



What is CDP

Righteous Software's CDP Server is a server software application that enables disk-based data protection and recovery for servers and workstations running Microsoft Windows and Linux operating systems. CDP Server protects disk volume data using replication and synchronization over the network storing point-in-time recovery points in disk-based storage.



Righteous Software's Continuous Data Protection Server is a nearly continuous data protection system capable of providing hundreds of recovery points per day scheduled as little as 5 or 10 minutes apart. For an introduction to continuous data protection technology we recommend the following Wikipedia articles:

http://en.wikipedia.org/wiki/Continuous_Data_Protection

http://en.wikipedia.org/wiki/Near_Continuous_Backup

CDP Server works by reading your hard disk volumes at the sector level, bypassing the file system for the ultimate in performance and recovery. This disk sector synchronization is performed while the server is online and provides no interruption to other I/O requests even on a busy server. By reading the disk at the lowest possible level point-in-time recovery images contain your files and all the formatting, partition tables, and volume configuration needed for complete and instant disaster recovery.

The Data Protection Process

Scheduled point-in-time volume snapshots are scheduled on the CDP server. The CDP server then periodically connects to the CDP Agent program and synchronizes changed disk sectors to the CDP Server. The CDP Server creates a new point-in-time image of the disk volume every time it connects to the agent for synchronization. The point-in-time images are called recovery points and are stored in what Righteous calls a Disk Safe.

Recovery points only consist of a copy of changed disk sectors. This means it usually only take seconds or minutes to complete disk synchronization even on very large volumes. The more frequently recovery points are schedule the quicker they complete. When compression is enabled hundreds of recovery points can be stored in less space than it takes to store one disk image.

In between synchronization requests from the CDP Server, the CDP Agent passively tracks changes to the hard disks as they are happening. This process introduces NO overhead and requires a relatively small amount of memory. This is typically about 6 MB of memory per 100 GB of disk storage being synchronized.

Secure Data Management and Archiving

Data on the CDP Server is stored in Righteous Software's patent-pending Disk Safe storage format. This on disk format enables CDP Server to archive point-in-time recover images for long periods of time using as little disk space as possible. For each configured backup schedule a rotation policy can be defined. This policy specifies the number of different incrementals to keep for each schedule. Old recovery points are automatically deleted according to the policy. This system of minutely, hourly, daily, weekly, and monthly recovery point management is flexible enough for all needs.

Please consider the following example policy demonstrating the flexibility of automatic data protection policy:

synchronize every 10 minutes - retain the last 48 recovery points
synchronize hourly - retain the last 48 recovery points
synchronize daily at midnight - retain the last 7 recovery points
synchronize weekly on Sundays - retain the last 4 recovery points
synchronize monthly on the 1st - retain the last 48 recovery points

Such a policy can be automatically managed by CDP Server. In addition to policy based management any unwanted recovery point can be deleted by an administrator at any time. Selected recovery points can also be locked to prevent automatic deletion by a policy.

Support Heterogeneous Environments

The CDP Server Software can be installed on either a Microsoft Windows Server or Linux Server. Regardless of O/S selection for the CDP Server both Windows and Linux computers running the CDP Agent program can be protected. Both Linux and Windows data protection are managed from a single web interface on the CDP Server.

Linux Server Open File Backups and Point-in-time Recovery

The Linux CDP Agent runs on most 2.4 and 2.6 Linux distributions. There are a variety of agent installers built with binary compatibility for most popular Linux distributions. For unsupported distributions and customized Linux kernels we make a Linux 2.6 Generic installer. For more details and an up to date list of Linux CDP Agent installers go to <http://www.r1soft.com/distros/>.

Windows Server Volume Shadow Copy Integration

The Windows CDP Agent integrates with Microsoft Volume Shadow Copy Service (VSS) providing online synchronization of VSS aware applications such as Microsoft SQL Server, Exchange Server, and SharePoint Services. VSS is also used to provide online backup of disk volumes on Microsoft Windows Servers and work stations.

Browsing and Restoring Files

Files for both MS Windows NTFS partitions and Linux file systems can be browsed on the CDP Server web interface. Administrators can verify backups by browsing files. Any combination of files and directories can be selected for restore through an easy-to-use web interface and file browser. Files can be restored to their original location, an alternate location, or even alternate host. They can also be optionally encrypted in transit using RSA keys and 128-bit blowfish encryption.

The CDP Server has proprietary implementations of NTFS and Linux file systems enabling the CDP Server to read directly into the recovery point disk images just like they were mounted on a live server.

Bare-Metal Restore and Disaster Recovery

Each recovery point stored on the CDP Server is virtually a complete disk image as seen at a particular point-in-time. Each disk image includes the file system formatting, partition table, and volume management data needed to rebuild the entire disk.

In the case of disaster or for quick roll-back your Windows or Linux server can be booted into a special disaster recovery mode (see Disaster Recovery Methods below). Once booted into disaster recovery mode a recovery point can be streamed across the network directly onto your server's hard disks from the CDP Server.

Disaster Recovery Methods

Windows PE Builder (Windows Boot CD-ROM and PXE Boot builder) – Righteous Software distributes a utility to make Microsoft Windows Pre-Execution environments and burn them into a bootable CD-ROM. The PE builder utility is available for download at www.r1soft.com. The utility builds an ISO image based on your own Windows install CD and license. PE Builder generates the files necessary for a successful Windows PXE boot using a standard DHCP and TFTP server.

Linux Boot CD-ROM - A bootable CD ISO is available for download at www.r1soft.com. Burn this ISO image to a CD and boot your Linux servers off of it.

Linux PXE (network) Boot - A tar.gz file is available for download at www.r1soft.com. Extract this file to your TFTP server. A sample DHCP server configuration is also provided.

Linux Live Boot – Linux Live Boot is a self-extract install available for download at www.r1soft.com. Extract this file to Linux server. It will install a new boot loader (grub or lilo) option to boot your Linux server directly into disaster recovery mode. Booting into disaster recovery mode can also be initiated via the command line by an administrator.

End-To-End Strong Encryption

CDP Server supports strong encryption of disk data using RSA keys and the blowfish cipher. During a synchronization data is encrypted (and optionally compressed) on the agent and sent to the server over the network where it is stored in encrypted form. The data can only be decrypted using a RSA key protected with a passphrase. During a bare-metal restore disk sectors are decrypted on the fly at the agent.

Block Transfer Protocol

CDP Server communicates over the network using the TCP based Block Transfer Protocol developed by Righteous Software. This protocol enables the efficient pipelining of disk sectors and blocks over the network. All blocks are verified on the sending and receiving end using MD5 check sums. The CDP Agent authenticates CDP Servers using RSA keys. All data is encrypted using RSA keys and blowfish cipher with 128-bit keys.