Reliability Modelling and Quality Analysis of SQL Servers in Database Reporting

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Abstract

This study analyzes the reliability modelling and quality analysis of SQL servers in millennium database reporting, predicts failures on Microsoft SQL Server version 2012 (pre-) and version 2014 (current or post-), and compares failure data on both the servers. The SQL reporting server runs as an application server that provides capabilities to process and manage reporting services. The SQL server helps in processing reports that are placed on the server either by scheduling the reports to run at a certain time or they could be run on demand. The data required for this project is collected from Millennium database servers of a US organization. Each of these server versions is analyzed based on report failure rate for two years and compared using the paired t-test. This data is used to determine the mean time to failure (MTTF) and is fit to four statistical distributions: Weibull, lognormal, exponential, and normal. Weibull is found to be the best fit. Goodness of fit test validates the Weibull model. For the Weibull distribution, parameters are estimated which can be used to determine reliability, hazard rate, etc. of the database management server. Quality

analysis was done using quality tools like the fishbone diagram to perform root cause analysis of the failures and a

Pareto chart to know the vital causes from trivial many.

Keywords

Millennium database, SQL server, report failure, censored data, mean time to failure (MTTF).