

ABSTRACT

A method of allocating and managing whole number identification number is needed for identification in many areas such as network session id and channel id. Identification numbers have been generated by using an identification number counter which either lacks proper identification number management to support identification number reusability or involves high memory usage and processing time in sorting and searching. This invention aims to provide an efficient method of allocating and managing identification numbers in terms of memory and processing time, by mapping the identification numbers to a scalable array table of bits. This invention is also able to handle in an environment where identification number is to be handled in a distributed environment. An environment where each network node handles the full range of numerical value for generating the identification number with collision avoidance apparatus.

REFERENCES

1. Rivest, R., "The MD5 Message-Digest Algorithm", RFC 1321, MIT Laboratory for Computer Science and RSA Data Security, Inc., April 1992.

APPENDICES

This section provides an evaluation of the performance based on prior art compared to the invention. The identification number generating method, which employs a counter and a list that contains the identification numbers in use, will be used as the prior art for comparison. The reason is because this method is free from conflict in identification number generation whereas the other two methods mentioned in Section 3.2 are susceptible to conflicts in identification number generation, thus they are not suitable to act as a basis for comparison.

Appendix A: Memory performance based on prior art compared to the invention

In the prior art, the list, that contains the identification numbers in use, is made up of a one-dimensional array of identification numbers. Each identification number can be a byte, integer or unsigned long which has four bytes. This constitutes a relative large amount of memory as compared to the invention, which only requires a bit to indicate whether the identification number is being allocated. The ratio of memory used for indicating whether the identification number is allocated in invention to prior art is 1:8 or more, depending on the number of bits required to represent each identification number.

Appendix B: Search performance based on prior art compared to the invention

In the prior art, the search for whether the identification number is in use is performed by comparing the counter value and each element in the list of allocated identification numbers, one at a time. However, in the invention, the array table is searched first byte level until the byte that contains at least one unset bit is first encountered. For instance, if the ByteSize is eight, each byte in the array table is compared with 0xff. A value not equal to 0xff indicates that the byte in the array table contains at least one unset bit. Once this byte is found, it will be searched bit by bit from its non-significant bit for the first unset bit present. The invention is thus more efficient as the search is done eight at a time in the case where the ByteSize is eight.

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