

## Mutlimedia & Animation (Unit-3)

### Resource Interchange File Format Services(RIFF)

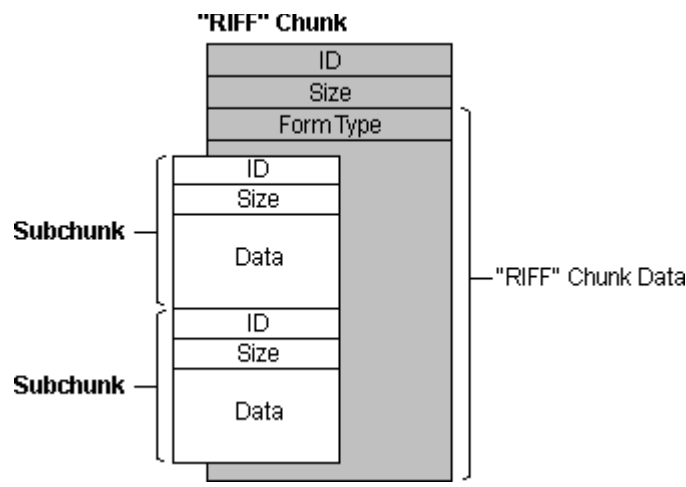
The preferred format for multimedia files is resource interchange file format (RIFF). The RIFF file I/O functions work with the basic buffered and unbuffered file I/O services. You can open, read, and write RIFF files in the same way as other file types. For detailed information about RIFF, see AVI File Functions and Macros.

RIFF files use four-character codes to identify file elements. These codes are 32-bit quantities representing a sequence of one to four ASCII alphanumeric characters, padded on the right with space characters. The data type for four-character codes is **FOURCC**. Use the **mmioFOURCC** macro to convert four characters into a four-character code. To convert a null-terminated string into a four-character code, use the **mmioStringToFOURCC** function.

The basic building block of a RIFF file is a *chunk*. A chunk is a logical unit of multimedia data, such as a single frame in a video clip. Each chunk contains the following fields:

- A four-character code specifying the chunk identifier
- A double word value specifying the size of the data member in the chunk
- A data field

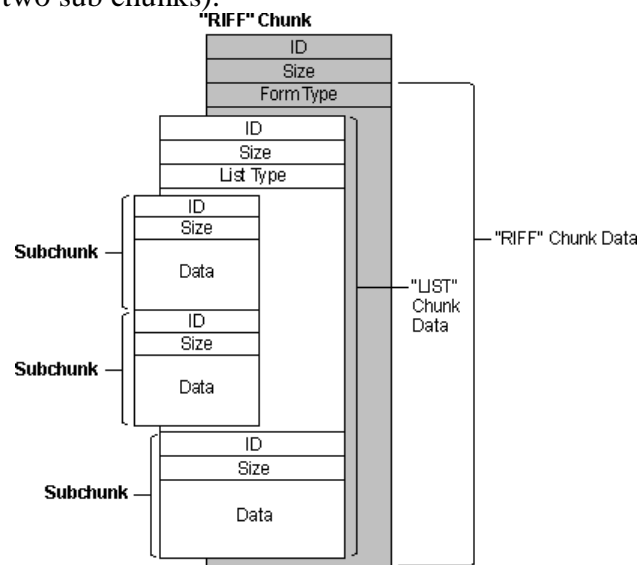
The following illustration shows a "RIFF" chunk that contains two sub chunks.



A chunk contained in another chunk is a *sub chunk*. The only chunks allowed to contain sub chunks are those with a chunk identifier of "RIFF" or "LIST". A chunk that contains another chunk is called a *parent chunk*. The first chunk in a RIFF file must be a "RIFF" chunk. All other chunks in the file are sub chunks of the "RIFF" chunk.

"RIFF" chunks include an additional field in the first four bytes of the data field. This additional field provides the *form type* of the field. The form type is a four-character code identifying the format of the data stored in the file. For example, Microsoft waveform-audio files have a form type of "WAVE".

"LIST" chunks also include an additional field in the first four bytes of the data field. This additional field contains the *list type* of the field. The list type is a four-character code identifying the contents of the list. For example, a "LIST" chunk with a list type of "INFO" can contain "ICOP" and "ICRD" chunks providing copyright and creation date information. The following illustration shows a "RIFF" chunk that contains a "LIST" chunk and one other subchunk (the "LIST" chunk contains two sub chunks).



Multimedia file I/O services include two functions you can use to navigate among chunks in a RIFF file: **mmioAscend** and **mmioDescend**. You can use these functions as high-level seek functions. When you descend into a chunk, the file position is set to the data field of the chunk (8 bytes from the beginning of the chunk). For "RIFF" and "LIST" chunks, the file position is set to the location following the form type or list type (12 bytes from the beginning of the chunk). When you ascend out of a chunk, the file position is set to the location following the end of the chunk. To create a new chunk, use the **mmioCreateChunk** function to write a chunk header at the current position in an open file. The **mmioAscend**, **mmioDescend**, and **mmioCreateChunk** functions use the **MMCKINFO** structure to specify and retrieve information about "RIFF" chunks.

# Resource Interchange File Format (RIFF)

- This is a file format for multimedia data on PCs. It can contain bit-mapped graphics, animation, digital audio and MIDI data.
- The WAV file format is the RIFF format for storing sound data.
- RIFF (similarly to TIFF - Tagged Image File Format) is a tagged file format. Tags allow applications capable of reading RIFF files to read RIFF files by another application, hence the word interchange in RIFF.
- Other Formats/Players - RealPlayer 7 (Windows NT) with RealAudio, MP3 (MPEG Audio Layer 3) audio, Midi players; MP3 players (MP3.com)

The **Resource Interchange File Format (RIFF)** is a generic file container format for storing data in tagged chunks. It is primarily used to store multimedia such as sound and video, though it may also be used to store any arbitrary data.

## **History:**

RIFF was introduced in 1991 by Microsoft and IBM, and was presented by Microsoft as the default format for Windows 3.1 multimedia files. It is based on Electronic Arts' Interchange File Format, introduced in 1985 on the Commodore Amiga, the only difference being that multi-byte integers are in little-endian format, native to the 80x86 processor series used in IBM PCs, rather than the big-endian format native to the 68k processor series used in Amiga and Apple Macintosh computers, where IFF files were heavily used. A RIFX format, using big-endian format, was also introduced. In 2010 Google introduced the WebP picture format, which uses RIFF as a container.

RIFF files consist entirely of "chunks". The overall format is identical to IFF, except for the bendiness as previously stated, and the different meaning of the chunk names.

All chunks have the following format:

- 4 bytes: an ASCII identifier for this chunk (examples are "fmt " and "data"; note the space in "fmt ").
- 4 bytes: an unsigned, little-endian 32-bit integer with the length of this chunk (except this field itself and the chunk identifier).

- Variable-sized field: the chunk data itself, of the size given in the previous field.
- A pad byte, if the chunk's length is not even.

Two chunk identifiers "RIFF" and "LIST", introduce a chunk that can contain sub chunks. The RIFF and LIST chunk data (appearing after the identifier and length) have the following format:

- 4 bytes: an ASCII identifier for this particular RIFF or LIST chunk (for RIFF in the typical case, these 4 bytes describe the content of the entire file, such as "AVI " or "WAVE").
- Rest of data: sub chunks.

The file itself consists of one RIFF chunk, which then can contain further sub chunks: hence, the first four bytes of a correctly formatted RIFF file will spell out "R", "I", "F", "F". More information about the RIFF format can be found in the Interchange File Format article. RF64 is a multichannel file format based on RIFF specification, developed by the European Broadcasting Union. It is BWF-compatible and allows file sizes to exceed 4 gigabytes.

**REETA**

20/03/2020