# ENTERPRISE CONNECTIVITY

**ST Engineering**

## Elevating Enterprise Private Networks with Cost-effective Satellite Services

The success of today's organizations and enterprises highly depends on reliable and secure connectivity. Enterprise connectivity exists between different branches, between a central office and geographically widespread points of activity and between an enterprise and the public internet. The connectivity **enables faster, more secure transactions and improved productivity** by sharing information between entities, no matter where they are.

By offering an extremely cost-effective terminal as part of a scalable network solution, attractive IP services can be deployed complementary to terrestrial infrastructure:
- As a backup service for the terrestrial network providing business continuity
- As the main connectivity service in case no adequate terrestrial infrastructure is available providing a way to extend the operation to any location
- As a highly efficient multicasting data/video service for media-rich collaboration services, video conferencing and financial trading applications

**ST Enigneering iDirect offers a cost- effective broadband connectivity for a wide variety of professional applications on a single platform.**

**DIALOG**

*powered by*
**Newtec iDIRECT**

| Applications | Service Properties | | |
| --- | --- | --- | --- |
| | Priority | Acceleration | Encryption |
| Corporate applications<br>- ERP<br>- CRM | High | TCP/HTTP | Yes |
| Unified communications<br>- VoIP<br>- Video conferencing<br>- Screen sharing | High | RTP compression | Yes |
| SaaS/Cloud applications | Medium | TCP/HTTP | Yes |
| Email | Medium | TCP/HTTP | Yes |
| File sharing | Low | TCP/HTTP | Yes |
| Internet data and video | Low | TCP/HTTP | Yes |
| Data multicasting – file distribution | Medium | No | No |

## Applications

Typical enterprise applications can be served with different transport IP services. The service properties vary in the need for encryption, the need for acceleration and the sensitivity to latency and jitter.

## Efficient Carrier Grade Infrastructure

Our Newtec Dialog® platform provides the means to establish an "always-on" two-way IP connectivity completely independent from existing terrestrial networks.

The basic IP connectivity between hub and modem is extended with Quality of Service (QoS) in forward and return allowing the deployment of different services. The gateway contains management functionalities to monitor, configure and control all worldwide remote sites.

### Bandwidth Efficient Technologies

To make satellite an attractive alternative for enterprise connectivity, our Broadband Solution implements the most bandwidth efficient technologies, such as
- DVB-S2X Wideband ACM forward link, with Equalink® 3 predistortion and Clean Channel Technology® (low roll off)
- High Resolution Coding (HRCTM) Mx-DMA® return link
- Quaternary Continuous Phase Modulation (4CPM) MF-TDMA return link
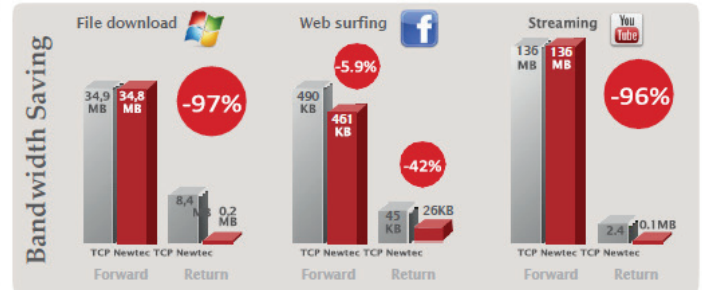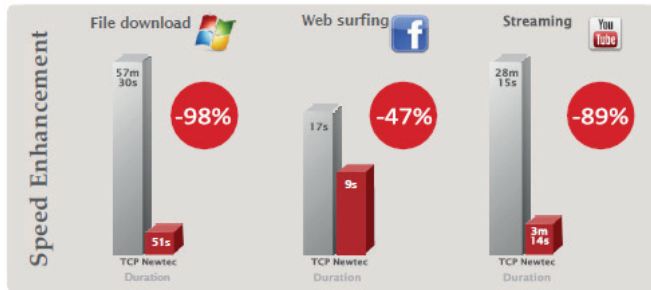- Embedded IP traffic enhancement

The 4CPM modulation combines bandwidth efficiency of linear modulation, as in the DVB-RCS standard, with a lower cost terminal.

## Hub Redundancy

The hub provides internal and interface (RF, IP, power supply) redundancy. The internal redundancy is conceived to allow full hot-standby redundancy without any single point of failure. If there would be a failure, a switch is automatically performed. High end-to-end service resilience and disaster recovery can be further assured using two hubs configured in a geographical redundant configuration, where each hub can serve as backup for the other.

## Network Optimization

ST Engineering iDirect's Network Optimization technology offers up to 35% bandwidth reduction for typical applications such as file downloading, web surfing and content streaming. The reduction of traffic in both volume and number of packets is up to 20% in the forward and up to 90% in the return. The bandwidth savings of forward acceleration is today limited since most content is pre-compressed. Bandwidth reduction is mainly achieved through overhead reduction. The gain can also be viewed from the user experience point of view. The load time of a webpage is reduced by up to 60%, while a file download time is reduced by up to 90%.

**Speed Enhancement**

| File download | Web surfing | Streaming |
|---|---|---|
| 57m 30s / 51s | 17s / 9s | 28m 15s / 3m 14s |
| -98% | -47% | -89% |

TCP Newtec Duration

**Bandwidth Saving**

| File download | Web surfing | Streaming |
|---|---|---|
| 34,9 MB / 34,8 MB — -97% | 490 KB / 461 KB — -5.9% | 136 MB / 136 MB — -96% |
| 8,4 MB / 0,2 MB (Forward / Return) | 45 KB / 26KB — -42% (Forward / Return) | 2,4 / 0,1MB (Forward / Return) |

TCP Newtec — Forward / Return

## Offering Business to Business Services

Service providers, corporations and organisations are all faced with different security and scalability needs. Some organisations will have high needs for security that they will fully take care of themselves. Others will have enough trust and confidence that they will leverage the services offered by the service provider.

On a VSAT platform different network architectures can coexist on the same platform, providing service diversification. Service providers can optimize CAPEX and OPEX by offering enterprise connectivity services for multiple entities in a shared platform. This helps service providers struggling to strike a balance among their biggest business concerns - capacity, scalability, customer satisfaction and cost.

### Internet Access for SOHO and SME

Small offices are typically looking for pure broadband access with main office applications like web surfing, VOIP and email.

An architecture where all terminals belong to the same network is ideal to offer internet access services for Small Office and Home Office or Small & Medium Enterprises. In this configuration our Dialog terminals consume only one public IPv4 address and IP address management is simple. A DHCP server is integrated in the modem assigning the addresses to the devices connected to the modem. All payload traffic is encrypted and fully accelerated.
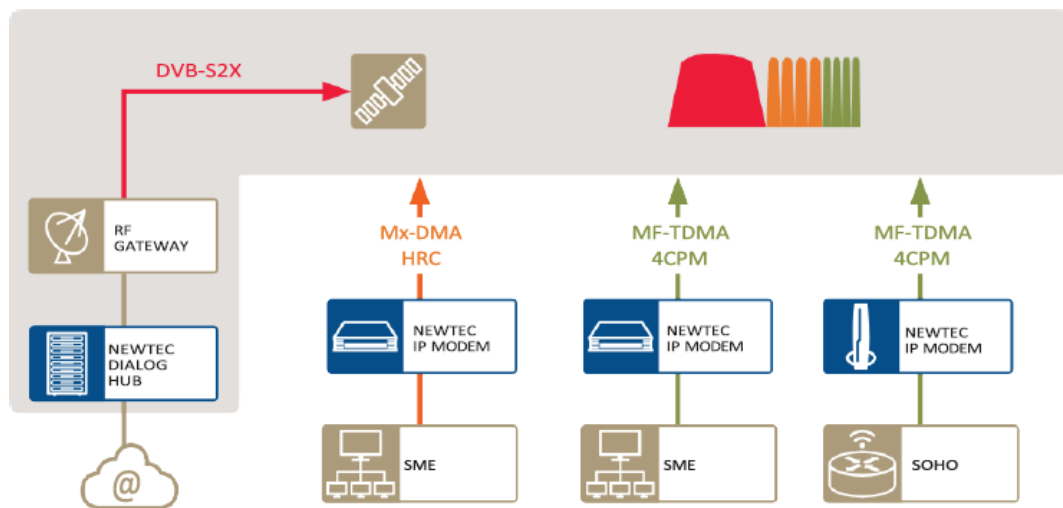


Figure 1 - Internet access for SOHO and SME

## Internet Access for SOHO and SME

Enterprises or larger organisations have typically different needs for their communication infrastructure. First of all they need more public IP addresses in order to connect their own servers to the internet.

Our Dialog configuration offers full routing capabilities on the modem.

## Private Networks for Large Enterprises and Organisations

A network that connects the numerous sites of a distributed enterprise using a shared communication platform is a Virtual Private Network (VPN). These VPNs provide the benefits of dedicated networks but not the associated cost. Administrators can easily create and modify the Virtual Network (VN) environment.

In a VN context, a key requirement is network isolation. This means routing and forwarding tables used by one VN should be able to be isolated from those used by other VNs. The Virtual Routing Function (VRF) creates multiple virtual routers in a Dialog hub to realise multiple VPNs. On top of the network isolation, the Dialog platform offers further security measures such as AES encryption using X.509 digital certificates.

### Network Isolation
Service providers can optimize CAPEX and OPEX by offering enterprise connectivity services for multiple entities in a shared platform. Figure 3 depicts two isolated enterprise networks connecting a headquarters with its branch offices. The hub acts as a router with multiple VRF functions creating fully isolated virtual networks. Service OPEX is reduced because all forward traffic is shared on the same forward link.
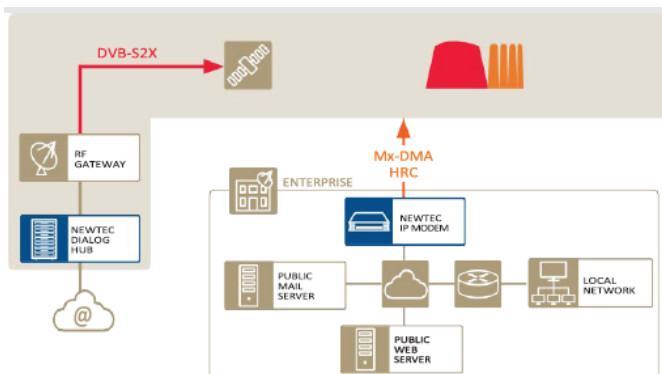
### MPLS Integration
Multiprotocol Label Switching (MPLS) is the underlining technology that enables service providers to **offer customers high-speed private networks**.

Service providers can easily integrate their MPLS networks with the Dialog platform. This way, a customer's remote location can be integrated with the rest of their sites to an MPLS backbone. A network in this configuration can eliminate the need for encrypted VPNs and multiple-hops between remote locations and headquarters. This configuration also allows latency sensitive applications such as video conferencing and VoIP to be used between multiple sites.

An MPLS Label Edge Router that is connected to the hub can be configured to classify and push MPLS labels onto the packets. This classification can happen either on Source or Destination IP address or 802.1Q VLAN tags coming from the hub.

### Layer 2 Bridging
Service providers can offer a layer 2 based service to customers. Using a layer 2 bridging service, customers no longer need to align the configuration between the corporate network and the service provider network layer 3 configuration. All layer 3 traffic and routing is handled fully transparent over the layer 2 bridge. As a result it provides **maximal network flexibility and transparency for the end customer.**

Additionally, using the layer 2 bridging service providers can deliver **new types of high throughput services** either as layer 2 or as more advanced layer 3 services supported through a customer premises router.
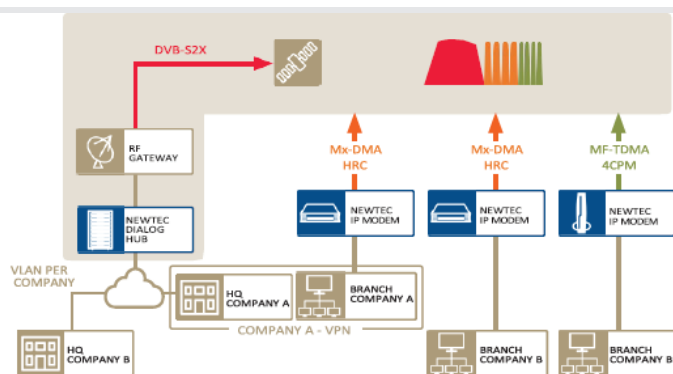
Figure 2 - Broadband access for enterprises

Figure 3 - Private networks for large enterprises and organisations

## Offering Business to Business Services

More than ever, enterprises require reliable network connectivity. It is especially important for remote offices that need to access other sites, headquarters and public cloud services where information resources exist. In such cases WAN redundancy is a key requirement for business continuity plans.

**Satellite networks have the distinct advantage in this setup of being independent of landline infrastructure, which could be affected by accidental cable cuts or natural disasters.**

Service providers that want to offer a satellite business continuity solution, can do this in a cost effective way using a combination of the MDM3310 or MDM2510 IP Satellite Modem and Mx-DMA technology resulting into the following benefits:

- High bandwidth on demand with the highest efficiency
- Advanced QoS to support data, VoIP and video applications
- Authentication & encryption
- Embedded acceleration and compression

## IPv6 Support

The single biggest argument for IPv6 today is "business continuity". The public IPv4 networks, which most organisations use today, have nearly run out of unique numbers. Depending on the region you live in, this has already happened. To preserve the capabilities and value that we enjoy today, we have to adopt the new protocol.

### Migration Scenario Using Dual Stack IPv4/v6

The system supports networks where both IPv4 and IPv6 access is needed. In such cases, an IPv6 network can be merged with an existing IPv4 network to create a single, logical dual-stack IPv4/IPv6 network. Hosts behind a terminal in that dual-stack network can have both IPv4 and IPv6 access.

### IPv6 Remote Networks

With the larger address space inherent to IPv6, addresses within a network can be allocated more effectively in a hierarchical fashion. The IPv6 routing functionality is extended with IPv6 prefix delegation support as a way to centralize and delegate IP address assignment.
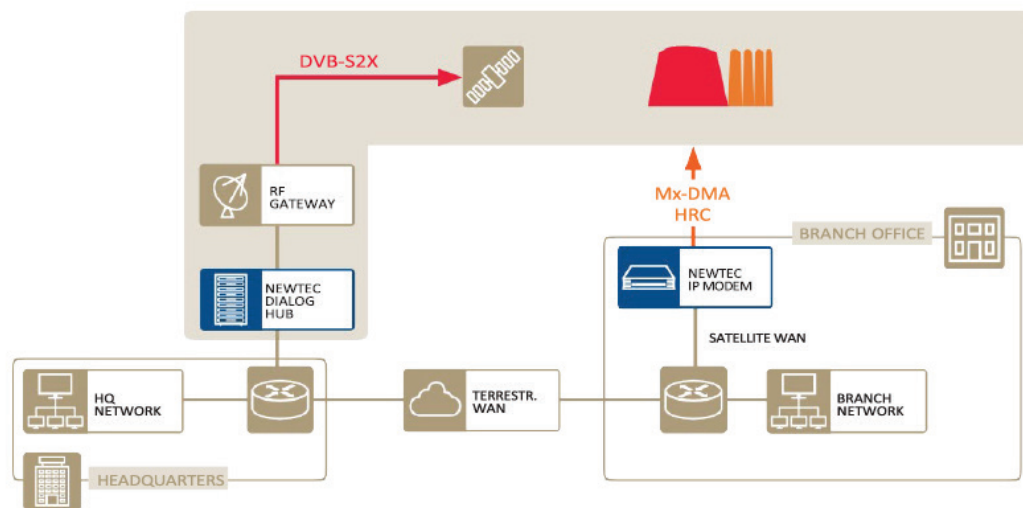
Figure 4 - Support for business continuity

## Premises Based VPN Solutions

In some cases, enterprises want full control over their network security and for example, premises-based VPN solutions, such as IPsec, are deployed end-to-end. IPsec supports key-based authentication and encrypts the complete data packet — both data and headers — and adds its own header. In doing so it prevents Web and TCP acceleration within the network.

The impact on the performance of the network depends on the scenario. Two scenarios are considered:
- A regional office: The VPN traffic is considered high, meaning that acceleration of VPN traffic is required in order to reduce bandwidth needs
- A Point of Sale: The VPN traffic is low volume traffic, cost of the equipment is main driver

### Regional Office

At the remote site a COTS VPN solution will be used and connected to the modem. The resulting encrypted traffic is preventing the TCP acceleration within the satellite platform.

TCP acceleration can still be applied but requires optimizing the traffic before it is encrypted. TCP Acceleration can be implemented using an off the shelf WAN optimizer solution at the remote location and company headquarter respectively.

The result is secure end-to-end accelerated VPN connecting the headquarter to regional offices.

### POS Terminal

A low cost VPN router add-on sets up the IPsec tunnel with the headquarters. No TCP acceleration is performed at the virtue of a low cost remote site implementation.
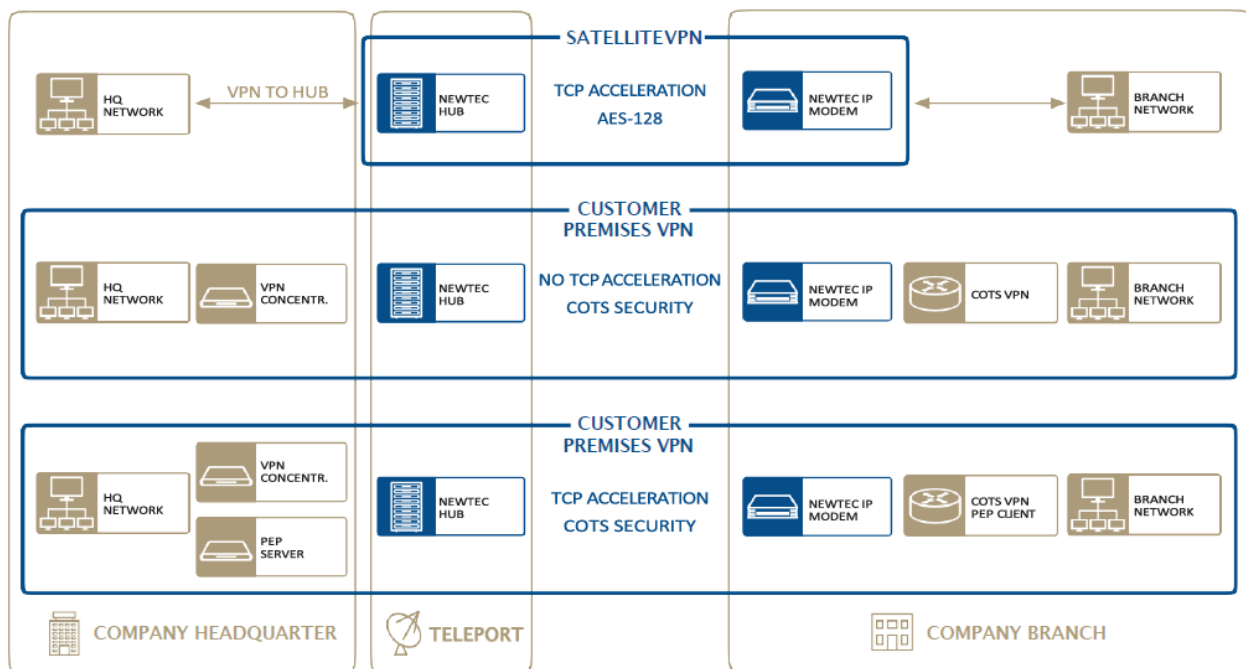


Figure 5 - Premises-Based VPN

## Matching Terminal Equipment with Remote Application Needs

The Dialog IP Satellite Modem portfolio is designed to serve a wide range of applications at **competitive price points in different markets**.

Different terminal configurations can be used on the same platform sharing the forward carrier. Management of the modems is done by a single management system.

Depending on the application requirements, the amount of users or the geographical location, different capabilities are expected from a terminal. Selecting the right mix of modem types and terminal configurations will **minimize the total cost of ownership while fulfilling all requirements**.

The modems are based on flexible hardware platforms, assuring a long life time for the installed base. Modems can be upgraded over the air when new features are introduced.

| | MDM2210 IP Satellite Modem | MDM2510 IP Satellite Modem | MDM3310 Satellite Modem | MDM5010 Satellite Modem |
|---|---|---|---|---|
| # LAN ports | 1 | 4 | 4 | 4 |
| Max RX/TX Rate TCP | 100 / 5 Mbps | 150 / 20 Mbps | 150 / 70 Mbps | 400 / 200 Mbps |
| Max RX/TX Rate Multicast | 120 / 5 Mbps | 150 / 20 Mbps | 150 / 100 Mbps | 400 / 200 Mbps |
| TCP Acceleration | ✔ | ✔ | ✔ | ✔ |
| Encryption | ✔ | ✔ | ✔ | ✔ |
| L3 Routing | ✔ | ✔ | ✔ | ✔ |
| L3 Bridging | ✔ | ✔ | ✔ | ✔ |
| L2 Bridging | | ✔ | ✔ | ✔ |
| DVB-S2X | ✔ | ✔ | | |
| MF-TDMA | ✔ | ✔ | ✔ | ✔ |
| Mx-DMA | | ✔ | ✔ | ✔ |
| SCPC | | | ✔ | ✔ |

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