Research on breakpoint area detection of computer communication network transmission data based on cloud framework

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Abstract. Traditional detection method of data breakpoint in computer communication network has some disadvantages, such as time consuming, etc. Firstly, the data of computer transmission breakpoints are stored based on cloud framework, and the density distribution characteristics of the region are extracted according to the breakpoint data. Then the optimal data breakpoint detection path is selected. Finally, the similarity of each data breakpoint is detected by the computer, so that the detection of data breakpoints is realized by computer. After experiments, the data breakpoint detection is realized, the results show that the designed method can detect data breakpoints accurately, which is time-saving and has a certain significance of popularization.

1. Introduction

With the progress of science and technology, the Internet has shown great advantages, especially in the current computer network environment, people pay attention to information communication, so the application of the Internet in communication is also very prominent, but at the same time of progress, people's demand is also improving, demand improvement will produce a lot of related problems. Mobile communication needs data flow, and data flow is often affected by some force majeure factors, such as network fluctuations, data connectivity status, etc. the most serious problem is data breakpoint. Data breakpoint causes damage to a whole data link by blocking data in data transmission and communication, thus affecting communication [1]. But data breakpoints can be detected, mainly because breakpoint data has different data information from other data. The screening and detection of data breakpoints can correctly find out the breakpoint data with problems and connect them in time, which can improve the efficiency of data transmission and strengthen the data transmission chain.

For data problems, people usually study less, researchers focus on network security, and ignore the research of data breakpoint detection technology, the related technology is not perfect. Based on this,
we need to pay more attention to the data breakpoint technology, strengthen the breakpoint detection technology, sort out and classify the information of each data breakpoint, identify the information at the data breakpoint, and identify the data breakpoint correctly and efficiently. The traditional data breakpoint detection method is relatively simple [2], and the detection time is relatively long, so we need to design a new data breakpoint detection method. Cloud framework is a new idea at present, and it is also the general direction of data breakpoint detection. Therefore, we need to design new data breakpoint detection methods based on cloud framework, break the disadvantages of traditional methods, and implement correct data breakpoint detection.

2. Design of computer transmission data breakpoint detection method based on cloud framework

2.1. Storage of computer transmission breakpoint data based on cloud framework
In recent years, due to the advantages of cloud framework in computer, cloud framework has been widely used in many fields of data transmission and scientific computer. Relevant data breakpoint research experts proposed the use of cloud framework to achieve low-cost, efficient and scalable solutions. Using this technology to solve the abnormal problem of a large number of data transmission and a large number of dynamically growing stored spatial data is an effective method to solve the data breakpoint [3]. In short, this framework refers to a system. The cloud framework system uses collection algorithm and file management information synthesis technology to collect various types of data breakpoints on the network through application software, and jointly provides breakpoint screening and tips to the outside world. The core of the framework is data screening and storage, so many storage devices need to be configured in the cloud framework to become a whole cloud framework system. The flow chart of data breakpoint storage is shown in Figure 1.

As shown in Figure 1, the core of breakpoint calculation in the established cloud framework storage process is the storage system. The system has many characteristics, such as the service nature of data, the storage characteristics of data, etc. these characteristics need to be combined [4] to comprehensively transform the whole large process, and combine the whole data breakpoint detection process with the storage process, so as to realize efficient data storage, Meet the needs of the rapid growth of information. In storage, the storage process based on cloud framework system has many advantages. Firstly, its storage capacity is amazing, even reaching Pb level. Secondly, the capacity is not fixed. It can be further increased according to the number of subsequent files to meet the reading and storage requirements of various data. Moreover, the storage and reading process is very simple and efficient. Finally, the cloud framework storage process also has high reliability. Because it is connected to the reliability network, even if the repository is suddenly closed due to failure, it can be maintained automatically, and the stored data will not be lost, so it has high application value [5].

![Figure 1. Data breakpoint storage process.](image)
2.2. Extracting the density distribution characteristics of breakpoint area of computer transmission data

The important step before the breakpoint area of data transmission is to extract the density. By extracting the density, the weight information of other fault areas can be obtained and identified. The schematic diagram of distributed connection is shown in Figure 2.

![Figure 2. Data breakpoint storage process.](image)

As shown in Fig. 2, the distribution diagram shows elliptic distribution. According to the schematic diagram, the overlapping points of each data are captured to determine the function calculation formula of each area, thus the characteristics of density distribution are derived.

2.3. Select the optimal data breakpoint detection path

In the process of data transmission, we need to ensure the efficiency of its transmission, so we need to improve the speed of data transmission. The method to improve the speed of data transmission mainly needs to find the optimal path of breakpoint detection, specifically needs to judge the signal weight, solve the fault vector, and calculate the overlapping of communication transmission algorithm.

Step 1: cluster the edge weights of the whole graph \( n \) in ascending order, mark different edge weights, and the edge with the same weight has the same symbol identification.

Step 2: set \( J = 1 \) to search the source node in vertex \( u \) set. The formula is used to calculate whether the network node has the error weight or distance detection value to reach the threshold, and the filter is used to calculate the effective detection path.

Step 3: if no effective path is found after calculation, go back to step 2. If an effective path is found, continue to run.

Step 4: after detection, if the number of effective paths is 1, the program ends, indicating that the path is the optimal path. If the number of effective paths is large, it needs to continue to run.

Step 5: select a specified method and continuously filter the processing information until the final step is realized.

2.4. Detect the similarity of data breakpoints transmitted by computer

To calculate the similarity of breakpoint samples in each region, first of all, we need to collect the information of each sample, select the data paragraphs that meet the detection conditions, and determine the distance between each feature point. Generally, Euclidean distance function is selected for subsequent calculation. In the process of computer transmission, it is necessary to calculate the basic values of breakpoint generation or optimization. These basic values need to be transmitted by using the
sample information in data transmission and communication. This method assumes that the sample information value in transmission is $s$, and the sample sequence also selects $s$ sequence. The overall threshold is calculated by the sample information value, and the standard feature points need to be set, Compare and infer the data volume in turn [6]. Formula (1) indicates the same extent of the breakpoint area.

$$S = \frac{s}{W \times P}$$  \hspace{1cm} (1)

Among them, $s$ represents the feature information of the sample, $w$ represents the sample of the data breakpoint area, and $P$ represents the storage weight between the samples in the data breakpoint area.

The threshold value of data fluctuation information is more accurate by selecting neighbor data. The target object is closely related to the useful information covered by the data. Therefore, it is necessary to transform the target information in a rich way. The approximate data and each processing target need to be compared twice. Usually, the nearest neighbor algorithm is selected, the collected information is loaded and verified, the information collected is loaded, the information collected is calculated, classified and integrated, or the nearest neighbor algorithm is selected to process the information circle. The access value and the neighbor information data are the key indexes to deal with and compare the similarity of data information. It can solve the problem that some data have great fluctuation in data processing.

The correlation degree between data information can be obtained by comparing the similarity between data. A specific micro cluster is the product of data inference and data information processing. At the same time, the phenomenon of relatively concentrated data distribution can be calculated according to the meaning of the nearest neighbor algorithm corresponding to the data information object. If the distribution of the nearest neighbor data is relatively small, it means that the distribution of data information is relatively compact, otherwise it means that it is loose. Therefore, because the data information target is corresponding, the threshold comparison analysis method can be used to find the location of the data breakpoint region and find new micro clusters, and the threshold can be used to automatically control the distribution density and shape of micro clusters. The fixed value of the threshold is also determined by the data information.

The reasonable value of the micro cluster index and the remaining data information target can be obtained by obtaining the cluster centroid value through iterative algorithm. Any data information target can be regarded as the target object of the cluster center. When the nearest neighbor algorithm calculates the sample data, it needs to calculate the comparison results to obtain the matrix formed by them. For different data information objects, the data set information is calculated by using the nearest neighbor algorithm, which is an optimal solution evaluation method. In the early stage of the calculation of the nearest neighbor algorithm, it is necessary to ensure the update rate of the data, which requires the data set as a group of comparative analysis. Finally, the representation is put back into the matching classification, and the input value is as follows, to ensure the continuous acquisition of information, it also needs iterative calculation. Calculate the attribute relationship with data information saved and waiting, and then find the attraction relationship of another data information target as the basis of data breakpoints.

The composite effect between the original data and the information results needs to be realized through the maximum calculation, and the weighted nearest neighbor algorithm is the preferred algorithm in the current environment. The calculated data information structure and classification must have good adaptability. When calculating the target index, the optimal solution can be used to determine the target data object and ensure the security, so as to avoid malicious damage to the detected data information.

The optimal threshold is determined by the algorithm of the existence of class valued function, and the islanding effect is mainly caused by the transfer of information. Therefore, in order to avoid the
influence of this effect on data transmission, we need to use the relevant characteristics of the algorithm to calculate the adjacent weights, and then make a unified classification according to the data results. The traditional data point similarity algorithm and detection method have a lot of loss problems in the information transmission, so the method designed in this paper needs continuous superposition calculation, it makes the final value closer to the real information and increases the accuracy.

2.5. **Realization of breakpoint detection of computer transmission data**
The realization of data breakpoint detection in computer transmission should also determine whether to use the mechanism principle of data information transmission to repeatedly update the data information. When the update conditions are met, the tasks will be merged and a reasonable update model will be created to effectively respond to the data fluctuation information.

![Test flow chart.](image)

As shown in Figure 3, the data detection process is often superimposed by continuous data updating and calculation. The sparse degree of data information target needs threshold improvement detection for numerical analysis. When updating at the initial time, micro clusters need to update in real time. Comparing the threshold value, selecting information target to update micro clusters can reduce the overall cost of the system, Reduce the situation of excessive operation. Because of the fast update speed of data information, it is necessary to meet the numerical calculation standard to avoid the decline of data information target.

3. **Experiment**
In order to test whether the data breakpoint region detection method designed in this paper can effectively detect the data breakpoint region, and whether it can save detection time compared with the traditional data breakpoint region detection method, experiments are carried out, as shown below.

3.1. **Experimental preparation**
Select Matlab 2015 to build the detection platform, set the sampling frequency to 36 kHz, define its rate and coverage, and collect the breakpoint time of detection data.
3.2. Experimental results and discussion

In the experiment, six groups of lines with data transmission failure are selected, and the traditional computer communication network transmission data breakpoint area detection method and the computer communication network transmission data breakpoint area detection method designed in this paper are used to detect respectively. The data breakpoint area detection time of two different methods is counted, and the results are shown in Table 1.

Table 1. Experimental results.

| Data breakpoint area | Detection time of traditional data breakpoint region detection method | Detection time of data breakpoint region detection method |
|----------------------|---------------------------------------------------------------------|--------------------------------------------------------|
| 1                    | 3min29s                                                             | 1min20s                                               |
| 2                    | 5min59s                                                             | 2min10s                                               |
| 3                    | 4min23s                                                             | 1min59s                                               |
| 4                    | 6min03s                                                             | 3min10s                                               |
| 5                    | 7min15s                                                             | 4min31s                                               |
| 6                    | 4min24s                                                             | 2min29s                                               |

It can be seen from table 1 that the detection method of transmission data breakpoint area designed in this paper can effectively detect the data breakpoint area, and compared with the traditional data breakpoint area detection method, it has time-saving.

4. Conclusion

To sum up, the data breakpoint region detection method designed in this paper can quickly and accurately detect data breakpoints. In the experiment, by comparing with the traditional data breakpoint region detection methods, it can be seen that the method designed in this paper is time-saving and can be used as a reference for subsequent research. However, due to the different types of data breakpoints, there may be some errors, it also needs to be improved in the follow-up practice.

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