Assignment 6 - Resource management patterns

Job desc. ———→ [Frontend mgr]

<duration, #resources>

ephemeral component for handling each job

[Job Mgr] 1. Creates, passes job desc.

2. request #res → [Res. Mgr.] Singleton

3. worker instance : IPaddr, etc.

4. creates worker proxy for each instance

AWS } Preferred cloud provider

Dummy Cloud Provider that is always available
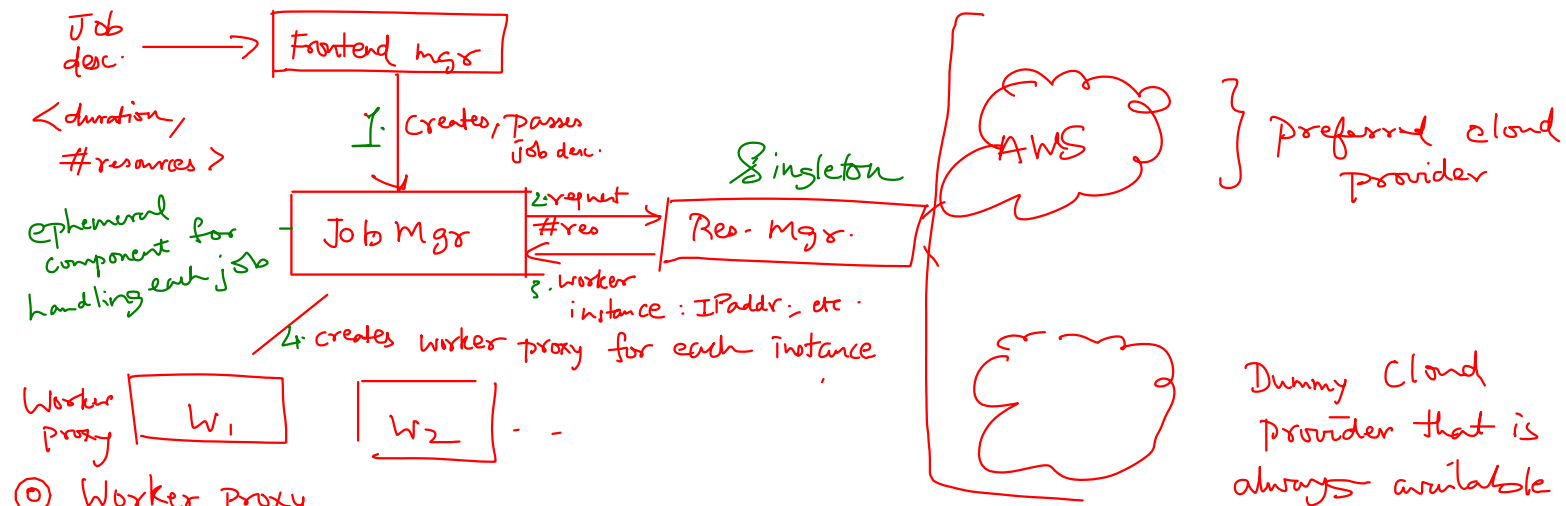
Worker proxy [W₁] [W₂] - -

○ Worker proxy
  ↳ monitors the health of the instances
  ↳ keeps it running till the specified duration
  ↳ reports failures to Job mgr., if any

① Job Mgr's responsibility is to ensure the desired number of resources are available for the required duration. In case of any failures, it requests for a new resource from the Res. Mgr.

② Job mgr- specifies the number of instances & the cloud provider to the Res- Mgr.

③ Res mgr- is a singleton, responsible for creation and shutting down instances from the cloud providers. It implements the factory method pattern to create instances either from AWS or any other cloud provider. Res- mgr. implements a circuit breaker to ensure that if the conn. to the cloud provider is unavailable, it will retry after some duration & in case of 3 failed attempts it will throw a failed message.

④ Design a system with the requirements as above by using appropriate design patterns. Emulate different failure scenarios to test whether the system is working correctly. Prepare a short report explaining the design.