

Case Study - Simulating a container

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Process: { move_containers_from_vessels, move_container_to_yard }
Resources: { Berths[2], Trucks[3], Cranes[2] }
Event: { crane_request, truck_request, berth_request }
Environment: { ContainerSimulation }
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Container terminal has limited number of resources {berths, cranes, and trucks} to operate the containers in parallel.

1. Scenario of Vessels and Berths:

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vessels are coming in an interval, i.e. exponentially distributed with an
average time of [u = 5hrs] = 5 * 60 mins
vessels will be queued and request for berth,
    if no berth allocated[busy/not_in_service] to vessel:
        wait_for_berth()
        if berth get freed:
            allocate to vessel at front in the queue
            move_containers_from_vessels()
            leave_the_berth()
    else:
        allocate to vessel at front in the queue
        move_containers_from_vessels()
        leave_the_berth()
```

2. Scenario of Containers and Cranes: move_containers_from_vessels()

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All containers numbered from [1-150] will be queued and request for the crane [2
cranes available] to be allocated
for every container on a vessel:
    wait_for_crane()
    if crane available to container:
        wait_for_truck()
        if truck available to crane:
            move_container_to_truck(3 minutes required)
            move_container_to_yard()
            release_truck()
    else:
        wait_for_the_crane()
        recontinue_from_same_container
```

3. Scenario of Crane and Trucks: move_container_to_yard()

Truck takes 6 minutes to drop the container to yard block and return