



NETWORKS

P O W E R I N G Y O U

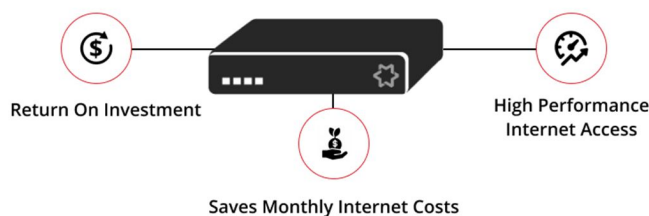
Cloud Leased Line (CLL) for
Communications between
Offices

CLOUD LEASED LINE (CLL) FOR COMMUNICATIONS BETWEEN OFFICES

Reliable High Throughput Data Connections With Low-Cost & Diverse Transport Technologies

Executive Summary

The Bonder enables businesses with branch offices to have reliable high performance data connectivity between their branch offices as well as between offices and datacenters. Each branch office is enabled with this fast Internet pipe by bonding multiple instances of cost-effective transport technologies such as DSL via Bonder. The Internet lines to be bonded may be from different carriers



for ISP diversity to increase reliability. Additionally, the Bonder provides the branch office facility with reliable, high performance Internet access at a fraction of the cost of single provider solutions. In this brief application note, we explain how a Bonder can save businesses with branch offices on their monthly Internet access cost, with a return on investment measured in a few months.

**The Bonder Enables Businesses With
Branch Offices to Have Reliable High
Performance Data Connectivity**

Problem

**Data Connections Between Two Branch
Offices are Unreliable, Not Fast Enough
And Expensive.**

Businesses that have branch offices need to electronically communicate with each other as well as with devices and servers on the public Internet. With the proliferation of cloud services based on private and public clouds, as well as services that are heavily dependent on reliable and high-performance applications have saturated the limits of available WAN (Wide Area Network) services. Providing the high speed connections to each branch office can become prohibitively expensive since the available Internet services might be limited or costly. Thus, for the data connection between the branch offices and from the offices to private/public clouds, it is desired to have as high throughput as possible with high reliability.

Generally speaking, if the branch office uses the Internet to communicate with the main office, and has only a single DSL or cable modem connection this will provide insufficient data throughput, particularly for uploading data from the branch office to the main office. For this reason, many businesses use a lease line to provide Internet access. The Internet connection that is provided by the lease line is then used to access devices and servers in the main office.

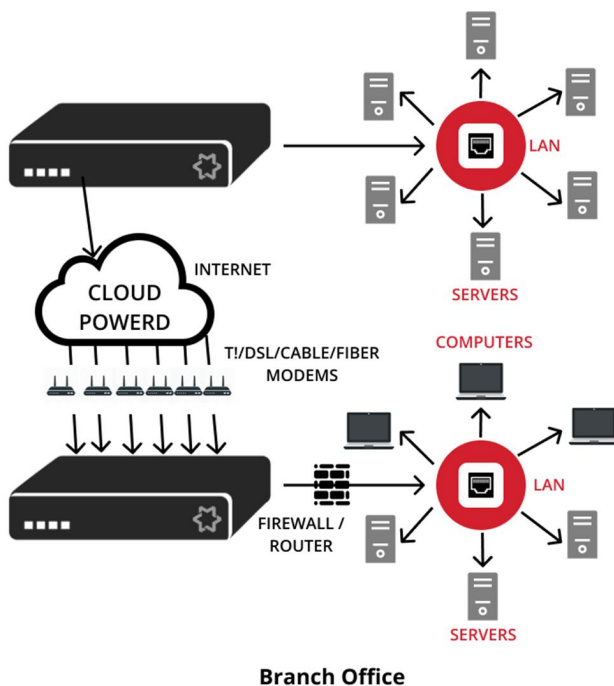
In many cases more data throughput than that is provided by a lease line is needed between the main office and the branch office. Fibre lease lines are often used in such cases, which may double the throughput, with a commensurate increase in cost

At the branch office B, suppose six ADSL lines are plugged into the WAN ports of the Bonder device installed there. Suppose each of the ADSL lines provides a 15Mbps pipe in the downlink direction and a 2mbps pipe in the uplink direction .

Solution

Leveraging Low Cost Transport Technologies And Carrier Diversity for Fast and Reliable Connectivity Between Branch Offices and Datacenter.

We have developed a Cloud Leased Line (CLL) solution, which enables bonding of multiple Internet access resources such as DSL or Cable to provide reliable high throughput data channels with 99% uptime. The bonder will leverage the unlimited availability of throughput and speed of the data center and reliability of a lease/dedicated circuit installed at the main-office/data-center and at a branch office as illustrated below.



The two devices form a transparent high-speed data tunnel between them by combining all access resources. To illustrate, suppose that office A has a 4 DSL connections that provides 4 WAN connections that provide 20Mbps/5mbps pipe to the Internet each. These pipes are in the form of an Ethernet connection that is plugged into a WAN port of a Bonder device. At the

Benefits

- **High Speed Connectivity Between Offices.**

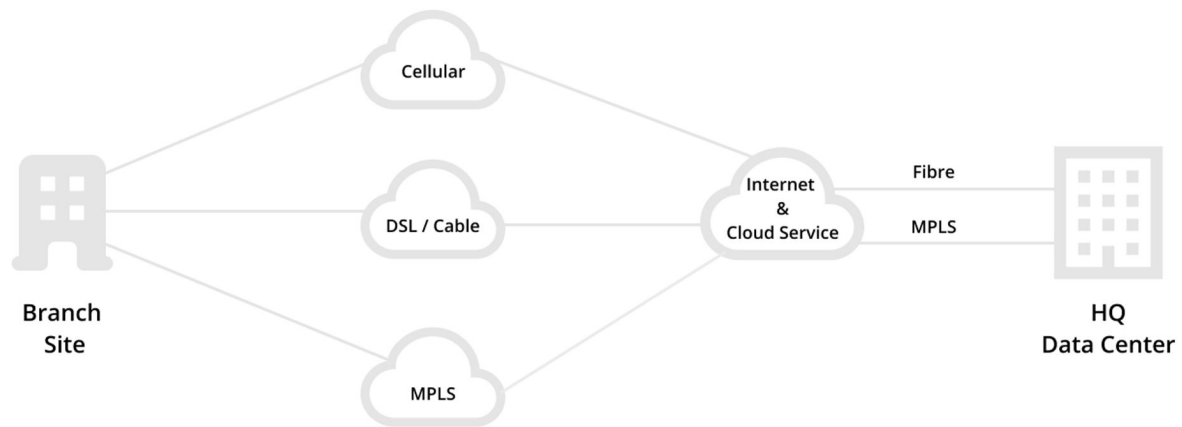
In this example, the four ADSL lines provide an aggregate capacity of 20Mbps (4 x 5mbps) in the uplink direction. These lines are infact aggregated by the Bonder device, and provide a 20Mbps pipe from the branch office A to office B. Similarly office B will have a 12Mbps (6 x 2mbps) uplink to office A.

- **High Speed General Internet Access at the Branch Office.**

Aside from the bonded IP connection, both office A and office B will be able to utilize the bonded speed of their DSL lines for their regular HTTP Internet access, in this example 80Mbps for office A and 90Mbps for office B.

- **High 9's Reliable WAN Connectivity for All Branch Offices.**

The overlay bonding tunnel CLL is similar conceptually to a VPN tunnel in the sense that there is a logical connectivity path between the two Bonder points. This provides the ability of the CLL tunnel to shield any ISP outages from the applications that are utilizing the SD WAN powered CLL tunnel. For the branch office to loose their application session, all of the ISPs that are bonded require to have disconnect event at the same time, which is a very low probability event compared to a single Internet connection. CLL can bond various types of Internet connections from any service provider including DSL, Cable, MPLS, T1, E1 or any other IP based Internet connectivity.



- **Up to 40% Cost Reduction on Monthly Internet Access Fees & Quick ROI (Return On Investment)**

Compared to using a leased line or a dedicated fibre line, our CLL solution provided by Bonder units can save a business 50% per month. For example, a typical price for dedicated fibre service is \$800 per month. Rather than using dedicated fibre, which has a throughput of 100Mbps in each direction, the business can use two Bonder units and four 20Mbps/5mbps DSL lines. This provides the branch office with a faster 80Mbps/20Mbps data connection to the main office at a fraction of the cost. A typical price for business DSL is \$75 per month, so the cost of four DSL lines is approximately \$300 per month. This results in a savings of \$400 per month, a 50% savings on monthly fees and therefore paying for the Bonder equipment in less than a few months.

Similarly, consider the case where a leased line is used, which typically costs around \$400 per month. Instead, this could be replaced by 3 DSL lines resulting in a savings of approximately \$200 per month.

25% - 40% Cost Reduction



Quick ROI



These calculations do not factor in the added value of high speed general Internet access at the branch office that is enabled by our CLL solution. In the example above, a 80Mbps down / 20 Mbps up Internet access service is provided at a cost of \$200 per month. Nor do these calculations take into account that the CLL solution can provide highly reliable service than otherwise possible, by combining different types of services from different carriers and providing session continuity for applications even during ISP failures.

Compared to Using a Leased Line Or a Dedicated Fibre Line, Our CLL Solution Provided by Bonder Units Can Save a Business 50% per Month.

Features

- **Plug and Play Transparent Installation & Advanced Router and QoS Features .**

In situations where the branch office has an existing local network with a single WAN connection, Bonder can be installed without any modification to the existing network, including assignment of IP addresses and the existing firewall configuration. This makes the installation of the CLL solution very fast, with minimal down time of an operational network during the installation process.

The Bonder has advanced router features, which can be optionally enabled at no additional cost. A notable feature is the VOIP module, to control congestion from in-bound traffic to control QoS for real-time applications. Many company network administrators currently provision dedicated access lines that only carry VoIP traffic, to prevent QoS degradation. The VOIP module present on the Bonder enables user defined rate limiting of non-real-time traffic so that real-time traffic, such as VOIP traffic, does not suffer unacceptable QoS degradation due to non-real-time traffic, for example video downloads.

The Bonder includes a full function stateful firewall, which can optionally be enabled. Flows can be defined by source IP address, destination IP address, source port, and destination port, and protocol number, and each such flow can be selectively blocked (outgoing) or selectively unblocked (incoming). Bonder can be easily configured so that traffic to certain external public IP addresses and ports numbers can be forwarded to local servers and hosts with internal private IP addresses and ports, a feature called port forwarding.

A DMZ feature is included so that all incoming traffic not matching certain criteria are sent to a "DMZ" server, to facilitate advanced

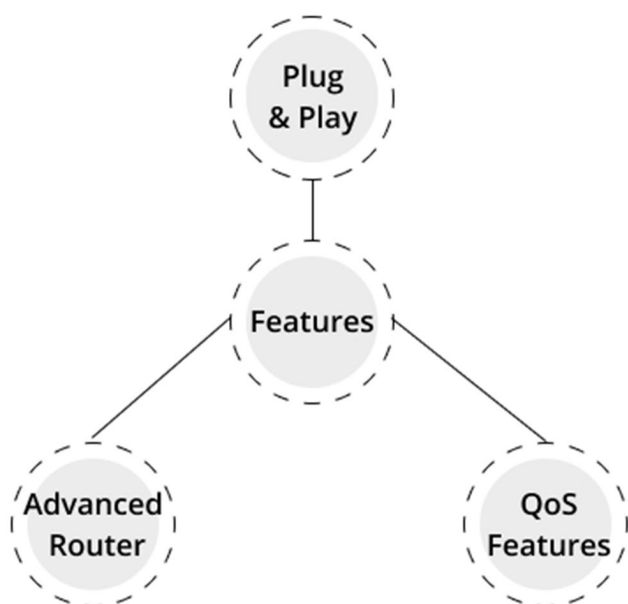
The Bonder also supports a feature called tunnel bypass, which allows an operator control to pin down certain types of traffic to a particular interface during normal conditions.

This allows the operator maximum flexibility for configuring the Bonder for operation in many application environments .

The Bonder can be configured to automatically send out email alarm messages after critical events. It is easily managed through an easy to use web-based graphical user interface, which can either be accessed locally, or remotely, via a password. SNMP support is included (MIB 2, read-only).

Traffic Monitoring module provides identifiers of traffic which gives pin-point control of your traffic the network. A graph based traffic monitoring is also available with histograms over minutes, hours, days, months and years .

Scalable design of the Bonder, enables IT personnel to easily and quickly deploy units in large scale. The remote manageability, remote firmware upgrades, configuration backups, CLI scripting options, hot-fail over dual install options enables businesses with the highest level of uptime with ease .



Conclusion

The Bonder provides a unique fast, reliable and inexpensive data connectivity between the offices of a business by bonding low cost transport technologies, such as DSL, cable or any other IP based Internet connection. Compared to the alternative of using a single and expensive Internet line, CLL solution reduces WAN expenses for a business around 50% per month per branch office. As an added benefit, reliable general Internet access can be provided for the branch offices .