Sequential Series-Based Prediction Model in Adaptive Cloud Resource Allocation for Data Processing and Security(Conference Paper)

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Просмотр дополнительных организаций ⌄

Краткое описание

A developed adaptive forecasting model for cloud resource allocation is presented. It employs principal component analysis on a sequence of virtual machine (VM) requests. Requests are processed to detect anomalies, and adaptive predictions are computed using EEMD-ARIMA or EEMD-RT-ARIMA methods. The choice between EEMD-ARIMA and EEMD-RT-ARIMA methods is determined by comparing the execution time values R_i (sequential series test) with the threshold value $R_{t\,d}$. If $R_i > Rtd$, EEMD-ARIMA is used; if $R_i \leq R_{t\,d}$, EEMD-RT-ARIMA is applied. This adaptive approach enables the selection of a prediction method based on data characteristics and resource demands. To optimize the selection of the $R_{t\,d}$ threshold, the impact on accuracy and time costs is examined. A quartile method is utilized to detect dynamic spikes, and cubic spline interpolation is employed to smooth data. EEMDRT-ARIMA-based forecasting enhances accuracy through preprocessing of dynamic spikes and adaptive method selection. Calculations of time costs indicate that this method reduces forecasting time by 1.5 times by extracting core component sequences. © 2023 IEEE.

Ключевые слова автора

adaptive forecasting   cloud resources   request distribution   request sequences   virtual machines

Включенные в указатель ключевые слова

Engineering controlled terms: Forecasting   Interpolation   Network security   Principal component analysis   Resource allocation

Engineering uncontrolled terms   Adaptive forecasting   Anomaly predictions   Cloud resource   Forecasting models   Prediction modelling   Principal-component analysis   Request distributions   Request sequence   Resources allocation   Time cost

Engineering main heading: Virtual machine