

Satellites Benefit the Cloud

Hughes Backup Connectivity for the Cloud

The “Cloud” is a nebulous term referring to the universe of services and solutions available on the Internet or within distributed private networks. As illustrated in Figure 1, consumers, government agencies, and businesses of all sizes are increasingly accessing an ever-expanding range of applications and their own private data hosted and managed in the Cloud—everything from family photos to corporate reports and applications. Cloud-based services often present a more economical and simplified solution to the user, but consequently make a highly reliable and robust connection that much more critical.

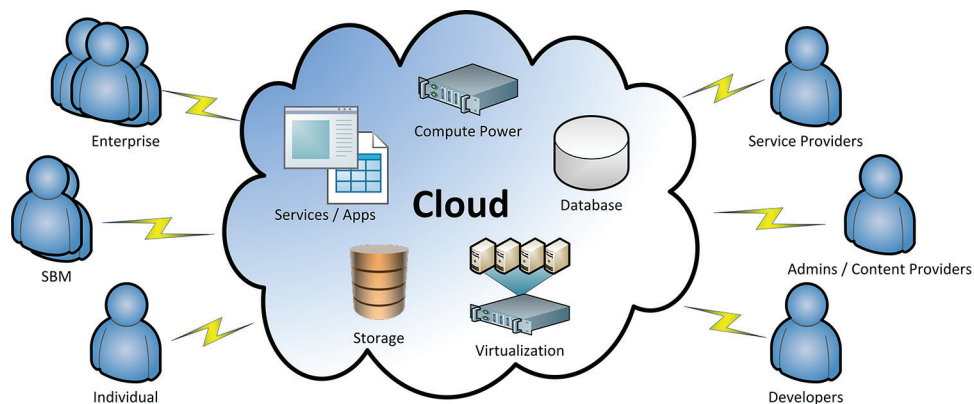


Figure 1. Cloud-Based Services and Solutions

By 2014 some estimates are that over 50% of all workload will occur in the Cloud (the balance remaining in traditional data centers) and over 80% of new applications will be developed in the Cloud.¹

Cloud-based services cover a wide range of applications in three major categories:

- Software/Apps as a Service (SaaS): Office suites, CRM, collaboration, financial, gaming, email, etc.
- Infrastructure as a Service (IaaS): Servers, platforms, virtualization, storage
- Platform as a Service (PaaS): Raw compute power, Web servers, database servers

For example, Customer Resource Management (CRM) that was typically handled in-house with custom-built solutions, is now available in the Cloud as a customizable “Software as a Service (SaaS)” solution. In fact, thousands of companies are today offering cloud-based “XaaS” models with potential cost savings in front-end development, computer infrastructure, maintenance, and training.

1 Cloud Computing, Ann Patimetha, Caravelle Group, January 15, 2013, www.caravellegroup.com.

Going for a Ride on the Cloud

Moving to the Cloud is a logical and inevitable step. But what happens when connectivity goes down and an organization no longer has access to its Cloud-based, business-critical applications or data? Broadband connectivity is often taken for granted, but it is the core requirement for the Cloud. As illustrated in Figure 2, connectivity can be lost for a number of reasons:

- Equipment failure (e.g., modem failure, ISP PoP failure)
- Last mile interruptions (e.g., a backhoe working in the area)
- Core network issues (e.g., cyber-attacks on infrastructure)
- Natural disasters (e.g., hurricanes, tornados, floods, etc.)



Any of these failures can bring an organization to a halt and result in lost productivity, production, or revenue. Does the organization even have a disaster recovery plan? Does it include backup connectivity? All too often, disaster recovery is overlooked or considered low priority due to budget constraints. However, can any organization afford network outages that last for days or even weeks?

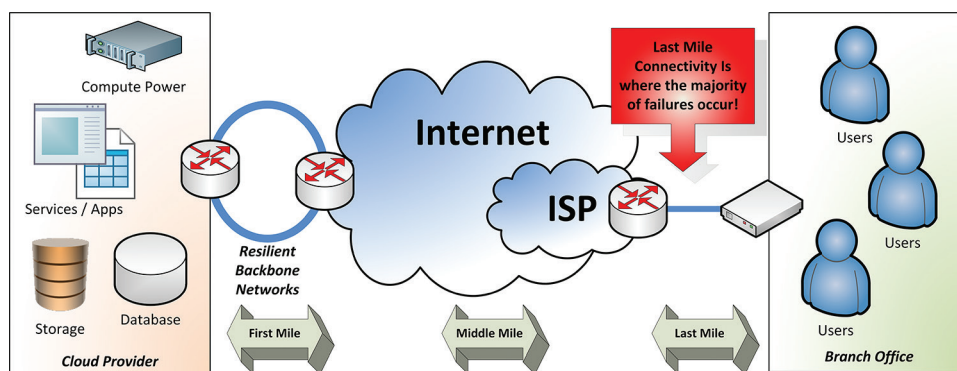


Figure 2. Connectivity Vulnerability Points

Cloud providers host their services and solutions in well-protected data centers that offer protection from physical damage, electrical outages, and network outages. Very often they also provide redundancy and protection at the higher OSI layers for applications. But, they can't do anything about problems at lower layers, especially at the “last mile.” The problem of network outages occurs mostly at the “last mile”—that is, the layer 1 through layer 3 connectivity from a telecommunications service provider to an organization.

A US Department of Labor study found that 93% of companies are impacted by network outages that negatively affect their business. Even more startling is an America Red Cross study that showed about 40% of businesses never recover from major disasters due to a lack of preparedness. Network resiliency is an important part of that preparedness, especially as more business-critical applications move to the Cloud.

For example, SuperStorm Sandy which hit the US Northeast coast in 2012, clearly showed that a major hurricane can wipe out terrestrial networks for weeks—and in some areas, months—even with advance warning and despite a well-developed infrastructure and support resources. Unfortunately, most of the network redundancy was also based on terrestrial technology, making both primary and alternate paths susceptible to the same disaster conditions. Satellite-based connectivity proved to be the networking lifeline to support recovery efforts because it provides the only truly diverse path to terrestrial fixed or wireless infrastructure.

Satellite as a Backup Connectivity Solution

Path diversity via satellite ensures that an organization can retain connectivity when a primary terrestrial network fails for any reason—not necessarily a disaster. In a properly designed, fail-safe network design, the switchover would be seamless to users. As noted, any terrestrial technology network backing up a primary network creates a vulnerability even if they are each different—for example, fiber and the backup copper E1 from another service provider—because many carriers use common rights of way into premises, so true path diversity is lost since the right of way is a single point of failure.

As Figure 3 shows, a truly diverse path can only be obtained via a satellite connection.

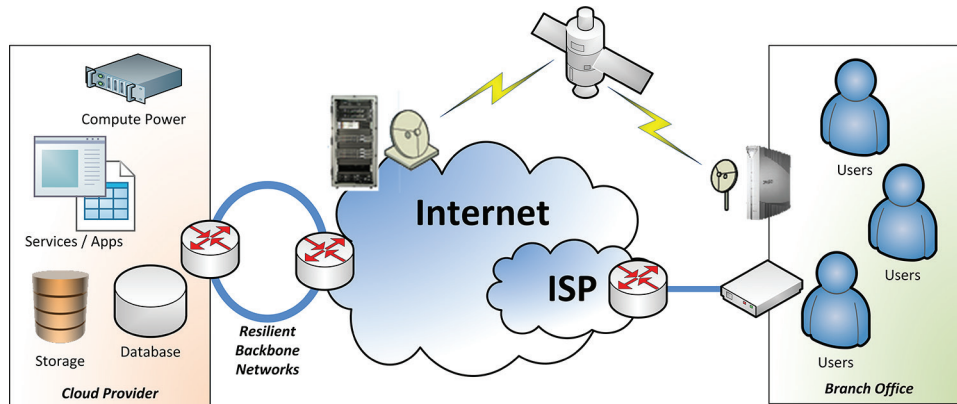


Figure 3. True Path Diversity with Satellite

The satellite link enables network connectivity that completely bypasses terrestrial networks, not just on the last mile, but also on the associated core network from the ISP.

Satellite-based communications have been in operation for decades, providing reliable primary and backup services for a range of industries. In the financial sector, a number of banks, brokerage houses, and financial services companies have been using broadband satellite communications for their primary service, or as the disaster backup to their landline network. Many leading companies in the retail, hospitality, and numerous other industries have been using broadband satellite-based networks to connect their remote locations. In fact, the turnkey managed networks for many such enterprises that have been provided by companies like Hughes certainly qualify as Cloud services, with stringent contractual commitments calling for the highest levels of performance, security, and reliability.

The networking solutions employed by Hughes are based on its successful HN and HX Systems, either as backup or primary connectivity platforms to maintain mission-critical Cloud computing access. With a powerful set of features, including full-fledged routing capability and advanced QoS capabilities, HN/HX Systems enable true enterprise-class networking. As illustrated in Figure 4, using Virtual Router Redundancy Protocol (VRRP), HN/HX Systems can negotiate with a terrestrial access device to determine which route is active or to load balance traffic across both routes.

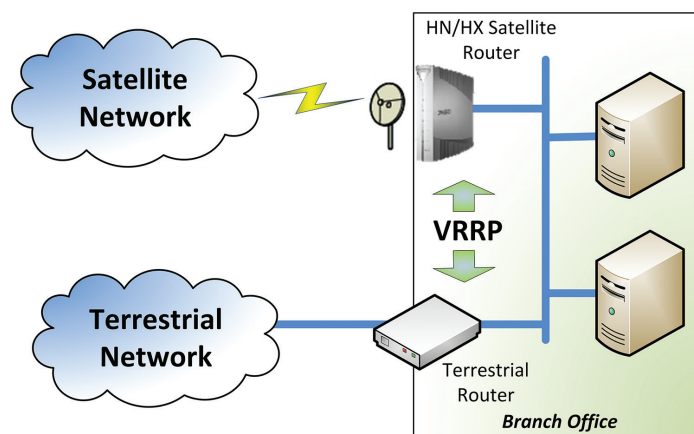


Figure 4. VRRP Enables Seamless Backup and Load Sharing

Using the VRRP (IETF RFC 3768) protocol, the physical routers elect and monitor a master router to service requests. If the master router fails, another group member assumes its responsibilities. In addition, Policy-Based Routing (PBR) rules can be defined, which allow traffic to be distributed across both links in a load-sharing fashion.

Most importantly, with this approach Hughes can provide a virtual 99.99% availability for network access.

Illustrated below, for large businesses with multiple branch locations, HN or HX Systems can be deployed as a private backup Intranet, employing a private hub operating over satellite bandwidth in the required area.

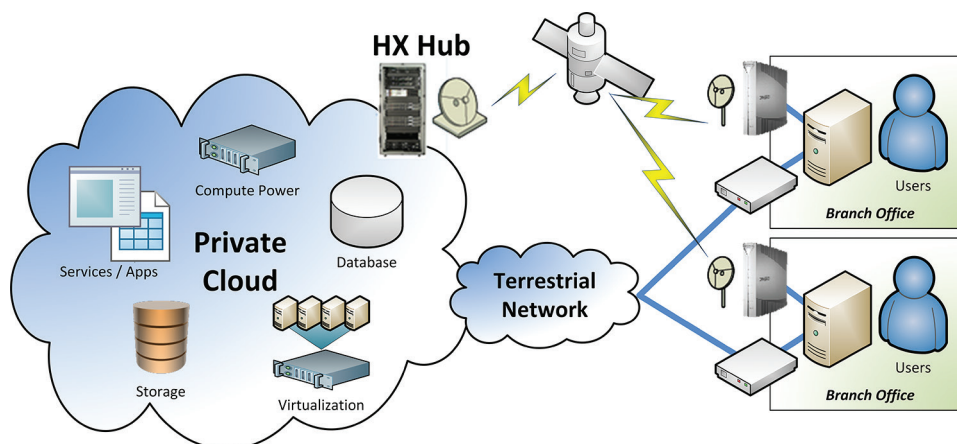


Figure 5. HX-Enabled Backup

Similarly, for smaller SMB networks, connectivity via an HN or HX System may be available on a shared basis from service providers who already deploy an HN/HX-based satellite data service that covers the business locations.

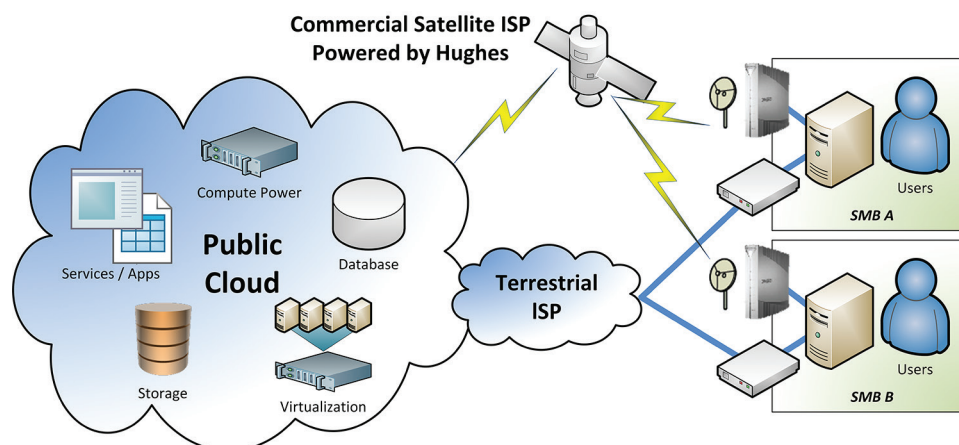


Figure 6. Hughes-Enabled Backup

These illustrations provide just a few of many possible solutions for backup connectivity to the Cloud. Hybrid solutions employing any mix of satellite and terrestrial fixed or wireless technologies can optimize connectivity to best suit the organization's needs and budget.

Benefits of Satellite Beyond Backup

Hughes satellite connectivity solutions bring many additional benefits beyond backup alone, including:

- Offload of nonessential background traffic from the primary network connection. For example, data backups can be routed over the satellite link to reduce load on the terrestrial link.
- Multicast and broadcast capability for branch locations. Satellite provides the most economical and efficient means to deliver content anywhere, whether state-wide or nationwide, and is ideal for branch locations where digital signage, large data downloads, and other applications are needed.
- For new branch offices, the satellite link can very often be operational and online far faster than the primary terrestrial connection. This means that a business can be online more quickly too.

In each case, the Hughes satellite link provides additional capability beyond just being a backup solution for Cloud-based services.

Conclusion

The Cloud offers many opportunities to reduce cost and grow a business, or allow government agencies to better serve their constituents. But not having a reliable, path diverse, backup connectivity solution can leave an organization in the dark. Only satellite broadband offers a truly diverse backup solution, which is essential when disaster strikes. Hughes stands ready to assist your organization to ride the Cloud and stay connected, no matter what.

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