Real-Time Communication with a Receiver Collective, Activity Manager, and Queues

Asynchronous Communication for Real-Time Systems

Benefits
- anonymous communication,
- decoupling of publishers, and subscribers,
- many-to-many interaction,
- scalability, and efficient use of network bandwidth,
- robust application design, and portability across platforms.

Drawback
- lack of synchronization?

Design Pattern Structure

EventChannel Declaration
- publish/subscribe topic,
- list of events,
- configuration of handling threads by
  - queue capacities,
  - schedulability (periodic, sporadic),
  - priority parameters.

Manager
- pool of activities.

Queues
- asynchronous cooperation.

ReceiverCollective
- one thread per socket,
- highest priority, and
- dispatch received events by priority.

Nodes Interaction & Phases

mission phase
event communication in real-time constraints.

initialization phase
non-time-critical activities: object creation, configuration for mission phase, and dynamic negotiations.

Timing / Scheduling in VM

schedulability of active objects

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