OCA Alliance
Open Control Architecture (OCA)
Technical Overview

for the OCA Alliance:
Jeff Berryman
Bosch Communications Systems
What is OCA?

- Control and monitoring architecture for networked media devices
  - "Media" = audio & video

- OCA is not
  - A media transport standard
  - A device programming model
  - A system controller programming model
  - A user interface generation architecture

- Target
  - Professional applications
  - Networks of all sizes, tiny (2 nodes) to huge (10k nodes)
  - Mission-critical applications

- Goal
  - Open public standard
  - Not limited to audio in the future

- Honored Ancestor
  - AES-24
Features

• Flexible
  – Expandable, evolvable
  – Upwards-compatible
  – Friendly to proprietary extension (aka "laterally compatible")
  – Multiple protocol platforms

• Functional
  – Full discovery and enumeration feature set
  – Full multiple controller support
  – Supports control grouping - submastering, ganging, etc
  – Supports parameter storage - presets, scenes, snapshots, etc.
  – Supports multiple simultaneous control and media transport networks

• Robust
  – Fully acknowledged
  – Security option (using TLS)

• Efficient
  – Compact binary protocol data formats (in most protocol versions)
Divisions

• Framework (OCF)
  – Device model
  – Functional mechanisms

• Class Tree (OCC)
  *Object-oriented definition of control & monitoring functional repertoire.*
  – Manager Classes  *Device housekeeping & global functions*
  – Worker Classes  *Signal processors & monitors*
  – Agent Classes  *Control & monitoring modifiers/aggregators*

• Protocol Implementations (OCP.1 ... OCP.n)
  *OCA will be a family of protocols for different contexts.*
  – OCP.1 : for TCP/IP networks
  – OCP.2-n : TBD, may include USB, XML, ...
Device Model
Typical Classes

• Workers
  – Actuators
    • OcaGain = { Value }
    • OcaFilterParametric = { Frequency, Boost, Shape }
    • OcaMute = { Setting [Muted | Unmuted] }
  – Sensors
    • OcaLevelMeter = { Reading, MeterLaw }
    • OcaTemperatureSensor = { Reading }
  – Blocks
• Agents
  – Grouper = { Sets of Workers }
  – Library = { Sets of stored parameter values }
Blocks

- Collect Workers into useful sets
- Represent internal signal flows
- May be nested
Grouping

<table>
<thead>
<tr>
<th>GROUPER</th>
<th>Power Amp Gain</th>
<th>Power Amp Gain</th>
<th>Power Amp Gain</th>
<th>Power Amp Gain</th>
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<tbody>
<tr>
<td></td>
<td>Main Cluster</td>
<td>Main Cluster</td>
<td>Main Cluster</td>
<td>Main Cluster</td>
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<tr>
<td></td>
<td>Left Channel</td>
<td>Left Channel</td>
<td>Right Channel</td>
<td>Right Channel</td>
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<td></td>
<td>Tweeters</td>
<td>Woofers</td>
<td>Tweeters</td>
<td>Woofers</td>
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- Groupers allow aggregate control actions (mastering)
- Grouping is independent of block configuration and signal flow
OCP.1 - Protocol Context

- **OCP.1**
- **TCP/IP General**
- **Net Mgmt (opt.)**
- **Bonjour**

<table>
<thead>
<tr>
<th>Layer</th>
<th>Protocol</th>
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<tbody>
<tr>
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<tr>
<td>6</td>
<td>mDNS</td>
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<td>DNS-SD</td>
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<td>DHCP DNS</td>
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<td>3</td>
<td>other IP protocols*</td>
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<td>2</td>
<td>SNMP</td>
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<td>1</td>
<td>SNMP</td>
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* e.g. PIM-SSM, ARP, RARP, ICMP, ICMPV6, and IGMP
OCP.1 - Typical Protocol Data Unit

- This is the format of a command message.
- Other message types are similar
- Minimum command message length is about 25 bytes.
About the Alliance

• Unincorporated alliance of nine companies
  – Bosch Communications Systems
  – d&b audiotechnik
  – Duran Audio
  – LOUD Technologies Inc
  – Media Technology Systems
  – PreSonus
  – Salzbrenner Stagetec Mediagroup
  – TC Group
  – Yamaha Corporation
  – plus 27 Observer members

• Plan
  – Phase 1
    • Produce draft 1.0 of OCA Specification by end of Q1 2012
    • Turn it over to a public standards organization for rendering into a formal standard
  – Phase 2
    • Expand membership
    • Support development of the standard
    • Other activities TBD

www.oca-alliance.org