

## VIRTUAL PRIVATE NETWORKING - THE FLEXIBLE APPROACH

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### Introduction

Internal and external communication needs are a vital part of today's business environment. The solution a business chooses to satisfy these needs can be driven by many factors including financial, functional, and service considerations.

The use of virtual services to satisfy these needs is growing, with Virtual Private Networks (VPN) and Centrex offering an alternative to more established solutions. This paper explains what these services are and what makes them attractive to customers. The FeatureNet service, offered by BT, is used to illustrate implementations of virtual services in the market place.

### Virtual Private Networks

A VPN provides a customer's site with access to a "Cloud" that manages the inter-site and external traffic for the company (See figure 1). A dial plan is maintained for the customer's sites that enables private numbering schemes to be implemented across the network.

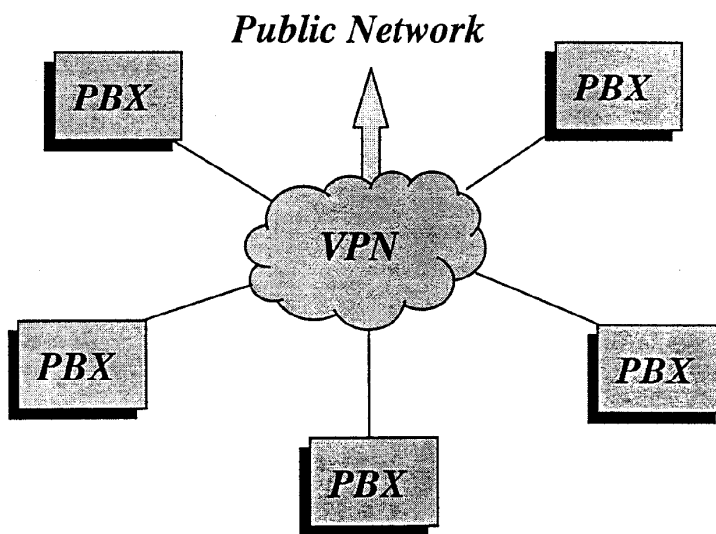


Figure 1. A Virtual Private Network

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The service surround and connection options to the public network will vary across different service providers. Although adopting a VPN is not usually considered as outsourcing, the day to day management of the network is left to the service provider, leaving the customer free to focus their efforts on core business. The tariff for inter-site traffic will usually be designed to make the VPN more attractive than the use of the public network for the target customers. As fluctuations in inter-site traffic levels occur, then the VPN can handle the variations without blocking or overflow to the public network, and therefore provide a cost effective and flexible solution.

VPN's provide a solution to a business need to connect more than one site together. This need can arise out of a business expanding out of a single site, or the desire to replace existing solutions. Existing solutions are usually the direct use of public network dialling between sites, or private circuits providing a company dial plan.

The use of the public network (See figure 2) for all inter-site calls can be a sizeable part of the communication spend for a business. If inter-site traffic is significant then a private network solution will usually provide a cost effective way of satisfying the business needs.

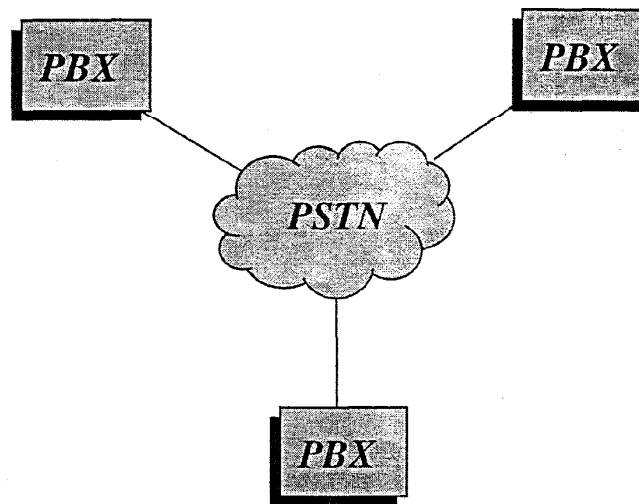


Figure 2. The public network for connecting sites

Private networks have been traditionally implemented using private circuits to build an interconnect network between the sites (See figure 3). This requires the customer to manage the ordering of all the circuits, provide sizing information, and manage the fluctuations in traffic. The sizing of the routes requires the number of channels to be specified in and out of each site to all other sites. This information must be managed and any variation predicted. For a very stable company infrastructure this task can settle down but for a large proportion of businesses this task can quickly require a large amount of their resource. The greatly reduced level of management required for a VPN enables a company to re-focus this effort on core business and quite often the VPN "Cloud" can be more cost effective than under optimised or overflowing private circuits.

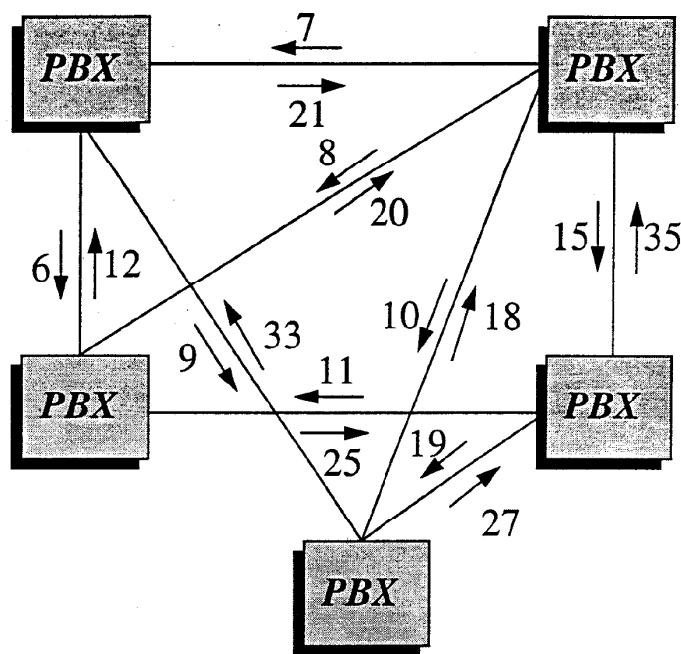


Figure 3. A private circuit based private network

The use of Virtual Private Networks will usually appeal to customers who have one or more of the following characteristics :-

1. A company that has significant inter-site traffic and numerous sites
2. A company that is frequently changing its traffic patterns
3. A company that wants to focus on core business
4. A company that is growing
5. A company that is looking for cost reduction opportunities
6. A company that wants to improve the management of its private network

## Implementing a VPN

FeatureNet1000 is the VPN service currently offered by BT and it is targeted at the large multi-site companies. The VPN is supported by a network of 25 Nortel DMS100 switches which are located around the country (See figure 4). The sites get access lines to the VPN at the Point of Presence (POP) on the network and this is routed to the switch. The switches will manage the routing of any traffic between sites and generate usage based charging information for each inter-site call.

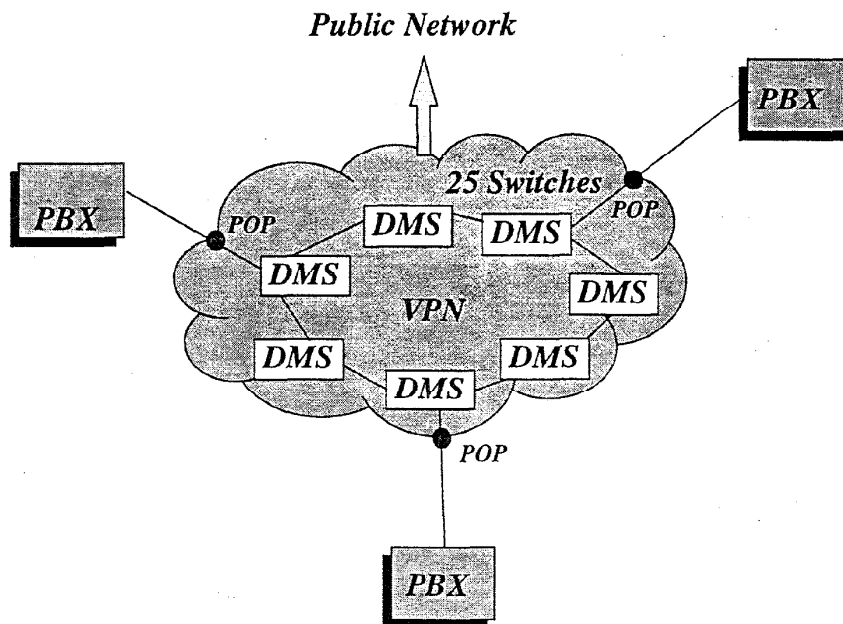


Figure 4. The BT FeatureNet VPN

Any calls to the public network get routed via the switch to a public access point. This access point can be the nearest switch to the public destination (Far-end breakout) so optimising usage of the VPN while reducing public network charges.

The switches inter-connection network is managed by BT's Network Management Centre and this ensures that capacity is always available between the switches. The routes between the switches are resilient, which can be an expensive additional cost for a private circuit based network. To size a network the customer has only to specify how many access lines they require from each site into the network and all inter-site dimensioning is handled automatically by the VPN. If traffic patterns change, the VPN has the capacity to handle new traffic flows without the customer being involved. In a private circuit implementation the customer must anticipate and specify variations so that new capacity can be bought and also potentially leaving under utilised routes.

Feature transparency between the PBX's is achieved by carrying DPNSS messages in the C7 signalling between the switches. Customer data is partitioned on the switches so that the network is as secure as a private circuit implementation.

FeatureNet offers the customer a reporting package that enables them to understand their use of the VPN. This along with an itemised bill, that can be broken down into cost centres, enables the customer to focus on cost management rather than network management.

FeatureNet1000 also offers virtual circuits (See figure 5) that enable the customer to implement a route through the VPN analogous to a private circuit but with the advantages of the VPN infrastructure. Implementing the private network with virtual circuits requires inter-site dimensioning where the number of channels in and out of a site to all the others must be specified and managed. Some customers find this attractive because it has a fixed cost independent of usage providing they have specified excess capacity. These customers see predictability of costs as paramount to their business and put it before long term cost reduction.

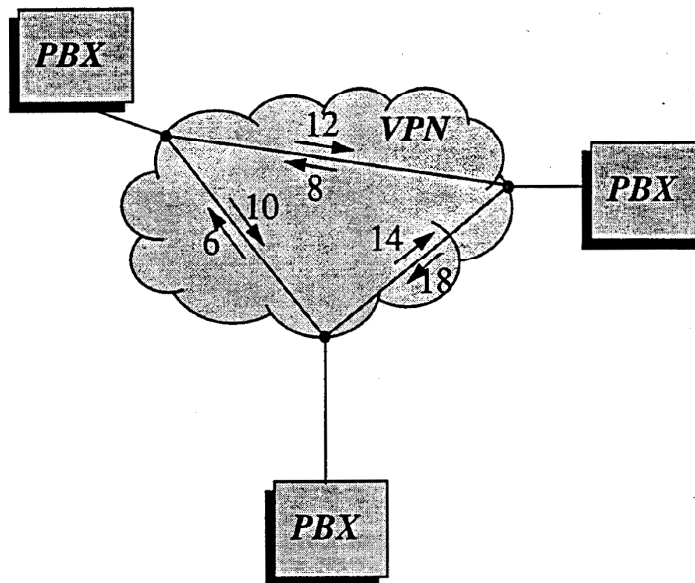


Figure 5. Implementing virtual circuits through a VPN

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