Generic scheduler – airline, railway, base station, os, travel and hotel, competitive exam.. etc.

User Requests

Physical resource – airline/railway -> seats, BS -> BW, OS -> processor cores

Time resource

Request Priority (fix/flexi)

Division in physical resource (fix/flexi)

Division in Time resource (fix/flexi)

Preemption (allowed/notAllowed)

Delta – (Providing confirmation of resource scheduling, delta time in advance)

Reschedule: (BS-NACK, air/train - cancellation from service provider) – Not applicable as it can be treated as a new user request.

Partial physical resource allocation (fix/flexi)

Partial time resource allocation (fix/flexi)

Dynamic physical resource (Addition/removal of different resource at different time, addition of car in train, changing of channel/carrier in BS) – Too early to decide

Dynamic time resource?

Wait Queue – (OS – waiting for a resource, Train – waiting list)

MAX\_REQ\_IN\_ONE\_TICK – Dependent on MAX\_PHY\_RES and/or capability of handling N request in a time slot.

Physical Resource

Max physical resource - N

Physical resources list (1-N)

Number of divisions

Division list

Start resource id

End resource id

Time Resource

Time Slot – Smallest unit of time resource allocation possible

Frame – Group of time slots that repeat periodically

Number of Time slots

Division list

Start slot id

End slot id

User Requests

User request identifier

Request priority

Priority type (fix/flexi)

Priority modification function (mandatory in case of priority type flexi)

Physical resource Division Id

Number of physical resources requested

Start physical resource id?

Is physical division flexible

Time resource Division Id

Is time resource division flexible

Number of time slot requested

Start time slot?

Preemption allowed

Delta time

Partial allocation of physical resource allowed

Partial allocation of time resource allowed

User request information.

Basic Design

Invocation – Hybrid (Periodic/event)

Priority handling

Invocation Periodic: Check priority queues and schedule

Invocation Event: Check if resource available then schedule, Check for lowest priority

Preemptable user request, if found preempt it and schedule, else put it in wait

Resource allocation

Start allocation of resources priority wise

If for a given request the resource cannot be allocated, check if partial allocation is possible.

If partial allocation not possible then

Approach1: drop the request take another request (same prio or lower prio) for which the resource can be accommodated.

Approach2: Check if the existing request(s) support partial resource allocation then reduce the resources to accommodate.

After resource allocation inform user atleast delta time in advance.

Delete from queue if request resources (even partial) is allocated.