You can move a signal from A to B, but what are you going to do with it when it gets there?
OCA ● Open Control Architecture ● AES70

MEDIA NETWORK

MEDIA TRANSPORT

SYSTEM CONTROL
OCA ● Open Control Architecture ● AES70

PROTOCOLS

AES67
Dante
AVB/TSN
CobraNet
Analog Cable
IP Video
whatever

OCA
AES70
OCA : AES70

• **OCA** is an architecture for connection management and control of media devices over digital networks.

• **AES70** is the open public standard technical specification of OCA.

AES70 was created from the public OCA 1.3 specification. Technical differences between the two are minor and few.
Why AES70?

- AES70 is the only control architecture standard that is *all* of the following:
  - Open and license-free
  - Pro application oriented
  - Scalable up to huge network sizes
  - Suitable for mission-critical applications
  - Friendly to proprietary product features
  - Futureproof
  - Secure
  - Able to support dynamic DSP device reconfiguration
  - Heterogeneous-network capable
A Peek Under the Hood
AES70 Device Model

Box of Objects
AES70-2015 Control Repertoire

**Media connection management**
- Connection control
- Directory/discovery

**Additional Functions**
- Control grouping (~VCA groups)
- Crossfading
- Snapshot & preset management
- Reconfigurable DSP device setup
- Reliable firmware updating

**Signal Monitoring**
- Level sensors (meters)
- Frequency sensors
- Time interval sensors
- Temperature sensors
- Arbitrary numeric sensors

**Signal Processing**
- Gain controls
- Mutes
- Switches (n-position)
- Delays
- Equalizers
- Filters (IIR & FIR)
- Limiters & Compressors
- Expanders & Gates
- Levelers
- Matrices
- Signal generators
- Arbitrary numeric parameters

+ Proprietary extensions as needed
AES70 In Action
AES70 In Action: Small Music Act

Integrated Network Sound System with Simple Interconnect

- Single media network connecting everything
- Four house speakers, two stage monitors, in-ear monitors, ancillary gear
- Powered loudspeakers, network-connected
- One main house mixer, tablet-based (no big mixing desk)
- Onstage monitor mixers for each musician - small tablets on mic stands
- Wired microphones connect through stage box on network
- Wireless microphones connect through receiver(s) on network
- In-ear monitors connect through transmitter(s) on network
- Wireless access to main house mix is an option
- Optional external interfaces, both analog and digital, to house systems
- Optional multitrack digital recorder on network
- Optional webcasting interface on network and on internet

AES70 Benefits

- Much simplified cabling. Improved diagnostic functions/features. Easy reconfiguration.
AES70 In Action: Large Night Club

Multi-Room Sound System with Powerful Automation

- Single media network connecting everything
- Multiple house speaker clusters, various stage monitors and ancillary gear
- Integrated video systems with local, internet, and broadcast feeds
- Combination of powered speakers and separate amp racks, all network-connected
- Multiple house mixers and/or DJ stations, possibly tablet-controlled
- Wired microphones connect through stage box on network
- Wireless microphones connect through receiver(s) on network
- In-ear monitors connect through transmitter(s) on network
- Automation controllers on network
- Integration with lighting and effects via show-control gateways to/from AES70

AES70 Benefits

AES70 In Action: Concert tour

Concert tour sound system

- Touring system, possibly incorporating equipment from prime contractor and various subcontractors.
- Multiple ad-hoc connections, varying from place to place, ideally using network audio. For example:
  - Prime contractor provides main loudspeakers, subcontractors provide delay systems, fills, woofers, etc.
  - Connected to resident venue system for area fill.
  - Connected to show video systems, radio, TV, & internet broadcast systems, recording systems, & press.
- System configured modularly, with multiple mix and loudspeaker/amplifier subsystems, variously deployed from rental house(s) for different tours.
- Media transport may be mix of Ethernet, AES3, MADI, AVB, Dante, etc.

AES70 Benefits

Central wired & wireless control of multiple network(s).
Multivendor support. High reliability. Media flexibility.
AES70 In Action: Large Install Venue

**Large installed sound system**

- Example: stadium, multipurpose arena, large auditorium
- Multiple program sources, control stations, loudspeaker clusters, and external interfaces.
- Interfaces to paging, signage, security, emergency (fire), show video, security, and other internal systems.
- Interfaces to external systems - broadcast, internet, user devices (tablet, smartphone).
- Evacuation standards compliance may be required.
- Security may be required.
- Network infrastructures are typically administered by central IT.
- Large to very large network diameters.

AES70 Benefits

Current Products

- d&b Audietechnik
- Focusrite
- Bosch Communications
  - Electro-Voice
  - Dynacord
  - RTS-Telex
  - Bosch Conference
- Beckhoff Automation
Current OCA Alliance Members

- Atlas Sound, LP / Innovative Electronic Designs
- Attero Tech
- Bittner Audio
- Bosch Communications Systems
- d&b audioteknik
- Focusrite
- Harman Professional Group
- LOUD Technologies
- Rational Acoustics
- RCF
- Salzbrenner Stagetec Mediagroup
- TC Group
- THAT Corporation
- Yamaha Commercial Audio
AES70 Interoperability Demo

ISE 2016
Booth 7-F221
OCA Interoperability Demo

- Focusrite RedNet 4
- Bosch APS
- d&b D20
- OCA MicroDemo
- Ethernet Switch
- LinkSys Wireless Router
- Windows laptop
  - d&b controller
  - Focusrite controller
- Windows laptop
  - CCP Server
  - CCP Client
- BIG SCREEN
Current & New Topics

- **AES70 for connection management**
  - AES70 already offers a standard solution for current connection management problems in audio and video systems.

- **AES70 profile development**
  - AES70 profiles are starting to be defined for specific application areas.

- **AES70 over additional network types**
  - Protocol specifications are under development for USB and Bluetooth; other network types will be addressed, too.

- **AES70 gateway specifications**
  - The OCA Alliance will work with others on specifications for interfacing AES70 to other control schemes such as SMPTE 2071 and Ember+.

- **AES70 functional expansion**
  - The AES70 specification will (compatibly) add various new control functions over the next few years. A number of these have already been identified.
Information

- **AES70 standards documents**
  - [www.aes.org/standards/blog/2016/1/aes70-open-control-architecture-160102](http://www.aes.org/standards/blog/2016/1/aes70-open-control-architecture-160102)
  - AES70 is in three documents and two appendices.
  - Downloads are free to AES members.

- **AES70 in the AES Journal**
  - *The Open Control Architecture*
  - [JAES Volume 61 Issue 4 pp. 185-200; April 2013](http://jaes.aes.org/jaes-2013-4-185)

- **OCA Alliance**
  - Website: [ocaalliance.com](http://ocaalliance.com)
  - The OCA Alliance is a trade association. Its members are companies.

- **AES Standards Working Group**
  - The AES working group responsible for AES70 is:
    - [AES SC-02-12, Working Group on Audio Applications of Networks](https://www.aes.org/standards/sc-02-12)
  - Anyone can participate in this group; AES membership is not needed.
  - A membership application form is [here](http://www.aes.org/membership/application), or you can just attend a meeting at an AES Convention to join.