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Cloud Leased Line (CLL) for Enterprise to Branch Office Communications

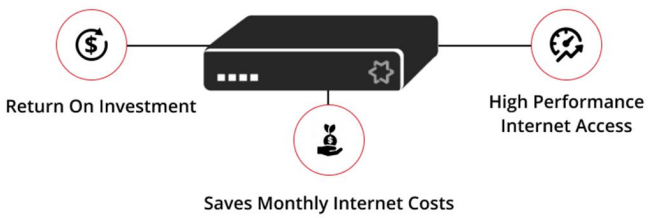
CLOUD LEASED LINE (CLL) FOR ENTERPRISE TO BRANCH OFFICE COMMUNICATIONS

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

Executive Summary

The Bonder enables enterprises with branch offices to have reliable high performance data connectivity between their main headquarter office, datacenters and branch offices.

Each branch office is enabled with this fast Internet pipe by bonding multiple instances of cost-effective transport technologies such as DSL via a Bonder .



The Internet lines to be bonded may be from different carriers for ISP diversity to increase reliability.

Additionally, leveraging the high bandwidth connectivity present at the Data Center of the enterprise, Bonder provides the branch office facility with reliable, high performance Internet access at a fraction of the cost of single provider solutions.

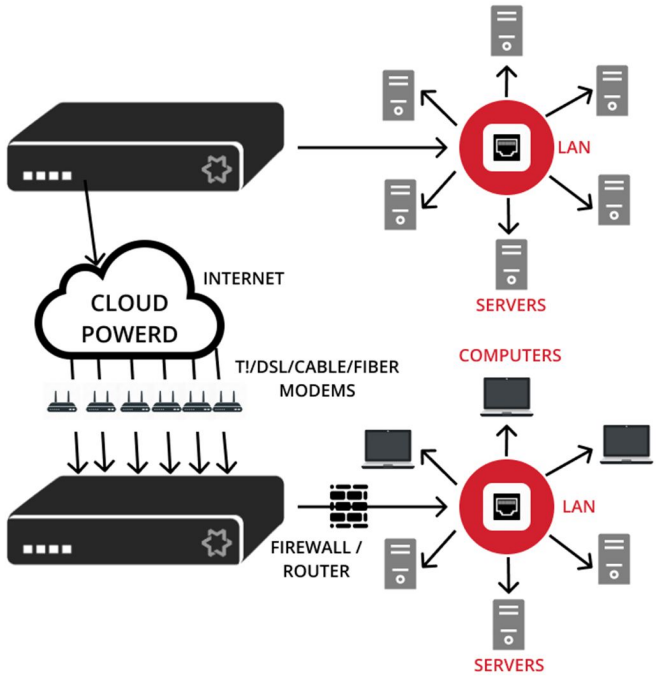
In this brief application note, we explain how the Bonder can save enterprises with branch offices on their monthly Internet access cost, with a return on investment measured in a few months .

Problem

Data Connections Between an Enterprise Headquarters Facility and Branch Offices are Unreliable, Not Fast Enough and Expensive.

Enterprises that have a main headquarters facility such as a main office or data-center and 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. Although it may be economically feasible to provide high bandwidth Internet connectivity to the main office, providing the same speed connections to each branch office can become prohibitively expensive since there may be many branch offices and the available Internet services might be limited or costly. Due to security considerations, typically all data communications at a branch office, including Internet access, is funneled through the main office facility. Thus, for the data connection between the main office data-centers or public data-centers and the branch office, it is desired to have as high throughput as possible with high reliability that also supports session continuity of applications even during some ISP failures .

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 leased line to provide Internet access. The Internet connection that is provided by the leased 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 leased line is needed between the main office and the branch office. Bonded/fibre leased lines are often used in such cases, which may double the throughput, with a commensurate increase in cost. .



Branch Office

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 .

The two Bonder devices form a transparent high-speed data tunnel between them by combining all access resources. To illustrate, suppose the enterprise data-center has a fibre connection that provides the data-center with a symmetric 100Mbps pipe to the Internet. This 100Mbps pipe is in the form of an ethernet connection that is plugged into a WAN port of a Bonder device. At the branch office, suppose four 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.

Benefits

- **High Speed Connectivity From Branches to the Headquarters/Datacenter.**

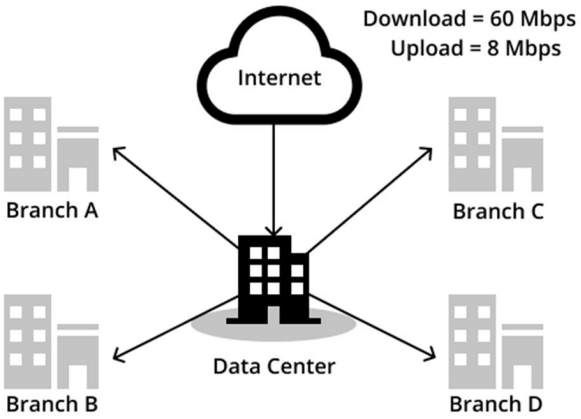
In this example, the four ADSL lines provide an aggregate capacity of 8Mbps (4 x2mbps) in the uplink direction. These lines are in fact aggregated by the Bonder device, and provide a 8Mbps pipe from the branch office to the cloud. From the cloud to the Internet there is 100Mbps connection, and from the Internet to the branch office there is an aggregate capacity of 60Mbps.

In summary, the bonder create an IP pipe between the cloud and the branch office, which has a capacity of 60Mbps from the cloud to the branch office, and a capacity of 8Mbps from the branch office to the cloud.

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

If desired, the branch office can use the 60Mbps/8Mbps pipe that connects it to the main office for general Internet access. On the other hand, the Bonder device at the office can leverage the 60Mbps aggregate download capacity for HTTP downloads directly.

Thus, the users at the branch office facility can enjoy an Internet access with downloads up to 60Mbps and upload speeds of up to 8Mbps.



In summary, the bonder create an IP pipe between the cloud and the branch office, which has a capacity of 60Mbps from the cloud to the branch office, and a capacity of 8Mbps from the branch office to the cloud.

- 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)

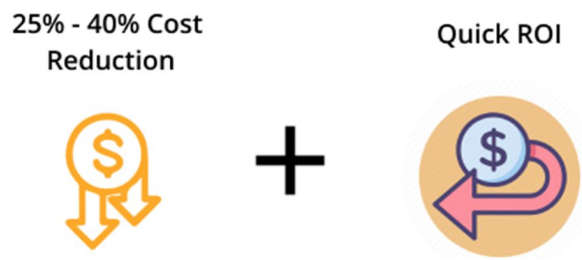
Compared to using a fibre line or a lease line, our CLL solution provided by Bonder units can save a business 50% per month.

For example, a typical price for leased fibre service is $600 per month. Rather than using leased fibre, which has a throughput of 100Mbps in each direction, the business can use two Bonder units and four 15Mbps/2Mbps DSL lines.This provides the branch office with a faster 60Mbps/8Mbps 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 $300 per month. Similarly, consider the case where a leased line is used, which typically costs around $400 per month. Instead, this could be replaced by 1 DSL lines + 1 Cable and 1 cellular (as back up) resulting in a savings of approximately $100 per month.

These calculations do not factor in the added value of high speed general Internet access at the branch office that is enabled by the Bonded CLL solution. In the example above, a 60Mbps down / 8 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.



Features

- Plug and Play Transparent Installation & Advanced Router and QoS Feautres .

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 inbound 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 .

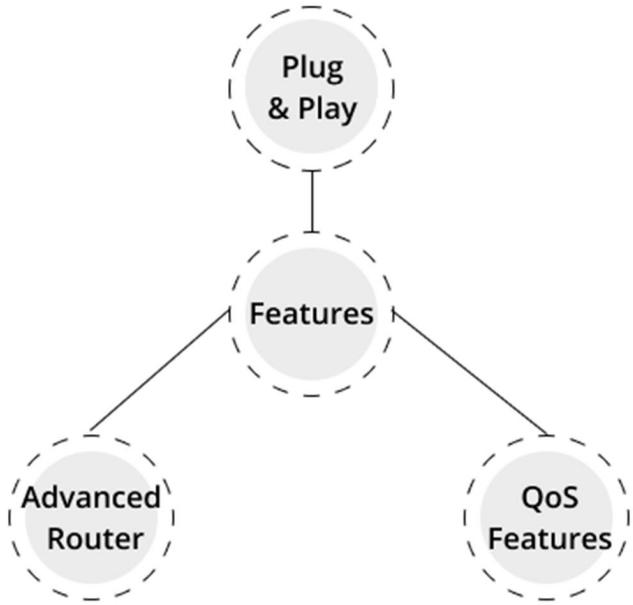
The Bonder includes a full function stateful firewall, which can optionally be enabled. Flows can be defined by source IP address, destination IP address, source port, and destination port, and protocol number, and each such flow can be selectively blocked (outgoing) or selectively unblocked (incoming). 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 security.

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 .

Bonder can be configured to automatically send out email alarm messages after critical events .

Bonder 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 application identifiers of traffic which gives pin-point control of your traffic within 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 Bonders in large scale. The remote manageability, remote firmware upgrades, configuration backups, CLI scripting options, hot-fail over dual install options enables enterprises with the highest level of uptime with ease.

Conclusion

The Bonder provides a unique fast, reliable and inexpensive data connectivity between the main-office / data-center of an enterprise with its branch offices, 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 an enterprise around 50% per month per branch office. As an added benefit, reliable general Internet access can be provided for the branch office through the Internet connection at the main office .

Traffic Monitoring Module Provides Applications Identifiers of Traffic Which Gives Pin-Point Control of Your Traffic Within the Network. A Graph Based Traffic Monitoring Is Also Available With Histograms Over Minutes, Hours, Days, Months and Years.