

### Overview

The following is a whitepaper discussing the SmarttNet Managed MultiLink PPP service known as SmarttNet Arista. This document aims to provide an introduction and overview of the technology and its adaptation to meet high bandwidth demands:

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### Introduction

SmarttNet Arista Connect is based on traditional PPPoE (Point to Point Protocol over Ethernet) which permits multiple users to connect to a CAD (Common Access Device) such as a router. The CAD manages the users and connects them to a common Internet uplink such as DSL, Cable or Wireless connection. PPPoE was developed as a result of the emergence of high speed data transfer technology such as DSL and their convergence with high speed connection interfaces such as Ethernet.

For further information regarding the development of PPPoE, visit the IETF (Internet Engineering Task Force) website or click [here](#).

### SmarttNet PPPoE Adaptation

SmarttNet has taken the traditional PPPoE technology and adapted it to our network for those customers requiring higher bandwidth connections. We are able to seamlessly operate multiple DSL connections under one PPPoE interface (Multilink) and provide greater bandwidth to the end user. Data throughput rates up to 24Mbps for download and 4Mbps for upload can be achieved using this technology.<sup>1</sup> Arista provides not only greater throughput, but also some redundancy. If one DSL connection were to fail, the other DSL connections will still provide throughput capability without interruption.

### Benefits to Consumers

SmarttNet Arista Connect benefits a wide range of consumers. Specifically, businesses which require:

1. Higher data throughput and bandwidth usage.
2. Have multiple offices which interconnect (or one office which acts as the host with satellite offices. connecting to it in order to retrieve customer information, process payments, share files, etc.)
3. Require added redundancy to a native connection.
4. Wish to take advantage of unmetered traffic within our network and data center.
5. Want the option of scalability without expensive cost of future infrastructure, re-wiring or outages.

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<sup>1</sup> Higher data transmission rates are possible but are customized options. Please inquire for details.

Arista does not require 3<sup>rd</sup> party software and therefore there are no hidden or additional licensing fees. Also, Arista can be modified to permit even higher data throughput by adding additional lines making future upgrades more convenient and cost-effective.

## Equipment, Dependability and Security

**Equipment:** SmarttNet Arista Connect uses only Cisco equipment to manage the customer connection at each controllable end point (Customer Premise and our Network Operations Center). The network and connection as a whole are managed by our IT in-house staff.

**Dependability:** Arista is based on stable and widely available DSL technology. The multiple-bonded DSL can combine even on Dark DSL (circuits without a telephone number assignment). Arista’s use of multiple lines provides for some redundancy. If one of the lines were to fail, other lines take over the load in real-time, reducing the impact on your business and your employees.

**Security:** You or your network administrator retain control over your Local Area Network (LAN), SmarttNet assigned IP addresses and network topology. Arista also helps you with Internet or Intranet communications as it is a connectivity service which is only provided with static IP assignments – so you can easily establish VPN (Virtual Private Network) connections and enforce other security measures. Your LAN environment can also be managed by SmarttNet as part of our ISLA (Integrated Service Level Agreement).

## Service Comparison

Below is a brief overview of how SmarttNet Arista compares against other high bandwidth services. There are pros and cons to all service types – this analysis will help you identify whether Arista is the service that can fulfill your business needs.

### Arista VS Cable

Cable service has enjoyed a competitive advantage against other types of connections until recently. It had significantly reduced the cost of high bandwidth service through emulation technology which allows higher throughput to be achieved. Also, its wide deployment allowed for very inexpensive startup or initial investment costs for the end user. However, due to its shared nature, Cable is susceptible to variation in data throughput, making it a less dependable service for high bandwidth users unless a more expensive service level is purchased. Also, the lack of true static IP addresses in the base packages again make it an unreliable service for businesses, particularly those with security concerns.

Criteria	SmarttNet Arista	Cable
Availability	Excellent	Excellent
Service activation wait time	7 business days	Varies (usually same week service)
Startup & Infrastructure Cost	Inexpensive	Inexpensive
Consistent Connectivity	Excellent (Not shared)	Varies (Shared with others)
Static IP Address	Yes	Varies (higher packages available)
Future Expansion Costs	Very Low	Very Low
Redundancy built in	Yes (multiple connections)	No (single connection)
Data Transmission	Asymmetric	Symmetric
Data Throughput (Download)	6 - 24 Mbps (for businesses)	1 - 5 Mbps (for businesses)
Data Throughput (Upload)	1 – 4 Mbps (for businesses)	2 Mbps (for businesses)

SmarttNet Arista now provides a viable 2<sup>nd</sup> option. Not only can our data throughput rates exceed those of cable, the DSL framework also does not share connectivity with any other users. Finally, SmarttNet provides true static

IP addresses, allowing greater flexibility for security deployments by you. And now, with the launch of Arista's competitive packages, a service is available that competes and beats Cable when it comes to value and cost savings.

### Arista VS Fiber

Fiber is one of the most stable and reliable connection types available. Its framework provides flexibility on how data transmission is achieved and security concerns can be dealt with by the Network Administrator through various tools. Its infrastructure is designed in such a way that near seamless expansion and upgrades are possible. Unfortunately, Fiber is restrictive not only due to its startup and deployment costs, but its availability. Outside of urban centers or major communication hubs, Fiber becomes an expensive commodity not widely available.

Criteria	SmarttNet Arista	Fiber
Availability	Excellent	Limited
Service activation wait time	7 business days	Varies (4 – 6 weeks)
Startup & Infrastructure Cost	Inexpensive	Varies (moderately expensive – very)
Consistent Connectivity	Excellent (Not shared)	Excellent (Not Shared)
Static IP Address	Yes	Yes
Future Expansion Costs	Very Low	Varies (usually very expensive)
Redundancy built in	Yes (multiple connections)	No (single connection)
Data Transmission	Asymmetric	Symmetric
Data Throughput (Download)	6 - 24 Mbps (for businesses)	10 – 100Mbps
Data Throughput (Upload)	1 – 4 Mbps (for businesses)	10 – 100Mbps

### Arista VS Wireless

Wireless is a relatively new member to business connectivity options. Traditionally reliability and the initial startup costs have been the greatest barriers to its wide use. Non Point to Point connection options are often unreliable and affected more so by weather. Point to Point connections require line of sight, which if not available can substantially increase the deployment cost.

Criteria	SmarttNet Arista	Wireless
Availability	Excellent	Limited
Service activation wait time	7 business days	Varies (one week)
Startup & Infrastructure Cost	Inexpensive	Varies (moderately expensive – very)
Consistent Connectivity	Excellent (Not shared)	Varies (Not shared, weather)
Static IP Address	Yes	Yes
Future Expansion Costs	Very Low	Varies (usually very expensive)
Redundancy built in	Yes (multiple connections)	No (single connection)
Data Transmission	Asymmetric	Symmetric or Asymmetric
Data Throughput (Download)	6 - 24 Mbps (for businesses)	1 - 10 Mbps
Data Throughput (Upload)	1 - 4 Mbps (for businesses)	1 – 5 Mbps

Although organizations such as the Wimax consortium and IEEE are making strides in standardizing the protocols and technologies used for wireless communication, the industry is still not at a point where business class wireless services can be deployed at a cost that is competitive with DSL, Cable or even Fiber. Also, the data throughput rates of wireless connectivity options do not yet match those available for DSL, cable or Fiber.

Currently point to point wireless is almost exclusively used for out of reach locations where the other three connectivity types are not available or as a backup connection for businesses requiring absolute business continuity irrespective of cost or deployment time.

### **Current and Future Availability**

Arista is currently available for customers in British Columbia and Alberta. Future roll-out in other provinces are planned. If you wish to be considered as a candidate for one of our other geographic locations prior to an official mass launch, please notify your account manager and they will process your request.

### **Support and Trouble-Shooting**

SmarttNet Arista is part of the SmarttNet “No Touch” Connectivity Service Suite. We provide the equipment, verify its operations prior to delivery, manage the provisioning of the physical lines and install the service and equipment on-site. We will then verify its operation and provide you with a demo of its functionality. You don't have to touch a thing.

If there is a problem with the service anytime after departure, our support staff is on hand to assist you with any potential problems. Our support staff is available during normal business hours with speedier service available through our 24/7 Emergency Support service.

### **Service Activation Steps**

Activating your SmarttNet Arista service is quick and painless – below are the necessary steps we will take to activate your service. The entire process usually takes 10 business days or less:

1. Complete a Connectivity Order Form on our website or contact your Account Manager who will help you with the process. (same business day)
2. We will help you verify that you have all required infrastructure (such as being located in the service area and having sufficient copper cable capacity). If you should not meet one of the requirements, we can provide suggestions on how to rectify the problem. (1 business day)
3. Make the necessary provision changes on your lines.(5 business days)
4. Make an appointment for the installation of the equipment and activation of the service. (1 business day)

### **Questions & Next Step Procedures**

You likely have many questions about Arista and how SmarttNet can help satisfy your connectivity needs. Our sales staff can respond to most of your inquiries. If you have more detailed technical questions, one of our sales staff or your account manager can help direct you to the right technician for further consultation.

We suggest you visit our site for more information on Arista and other SmarttNet services.

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