Leased Line With Differentiated Services and Individual Protection

Tellabs' Ethernet-over-SDH solutions extend the life of your existing SDH network. By migrating it to a data network, you can now provide your subscribers with tailored communications solutions while making better use of your existing network infrastructure.

One application of use for Tellabs' Ethernet-over-SDH is leased line with differentiated services and differentiated protection, as an alternative to traditional leased-line service. This application also makes better use of your SDH network due to controlled over-subscription in the network. As a result, subscribers can receive the service they need at a significantly lower price.

Today's data subscribers want more than a traditional leased connection with 2 Mbps, 34 Mbps or 155 Mbps point-to-point connections. Rather, they need:

- A service tailored to their specific bandwidth requirements.
- A service that provides better protection and security.
- Fast and easy provisioning and changes in service parameters.
- All of the above at a competitive price.

As an operator, you naturally want to meet your subscribers' growing demands, yet you also want to avoid major investments in new technology. With Tellabs' Ethernet-over-SDH solutions, you can now offer a leased line with differentiated services that provides a much better fit to your data subscribers' needs. Moreover, as the network operator, you improve your profitability through better network utilization and the opportunity for controlled over-subscription of your SDH network.

Tellabs calls this new service Layer 2 Ethernet Private Line (Layer 2 EPL)

Provide New Differentiated Services

Ethernet-over-SDH is based on cost-effective Ethernet technology to better match the needs of customers' data appliances. Naturally, this offers potential savings in both interface costs and operational expenses.

But Tellabs' Layer 2 EPL is not just cost-effective, it is also extremely flexible. Thanks to Tellabs technology, the SDH network becomes packet aware through the use of multi-protocol label switching (MPLS). When a network becomes packet aware, it provides a much better match to the needs of data subsribers, since these subscribers are also packet based. In other words, the same technology is used by both the operator and the subscriber.

One major consequence of packet enabling is the ability to offer differentiated services, as today's data subscribers want a service that is more closely tailored to their individual needs. For example, these could be:

- A leased-line type service with 3 Mbps, typically for voice, voice-over-IP (VoIP) or video.
- A burst service that provides guaranteed bandwidth (for instance 11 Mbps), with the possibility to occasionally send more traffic (for instance up to 42 Mbps). This type of service is typically used for mission-critical data applications and services.
- A best-effort service in which nothing is guaranteed except a link to the network. Bandwidth is always the best available at any given time. This type of service is typically used for Internet access or overnight database updates.

Figure 1 illustrates the opportunities for differentiated services enabled by Tellabs' Ethernet-over-SDH solutions. That means that you, as the operator, can define the services that your subscribers need and thus increase your competitive edge.

It is also possible to change the services as needs changes, thereby meeting the subscriber expectations for fast and easy provisioning.

The above services are very similar to a ATM or frame relay service. However, since they are accomplished in the SDH network, you do not need a ATM or frame relay network, which undoubtedly will simplify your network and lower your capital and operational expenses. Once again, this helps improve your profitability.

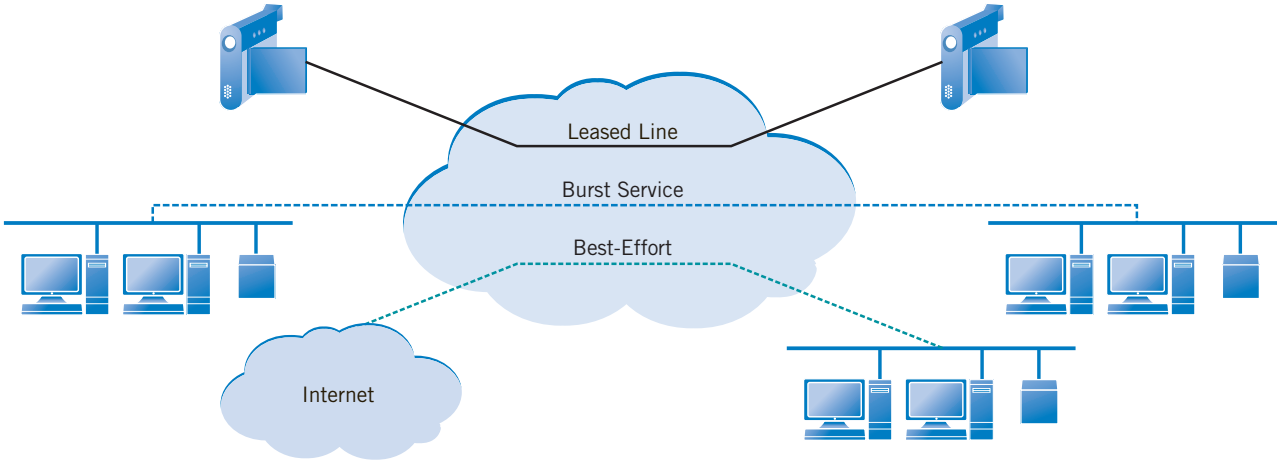

Figure 1: Layer 2 Ethernet Private Line With Differentiated Services Offer More than Just a Leased Line

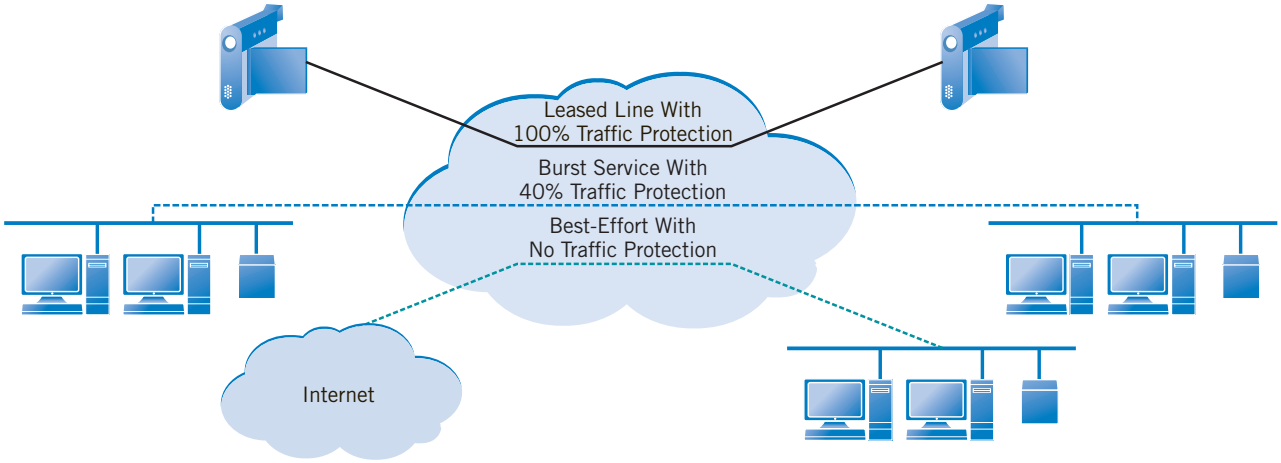

Figure 2: Differentiated Protection — The Protection the Subscriber Requests

Offer Customer Tailored Protection

When a leased line is configured today, it can be provided as an unprotected link, which means that if a fiber or a SDH component on the path fails, the subscriber cannot send or receive any traffic until the fiber or SDH component has been repaired.

The alternative in the traditional leased line is a 1+1 protection scheme in which two separate paths are established through the network. One path is primary, the other is secondary. If the primary path fails, data is sent/received on the secondary path. Naturally, the secondary path is not used for some 99.9xx per cent of the time.

With data applications becoming more and more critical to modern businesses, the unprotected line is far from ideal. However the 1+1 protection scheme that reserves an entire path for protection is often not required by data subscribers.

With the Tellabs Layer 2 Ethernet Private Line solution, it is possible to offer the protection that each subscriber request:

- A Service Level Agreement (SLA) with a traditional 1+1 protection. This could be a leased line type service with 3 Mbps in normal operation and 3 Mbps in case of path/network failure. Please notice how the capacity is offered outside the usual PDH granularity, i.e. not in steps of 2 Mbps.
- A burst service with 11 Mbps guaranteed bandwidth and the possibility to send up to 42 Mbps where bandwidth is reduced to 40 per cent in the event of path or network failure (4.4/16.8 Mbps).
- A SLA with no protection. This could be a best-effort service where no traffic can be received or sent in the event of path or network failure.

The above examples of protection offerings can be tailored to each individual subscriber.

The example in Figure 2 illustrates how protection can be specified by the operator to meet the specific needs of its subscribers, thus providing a significant competitive advantage.

Over-subscribing the SDH Network

Another important advantage in making the SDH network packet aware is that the network can now be over-subscribed. In other words, it is possible to sell the same bandwidth several times and dramatically increase the revenue from the network.

Over-subscription is possible due to the simple fact that most data applications (web browsing, e-mailing, video streaming, etc) is bursty by nature, meaning subscribers will not be using all their available bandwidth all the time.

If several subscribers share the same infrastructure, then this statistic variation in when the subscribers need bandwidth makes it possible to add more subscribers to the same infrastructure, without increasing overall network capacity.

However, just adding subscribers to the same infrastructure raises two questions:

- Security — if several subscribers share the same infrastructure, will they be able to access and read each other's information?
- Bandwidth guarantee — how can you predict the behaviour of subscribers in order to ensure bandwidth and reduce delays?

The answer to the first question regarding security is fairly simple. Because the Tellabs Layer 2 EPL solution is based on MPLS, it provides exactly the same security as frame relay, ATM or traditional SDH transport.

The answer to the second question is also fairly simple and is related to Quality-of-Service (QoS). With QoS, a traffic contract is established between the operator and the subscriber. The contract can specify parameters such as:

- Minimum bandwidth (CIR).
- Maximum bandwidth (PIR).
- Maximum delay.
- Maximum variation in delay.

Based upon these parameters, the Ethernet-over-SDH network constantly monitors the subscribers' traffic and takes action to ensure that each subscriber receives exactly what they are paying for. The consequence of packet enabling and QoS is that you, as an operator, can over-subscribe your network and still keep your subscribers satisfied. This, in turn, will increase your competitiveness and have a positive impact on your operational budget.

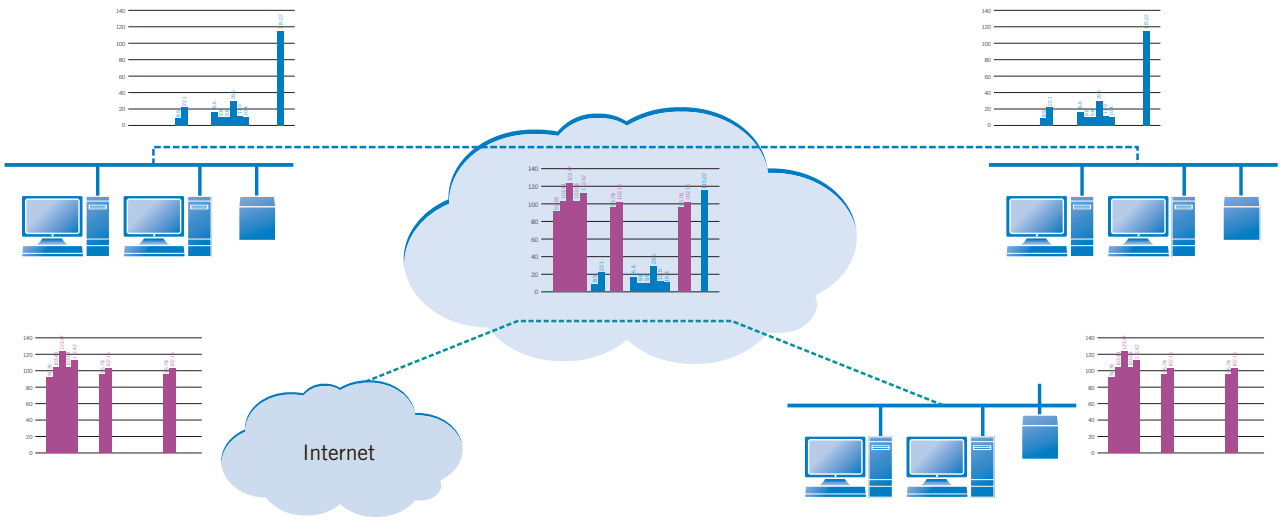

Figure 3: Over-subscribe Bursty Subscribers and Benefit From a More Efficient Network Utilisation

Benefits at a Glance

Here are just some of the many ways a Tellabs Layer 2 Ethernet Private Line solution can help to make you more competitive and reduce your operational expenses:

- The ability to offer leased line with differentiated services, similar to ATM and frame relay, but over your existing SDH network.
- The ability to offer custom-tailored individual protection packages, not just no protection or 1+1 protection.
- Over-subscription of your SDH network. The same capacity can be sold many times.
- Controlled over-subscription in your network via Quality-of-Service so that you keep your promises to your subscriber.

Tellabs Products for Ethernet-over-SDH

Tellabs® 6315 Metro Ethernet Node

Tellabs® 6325 Edge Node

Tellabs® 6340 Switch Node

Tellabs® 6345 Switch Node

Tellabs® 6350 Switch Node

For more information

Using Ethernet-over-SDH for Managed Bandwidth Services Application Note.

North America

Tellabs
One Tellabs Center
1415 West Diehl Road
Naperville, IL 60563
U.S.A.
+1 630 798 8800
Fax: +1 630 798 2000

Asia Pacific

Tellabs
3 Anson Road
#14–01 Springleaf Tower
Singapore 079909
Republic of Singapore
+65 6215 6411
Fax: +65 6215 6422

Europe, Middle East & Africa

Tellabs
Abbey Place
24–28 Easton Street
High Wycombe, Bucks
HP11 1NT
United Kingdom
+44 870 238 4700
Fax: +44 870 238 4851

Latin America & Caribbean

Tellabs
1401 N.W. 136th Avenue
Suite 202
Sunrise, FL 33323
U.S.A.
+1 954 839 2800
Fax: +1 954 839 2828

74.1410E Rev. D 02/07