

Keeping Your Business Up and Running

Rackspace® configurations for high availability and low risk

Within every organization, large or small, there are certain systems and applications that are more important than others. If a web server that provides customer access to old user manuals goes down for an hour, the impact on your business is likely to be minimal. But if the web servers providing customer access to your ecommerce system go down for an hour—thus preventing you from selling tens or hundreds of thousands of dollars worth of goods and services—the impact on your business is much more immediate and much more significant.

Rackspace already protects you from power outages by providing redundant data center power and onsite diesel generators. The Rackspace Zero-Downtime Network™ already provides your servers with continuous Internet connectivity—connectivity that provides an unequaled experience for our customers and their end users. Our backup engineers are onsite 24 hours a day to ensure that backups are always running and to perform emergency restores when needed. Our proprietary provisioning system allows us to deliver faster operating system reinstalls for our customers. We even maintain onsite parts inventories and guarantee to replace failed hardware within a single hour.

But what if you need more? What if your business cannot afford to be offline for an hour while a part is being replaced? Even then, Rackspace has you covered.

Rackspace provides high availability configuration options that can minimize the possibility that your mission critical systems will become unavailable—thereby minimizing the risk to your business. We offer a range of solutions to meet a wide array of system and application availability requirements—and you can combine several different high availability solution elements to build different levels of availability assurance for your various systems and applications.

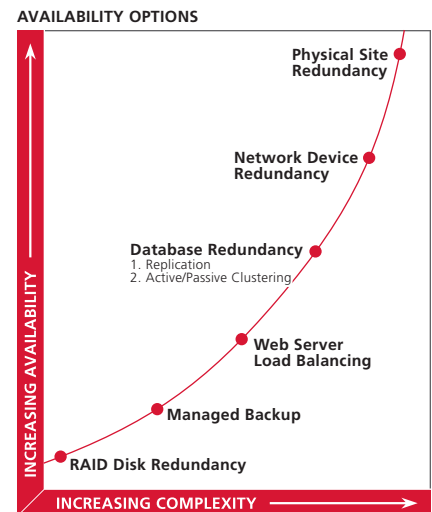
Your Options for Increasing Availability

Systems become unavailable for many reasons. Hardware crashes; software becomes infected by a virus or trojan horse; a database becomes corrupted. What you choose to do to minimize the impact of one of these events depends upon the system and its importance to your organization. One of the simplest solutions—configuring your critical servers with redundant disk systems—can protect the server from a disk failure, the most common cause of downtime. But such a solution cannot protect you from data corruption or viruses or a catastrophic event that affects the entire data center. More complex configurations, however, can provide those levels of protection.

The first step in assessing your availability requirements is to analyze the business impact of each component in your environment, estimating the potential for lost revenue, decreased customer satisfaction, diminished brand value or other impact due to system downtime. Your dedicated Support Team at Rackspace can help you determine the levels of availability that each of your systems require, while also helping you determine just how to achieve the level of availability that your business demands.

Base-level High Availability Configurations: RAID and Managed Backups

Hard drive failure is the most common cause of server failure. Constantly spinning, they will wear out over time. While the average lifespan of a hard drive is 36 months, it is not uncommon to experience a failure in as little as 18 months. If your server is configured without redundant hard drives, a hard drive failure can cause system failure. While Rackspace guarantees a 1-hour hardware replacement, it may take more time to restore the data that was on the drive. What's more, you might lose any data or transaction records that were created after you performed your last backup.



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Your business can avoid the downtime and potential data loss due to this type of hardware failure by having Rackspace configure your servers with a redundant array of inexpensive disks (RAID). RAID configurations can both protect data and can improve system performance by replicating data across multiple disks. With a RAID configuration, a failing drive does not immediately bring your application down. In addition, a RAID configuration will alert the data center staff immediately when one of the drives is failing, enabling Rackspace technicians to schedule the disk repair for a time that minimizes the disruption to your business.

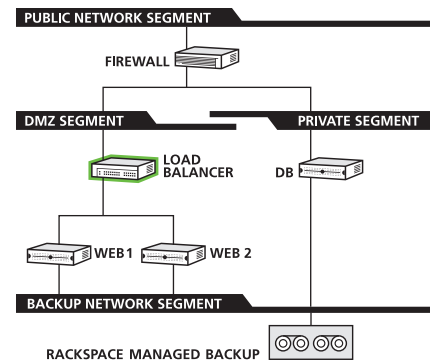
Adding RAID to your server, especially to your database server, is the most economical first step to increasing the availability of your system. RAID configurations do not, however, protect you from server downtime due to software or data corruption. The Rackspace Managed Backup service, can help you avoid significant downtime due to these causes. With the Managed Backup service, you will have means to recover data from complete hardware failure or even from common administrative errors resulting in the deletion of important data. Managed backup can capture daily changes in your data, as well as record weekly full backups and retain the copies for 2-4 weeks for backup purposes—or longer to meet archival requirements. Our experienced backup engineers can work with you to assess your data backup requirements and create a backup schedule that best supports your availability requirements.

Advanced Solutions for Ensuring Web and Application Server Availability

Using multiple servers and Load Balancing technology can ensure the availability of your Web and application servers. A load-balanced configuration relies on a dedicated network device to distribute traffic across multiple Web or application servers. If one server becomes unavailable, the load balancer reroutes and balances traffic among the remaining devices, ensuring the availability of your website or application.

In addition to helping you avoid unplanned site downtime, load balancing provides you with a way to avoid the disruption that can accompany planned downtime. Load balancing enables Rackspace to take individual servers offline for repairs, upgrades, or other routine maintenance activities—without having to take your entire site or application offline.

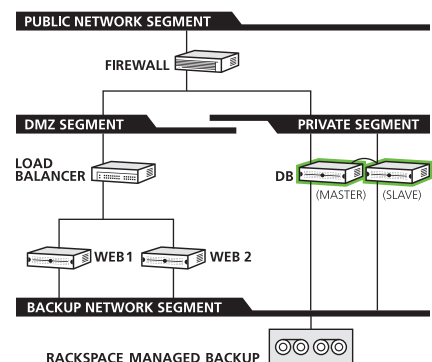
Load balancing increases the complexity of your environment and your application may need to be tailored to support load balancing. These costs may be justified by the availability benefits delivered by load balancing.



Advanced Solutions for Ensuring Database Availability

Database redundancy is the next step to consider in protecting your business against system downtime. Often the Web layer of an application is based on static data, while the database portion of the application is constantly being updated. This dynamic nature makes building redundancy into the database layer a more complex project than building redundancy into web servers. Rackspace recommends two options for ensuring database availability: database replication or database clustering. Which of these is right for your business depends upon your availability requirements.

The simplest method of building redundancy for your database is using Replication to back up the data from your master database server to a slave database server. In the event of a failure of the master database server, the slave database server can take over and fulfill the role of the database while the master database server is being repaired. You may have to configure your application to support replication and failover to the slave database server may require manual intervention. Failover time could be as little as 10 minutes, depending on how the application is configured.



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If your business needs even faster failover, you should consider an Active-Passive Database Server Cluster configuration. In a cluster, the active database server is connected via fiber to SAN storage. Your environment also includes a passive database server for failover. The operating system and application are stored on the server, while the database is stored on the SAN. Should you experience hardware or application failure in the active database server, the application will failover to the passive database server. Here, failover is measured in seconds, requires no manual intervention, and is often unseen by the application due to the minimal availability disruption associated with an automated failover. Only the clustered database service itself needs to restart to resume operation on the other node.

You may have heard about another high availability solution option involving fail-over capable blade servers connected to SAN storage. At this time, Rackspace does not recommend this approach due to certain limitations. In a blade environment all data—including the operating system, the application, and the database—is stored on the SAN. A fail-over blade configuration therefore provides protection from hardware failures in the blade itself, but it does not protect your business from any failure in the operating system or the application. For example, if a failure arose from an operating system or application error, the blade server would simply fail over to the new blade, which would then try to reconnect to the failed software or database, totally defeating the purpose of investing in a fail-over environment. Due to these limitations, Rackspace recommends either full database clustering or database replication. Building an environment with database replication usually involves an investment comparable to what a blade environment would cost, and the replication environment provides more comprehensive protection for your business.

Configuring for Highest Availability Assurances

Redundancy of network devices within the data center is the next step to consider in protecting your application uptime. Potential single points of failure such as firewalls, switches, intrusion detection systems, and load balancers are all flash-based machines (without spinning hard drives) that have been selected with low failure rates as a primary consideration. The Mean Time Between Failure (MTBF) for the Cisco 525 Firewall, for example, is 60,000 hours. If this low risk of downtime is too much for your application requirements, Rackspace can build a configuration with redundant network gear. Should the active device fail, its passive twin takes over in seconds, eliminating disruption.

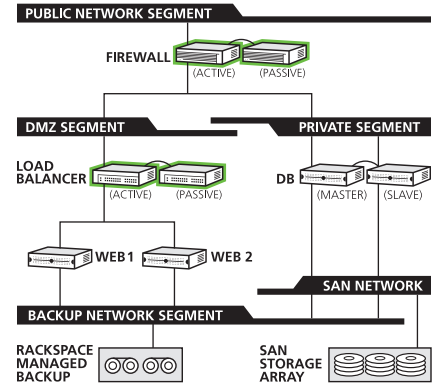
Geographic site redundancy is the most costly and complicated of all high availability solutions; however, it does provide the most comprehensive solution and can help ensure business continuity even in the face of a catastrophic data center event (such as a major earthquake or hurricane). With geographic redundancy, Rackspace would set up your application environments in two or more physically separate data centers and configure each environment for either load-balancing or fail-over between the environments. In the event that the primary environment went down, all traffic would route to the secondary location.

Not all business models can use a geographically redundant solution because of limitations in the ability to replicate data across data centers. To maximize your protection against the most common causes of application downtime, site redundancy should only be considered after fully exploring all other high availability configurations.

Helping You Determine Which Configuration is Right for Your Business

Rackspace enables high availability through an intricate system of processes, software, hardware, and infrastructure components, all backed by Fanatical Support®. Properly designed and implemented, a high availability environment mitigates the risk of unplanned service disruptions. It can eliminate single points of failure and dramatically decrease the impact of planned disruptions, such as upgrades or maintenance windows.

Is it complicated? Yes—but that's why you've selected Rackspace as your business partner. We understand and deploy high availability environments every day. If you'd like to discuss your requirements and options in more detail, contact your Rackspace sales representative or account manager today.



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