Virtual Network Operator (VNO) Program Technology Brief

Autonomy, Control, and Low Cost Entry into the Satellite Communications Market

iDirect's Virtual Network Operator (VNO) solutions are highly scalable, flexible and user friendly, designed to meet the changing resource needs of today's emerging business. Our VNO program allows service provides to operate their own VSAT network without all the high cost and investment in the VSAT teleport infrastructure such as baseband equipment, large antenna and radio frequency (RF) systems, physical space, uninterrupted power supply (UPS), etc.

And, of course, with the iDirect platform VNOs can provide a wide range of applications — cellular backhaul, ISP, rural telephony, mobile communications, disaster management, distance learning, just to name a few. And the low cost of entry, combined with the advanced iDirect technology enabling greater overall network efficiency, make the VNO Program a win-win for VNO and end user alike.

How it Works:

A VNO rents network capacity from a larger Host Network Operator (HNO) that already has the available teleport infrastructure resource. This capacity is physically isolated from the resources rented by other service providers and the HNO, and can be remotely configured and managed in any manner the VNO sees fit. This allows the VNO to offer the most highly competitive broadband IP service anywhere, without a substantial upfront investment.

As a VNO, you'll have the ability to fully control and run services to your end customers worldwide with the highest level of autonomy. Highlights include:

- Commission, control and monitor your own remote sites

- Deliver end users broadband speeds up to 20 mbps

- Ensure your network traffic is 100% physically separate

- Provide custom QoS service levels and definitions

- Support applications like VoIP, video and private networks

- Pay only for the capacity you need

- Design and configure your own IP addressing scheme

- Easily expand your service capacity as you build customer demand

iDIRECT
A company of VT Systems

VNO Solutions to Meet the Needs of Your Growing Business

Since customer needs vary widely, the iDirect VNO solution was designed to reflect the inherent flexibility of the iDirect platform.

By supporting VNOs with varied levels of functionality, the iDirect VNO Program can meet the needs of end customers with different requirements, or at different stages of deployment.

There are three options (available with iDS 7.0)

- VNO Package

- VNO License

- CNO (Customer Network Observer)

VNO Package

The VNO Package offers all the opportunity of the VSAT industry without the risk or the upfront investment of deploying a wholly-owned and separate teleport infrastructure. This option allows the VNO to deploy an entirely physically separate network on top of the HNO's assets with a completely independent data path, upgrade autonomy and the highest level of scalability. The VNO Package includes:

- Independent and fully owned NMS (with optional sparing)

- Independent and fully owned PP (with optional sparing)

- Line Card (M1D1 modem)

- Software license for 1 VNO

Since the VNO Package starts with a single line card, it can deploy exactly the network bandwidth for a VNO's initial business case with the flexibility to expand as much as the markets demand. This expansion is accomplished simply by adding an additional Line Card and/or NMS servers and Protocol Processors.

The VNO Package model allows new operators to develop niche opportunities worldwide, providing them with the scalability, increased security, autonomy, independent software upgrade path, and state of the art network management tools to deliver the applications and services customers require.

VNO License

The VNO License offers cost effective access to opportunities in the VSAT industry without assuming the risk of hardware investments.

This option allows the VNO to deploy a logically separate network on top of the full HNO's assets with a moderate level of scalability, while maintaining a lower initial investment. This option enables multiple small to medium size VNOs to run on the same hardware infrastructure (wholly owned by the HNO) with a logically independent data path. Each VNO License includes a single software license for one virtual network operator on a single NMS.

Since the VNO License starts with a software license only, multiple VNOs use the same equipment through a shared environment. As VNO networks experience greater network demand, they can migrate to a VNO Package with a simple hardware upgrade. The VNO License allows new operators to develop niche opportunities regionally, while providing them with interim scalability, a medium level of autonomy, and state of the art network management tools, security and functionality to deliver the applications customers demand.

Customer Network Observer (CNO)

The CNO option represents a monitor-only solution for an operator with no commissioning and very limited control of the customer base.

With the CNO option, the HNO provides all the regular functions of providing service to your end customer; however, you have the ability to monitor your specific set of remotes/clients, acting as another set of eyes watching over the network.

Since the CNO starts with a software license for Read-Only access, it represents a shared environment among other similar CNOs. When the operator wishes to provide more functionality to the client base, the migration path to a hardware upgrade and software license upgrade to a VNO License or VNO Package is available.

VNO Options Summary

	Options	Description
VNO Package	Includes network management software and a dedicated protocol processor, NMS server, line card and license	Provides autonomy and the highest level of scalability, independent upgrade path, unlimited growth and added security via dedicated data path.
VNO License	Includes one software license	Lower entry price point, small to medium scalability and simpler certification
CNO **(Customer Network Observer)**	Includes one read only license	Lowest price point. Monitor functionality only, lowest certification

SATCOM SERVICES

Mike Termondt
Phone: 1.805.649.1384
Fax: 1.805.500.4328
Email: Mike@satcom-services.com