WHAT IS CLAIMED IS:

1. A computer-implemented method comprising:

determining, for each of a plurality of different media items, a current time scale at which the media items are encoded for distribution, wherein at least two of the plurality of media items are encoded at different frame rates;

identifying, for the plurality of media items, a unified time scale that provides a constant frame interval for each of the plurality of media items, the identifying including determining a minimum number of time units per second at which the unified time scale is uniform for the plurality of media items; and

changing at least one of the plurality of media items from the current time scale to the identified unified time scale to provide a constant frame interval for the at least one changed media item.

2. The computer-implemented method of claim 1, wherein the media items comprise video media items.

3. The computer-implemented method of claim 2, wherein the video media items are encoded at 23.97, 24, 25, 29.97, 30, 59.94, 60, 120, 240 or 300 frames per second.

4. The computer-implemented method of claim 1, wherein the media items comprise audio media items.

5. The computer-implemented method of claim 4, wherein the audio media items have a frame rate of 1024, 1536, or 2048 samples per frame.

6. The computer-implemented method of claim 1, wherein each of the plurality of media items in a specified group of media items has a specified video frame rate and audio frame rate, and wherein the unified time scale is calculated to optimize the specified video frame rate and the specified audio frame rate of the media items in the group.

7. The computer-implemented method of claim 1, wherein the unified time scale is implemented to generate one or more presentation time stamps (PTSs) for the plurality of media items.

8. The computer-implemented method of claim 6, wherein the one or more PTSs are monotonically increasing, and wherein units used in the unified time scale are selected to maximize wrap-around time for the plurality of media items.

9. The computer-implemented method of claim 8, wherein the units selected to maximize wrap-around time for the plurality of media items are selected based on video frame rate.

10. The computer-implemented method of claim 1, wherein the identified unified time scale includes a presentation time stamp (PTS) interval, and wherein the PTS interval comprises a minimum frame interval or a multiple of a minimum frame interval.

11. The computer-implemented method of claim 10, further comprising restoring the PTS interval to a specified resolution.

12. A system comprising:

at least one physical processor; and

physical memory comprising computer-executable instructions that, when executed by the physical processor, cause the physical processor to:

determine, for each of a plurality of different media items, a current time scale at which the media items are encoded for distribution, wherein at least two of the plurality of media items are encoded at different frame rates;

identify, for the plurality of media items, a unified time scale that provides a constant frame interval for each of the plurality of media items, the identifying including determining a minimum number of time units per second at which the unified time scale is uniform for the plurality of media items; and

change at least one of the plurality of media items from the current time scale to the identified unified time scale to provide a constant frame interval for the at least one changed media item.

13. The system of claim 12, wherein the identified unified time scale allows the plurality of media items to be streamed at a variable frame rate while maintaining the constant frame interval.

14. The system of claim 13, wherein media items with different frame rates are streamed at a variable frame rate while maintaining the constant frame interval for each frame rate using the unified time scale.

15. The system of claim 12, wherein media items having video content that was captured using a variable refresh rate are streamed at a variable frame rate while maintaining the constant frame interval using the unified time scale.

16. The system of claim 12, wherein identifying the unified time scale includes converting one or more input presentation time stamps from the plurality of different media items having different time scales into PTSs based on the unified time scale.

17. The system of claim 16, wherein implementing the converted input PTSs avoids PTS counter wrap-around.

18. The system of claim 12, wherein changing at least one of the plurality of media items from the current time scale to the identified unified time scale allows a single fixed V-Synch interrupt to be implemented during playback of the plurality of media items.

19. The system of claim 12, further comprising optimizing PTSs for the plurality of media items, such that scaled presentation time stamps match native PTSs without a resulting rounding error.

20. A non-transitory computer-readable medium comprising one or more computer-executable instructions that, when executed by at least one processor of a computing device, cause the computing device to:

determine, for each of a plurality of different media items, a current time scale at which the media items are encoded for distribution, wherein at least two of the plurality of media items are encoded at different frame rates;

identify, for the plurality of media items, a unified time scale that provides a constant frame interval for each of the plurality of media items, the identifying including determining a minimum number of time units per second at which the unified time scale is uniform for the plurality of media items; and

change at least one of the plurality of media items from the current time scale to the identified unified time scale to provide a constant frame interval for the at least one changed media item.