

NMOS in the EBU Technology Pyramid

This document is based upon the EBU document

TECH 3371

THE TECHNOLOGY PYRAMID FOR MEDIA NODES

MINIMUM USER REQUIREMENTS TO BUILD AND MANAGE AN IP-BASED MEDIA FACILITY USING OPEN STANDARDS & SPECIFICATIONS

Version 2 – July 2020

<https://tech.ebu.ch/docs/tech/tech3371.pdf>

The extract below shows paragraphs for the sections relating to NMOS implementations.

Please refer to the original EBU document for the full specifications before use in RFI / RFP / tender and procurement processes.

Business requirements	Technical specifications
<p>III Operational Control</p> <p>The ability to discover media sources and connect them to destinations easily and securely is a key requirement to enabling basic operation. Control of operational parameters enable multi-vendor integration of controllers is important.</p>	<p>III Operational Control</p> <ol style="list-style-type: none">1. Media Nodes shall pass the tests for the supported NMOS specifications and versions using the latest NMOS Test Suite. [https://github.com/AMWA-TV/nmos-testing].
<p>III.1 Discovery and Registration</p>	<p>III.1 Discovery and Registration: AMWA IS-04</p>

<p>It must be possible to discover media nodes in large-scale routed networks.</p>	<ol style="list-style-type: none"> 1. Media Nodes shall support the latest published version of AMWA IS-04 NMOS Discovery and Registration Specification. 2. They shall support IS-04 Node API with unicast announce so they can be discovered in large-scale routed networks; 3. They shall support IS-04 Registration API calls so that they can register themselves in the registry; 4. Sources that send essences (video, audio and ancillary data) that belong together shall use the group hints tag to get registered as a group, according to AMWA BCP-002-01 Natural Grouping of NMOS Resources; 5. Senders shall provide their SDP information through the IS-04 transport file. 6. When a Sender format configuration is modified (resolution, colour space, number of channels in an audio stream, etc.), the Sender Media Node shall signal the change through IS-04 to allow a Broadcast Controller to remake the connection if required.
<p>III.2 Connection Management</p> <p>Receivers must</p> <ul style="list-style-type: none"> • be able to connect to Senders that are registered, • be able to do salvos and automated connection scenarios and • be assigned and managed via a controller. 	<p>III.2 Connection Management: AMWA IS-05</p> <ol style="list-style-type: none"> 1. Receivers shall support the latest published version of AMWA IS-05 NMOS Device Connection Management Specification so that they can be connected to Senders that are registered in the IS-04 registry; 2. Receivers shall support single and bulk connections and immediate, staged and scheduled activation so that they can do salvos and automated connection scenarios; 3. Senders shall support IS-05 for configuration of their Multicast groups so they can be assigned and managed via a controller.
<p>III.3 Device Control: Open Methods</p> <p>Operational parameters of Media Nodes shall be controlled by an Open method so that they can be used with a third-party controller.</p>	<p>III.3 Device Control: Open Methods and AMWA IS-07</p>

	<ol style="list-style-type: none"> 1. Operational parameters of Media Nodes shall be controlled by an Open method so that they can be controlled by a third-party controller. 2. If Media Nodes need to act on an event (e.g. GPI) or tally, Media Nodes should support AMWA IS-07 NMOS Event and Tally Specification.
<p>III.4 Audio Channel Mapping</p> <p>Audio Receivers with a matrix capability must work so that a Broadcast Controller can select the channel arrangement within a stream to be used by the Receivers.</p>	<p>III.4 Audio Channel Mapping: AMWA IS-08</p> <ol style="list-style-type: none"> 1. Audio Receivers with a matrix capability shall use the latest published version of AMWA IS-08 NMOS Audio Channel Mapping Specification so that a Broadcast Controller can select the channel arrangement within a stream to be used by the Receivers.
	<p>III.5 Topology discovery: LLDP</p> <ol style="list-style-type: none"> 1. Media Nodes shall support Link Layer Discovery Protocol (LLDP) part of IEEE 802.1AB so that it can announce on which switch and interface it is connected to inform a Network Controller using AMWA IS-06 NMOS Network Control Specification or another proprietary API.
<p>IV Configuration and Monitoring</p> <p>Ease of configuration, monitoring and alarming is key to successfully operate and maintain an IP based facility.</p>	<p>IV Configuration and Monitoring</p> <p>Ease of configuration, monitoring and alarming is key to successfully operate and maintain an IP based facility.</p>
<p>IV.1 IP assignment and low-level configuration</p>	<p>IV.1 IP assignment and low-level configuration: DHCP, AMWA IS-09</p>

<p>Media Nodes must be able to obtain global configuration parameters that are common across the system.</p>	<p>5. Media Nodes should support IS-09 System Parameters Specification in order to obtain global configuration parameters that are common across the system.</p>
<p>V Security</p> <p>IP networking of real-time media devices brings additional cybersecurity risks compared to isolated SDI connections. All IP devices, including Media Nodes, shall take care to follow cybersecurity best practices. This is an area that still requires work and education in the industry and the user community.</p>	<p>V Security</p> <p>IP networking of real-time media devices brings additional cybersecurity risks compared to isolated SDI connections. All IP devices, including Media Nodes, shall take care to follow cybersecurity best practices. This is an area that still requires work and education in the industry and the user community.</p>
	<p>V.3 Secure HTTPS API calls</p> <p>1. All NMOS APIs shall support AMWA BCP-003 Security recommendations for NMOS APIs The AMWA on security recommendations for AMWA NMOS APIs [https://amwa-tv.github.io/nmos-api-security/].</p> <ul style="list-style-type: none"> ◦ Media Nodes shall support TLS 1.2 for APIs, and should support TLS 1.3, with cipher suites as required by BCP-003-01 ◦ Media Nodes should support authorisation of API calls as per BCP-003-02.