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**BBC** | Research & Development





Transition to IP

Contents

- AMWA Networked Media Open Specifications
- · Approach and model
- Discovery (IS-04)
- Connection (IS-05)
- Implementations
- Network Control (IS-06)
- Current activity

NMOS

**BBC** | Research & Development





## Reasons to go IP?

- New facilities
- · New formats and content types
- New distribution platforms
- Production flexibility
- New tools
- Simplified connectivity
- Joined-up operations
- Dynamic scaling (virtualisation / cloud)
- Cost reduction from COTS components
- Modern development techniques
- New market opportunities

NMOS







SMPTE ST	2022 IP transport standard	SMPTE - Enabling Global Education
• ST 2022-1:	Forward Error Correction for Real-Time Video/Audio Transport Over IP Networks	
• ST 2022-2:	Unidirectional Transport of Constant Bit Rate MPEG-2 Transport Streams on IP Networks	MPEG TS
• ST 2022-3:	Unidirectional Transport of Variable Bit Rate MPEG-2 Transport Streams on IP Networks	over IP
• ST 2022-4:	Unidirectional Transport of Non-Piecewise Constant Variable Bit Rate MPEG-2 Streams on IP Networks	
• ST 2022-5:	Forward Error Correction for Transport of High Bit Rate Media Signals over IP Networks	
• ST 2022-6:	Transport of High Bit Rate Media Signals over IP Networks	HBRMT
• ST 2022-7:	Seamless Protection Switching of SMPTE ST 2022 IP Datagrams	
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Discovery Ensure the parts of a networked system can find each other If you can't find it, you can't control it Traditionally manual and static Essential for dynamic provisioning Various proprietary approaches Some build on DNS-SD / uPNP	292.168.211.36 192.168		192.168.230.40	192.168.200.38	292.168.230.36 192.168.23580		192.168.200.40	192.168.200.38	292.168.233.36 192.568.23580		192.168.230.40	192.168.200.38	292.168.235.36 192.168.23580	192 168 200 36 192 168 290 40	192.168.210.36 192.568.23500		192.168.200.40	192.168.200.38	90
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<ul> <li>Ensure the parts of a networked system can find each other</li> <li>If you can't find it, you can't control it</li> <li>Traditionally manual and static</li> <li>Essential for dynamic provisioning</li> <li>Various proprietary approaches</li> <li>Some build on DNS-SD / uPNP</li> </ul>	192.168.212.131 192.168	interest in the second se	192.168.200.135	192.168.300.131	182,166,213,131, 192,166,213	Table 1	192.168.200.135	192.168.200.131	192.168-212.131 192.168-210	interest in	192.168.200.135	192.168.200.131	182,168-212,131, 192,168-210					192.168.200.131	
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<ul> <li>If you can't find it, you can't control it</li> <li>Traditionally manual and static</li> <li>Essential for dynamic provisioning</li> <li>Various proprietary approaches</li> <li>Some build on DNS-SD / uPNP</li> </ul>	192.168.210.51 192.168	100	192.168.200.55	192.168.200.51	192.168.210.51 192.168.21	100	192.168.200.55	192.168.200.51	192.168.210.51 192.168.210			192.168.200.51	etworked	ins of a n	e me na	ngill	100.10	192.568.200.51	
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<ul> <li>If you can't find it, you can't control it</li> <li>Traditionally manual and static</li> <li>Essential for dynamic provisioning</li> <li>Various proprietary approaches</li> <li>Some build on DNS-SD / uPNP</li> </ul>	192.168.210.36 192.168	10001	152.168.200.80	192 168 200.76	192,168,210,76 192,168,210	10001	152.168.200.80	192 168 200.76	192.168.210.76 192.168.210		152.168.200.80		502 No. 2 1 1 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2	ia caon o	n carr m	0.01	110.100.00	192.168.200.76	-
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<ul> <li>Traditionally manual and static</li> <li>Essential for dynamic provisioning</li> <li>Various proprietary approaches</li> <li>Some build on DNS-SD / uPNP</li> <li>Some build on DNS-SD / uPNP</li> </ul>	292.166.238.331 192.568	-	192.164.200.115	192.168.200.111	145 168 110 111 145 168 110	-	192.164.200.115	192 168.200 111	292.168.230.311 192.568.230		$\alpha i$	ornr	n can $n$ c	HHO H VO	ni can i	II V		192.168.200.111	-
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## SMPTE Technology Webcast

Enabling Global Education











IS-04/	05 Open	SMPTE SM		
Creator	Language	License	URL	Description
BBC R&D	Python	Apache 2.0	https://github.com/bbc/nmos-joint-ri	IS-04 and IS-05 implementation used as reference in AMWA workshops
Riedel Comms	(executable)	EULA	https://myriedel.riedel.net/de/	Connection manager and resource explorer
Streampunk Media	Javascript (NodeJS)	Apache 2.0	https://github.com/Streampunk/ledger	IS-04 v1.0 APIs
Streampunk Media	Javascript (NodeJS)	Apache 2.0	https://github.com/Streampunk/zenmos	IS-04 automated testing
Sony	C++	Apache 2.0	https://github.com/sony/nmos-cpp	IS-04 and IS-05 registry, APIs
Sony	Javascript	Apache 2.0	https://github.com/sony/nmos-js	IS-04 and IS-05 partial client

## SMPTE Technology Webcast Enabling Global Education

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