Assignment 01
Introduction to NoSQL Databases

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High-availability is characteristic of a system which aims to ensure an agreed level of operational performance, usually uptime, for a higher than normal period. High-avaibility NoSQL database are systems designed to run without interruption of service.[1]
The way to calculate availability of a system is using this formula as

$$A = \frac{MTBF}{MTBF + MTTR}$$

A is availability
MTBF is mean time between failures
MTTR is mean time to recovery

When a system's availability is higher than 99.999%, we call it as a High-availbility system.

NoSQL databases are designed to run without interruption of service, and it highly used for Highly-accessed system, distributed system and database.

For example, e-commerce website such as bestbuy's app database is noSQL database, it stored pictures, strings, numbers, certificate files. Database like bestbuy need high access speed for hight page visitor, they separated databases and built up distribute database, once one database fail, the whole system still working well for customers. Its strategy is application-level routing, while using bestbuy's app one service point down the app change its reprocessed at the secondary service point.

Another type of high-availability is using Network IP management, this is using for big company's website, it allows a published service IP to move between machines, one database has fails it will give its IP address to another machine to let user access through the IP address successful.

The 3rd strategy is Monitoring[2], monitoring shows how many service is available and what is the error or failure happens in which part, this technology can help technicians to identify the error and fix the problem as soon as possible.

The 4th is Stateless transactions, Amazon uses leverages stateless transactions, because of stateless transaction doesn't include state stamp, so once transaction is interrupted or closed accidentally, system can just start a new one and ignore fails before, this database is used for bing, google like search engines, once user input keywords, if user's browser is crashed, user can just ask a same request again to reduce processing interrupted by timeout.[3]

Multi-Site configuration is also a strategy for high-availability database, multi-site configurations allow a company to redeploy their infrastructure in a new data center. It allows redeploy entire application infrastures from a location to the other location in minutes, and the data center that hosts the independent copy of the primary site and services. It usually using for important data copy like bank system or stock market, once a data center had physical damaged it still can keep data exist and safe.

References:
[1] Making Sense of NoSQL: A Guide for Managers and the Rest of Us — Ann Marie Kelly,Manning Publications, Sep. 20, 2013
[2]https://docs.oracle.com/cd/E11882_01/server.112/e10803/monitor.htm#HABPT003
[3]https://www.redhat.com/en/topics/cloud-native-apps/stateful-vs-stateless