

# Typical Failure Scenarios

An AtScale cluster responds to different failures in different ways. This topic describes the behavior of the system under several common failure scenarios.

## Scenario: Loss Of Physical Host 1

Description: Host 1 (see Figure 1 in [Architecture of an AtScale Cluster](#)) physically fails.

Actions:

- ▲ The AtScale DBMS on Host 2 detects loss of the master via AtScale Coordinator and automatically promotes itself to master.
- ▲ The internal load balancer routes database traffic to the Host 2 AtScale DBMS.
- ▲ The Host 2 engine detects the loss of Host 1.
- ▲ The external load balancer detects the loss of Host 1 and routes all traffic to Host 2 services (engine and Design Center).

## Scenario: The AtScale Engine Cannot Reach The Coordinator Service Due To Network Degradation

Description: The Host 1 AtScale engine is unable to contact the AtScale Coordinator Service due to a degraded network.

Actions:

- ▲ The Host 1 engine detects loss of communication with the AtScale Coordinator and shuts itself down. The Host 1 engine announces its departure to the other AtScale engine.
- ▲ The Host 2 engine receives notice that Host 1 engine is shutting down. The external load balancer detects the loss of the Host 1 engine and routes traffic only to the Host 2 engine.

## Scenario: The AtScale Engine Runs Out Of Memory

Description: A series of unconstrained queries causes the Host 1 AtScale engine 1 to run out of memory and crash.

Actions:

- ▲ AtScale Service Control will restart the Host 1 Engine process. If restart happens quickly enough, no other actions are taken. However, if the restart happens slowly the following actions may occur:

- ▲ The Host 2 Engine detects the loss of the Host 1 engine.
- ▲ The external load balancer detects the loss of the Host1 engine and routes traffic only to the Host 2 engine.
- ▲ The external load balancer detects the presence of the Host1 engine and routes traffic to both Host 1 and Host 2 engines.

## **Scenario: AtScale Engines On Host 1 And Host 2 Can Communicate With The AtScale Coordinator Service But Not With Each Other**

Description: The network conditions between the AtScale engines on Host 1 and Host 2 are degraded, preventing timely communication between Host 1 and Host 2.

Actions:

- ▲ The newest host shuts itself down.
- ▲ The external load balancer detects loss of the newest host and routes traffic only to the oldest host.

## **Scenario: Loss Of Physical Host 3 (AtScale Coordinator)**

Description: Host 3 physically fails.

Actions:

- ▲ Coordinators on Hosts 1 and 2 detect the loss of the Host 3 (AtScale coordinator) and adapt the Coordinator cluster for operation without the Host 3 Coordinator.
- ▲ During this process, the AtScale engines on Hosts 1 and 2 may restart themselves to ensure the engine cluster is reformed in a stable state. This avoids the possibility of a split-brain scenario, whereby the engines act independently of one another.
- ▲ The coordinator on Host 3 may come back online and join the other Coordinators at any time without any impact.