Docker Use Case 1 - IBM BDA

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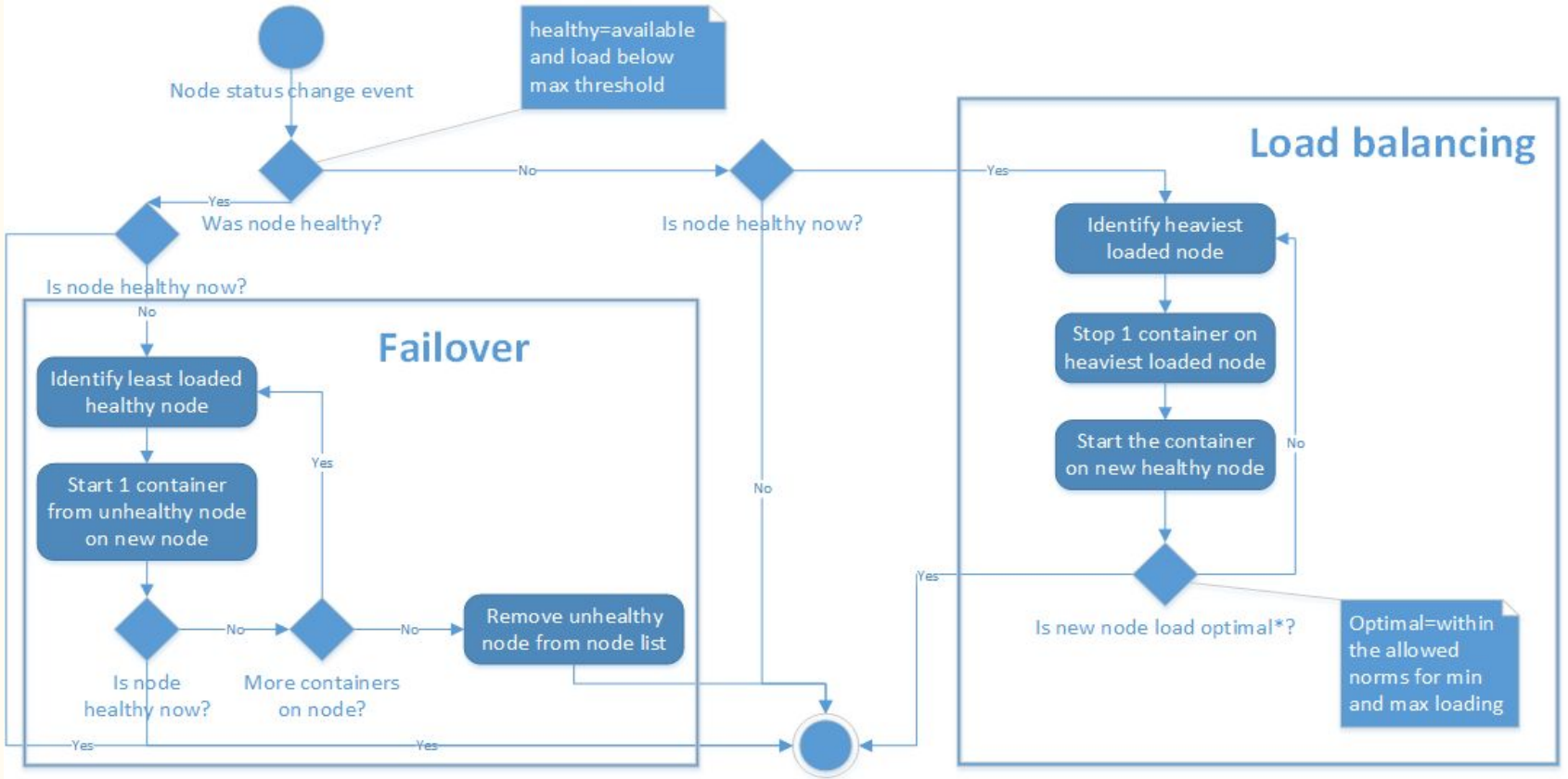
Use Case Statement

Design a Docker manager application. This application should include detection of node failure with automatic container failover, automatic container rebalancing between nodes, and dynamic inclusion and exclusion of available nodes. This Docker manager application should include an easy to use GUI for adding containers, removing containers, displaying container status, and displaying node status.

High level solution design

- User GUI - Allows use to add and remove containers, add and remove nodes, allows user to view container and node status
- Node manager - monitors nodes through direct API calls to VirtualBox, generates events on node status change between healthy/unhealthy
- Container manager - monitors containers through direct API calls to Docker, starts, stops, and removes containers
- Rebalancer engine
  - Rebalances container load across all nodes when nodes come online/become healthy
  - Iteratively redistributes containers across remaining nodes when a node goes offline/becomes unhealthy, until either there are no containers left to redistribute or the node becomes healthy
  - **Healthy** is defined as available, and loading below maximum thresholds
  - **Unhealthy** is defined as either unavailable, or loading above maximum thresholds

Rebalancer engine



References

Docker-client Java API, https://github.com/spotify/docker-client

VirtualBox SDK, http://download.virtualbox.org/virtualbox/