

(12) **United States Patent**
Huang

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- (54) **CRITICALITY AND QUALITY OF SERVICE (QOS) BASED RESOURCE MANAGEMENT**
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- (52) U.S. Cl. **709/227; 709/228; 370/468**
- (58) Field of Search **370/230, 395, 370/468; 709/228, 222, 226, 227**

Huang, et al., "A Decentralized End-to-End Scheduling Approach for Continuous Multimedia Applications," *Proceedings of the 6th International Workshop on Network and Operating System Support for Digital Audio and Video*, Japan (Apr.).

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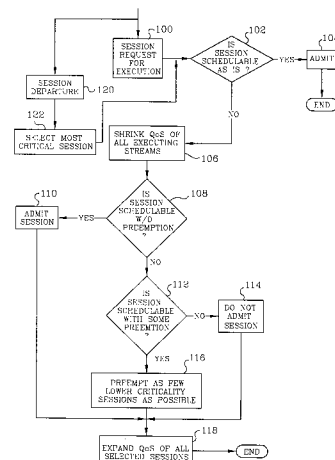
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(57) **ABSTRACT**

A resource executes a plurality of executing sessions, the resource receives an arriving session, and the resource has a resource capacity constraint. Each of the executing sessions has a QoS, a timing requirement, and a criticality level, and the arriving session has a QoS, a timing requirement, and a criticality level. The arriving session is admitted if there is sufficient resource capacity. If the resource capacity is not sufficient, a resource manager shrinks the QoS of each executing session and the QoS of the arriving session. The resource manager then (i) admits the arriving session without preemption if the resource capacity constraint can be met without preemption, (ii) admits the arriving session with criticality-based preemption if the resource capacity constraint can be met only with preemption, and (iii) denies admission of the arriving session if the resource capacity constraint cannot be met even with criticality-based preemption. The resource manager expands the QoS’s of appropriate sessions following (i), (ii), or (iii), as the case may be.

56 Claims, 7 Drawing Sheets



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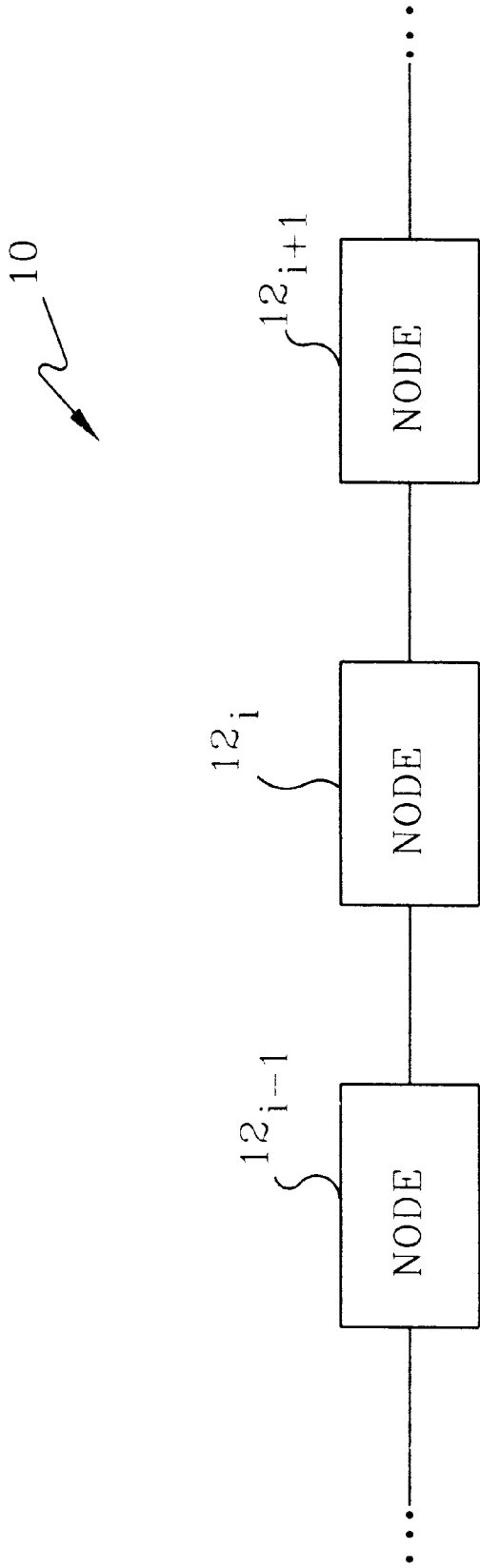


Fig. 1

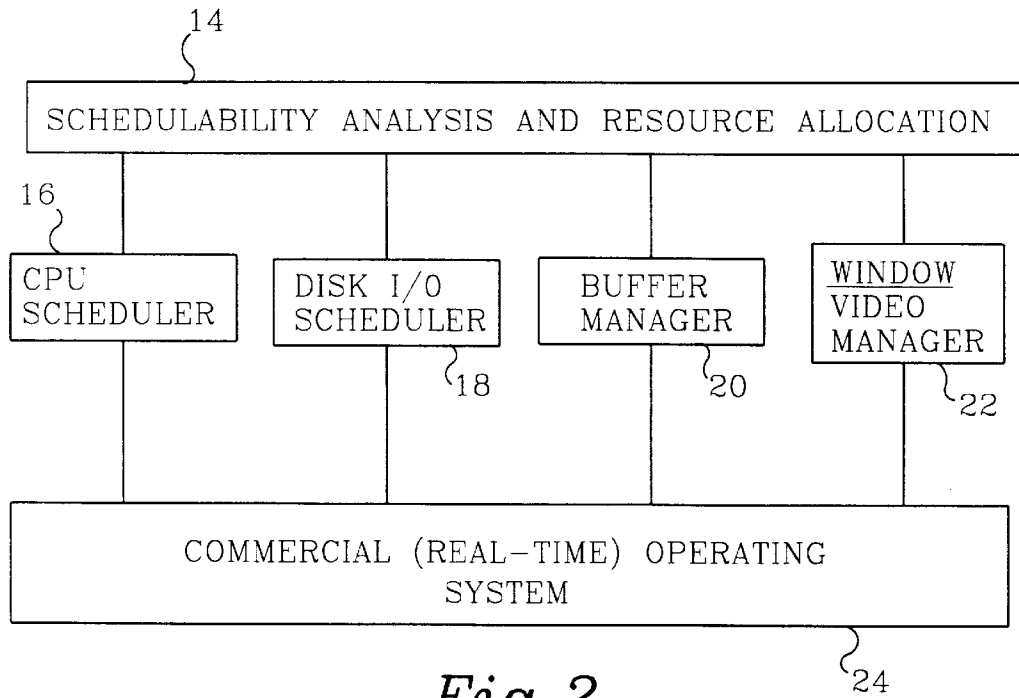


Fig. 2

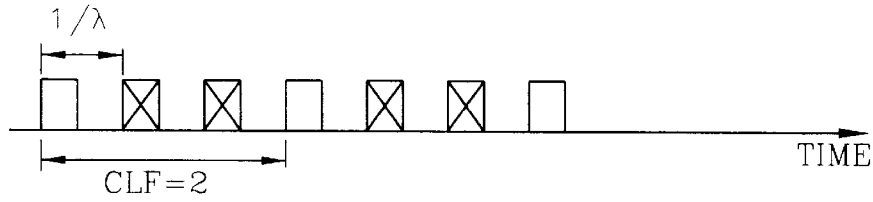


Fig. 3

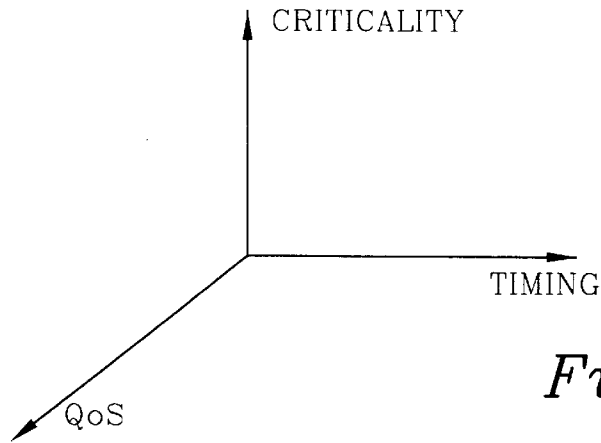


Fig. 4

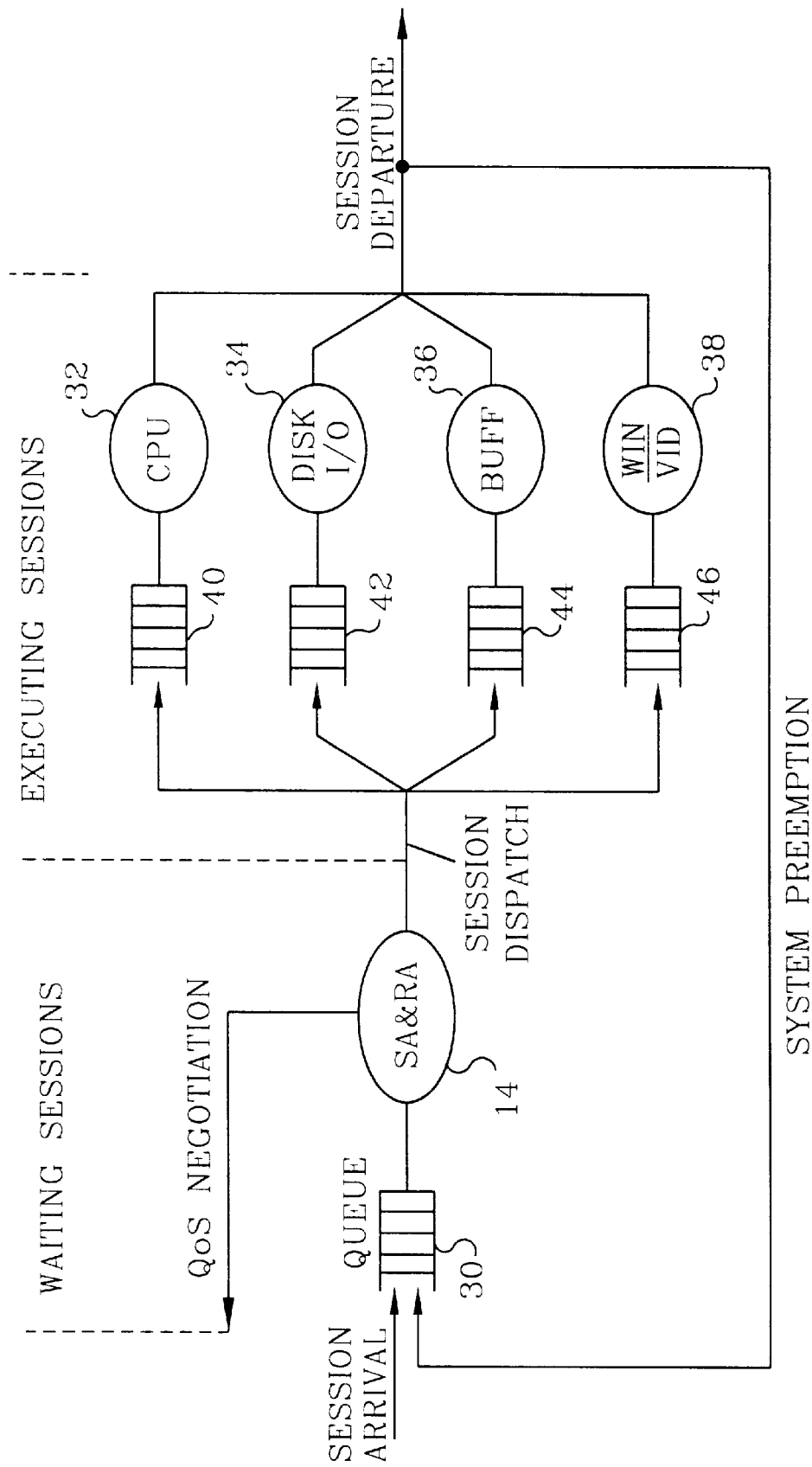


Fig. 5

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