

## CARBONITE ONLINE BACKUP

# DATA SECURITY PRACTICES

### INTRODUCTION

When you entrust valuable data to an online backup provider, you must feel confident your data is private, secure, and can be restored without corruption. Carbonite uses state-of-the-art technology, secure infrastructure, and industry-leading standard operating procedures to keep our customers' data safely backed up and easily restorable. There are five areas of critical importance for an online backup solution:

- Highly redundant storage
- Hardened data center facilities and best-in-class operations
- Specialized system monitoring software
- World-class network security and encryption
- Transparent access to your backup status

### REDUNDANT STORAGE

Carbonite uses RAID 6 technology throughout our data centers. RAID 6 is a version of the “redundant array of independent disks” enterprise storage architecture that is optimized for data protection. This state-of-the-art technology is used around the world for the most demanding data security applications. In our implementation, your data is spread across 15 disk drives, with no less than three copies of your backup set. This means that in the unlikely event any one of the 15 drives fails, it can be “hot swapped”, or replaced in real-time, with no loss of data. This technology helps Carbonite ensure that single-disk failure never impacts our customers' data.

The enterprise-class disk drives used by Carbonite also use specialized technology like rotational vibration compensation to enable them to perform to the reliability standards demanded by data-intensive businesses like banks and airline reservation systems. In fact, the mean time between failure (MTBF) of the enterprise-grade drives used to store Carbonite customer data is 70% longer than drives typically found in personal computers: 1.2 million hours, compared to 700,000 hours for consumer drives<sup>1</sup>. These enterprise drives also have “smart data” early-warning systems that enable our operations team to detect errors in a drive and replace it before a failure occurs.

## HARDENED FACILITIES AND BEST-IN-CLASS OPERATIONS

Carbonite data centers are designed to maximize efficiency and reliability. Our RAID 6 arrays that store customer data are housed in climate-controlled data centers with fully redundant power distribution unit (PDU) diversity, independent AC systems, battery backup, uninterruptible power supply (UPS) and on-site generators with guaranteed fuel contracts. Carbonite data centers are guarded 24 hours a day, every day of the year. Personnel access to our datacenters is controlled by a combination of biometric scanners and electronic key cards. Security staff has direct view of all exits, preventing physical theft of equipment or media. All activity is monitored through closed-circuit television (CCTV). This hardened infrastructure protects our customers from disruption caused by external factors such as power loss, weather events, or unauthorized access.

Data protection is also a function of solid policies and procedures and that's another area where Carbonite excels. Our data center operating procedures call for immediate replacement of any disk drive that shows signs of possible failure. Our technology and standard operating process ensure that disk replacement has virtually no impact on the customer.

## SPECIALIZED SOFTWARE AND SYSTEMS

Our proprietary Carbonite File System (CFS) provides additional protection for storing and retrieving customer data. Deployed after a cumulative 10 years of engineering effort, this advanced technology provides tools that enable automated monitoring of every storage server to ensure your data is captured and stored without corruption. Its highly specialized features identify disk defects at the physical block level so that data isn't written to bad sectors on a disk. In addition, the Carbonite system software performs checks of every single stored file to ensure its integrity.

File integrity monitoring and data validation is critical to preventing the random error inherent to all storage systems, including computer hard drives. Called "bit errors," these can increment over time and render a file unreadable. To prevent file corruption, Carbonite's proprietary software will detect bit errors and automatically instruct the customer's computer to re-send any affected files. This constant file integrity checking helps ensure that a customer's backup remains an uncorrupted, exact copy of the original file.

CFS also provides the flexibility to spread data across all the arrays connected to the storage server's logical volume. The robust monitoring tool was also designed to scale in line with our rapidly growing infrastructure, as we add storage at the rate of one million gigabytes a month.

## NETWORK SECURITY AND ENCRYPTION

Carbonite protects against physical and Internet-borne attacks with the highest levels of security. All of our servers are located behind enterprise class network border hardware from leading enterprise vendors. Systems operators can control access to our network with a high degree of precision. All data is encrypted before it leaves a customer's computer using time-tested technologies like Blowfish and Triple DES encryption. In addition, 128-bit Secure Socket Layer (SSL) technology provides an additional level of security during the data transmission process. To further protect our customer's data, encryption keys are never stored with customer data. Carbonite never receives or stores unencrypted files.

## TRANSPARENT BACKUP INSIGHT

Customers have the additional peace-of-mind of being able to check the status of their backups whenever they want. The Carbonite client provides up-to-date reporting on the backup status of any computer. Simply open the Carbonite InfoCenter on a PC or Carbonite Preference Pane on a Mac to view the status of your backup.

## SUMMARY

Our state-of-the-art data backup infrastructure protects both the privacy and safety of your data. We believe that the combination of industry standard technologies like RAID 6 and strong encryption, plus the unique and proprietary capabilities of the Carbonite File System, make Carbonite the most secure way to back up your files.

1. Source: "Enterprise-class versus Desktop class Hard Drives," Intel, 2008

### About Carbonite, Inc

Carbonite is a leading provider of online backup solutions for consumers and small businesses. More than 1 million subscribers in over 100 countries rely on Carbonite to provide easy-to-use, affordable, unlimited and secure online backup with anytime, anywhere data access. The Carbonite software runs on both the Windows and Mac platforms.

Carbonite has backed up more than 100 billion files, restored more than 7 billion files and currently backs up more than 200 million files each day. For more information, please visit [www.carbonite.com](http://www.carbonite.com), [twitter.com/carbonite](https://twitter.com/carbonite), or [facebook.com/CarboniteOnlineBackup](https://facebook.com/CarboniteOnlineBackup).