

Introduction

Disaster recovery is an important trend in businesses of all kinds. One of the main obstacles for small and medium sized businesses (SMBs) is the high cost of disaster recovery (DR) solutions. And yes, DR implementation can be expensive. However, businesses still have the need for their online services to be available during disasters, the need to meet standards, and the need to be accountable to customers and agencies or government. This white paper describes a disaster recovery architecture that meets important recovery requirements and, at the same time, gives help to SMBs to keep down costs.

Overview of DR Solutions

Before we get into the example of the DR Solution we want to describe, let's first cover some background.

There are numerous possibilities when it comes to DR solutions. NetSource simplifies the problem by narrowing down the solution space to four main solution categories. Then, in each category there are a range of features and options to meet most any DR need.

First, let's talk about the key parameters a business needs to consider when implementing DR. There are three key parameters that the DR Solution must address.

1. Recover Time Objective (RTO)
2. Data and content synchronization interval (DSI) and
3. Mean Time to Repair (MTTR)

If a business skips over any of these concepts, they will not have a complete DR Solution. Let's briefly discuss each of these three parameters.

RTO simply defines how long a business can be down or how fast the solution can recover from a failure. NetSource offers solutions in each of the following categories.

- RTO < 1 week
- RTO < 1 day
- RTO < 1 hour
- RTO < 1 min (instantaneous)

These categories form natural cost breakpoints and solution architectures. For example, if you want a 2 hour RTO, it may cost about the same to achieve < 1 hour, so why not do the 1 hour solution. These numbers are rough guidelines and the exact solution a business chooses will determine that actual expected RTO.

Data and content synchronization involves keeping your data fresh at the DR site. For example, if you backup your database every day, then, in a failure, a business could lose one full day of data. A business needs to define goals for how out-of-date the data can be. Common goals here are 1 day, 1 hour, 15 minutes, or zero for stale data. And the goal can be different for data (databases) versus content (application code, text, images, etc.)

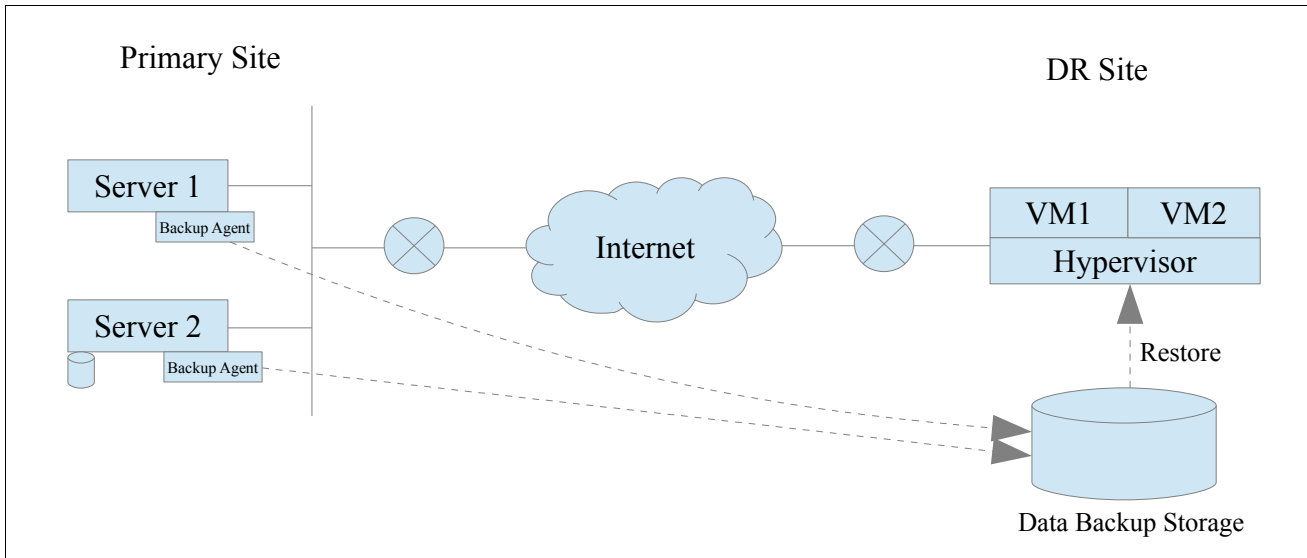
Mean Time To Repair (MTTR) is a metric that defines how long it takes to repair a failure. Why is this important? In a failure, an application is back up and running after the RTO period. However, a business can be vulnerable while the primary site is offline. What happens if the DR site fails before a technician can repair the primary site? The longer it takes to repair the primary site, the more risk a business takes. Another failure could occur in the meantime. Not good. So, a business needs to also understand its MTTR goals. Common MTTRs are 1 week, 1 day, 1 hour, or near zero.

Bring the goals for these three parameters to NetSource and we can put together a DR solution.

A Cost Effective DR Solution for Small Business

We described a wide range of possible goals for DR solutions above. The costs of these solutions range from relatively small to very high, even up to multiple times the cost of the original primary hosted site! A lot of customers we talk to really want a good DR solution, but many don't want to or simply can't pay the high costs for a < 1 hour or < 1 minute RTO. Below, we describe a DR Solution that is less than the cost of the primary site and it maintains an RTO of < 1 day, a DSI of between an hour and a day, and an MTTR of < 1 week. While these goals are not acceptable for some applications, they are perfect for a lot of small businesses and their applications. The point is that this solution is quite affordable.

The diagram below illustrates the implementation.



An Example DR Solution for Small Business

First, notice, that there are two sites; a primary site and a DR site. The primary site is actively serving the application. Notice that the redundant hardware at the DR site is implemented as virtualized server(s) in a private cloud. This is one key to keep the costs down. These private cloud server(s) are sized appropriately and are running but have no content or data. It doesn't matter if the primary site is virtualized or using dedicated physical servers.¹ The primary site is backing up its data to the DR site using a data backup program (R1soft is what NetSource provides and manages). Finally, note that the primary and DR site are at different geographic locations. They don't have to be separated, but, the business gets the additional benefit of being able to recover from the complete destruction of the primary site. NetSource provides multiple locations so that NetSource can provide both the primary site and DR site locations. But, often, the business provides one of the locations, sometimes at their business office.

The diagram shows two physical servers but there is no reason this solution couldn't scale to any number for servers. The practical limit is only the time it takes to restore each server from backup. The more servers there are, the longer it will take to restore.

Some other conditions are required to make this work.

- The domain name time-to-live setting should be set lower than the RTO.

¹ Virtualization is a useful technology because it takes advantage of the fact that many applications use the resources on physical servers sparingly so that multiple servers can be implemented on one virtualized physical server without hurting performance. Of course, that isn't true of all applications and this implementation would not work for those. But, a hybrid version of this implementation might work just fine.

- The backup interval should be set lower than the DSI (normally 1 day down to an hour).
- The Internet connection at both locations needs to be relatively fast.
- The application accesses all databases via a domain name rather than IP.²

Now, when a failure occurs in the primary site, the application is immediately down. The managed service provider (MSP) monitors the primary site, detects the failure, and immediately begins to restore the data from backup to the private cloud servers. Once the restores are complete and after the MSP changes the domain name service settings to point to the DR site, the application is back up.

There are other enhancements a business could make to this setup to improve RTO, DSI, or MTTR for additional costs. For example, database replication could be added to improve both RTO or DSI. A point-to-point connection could be added between an office site and the data center for faster and more reliable data transfers that can improve DSI. But, at some point, by adding more enhancements, we are getting closer to a 1 hour RTO and that is a different white paper.

Summary

NetSource provides a full range of DR solutions for SMBs. The categories cover the recovery time objectives ranging from,

- < 1 week
- < 1 day
- < 1 hour
- < 1 minute (instantaneous)

Of course the better the RTO, the higher the cost. But, in this white paper, NetSource has shown how a small or medium sized business can handle a < 1 day recovery time for a minimal cost. One day may sound like a long time. But getting this done is better than the alternative, especially, when you find it is affordable.

But, if you have more stringent requirements and a higher budget, NetSource can provide DR solutions for any need.

² We don't want to have to change the application during a disaster so using domain names enables a DNS change only.