

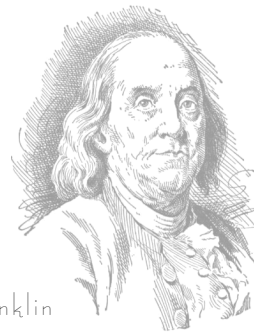


# Death, Taxes & Snapshots

Data Protection with  
**PERSISTENT STORAGE MANAGER™**

*“...in this world nothing is  
certain but death and taxes.”*

Benjamin Franklin



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Warren F. Miller, Jr.  
Vice President Product Marketing





## INNOVATION

Innovation begins as an extension of a known function; i.e., the wheel became the chariot, which became the automobile, an extension of our feet. Computers are an extension of our eyes and brain.

Early widespread implementations of computer technology were as replacements for individual non-computer functions – Word Processors replaced typewriters, Databases replaced card file systems, etc.

From a collection of stand-alone systems businesses have progressed to fully-integrated systems – e.g., the sale of a single Big Mac deletes “two all beef patties, special sauce, lettuce, cheese, pickles, onions, and a sesame seed bun” from inventory.

It is the stated goal of the automobile manufacturers that someday, you and the family will sit at your personal computer and from the manufacturer’s website, select the car, color, options, etc. and press the send key. The manufacturing software will order the supplies from the subcontractors and start the building your car which will be delivered to your home 10 days later – without ever talking to a car salesman (that is the “Death of a Salesman”)!

Studies done by the Big 5 accounting firms have shown that the addition of stand alone computers into the workplace have not, on the whole, been a profitable investment. The analysts were surprised to learn that even the addition of networking did not provide sufficient increase in productivity to off set the initial cost and the ongoing support costs of computers on the desktop.

The vertical and horizontal integration of all factors of manufacturing, procurement, shipping, design and even customer fulfillment is where economies of scale and integration have finally yielded to the corporation a Return-On-Investment. Integrated systems, such as the example that the automotive industry is striving to implement, will provide to all participants, tremendous savings and efficiencies when fully implemented.

Vertical and Horizontal integration of this nature cannot afford downtime. For this to work, all parties have to be connected and **Available** at all times. Fault tolerant systems start in places like Air Traffic Control, but in time we expect the same level of reliability from our automatic coffee maker.



## AVAILABILITY

Don’t confuse **AVAILABILITY** and **RELIABILITY** – they are two different factors, although interrelated.

System reliability is a combination of the reliability of the hardware components and the software reliability. Individual hard drives have a published MTBF (Mean Time Between Failure), the redundancy realized by placing the hard drive in a RAID increases the total MTBF for the system. Every level of redundancy incorporated into the system works to lower the mean.

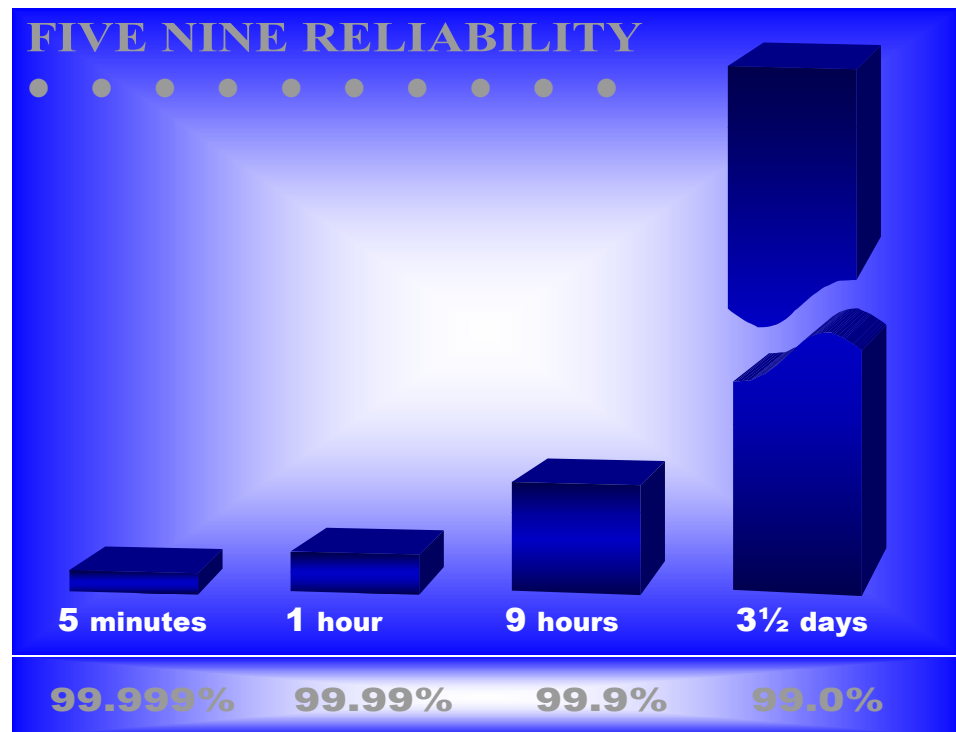
Beyond reliability, Availability needs also to take into consideration the MTTR – (Mean Time To Restore) of the system.

### **System Availability = MTBF + MTTR**

A Maserati, with an “average” number of service incidents over the past 12 months could, on the surface, be considered available an average amount of time. Factor in the MTTR, the weeks and weeks of waiting for parts from Italy, the availability suffers.

PSM plays a major factor in improving System Availability. The Persistent True Images (snapshots) are maintained on line and are accessible at all times.

For decades your local telephone company has been guided by the beat of the five-nine drum — 99.999% system availability.

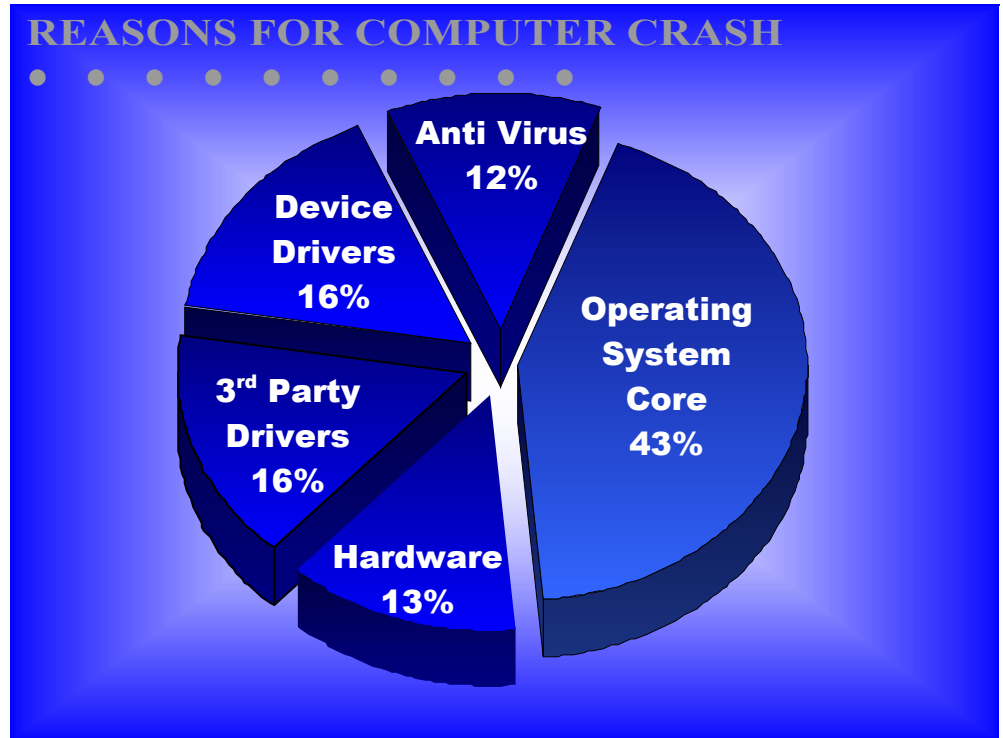


The integration of advanced data processing systems into all segments of our businesses has started the five-nine drum beating in the corporate network world.

I will make a bold statement. 99.999% system uptime is not attainable without snapshot technology! Just in case you have not done the math – 99.999% uptime permits less than six minutes of downtime per year... insufficient time for a single server reboot!



Why you are restoring may have much to do with what you are restoring. The following graph is based on a research paper published by Microsoft. They discovered that over 40% of the system crashes were attributable to the Core Operating system. But one thing is true, a hard system crash, no matter what the cause, will upon reboot, send the Operating System off scanning drives for



corrupt data, thereby extending by a factor of 10 the reboot time.

Today's world of integrated IT systems providing real time information and interaction taking 10 minutes to bring a server back to life is an unacceptable metric.

How many employees are idled? Even worse – what is the customer impact of 10 minutes?

E-commerce web sites measure their time in tens of thousands of dollars per minute, top e-commerce websites measure their time in millions of dollars per minute.

In a world with Snapshot technologies why would you wait ten minutes for anything – except Pizza delivery.



## EMPOWERING USERS

It is rare that System Administrators will need to restore a full volume. Research has shown that anywhere from 40% to 80% of accidental data loss is human error and requires the restoration of limited amounts of data.

PSM provides a vehicle so End Users may access their data located in the Persistent Images. The directory names and structures are exactly as they were at the time that the Persistent True Image was created as well as security rights and privileges remaining in force as they were.

User access to Persistent True Images is controlled by the System Administrator – access is denied by default. With the no change in the directory structure and access to the Persistent True Images through a web browser there is virtually no learning curve. Additionally, Persistent True Images are read-only so system administrators need not be concerned about damage being done by end users, either intentionally or unintentionally.



## OPERATIONAL OVERVIEW

Each Persistent Image is a complete point-in-time representation of the data on the volume(s). Like the photograph of a 2000 pound automobile that weighs only ounces, each Persistent True Image requires only a fraction of the size of the original data volume.

PSM, like OTM and other products from CDP, works with the Operating System at the Volume block level. The user interface for Persistent True Images is a collection of files, directories and volumes, the same directory structure users see daily.

PSM maintains a Library of Persistent True Images, each representing a specific point-in-time. Each subsequent Persistent True Image also presents to the end user a point-in-time representation of the volume. In actuality each subsequent Persistent True Image contains only the portions of the volume that had changed since the last image was created.



## VIRUS INFECTIONS AND PERSISTENT IMAGES

A computer virus, like a human virus, usually has an incubation period — sometimes destruction starts slowly, other times its actions are rapid, but in either case the System Administrator is able to “roll back the clock” to a pre-infection Persistent Image. In the event the pre-infection milestone is unknown, the System Administrator has the ability to examine each of the Persistent Images before making the decision. Even after selecting a Persistent Image, you retain the ability to move forward or backward to other Persistent Images as required.







## OEM AVAILABILITY

Network Attached Storage is a rapidly growing segment of the storage industry. OEMs who are considering entering this lucrative market need to consider the benefits of a PSM/Windows 2000 based solution:

- Performance of Windows 2000 & the Server Appliance Kit
- Scalability & Interoperability
- Based on Industry Standards
- Time to Market – Weeks, not Months
- Unparalleled Data Protection provided by Persistent Storage Manager

OEMs wishing to investigate PSM/Windows 2000 based NAS Appliances should contact CDP directly. OEM licenses for resale are available from either Microsoft or CDP. For more information contact [oesales@cdp.com](mailto:oesales@cdp.com)

## ABOUT COLUMBIA DATA PRODUCTS

CDP, the leader in TrueImage™ storage solutions, has been enabling OEM customers with high availability solutions since 1988. From the first-ever SCSI device driver suite bundled with the Western Digital WD7000 SCSI controller to its new PSM offering, CDP prides itself on offering robust yet simple to use storage solutions.

PSM is based on CDP's market-leading Open Transaction Manger™ (OTM) technology. OTM currently is the open file option for products such as VERITAS' NetBackup, NetBackup Professional, and BackupExec. OTM's image-based approach to open file protection affords users the highest level of data integrity, while eliminating the backup window completely. PSM uses the OTM concept but takes it to the next level of data protection by adding powerful data protection features that integrate tightly with Microsoft's Windows 2000 Server Appliance Kit.

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