**Guide for expected failures include solutions in the real-world**

* *EC2 Instance Failure:*

Failure Scenario: One of the EC2 instances hosting the system fails.

Handling Approach: Implement a load balancer in front of the EC2 instances. The load balancer can monitor the health of the instances and automatically route traffic to healthy instances. In case of failure, the load balancer would stop sending requests to the failed instance and redistribute the workload among the remaining instances.

* *Network Partition:*

Failure Scenario: A network partition occurs, causing a communication breakdown between instances.

Handling Approach: Implement a distributed consensus protocol, such as Paxos, to ensure consistency and fault tolerance in the system. These protocols allow the instances to elect a leader and replicate data across the instances. In the event of a network partition, the protocol would prevent split-brain scenarios and maintain the system's availability and correctness.

* *Work Item Processing Failure:*

Failure Scenario: An instance encounters an error or crashes while processing a work item.

Handling Approach: Implement a mechanism for tracking the state of work items. When a work item is enqueued, assign it a unique identifier and store its state (e.g., queued, processing, completed) in a shared data structure. If an instance fails while processing a work item, another instance can take over by checking the shared data structure, identifying the failed item, and resuming its processing.

* *Unresponsive Instances:*

Failure Scenario: An instance becomes unresponsive due to high load or other issues.

Handling Approach: Implement health checks for the instances. Regularly monitor the health of each instance and its ability to handle requests. If an instance is unresponsive or fails health checks, remove it from the load balancer's rotation until it becomes healthy again. This way, traffic is not directed to unresponsive instances, ensuring the stability and performance of the system.