

# ORACLE DATABASE 11G MULTIMEDIA

## KEY FEATURES SUMMARY

ORACLE MULTIMEDIA IS A  
FEATURE OF ORACLE  
DATABASE 11G

New with Oracle Database 11g  
Release 2

- Watermarking
  - New image processing operators
  - Enhanced Validation of DICOM Content and Structured Reports
  - DICOM Video Support
  - DEFLATE transfer syntax, RLE compression, multi-bit monochrome encoding
- Features of Oracle Multimedia
- Object Data Storage Options with Automatic Metadata Extraction from Object Header
  - Application Development APIs
    - PL/SQL and Oracle® Call Interface
    - JAVA
    - C++
    - JSP Tag Library for ease of application development
  - Audio and Video delivery in batch mode or through streaming server such as the RealNetworks Helix Server or Microsoft Windows Media Services Streaming Server
  - Management of popular video formats with basic parsing of AVI, QuickTime, MPEGI, MPEGII, MPEGIV, 3GP, Microsoft ASF, 3GP, and RealNetworks Real Video
  - Management of popular audio formats with basic parsing of AUFF, AIFF, AIFF-C, WAVE, MPEGI, MPEGII, MPEGIV, RealNetworks Real Audio, 3GP, and Microsoft ASF formats

*Oracle Multimedia (formerly Oracle interMedia) provides services for the management of rich content including images, audio, and video in Oracle Database 11g. Oracle Multimedia also offers support for web application development and deployment and Java interfaces for application development.*

### Integrate Digital Media with Enterprise Data

Multimedia content can quickly and intuitively convey huge amounts of information. Applications such as web publishing, e-commerce, and media asset management have dramatically increased the generation and consumption of pictures, sounds, music, speech, and video.

Oracle Multimedia provides foundational support for image, audio, and video datatypes. This enables the security, administrative controls, performance, scalability, and open access of professionally managed enterprise information systems to be used with multimedia content in corporate Web sites and media-rich applications and creates opportunities to share, re-purpose, and integrate media assets with traditional relational data and operational systems providing benefits of keeping them in synchronization and unifying their management.

### Flexible Data Storage

Oracle Multimedia uses object data types, similar to Java or C++ classes, to describe image, audio, and video data. The media data component of these objects can be stored in the database in a SecureFile BLOB under transaction control with excellent performance and security. The media data can also be stored outside of the database in an external BFILE (operating system flat file), in an HTTP server-based URL, in a specialized media data server, or in a user-defined source on other servers without transaction control.

Object metadata, attributes, and methods are always stored in the database under Oracle Multimedia control. Whether media data is stored within or outside the database, Oracle Multimedia manages metadata for all the media types and automatically extracts it for image, audio, and video. This relieves application developers of the burden of learning format nuances.

### Image Support

Oracle Multimedia image services support two-dimensional, static, digital images stored as binary representations of real world objects or scenes, in most popular file formats and compression schemes.

## Image Compression Formats

- CCITT G3
- CCITT G4
- DEFLATE
- HUFFMAN
- JPEG
- LZW
- PACKBITS
- RLE

## Image File Formats

- TIFF
- JPEG, JPEG 2000
- BMP
- TARGA
- EXIF
- PCX
- PICT
- GIF
- CALS
- SUN RASTER
- FPIX
- PNGF
- PPMF
- PGMF
- PBMF
- PNMF
- WBMP
- DICM
- RPIX - A Raw Pixel Format allows direct access to pixel data, which simplifies image processing

## Image Metadata Formats

- EXIF
- IPTC
- XMP

## Image Processing Operations

- Scale
- Compress
- Adjust Compression quality
- Crop
- Arbitrary Image Rotate
- Flip
- Mirror
- Gamma Correction
- Contrast Enhancement
- Quantization Methods
- Page Selection
- Alpha Channel
- Remove Metadata
- Sharpen
- Force output to be Tiled (TIFF only)

**File Formats**

Oracle Multimedia supports most popular desktop publishing image file formats including: TIFF, JFIF (more commonly referred to as JPEG), BMP, TARGA, EXIF, PCX, PICT, GIF, CALS, SUN RASTER, FPIX, PNGF, PPMF, PGMF, PBMF, WBMP, and RPIX (see complete list in sidebar).

**Content Formats**

Oracle Multimedia can read and write image data at a variety of bit depths including Monochrome (1 bit), four, eight, sixteen, twenty-four, thirty-two, forty-eight, and sixty-four bits.

**Metadata Extraction and Embedding**

Java and PL/SQL methods have been added to the Oracle Multimedia OrdImage object to extract embedded content metadata -- what the image is about, where/when it was created, who created it, etc. -- from popular binary image formats.

Embedded metadata can be extracted from IPTC (or IIM), EXIF, and XMP formats. Metadata extracted from images is represented as a collection of XML documents returned in XMLType objects. Oracle Multimedia can also write or embed metadata into popular image file formats.

**Efficient Compression**

Oracle Multimedia allows users to request that images be compressed or decompressed on demand. Oracle Multimedia supports the most popular and efficient compression schemes including CCITT G3 / G4 and Huffman encoding schemes which are lossless and used for bitonal document images, the baseline JPEG encoding scheme, which is lossy and used for photographic (continuous tone) images, and several de facto schemes.

**Format Conversions and Image Manipulation**

Oracle Multimedia provides conversion between formats (transcoding) on demand. Oracle Multimedia also provides a set of server-based manipulation functions, including scaling and cropping, that are useful in preparing image data for general-purpose viewing or input to another process.

**Basic Image Processing**

Oracle Multimedia provides a basic set of server side image processing operators.

- Scale for efficient and flexible thumbnail generation
- Sharpen to improve the quality and sharpness of an image during image scaling – **new in Oracle Database 11g Release 2**
- Watermarking – **new in Oracle Database 11g Release 2**
- Generation of an image or image thumbnail with all metadata removed – **new in Oracle Database 11g Release 2**
- Other image processing operations include: Arbitrary Image Rotate, Flip, and Mirror, Gamma Correction, Contrast Enhancement, Quantization Methods, Page Selection, and Alpha Channel.

- Transcode between supported image formats
- Watermarking
  - Apply image watermark
  - Apply text watermark

### SQL Multimedia Standard Support

In addition to offering both object oriented and purely relational application programming interfaces, Oracle Multimedia offers a SQL multimedia standard compliant interface (ISO/IEC 13249-5:2001 SQL/MM Part 5: Still Image Standard)..

### Digital Imaging and Communications in Medicine (DICOM)

Oracle Database 11g adds the following Oracle Multimedia DICOM features:

- ORDDicom object type
- DICOM format support
- DICOM metadata extraction
- DICOM image processing
- DICOM object conformance validation
- Making DICOM objects anonymous
- Creating DICOM objects
- Run-time, updatable DICOM data model

See the [Oracle Multimedia DICOM Feature Overview](#) for more information about Oracle Multimedia DICOM support.

### Audio and Video

Oracle Multimedia manages industry-standard audio data stored in AIFF, AIFF-C, AUFF, WAV, MPEG I, MPEG II, MPEG IV, 3GP, Microsoft ASF and Real Networks Real Audio formats. It extracts metadata information from these formats on demand and stores it in attributes of the Oracle Multimedia audio object. The audio data can either be stored locally in Oracle or referenced from external sources.

For video data stored in QuickTime, AVI, MPEG I, MPEG II, MPEG IV, 3GP, Real Networks Real Video format, and Microsoft ASF format, Oracle Multimedia enables applications to store metadata information in attributes of the video object. The video data can either be stored locally in Oracle Database 11g, or referenced from external sources.

### Compression

Oracle Multimedia recognizes compression schemes including ADPCM and MULAW for audio and AVI Indeo for video.

### Streaming and Batch Audio/Video

- The Real Networks Streaming Server and Microsoft Windows Media Services can stream audio and video stored locally in Oracle database to deliver audio/video on demand. If a streaming server is unavailable, Oracle Multimedia can deliver the multimedia information directly to the client in "download and play" mode. The entire audio or video clip is sent to the application, which then launches the appropriate player.

### Integration with Oracle Application Development Framework Business Components

Oracle JDeveloper enables developers to build multitier, component-based Internet applications in Java that use Oracle Multimedia features to create visually attractive applications using Oracle Application Development Framework Business Components (ADF Business Components). The Oracle Multimedia/ADF Business Components integration package includes media-specific domain classes and a set of utilities.

### Java Classes for Servlets and JSP or Multimedia Tag Library

Oracle Multimedia includes Java Classes for servlets and JSP and Multimedia Tag Library to facilitate application development.

### Integration with Oracle Application Express

Oracle Multimedia can be used with Oracle Application Express (APEX), a rapid web development tool for Oracle database.

### Application Development Environments

Oracle Multimedia is accessible to applications through both relational and object interfaces. Database applications written in JAVA, C++, or traditional 3GLs can interface to Oracle Multimedia through modern class library interfaces, or PL/SQL and OCI. These applications can easily add image, audio, and video columns to store objects in existing and new relational tables. Applications can use Oracle Multimedia to query and retrieve multimedia data in the same manner as any other relational data.

In addition, Oracle Designer can generate C++ classes that enable C++ applications running on the client or the application server to call Oracle Multimedia methods.

### Contact Us

For more information about Oracle Multimedia, please visit [oracle.com](http://oracle.com) or call +1.800.ORACLE1 to speak to an Oracle representative.



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