



Backup Planet Online Backup Suite v5.x

Whitepaper – Block and Bit Comparison

Version 5.x  
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## Introduction

Today, almost every industry, backup has become one of the most significance parts of the business; therefore it is essential for IT professionals to provide the most advance backup system. And as the demand for backup technology increase, IT professionals are looking to create a convenience, centralize and easy to manage backup software. And most importantly, fast and time saving will be the key to the successful backup solution.

In the earlier backup technology, when there is a minor change of a file, it requires to backup the entire file to the server. This has end up taking too much time. In the challenge to simplify and to reduce backup time, binary and block technology has been introduced to the backup system environment. Instead of backing up the entire file, only backup the changes of the file, the backup size and time will therefore be significantly decreased.

## Binary Technology

Binary technology is one of the methods of backing up the changes from the file. The binary process involves the comparison of two same files and extracting the differences between the files. The advantage of using binary is it use bit to transfer data, this helps save bandwidth and backup space. However, the process of comparison between two files will be relatively slower, because the procedure is to compare the differences between two files bit by bit.

If 1 kilobyte of data is being compared between two files, and if binary is the backup method, then it would have at least 1000 times of comparisons occurred. Combining with other changed files, the time to process this procedure will be significantly longer and if there is a major file changed, backup speed and time will be an issue.

## Block Technology

To backup data in faster speed, the most advanced backup software, block technology, will be used. By comparing with other backup software using binary technology, backup data using block will certainly be faster than binary, since the comparison process compare data in block size (e.g. 1 kilobyte). If the block size setting is 1 kilobyte for comparison, and a 1 kilobytes of data is being compared between two files, then there will be only 1 comparison between the files. This will definitely reduce the comparison time and increase the backup process.

In-File Delta technology is one of the most advances and flexible data block transfer technology, the delta is generated by extracting the differences between the most updated file and the original file stored on the server. Both files are divided into individual blocks using the same block size and the

blocks compared to determine whether they're the same or different. The differences are extracted into the delta file. Although this may seem to be the same methodology as binary technology, the only difference between the two is the compared size. With other advanced backup software using block technology, their block size maybe fixed at certain number of kilobytes. However, with Backup Planet In-File Delta technology, transfer size is flexible and the size can set to as small as 1 kilobyte.

The main theory of using block technology is to allow user to have a fast backup process, some binary backup system do save some space during backup, but the entire backup process will be comparatively slow. Imagine if there is a gigabytes change and the binary need to compare bit by bit, one can see the considerable amount of time it takes compare to block technology.

### Comparison

By observing the block backup process with binary, block technology is obviously faster than the binary technology. This is clearly demonstrated in diagram 1.

*Diagram 1: ... ..*

*\*Let's assume 1 block = 1536 bytes, 1 bytes = 8 bits. Therefore, 1 block = 12288 bits*

Block Technology	Binary Technology
1 block will establish 1 handshaking	1 bit will establish 1 handshaking, thus, 1 block will establish 12288 handshaking

### Conclusion

As in the backup technology today, one that can stand above others is a big challenge. Backup Planet is one of the successes that can stand above and think beyond others. With the unique and advance In-File Delta technology, all can enjoys the most convenience, centralize, and easy to manage backup system.