



From client/server streaming ...

... to multimedia middleware

## Network-Integrated Multimedia Middleware

Traditional client/server streaming consists of two isolated types of applications that do not provide fine-grained control or extensibility. This unnecessarily complicates the design and development of any kind of distributed application. The Network-Integrated Multimedia Middleware (NMM) by Motama overcomes these limitations by enabling access to all resources within the network: Distributed multimedia devices and software components can be transparently controlled and integrated into a common application, which results in completely new “virtual” devices. Motama’s software drives innovative products of world leaders in the areas of home entertainment, IPTV, building technologies, content processing, server-based rendering, multimedia installations, and e-learning.

Software solution for

- Networked home entertainment
- Content creation and processing
- Content distribution
- Multimedia installations

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|---|--|
| <ul style="list-style-type: none"> <li>■ Scalable architecture</li> </ul>                           | <ul style="list-style-type: none"> <li>■ Micro-core architecture: Codecs, devices, networks, and protocols are „plug-ins“</li> <li>■ Flow graph based multimedia architecture with transparently distributed components</li> <li>■ Easy integration of existing software/hardware portfolio</li> </ul>   |
| <ul style="list-style-type: none"> <li>■ Distributed synchronization architecture</li> </ul>        | <ul style="list-style-type: none"> <li>■ Lip-synchronization on single system</li> <li>■ Perfect synchronization of distributed rendering for both audio and video                             <ul style="list-style-type: none"> <li>■ Multi-room: Same content rendered synchronously at different locations</li> <li>■ Multi-device: Similar content rendered synchronously on different devices</li> <li>■ Multi-stream: Different formats of same content rendered synchronously</li> </ul> </li> </ul> |
| <ul style="list-style-type: none"> <li>■ Uniform messaging system</li> </ul>                        | <ul style="list-style-type: none"> <li>■ Out-of-band request-reply communication (RMI)</li> <li>■ One-way streaming of multimedia data and meta-data in both downstream and upstream direction</li> <li>■ Event notification from flow graph to application</li> <li>■ Advanced error handling for developing robust applications</li> </ul>   |
| <ul style="list-style-type: none"> <li>■ Extensible serialization and protocol framework</li> </ul> | <ul style="list-style-type: none"> <li>■ Support for all major standard protocols</li> <li>■ Integration of existing data types</li> <li>■ Integration of arbitrary meta-data into multimedia streams</li> <li>■ Integration of custom and optimized protocols</li> </ul>  |

<ul style="list-style-type: none"> <li>Advanced middleware services</li> </ul>	<ul style="list-style-type: none"> <li>Peer-to-peer registry service discovers and manages plug-ins, processing power within the network, and networking bandwidth</li> <li>Session sharing allows for dynamically connecting new applications to running applications and enables multi-room, multi-device, and multi-stream applications</li> <li>Seamless handover for continuous and synchronized migration of (parts of) running applications to new devices and enables location-based services (place shifting)</li> </ul>
<ul style="list-style-type: none"> <li>Cross-platform</li> </ul>	<ul style="list-style-type: none"> <li>Windows XP, Windows Vista, Windows 7, Linux, Embedded Linux, Mac OS X, iPhone OS, ..</li> <li>CE devices, mobile phones, PCs, servers, clusters, ...</li> <li>Combines 32 bit and 64 bit, little and big endian, ...</li> <li>Support for all major CPU / hardware architectures</li> <li>Built in support for multi-cores, GPUs, Cell, ...</li> </ul>
<ul style="list-style-type: none"> <li>Dual-licensing</li> </ul>	<ul style="list-style-type: none"> <li>Free and Open Source versions of NMM, or</li> <li>Commercial license with full warranty and support, at customer's choice</li> </ul>
<ul style="list-style-type: none"> <li>Software stack</li> </ul>	<ul style="list-style-type: none"> <li>C++ libraries</li> <li>NMM Interface Definition Language (IDL) and compiler</li> <li>Free SDK demonstrating interface, plug-in, and application development</li> <li>Comprehensive developer documentation and samples</li> <li>Tools for rapid prototyping</li> <li>100% compatible with all Motama products</li> </ul>
<ul style="list-style-type: none"> <li>Large number of codecs and devices</li> </ul>	<ul style="list-style-type: none"> <li>Free Open Source and commercial codecs</li> <li>More than 140 plug-ins for sources, sinks, demultiplexers, multiplexers, encoders/decoders, converters, and filters.</li> </ul>
<ul style="list-style-type: none"> <li>Supported standards, formats, and codecs</li> </ul>	<ul style="list-style-type: none"> <li>CD, DVD, DVB-S/S2/T/C, Firewire, VISCA, v4l(2), ...</li> <li>AAC, MPEG2 audio, MP3, Ogg/Vorbis, WMA, FLAC, ..</li> <li>MPEG2 video, H.264/MPEG-4 AVC, PNG, JPEG, ...</li> <li>Color space conversion, video scaler, on-screen display, deinterlacer, ...</li> <li>MPEG-TS, MPEG-PS, AVI, OGG, OGM, ...</li> <li>DXVA, DirectX, OpenGL, X, Xv, Framebuffer, ALSA, ..</li> <li>TCP, UDP, ...</li> <li>Unicast/multicast/broadcast</li> <li>RTP/RTCP</li> <li>HTTP</li> <li>XML</li> <li>UPnP AV</li> <li>SIP</li> </ul>

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