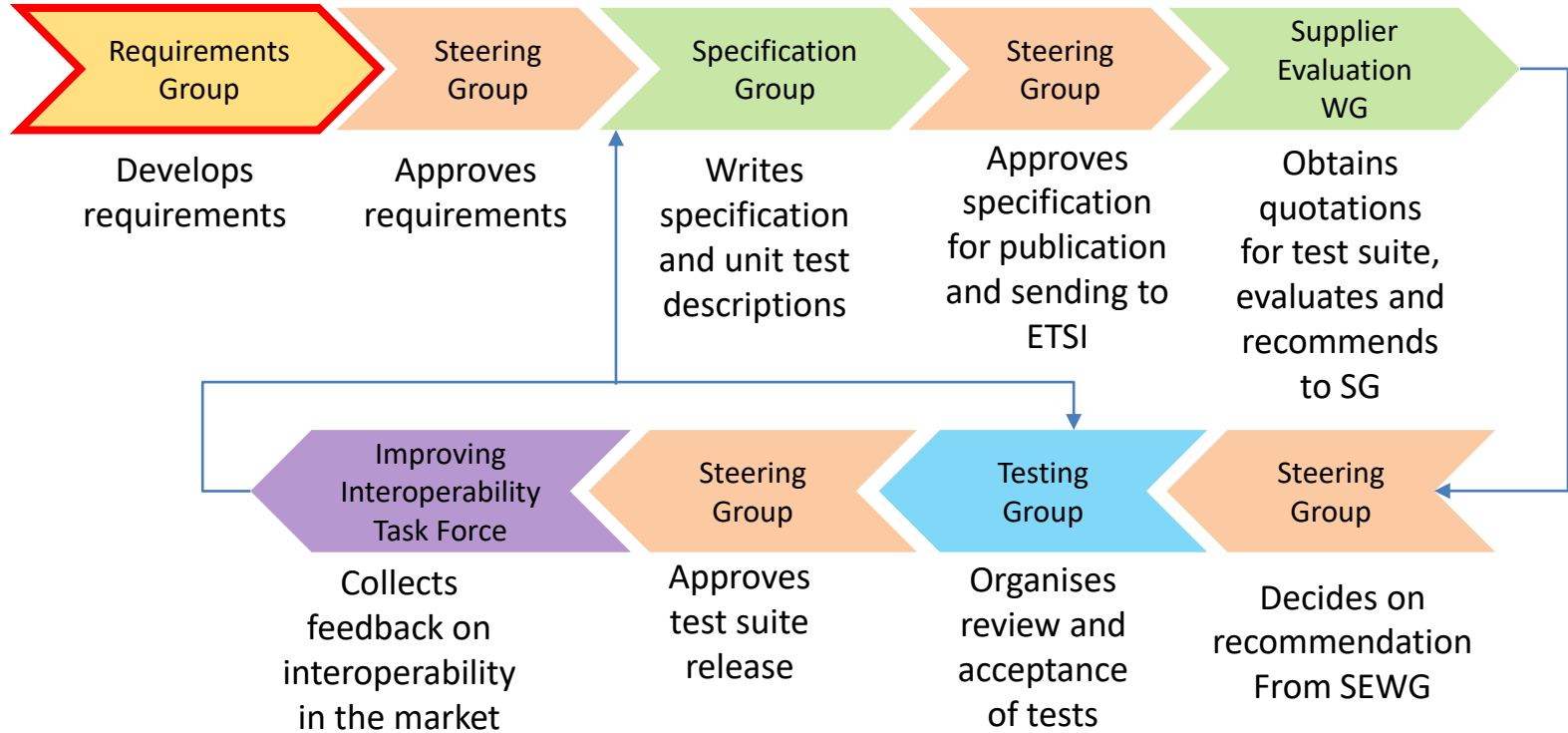
Vice-Chair HbbTV Association & Director Standardisation TP Vision



HbbTV Specification Workflow

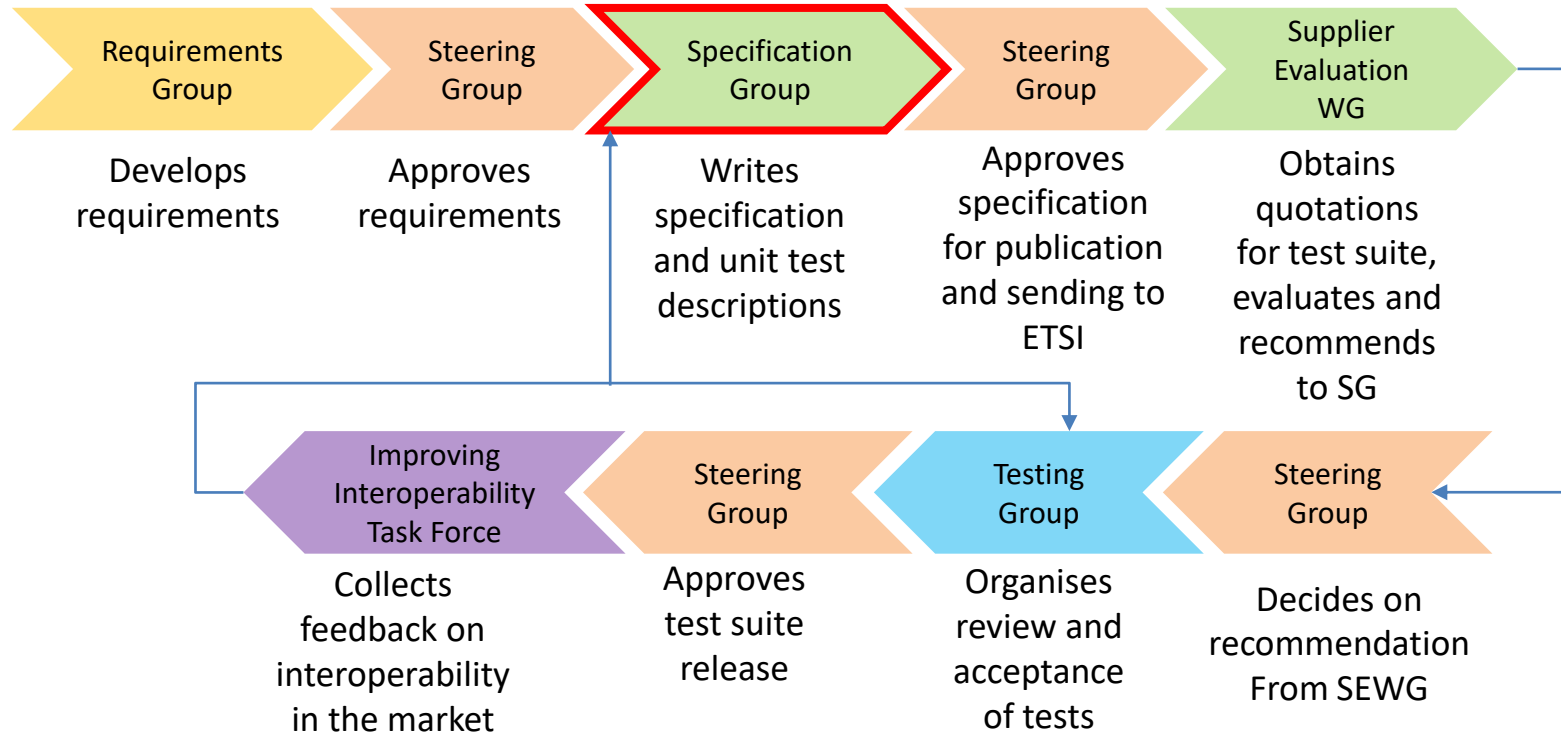


HbbTV Specification Workflow



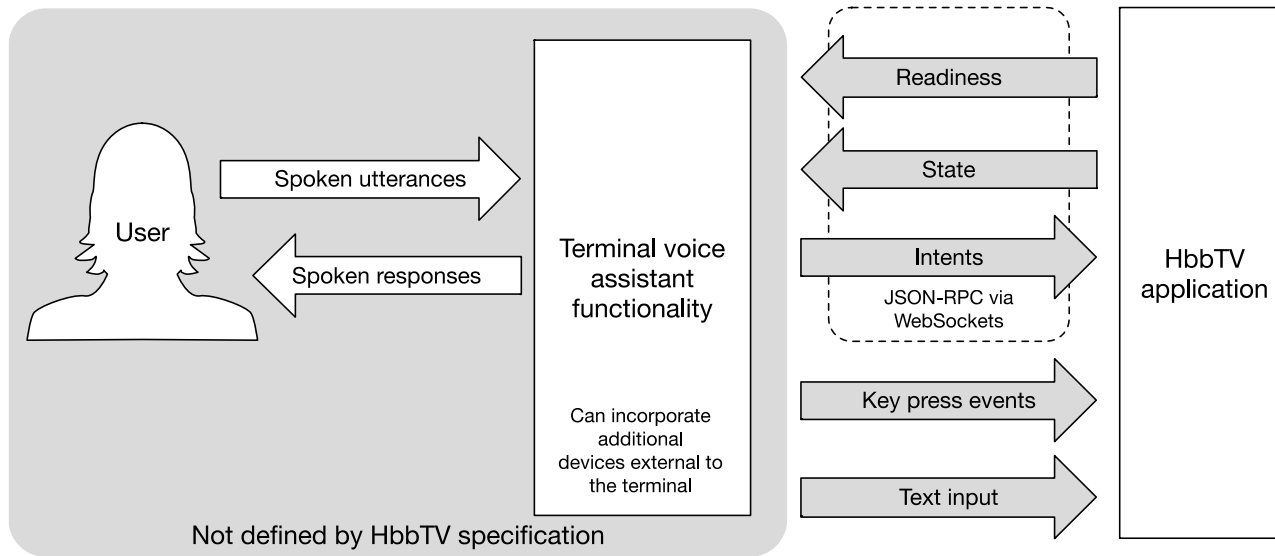
- Annual process to identify new requirements with support across the value chain
 - Broadcasters, operators / platforms and manufacturers
- 2020 requirements are being included in HbbTV 2.0.4/1.7.1
 - Details are in the Specification Group section up next
- 2021 requirements (still work in progress, some included in HbbTV 2.0.4/1.7.1)
 - Optional support for next generation video codecs – e.g. VVC, AVS3, AV1
 - Optional launching TV OS apps from HbbTV
 - Web standards update
 - Support for higher graphics resolutions
 - IPv6
- Deprecations
 - Features that will be removed in a following version, e.g. not used, replaced,
 - Don't panic – not removed yet, just a warning added, time to adapt your app or complain to HbbTV
 - Tiresias resident font
 - On-screen keyboard provided by TV for text input (apps do this themselves when they need it)
 - OTT streaming of MPEG-2 transport streams
 - The A/V control object from HbbTV 1.0/1.5 will eventually be deprecated and subsequently removed
- Removal without deprecation
 - Reserved for features that have never been used, e.g. obscure / duplicative parts of HbbTV 2

HbbTV Specification Workflow



- Next version of the core HbbTV specification
 - Aimed at products going on sale in 2024/5
 - Addresses 2020 & some 2021 requirements
- Access to TV OS accessibility features, settings & preferences
 - Screen Magnifier, High Contrast UI, Response / feedback to user on actions, audio description, audio dialogue enhancement control
 - Covered in webinar - see <https://youtu.be/w-Q5mxsNAJc> and <https://www.hbbtv.org/wp-content/uploads/2021/09/Nigel-Moore-HbbTV-Webinar-Accessibility-2021-09-21.pdf>
 - Particularly relevant given the European Accessibility Act which comes into effect in 2025
 - HbbTV spec will not require any specific accessibility features
 - About enabling HbbTV apps to work with features already supported by the TV OS

- Voice assistant integration (e.g. Alexa, Google Assistant, ...)

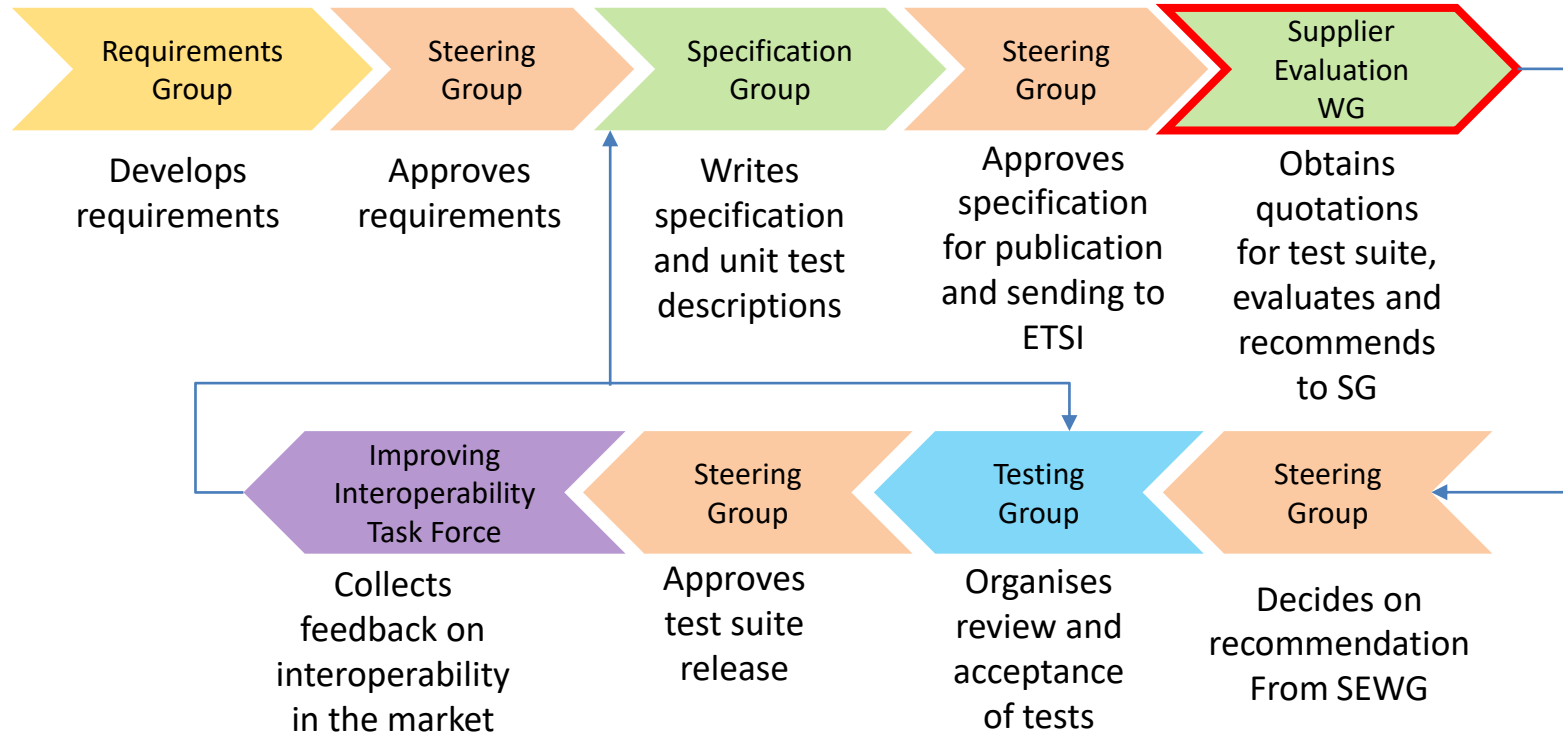


- Optional, HbbTV spec will not require any voice assistant

- Integration with DVB-I for linear OTT services
 - Particularly support for 'red button' broadcast-related apps
 - Existing broadcast APIs and features mapped to broadband / DASH
 - *Most* HbbTV red-button apps should be able to work on a DVB-I OTT streamed service without *significant* modification
 - 100% perfect mapping not possible
- Smaller improvements
 - Update web platform from 2018 to relevant APIs in 2021 desktop browsers (tbc)
 - Improved support for device graphics resolutions > 1280x720
 - Audio mixing enhancements
 - Notifying applications when they are hidden or suspended and resumed
 - IPv6
- Deprecations & removals according to Requirements Group list

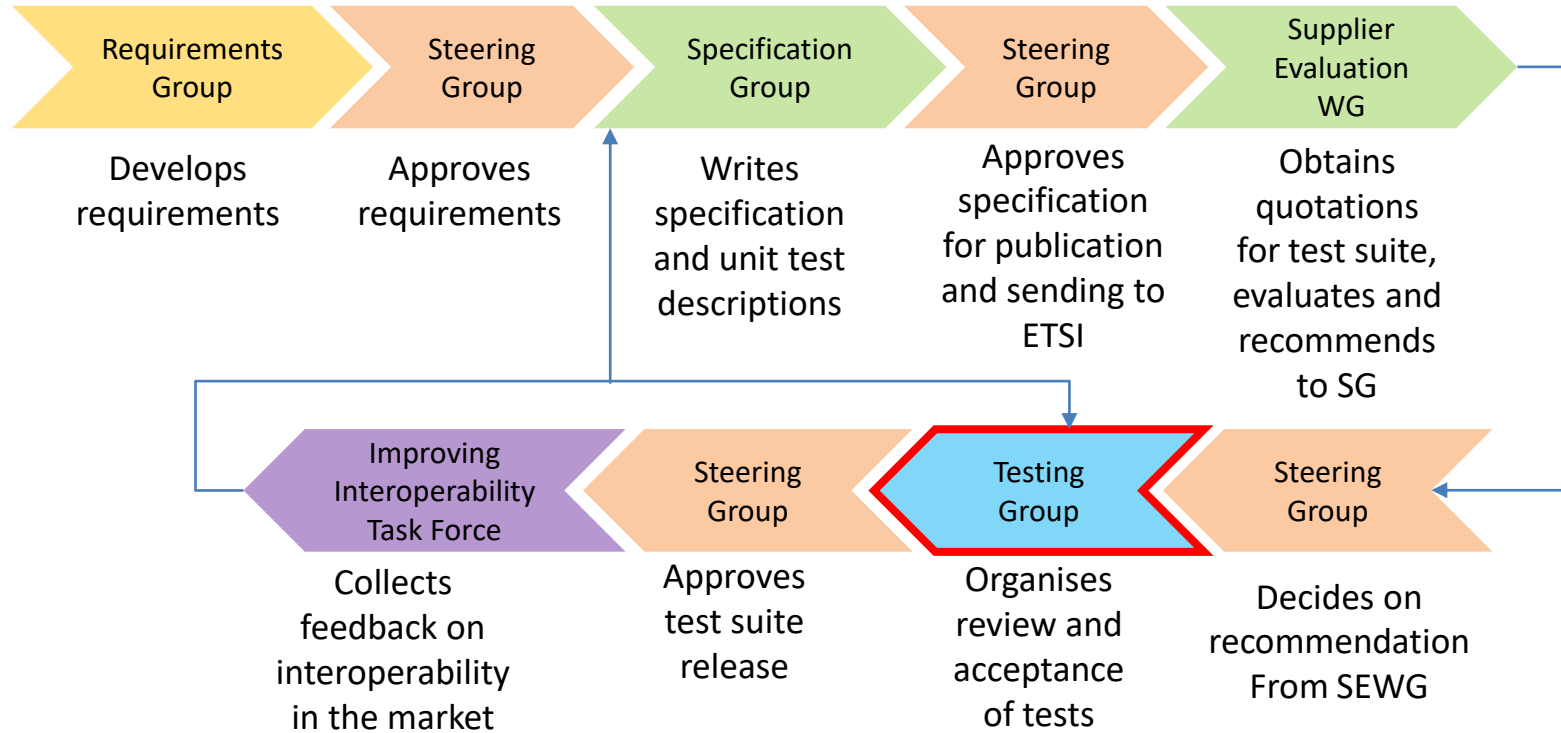
- Combined "application discovery over broadband" & "targeted advertising"
 - Enables HbbTV TA where "broadcast" is received by a STB
 - See <https://www.hbbtv.org/wp-content/uploads/2021/07/HbbTV-SPEC-00565-002-HbbTV-TA-Phase-2-Explained.pdf> and <https://youtu.be/v-ptJreMup4>
 - Also covered yesterday in Verance talk "Targeted advertising using watermarking"
- Operator applications – work in progress
 - Learning lessons from the HD+ OpApp experience
 - Many small but important details needed for the concept to work
 - Like to thank HD+ and their supplier Yotta Media for their input
 - Enable linking OpApp with CI+ CA module
 - User inserts module into TV, OpApp is installed
 - See SmarDTV and Irdeto sessions later today

HbbTV Specification Workflow



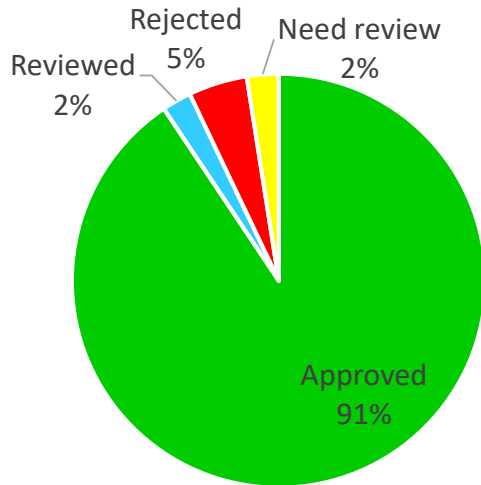
- RfP for targeted advertising test cases
 - Work divided across 4 suppliers
 - DTG Testing
 - Eurofins
 - Fraunhofer FOKUS
 - Ocean Blue Software (OBS)

HbbTV Specification Workflow

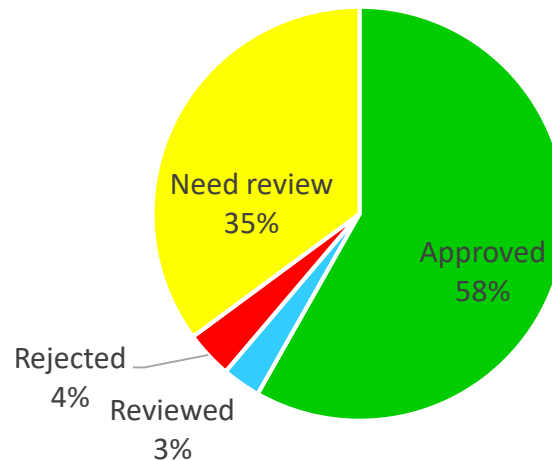


- 3 test suite releases during 2021 – 2021-1, 2021-2, 2021-3
 - 2021-3 includes total 2997 test cases, 2202 of them approved.

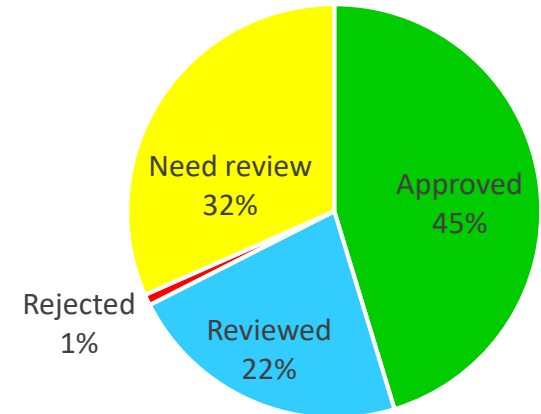
Core HbbTV



OpApps



TA



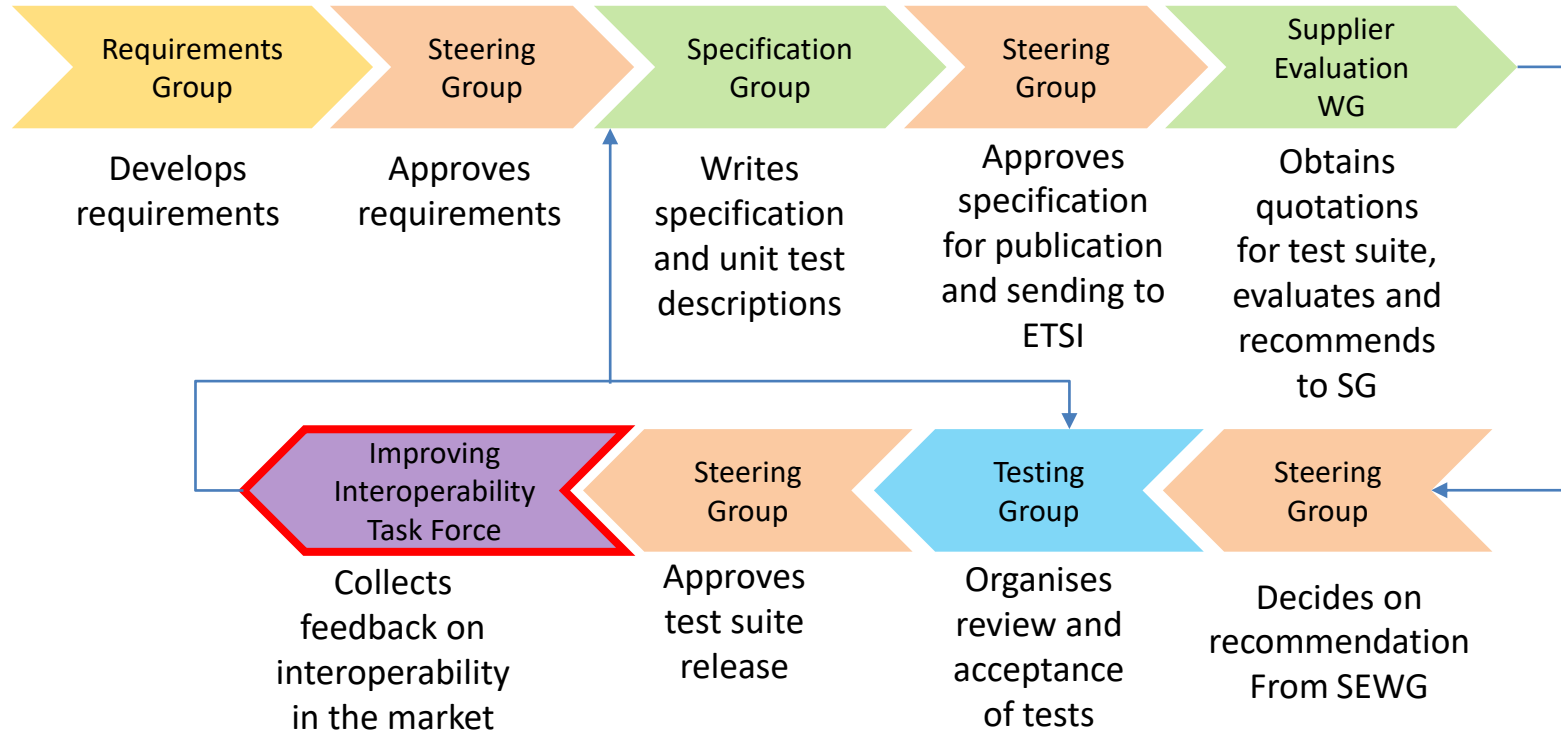
Test suite progress

Name	Approved size	% approved	Total size	Total size with Nordig & OIPF B	Date
v8.0	632	65%	966	966	31.07.2015
v8.1	731	76%	965	965	11.02.2016
v8.5	770	50%	1548	1548	31.08.2016
v9.0	1092	72%	1521	1715	31.10.2016
v9.1	1221	79%	1538	1791	16.01.2017
v9.2	1474	77%	1908	2102	20.07.2017
v9.2.1	1500	78%	1916	2110	17.11.2017
v2018-1	1674	87%	1924	2118	23.03.2018
v2018-2	1639	84%	1952	2146	04.07.2018
v2018-3	1644	84%	1951	2146	11.11.2018
v2019-1	1691	81%	2079	2274	15.03.2019
v2019-2	1677	75%	2239	2434	23.07.2019
v2019-3	1751	76%	2297	2492	12.11.2019
v2020-1	1879	79%	2391	2586	11.03.2020
v2020-2	2037	79%	2564	2759	13.07.2020
v2020-3	1929	73%	2626	2821	16.11.2020
v2021-1	2029	73%	2768	2963	26.03.2021
v2021-2	2202	79%	2799	3000	13.07.2021
v2021-3	2202	79%	2796	2997	17.11.2021



- Continual churn of challenges to existing test cases
 - Need to be analysed, fixed & fixes reviewed
- Improving our cloud based infrastructure
 - HbbTV provisioned test servers for TLS-related tests
 - Daily executed scripts for statistics gathering and report generation
- Integration of web platform tests from W3C and MSE media playback tests from CTA WAVE
 - How do to this technically, structurally & maintain compatibility with the existing statistics gathering & report generation scripts
 - For W3C web platform tests, need to define a subset (few hundred?) as there are far, far too many of these to include all in the HbbTV test suite
- Push OpApp and TA tests through to "Approved"
 - Never approved OpApp tests need reviewing & resulting issues fixing
 - Challenged TA tests need fixing & re-reviewing

HbbTV Specification Workflow



- Survey: "What are the top 3 interoperability issues you face?"
 - Results
 - Not always clear whether devices passed all the available material in Test Suite & if the Ref App runs OK
 - Some possible test gaps which may be addressed by new initiatives like inclusion of WPT / MSE tests
 - Some issues beyond HbbTV Association's remit: regional / national platforms play an important role
 - More education, hopefully new developer portal will help
- HbbTV – DASH – DRM reference app
 - HbbTV pays for this app be run on a receiver zoo & is provided with anonymised results (see next slide)
 - Recently updated to include content protected by PlayReady SL3000 – initiated by Salto
 - Becoming important to content providers but previously no test content available – not surprising it didn't work
 - Tested on a number of HbbTV TVs and works on some of them
 - In some cases the manufacturer deployed a fix via a software update
 - Being updated to simulate results of service-side ad insertion in DASH
 - Multiple periods with transitions encrypted/clear, subtitles/not,
 - Reminder
 - Open source license – re-use as-is, copy bits, do things the same way,
 - Available on github at <https://github.com/HbbTV-Association/ReferenceApplication>
- DASH content validator
 - Extensions to DASH-IF validator to support HbbTV 1.5 DASH and DVB-DASH as used in HbbTV 2.0 now integrated in DASH-IF validator - <https://conformance.dashif.org>
 - HbbTV "mode" selected based on contents of DASH MPD
 - Project about to be launched to re-architect & clean up all the legacy code

Anonymised Summary of DASH-DRM Ref App Results



Model year	Index	HbbTV versi	DRM ID	1.1. AVC 108	1.2. HEVC 216	1.3. OoB Sub	1.4. IB Subs	1.5. Ad Ins	1.6. IB Evt	1.7. Audio Switch	1.8. Multi MOOF/MDAT
2017	03	1.2.1		OK	OK	N/A	N/A	N/A	N/A	OK	OK
2018	04	1.2.1	PR	OK	OK	N/A	N/A	N/A	N/A	NOK	OK
2017	08	1.2.1		OK	OK	N/A	N/A	N/A	N/A	OK	OK
2018	09	1.2.1		OK	OK	N/A	N/A	N/A	N/A	OK	OK
2019	10	1.5.1		OK	OK	NOK	NOK	OK	NOK	OK	OK
2017	11	1.2.1		OK	OK	N/A	N/A	N/A	N/A	OK	OK
2018	12	1.4.1		OK	OK	NOK	NOK	OK	NOK	OK (2)	OK
2017	14	1.4.1									
2017	16	1.2.1		OK	OK	N/A	N/A	N/A	N/A	OK	OK
2018	18	1.5.1		OK	OK	OK	OK	OK	OK	OK	OK
2018	20	1.4.1		OK	OK	OK	NOK (3)	OK	OK	OK	OK
2018	21	1.2.1		OK	OK	N/A	N/A	N/A	N/A	OK	OK
2017	23	1.4.1		OK	OK	OK	OK	OK	OK	OK	OK
2017	32	1.2.1		OK	OK	N/A	N/A	N/A	N/A	OK	OK
2017	34	1.2.1		OK	OK	N/A	N/A	N/A	N/A	OK	OK
2019	38	1.5.1		OK	OK	NOK	NOK	OK	NOK	OK	OK
2019	43	1.4.1		OK	OK	OK	OK	OK	OK	OK (2)	OK
2018	47	1.4.1		OK	OK	OK	NOK	NOK	OK	OK	OK
2019	48	1.4.1	PR	OK	OK	OK	OK	OK	OK	OK	OK
2019	50	1.2.1		OK	OK	N/A	N/A	N/A	N/A	NOK	NOK
2019	51	1.2.1		OK	OK	N/A	N/A	N/A	N/A	NOK	NOK
2019	52	1.5.1		OK	OK	OK	NOK (1)	NOK	OK	OK	OK
2019	53	1.2.1	PR	OK	OK	N/A	N/A	N/A	N/A	OK	OK
2017	54	1.2.1		OK	OK	N/A	N/A	N/A	N/A	OK	OK
2017	58	1.2.1		OK	OK	N/A	N/A	N/A	N/A	OK	OK
2018	59	1.2.1	PR	OK	OK	N/A	N/A	N/A	N/A	NOK	OK
2019	60	1.5.1		OK	OK	OK	OK	OK	OK	OK	OK
2019	61	1.1.1		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2020	64	1.5.1	PR	OK	OK	OK	OK	OK	NOK	OK	OK

HbbTV members can obtain access to the full table via the IITF area on Higher Logic

- If your company is an HbbTV member, please come & participate in the working groups and task forces
- If your company is not an HbbTV member & you see something interesting or important, please join and participate