A Case for Client-Side PPPoE Software

fine point networks

Making Broadband Manageable: Be Empowered.

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TABLE OF CONTENTS

INTRODUCTION: WHY SELECT CLIENT-SIDE PPPOE SOFTWARE?

One of the most significant issues facing Internet Service Providers (ISPs) and carriers deploying high-speed access services continues to be the ease of configuration and clarity of service at the customer premise level. While maintaining such customer satisfaction is fundamentally important, it is critical to ensure that the costs of providing these services stay as low as possible if one is to maintain a viable business. Thus, balancing subscriber needs with a low cost structure has become a prime industry objective. The adoption of PPPoE has provided a solution to this challenge. With PPPoE any negative repercussions–both at the customer premise and at the NOC – are kept to a minimum.

A number of factors have kept the broadband service provider from realizing the originally anticipated profits. Infrastructure and support costs have been significant, and the competition has been greater than expected. With this in mind a number of service providers have begun installing CPE (customer premise equipment) PPPoE routers that perform the features of a PPPoE client. However, in the pursuit of a short-term solution, service providers have over-looked a great deal of the implications of PPPoE NAT routers and the long-term disadvantages of such.

SERVICE DELIVERY – THE KEY TO FUTURE BROADBAND SUCCESS

The business model for the broadband Service Providers is straight forward:

- Sign up subscribers
- Deliver Services/Generate new revenue streams

As in all industries, competition drives prices down, but with broadband service providers this competition comes from sources outside of the traditional Telecom community. Cable television providers, wireless communications companies – even the power utilities - are all in the game. Naturally, if costs remain the same as revenue drops, profits decline. Service providers are realizing that there is a level below which costs cannot be cut. To remain competitive and profitable, they MUST discover new revenue streams.

Using the CPE as the PPPoE client limits the service provider, cutting it out of many revenue streams that are made possible by emerging technology advancements. These include dynamic service selection, multiple service selection and many of the new breed of "killer apps". The implementation on the CPE level has the potential to dangerously stunt a growing company.

Dynamic Service Selection is a prime example. The service provider has the technology to offer users a variety of discrete services over the same facilities. However - PPPoE routers (CPE's that act as the PPPoE client and a NAT router), although they can connect to specific services, simply do not and can not support Dynamic Service Selection. Potentially, the end result is a revenue stream that will never be realized.

SUBSCRIBER IDENTIFICATION – WHO IS ON YOUR SERVICE?

Though immediately logical, the CPE approach does present a problem. When using a hardware solution to reduce costs, vendors who employ CPE to emulate a PPPoE client defeat one of the greatest advantages of using PPPoE: to identify and authenticate actual users. No longer can the service provider "know" who is online and building a database of quantifiable demographics becomes, at best, problematic. However, more than just the vital connection to each individual PC is lost. There is revenue that is never being realized. Many homes have multiple PCs in use at the same time and the connection requirements inherent to PPPoE allow for greater ISP profitability while remaining user-friendly for the subscriber.

Knowing who is online, and building an information database about them and their usage allows not only for the sale of this information, but direct and targeted marketing on an individual basis.

THE DANGER OF NAT ROUTERS TO YOUR SERVICE

When a service provider allows the subscriber to run multiple PCs behind the CPE, without the ability to manage or even monitor them, they open one door and close another. The door that is open: excessive bandwidth utilization. The door that is closed: revenues derived from each individual user. Looked at closely, the former results in higher infrastructure costs, and the latter, in lost income.

The network design team, unless they have access to a tool similar to Fine Point Technologies' Network Capacity Planner (NCP) – uses a "best guess" system when provisioning their infrastructure. That is to say – the average subscriber is expected to use only a portion of the available bandwidth available to him. The network infrastructure (or backbone) is designed to accommodate 'X' number of subscribers each using an average of 'Y' bandwidth.

The problem arises when the "number of subscribers" is based on the number of households, or number of physical lines, rather than on the number of actual users. Never more clearly was the danger of this method of overbooking facilities shown than in 1996 when one of the Big Three Carriers, having built a nation-wide Frame Relay network in the US, sold access with zero CIR (committed information rate)[1]. It under estimated the amount of traffic that the network would be required to support, and the resulting loss of data and network outages cost them millions of dollars.

Allowing, or not taking steps to prevent, the use of NAT (network address translation) routers in the home assures that the service provider can never know how many actual users there are, never know how much potential traffic can be generated, and never know how to best provision the infrastructure.

NAT also deprives the service provider of revenue in terms of fees that could be charged for "each additional PC" (just as the cable TV provider charges for each additional converter or TV hook up).

1 Committed Information Rate (CIR) is the amount of data a carrier commits to delivering over a given line. Frame Relay allows the customer to mark some data "Discard eligible" (DE) which is not calculated into the CIR. Because of digital facilities and higher level protocols, most of the data will still be delivered. Betting on this this, the carrier sold service to many customers where all data was DE and caused a serious problems. Their network capacity planners looked at the total committed data requirements, added 30% and built a network infrastructure that experienced five times the amount of utilization expected. DE data was being delivered in advance of non-DE data, and those customers who were sold zero CIR, (but promised, in writing, no delivery problems) experienced lost data, extraordinary delays and outages lasting as long as a day. The basic design flaw was that all data was allowed on the network and service providers expected the egress switches to deal with the DE/non-DE data flow.

PPPoE Client Software - Reliable, Low-cost Solution

Historically, the PPPoE technology was a newcomer to the broadband market and as with all new technology; initially there may have been problems and learning curves. However, both PPPoE and client-side PPPoE software has greatly evolved from what they used to be. Today, a client-side PPPoE solution, delivered via WinPoET, is one of the most reliable, low cost, low technical support solutions available. Fine Point Technologies prides itself with its new WinPoET PPPoE solutions because the amount of technical support required for deploying PPPoE has become small to negligible.

APPENDIX: THE PPPOE SOLUTION

ISPs may offer several architectural options by which subscribers may access broadband services. The most common of these options are PPPoE, PPPoA, Static IP, and DHCP. Many of the ILECs have decided to invest in PPPoE due to its flexibility in providing the following:

- Authenticating new users
- Automating IP configurations
- Enabling differentiated services
- Providing support for multiple user sessions
- Integration with back-end billing
- Support for low-cost bridged modems
- Support for DSL, cable, wireless, and satellite deployments with the same infrastructure
- Supported by multiple operating systems
- Requires new client software

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