

Transformation starts here.



A next-generation Network
Management System to run your
business at a higher level



Transforming Every Aspect of Your Business

There's a place at the heart of your business where day after day your success is earned. It's where key events are managed, critical data is analyzed, and important decisions are made. Decisions that impact profitability, growth and customer satisfaction. That place is your Network Operations Center (NOC).

Running a NOC can be anything but simple. There are multiple networks to monitor, individual tasks to manage and systems to integrate. And network operations impact your entire business – how you serve customers, manage profitability and pursue new revenue opportunities. That's why you need iDirect Pulse®. This is a next-generation

Network Management System (NMS) that transforms your network operations, enabling higher levels of performance.

iDirect Pulse provides all the functionality you expect in an NMS – configuration, monitoring, reporting, and analysis. But more importantly, it can improve every aspect of your operations.

Inside the NOC, iDirect Pulse enables integrated management and enterprise scalability of every iDirect Velocity™ and Evolution® network, no matter how large or complex. That greatly simplifies your operations so you can continue to grow while delivering superior customer support.

iDirect Pulse provides the information and tools needed to deliver high quality results – whether that's building a new mobility network using a desktop in the NOC or conducting on-site analysis over a tablet device at a customer site. And this NMS offers deeper visibility into network activity, pulling together rich sets of analytics to enable better decision-making and rapid troubleshooting.

Beyond the NOC, iDirect Pulse ensures your teleport will always be online, through a multi-site distributed architecture that provides critical redundancy and data backup support. And the extensibility obtainable through the Web service API means you can link the NMS into your other business

systems, such as billing and provisioning, for more seamless operations that boost performance.

Reaching outward to your customers, the tailored services and flexible permissions mean iDirect Pulse supports multiple business models and is accessible by a wide range of users. And you can leverage the API to develop portals and apps that create a rich customer experience.

Ultimately, this gives you what it takes to run your operations today and grow into the future. With iDirect Pulse, the ultimate goal isn't simply a better NMS. It's the total transformation of your business, wherever your people, operations and systems need to reach.



One Pulse, Any Network

“When I was newly hired, my trainer quickly oriented me with the iDirect Pulse management system. Whether tracking a mobility network for an airline we serviced or checking the QoS for thousands of ground terminals, I was impressed that the distributed architecture sustained such a variety of iDirect satellite networks over dozens of beams.”

– Network Engineer

One NMS able to scale to support any size and type of iDirect network

Satellite networks are highly diverse and challenging to manage, whether you're participating in a global service or operating your own regional infrastructure. Networks can involve thousands of customer sites, spread over a range of satellites and beams, with both fixed and mobile terminals. Success means bringing all of that into a single view controlled by a common NMS. With iDirect Pulse®, you can manage any type of iDirect Velocity™ and Evolution® network, no matter how large or complex. If you own the NMS and all the associated network infrastructure, you can use one installation of iDirect Pulse to operate many networks at the same time. That means you can expand your business effortlessly, managing large-scale global networks with world-class service and operational support.

Virtualized Modular Architecture

iDirect Pulse uses Network Function Virtualization (NFV) technology to simplify deployment and improve IT management. Virtualization enables a multi-site distributed architecture that broadens flexibility and enhances resiliency. This virtualized design facilitates the upgrade process while minimizing disruption to operations.

iDirect Pulse is composed of subsystems that interact to fulfill a complete NMS model. Each of these modules provides functionality for a specific aspect, such as configuration management or stats management. This "building block" model extends to how the NMS is deployed, where a primary core exists at the NOC site and each teleport is added by installing a new instance of the NMS. All the iDirect Pulse instances communicate with each other, exchanging data and command updates, to maintain consistency across the system.

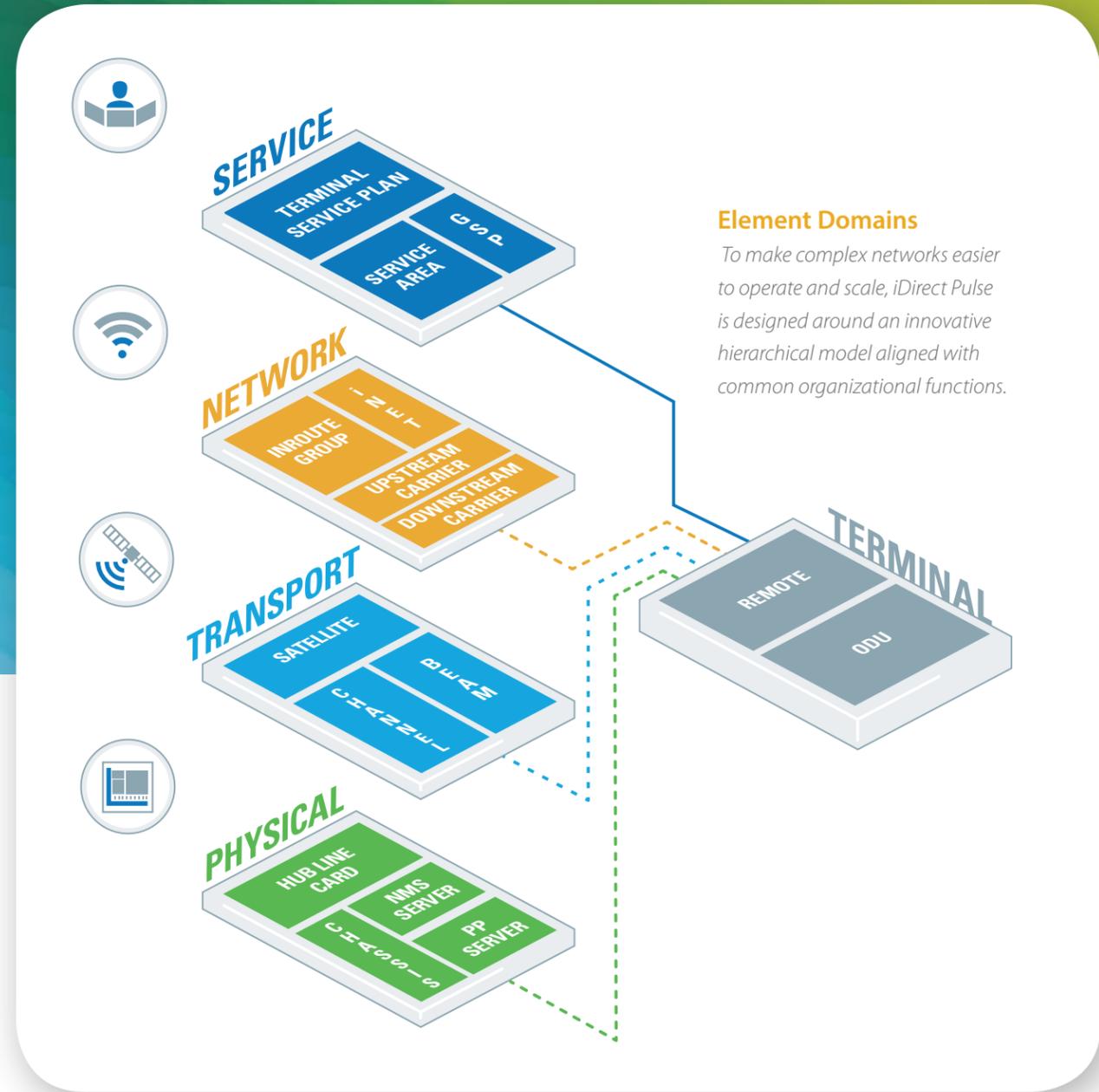
As a result, iDirect Pulse is configurable to support a range of system deployments. This ranges from a single site installation of iDirect Pulse operating a small network, to complex global operations requiring management of multiple NOCs and teleports where a dedicated instance of iDirect Pulse is running at each physical location.

Highly Scalable System

The underlying architecture of iDirect Pulse is designed to grow as the network grows, expanding to match the scope and complexity of the business. The NMS is able to manage many networks on one system, permit simultaneous access by hundreds of staff, and handle communication for over 100,000 remotes. The NMS scales through the power of distributed processing, where adding multi-core processors boosts performance, so the service provider can focus on expansion without worry about encountering system limitations.

Enhanced Mobility Model

With iDirect Pulse, you can manage a mobility network as easily as a fixed network. Each individual remote is configured once, but assigned to as many networks and beams as necessary to achieve a particular service offering. As the remote moves from one geographic area to another, the NMS is able to identify and track that remote, maintaining communication access dynamically. This simplifies deployment of mobile networks and consolidates reporting.



Organized Around Workflows

In order to simplify setup and operation of complex networks, iDirect Pulse employs an innovative hierarchical model in which configurable elements are grouped into logically related collections, which are called Element Domains. The five primary domains are Physical, Transport, Network, Service, and Terminal. Together, the components covered by these domains form a complete, operational satellite network.

The domains are aligned with common organizational functions to facilitate proper workflow. You can build the physical infrastructure such as hubs and line cards, add the satellite and beam transport layer, form in-route groups and define networks, set up the various customer service plans, and then provision and configure the terminals within the system.



The **Power to** Drive Results

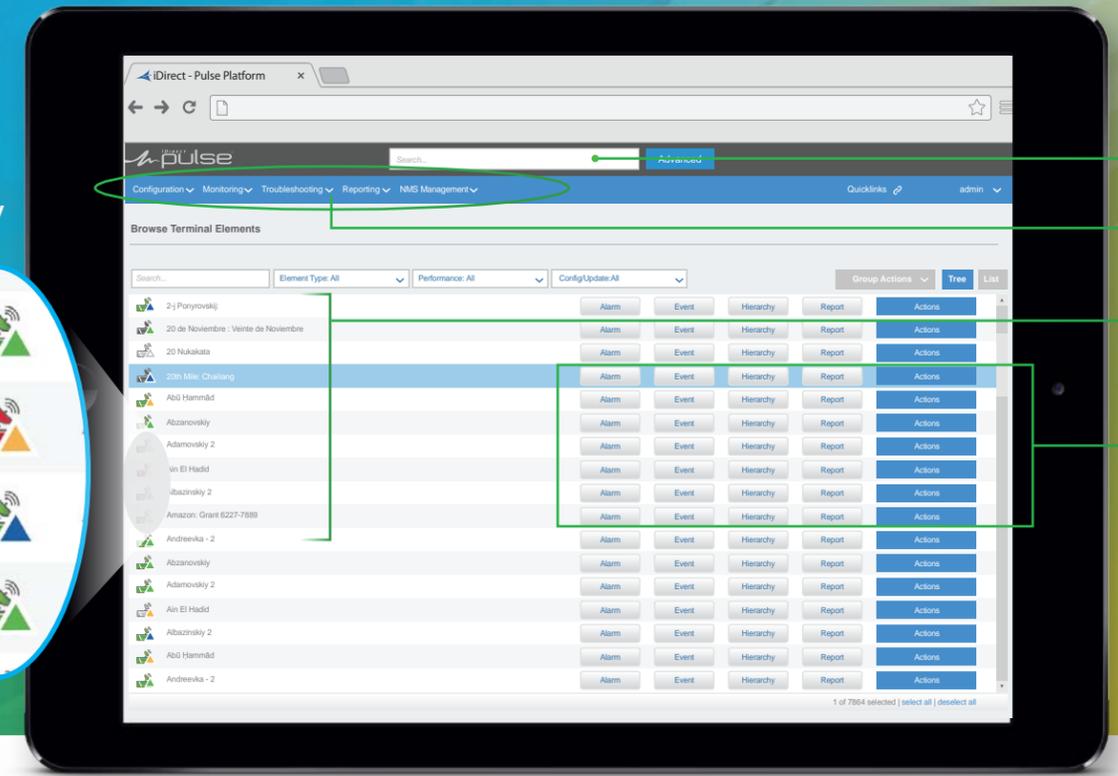
"I make it a point to visit important customer sites during major installations, but I still need to have full visibility of all my operations when I'm thousands of miles away. I can access all of iDirect Pulse's tools and show terminal information to my customers right here on my tablet. But the best part is watching my staff deliver results to customers, quickly deploying and easily managing large communication networks."

– NOC Manager

The right tools and information so people can work more effectively

Running a satellite network is a time and people intensive operation – and one that is inherently tied to the functionality of an NMS. With iDirect Pulse®, we've simplified all this complexity. A logically organized menu. Web-based tools accessible from anywhere. Helpful shortcuts that save time. Features like these create a positive user experience for employees who configure, monitor, and report on satellite networks on a daily basis. In order to design the NMS interface, our team analyzed common user tasks and workflows to determine the optimal menu design and GUI layout. We visited customer sites and incorporated partner feedback from live deployments. We saw how people needed device flexibility to access iDirect Pulse while on travel or at a customer site. The result is a full-featured, uniquely designed interface that truly meets the needs of your company inside or outside of the NOC.

Iconography with Status



Global Search
Mega Menus
List View
Quick Action Buttons

Simplified User Interface

The iDirect Pulse user interface follows a philosophy of simplicity – less clutter provides better clarity. The structure breaks content into smaller, manageable blocks where the most frequently used items and information are prominently displayed, but more advanced features are hidden until needed. This reduces system complexity and helps prioritize the user's attention so that they spend time only on the items that are most likely to be useful at that moment.

Streamlined Configuration

Since a service provider's terminals often share common characteristics, why waste effort configuring each new item from the ground up? iDirect Pulse streamlines the configuration of any system element through the use of profiles that maintains a permanent linkage to all the devices built upon them. Anytime a change is made to the profile, all those devices are also updated. Profiles make it easier to setup and manage groups of terminals and the related service plans. Because of the various profile linkages, the NMS includes an Impact Analysis tool to understand if applying a particular change to a single terminal might affect other related terminals.

Configuration Rollback

Modifying a setting might produce unexpected or detrimental service outcomes, which may not be recognized until later. iDirect Pulse stores a historical record of all changes, logging the time and details of each activity. The Activity Log Configurator allows an authorized user to search, retrieve and review the log to trace the origin of any problems and assess corrective action.

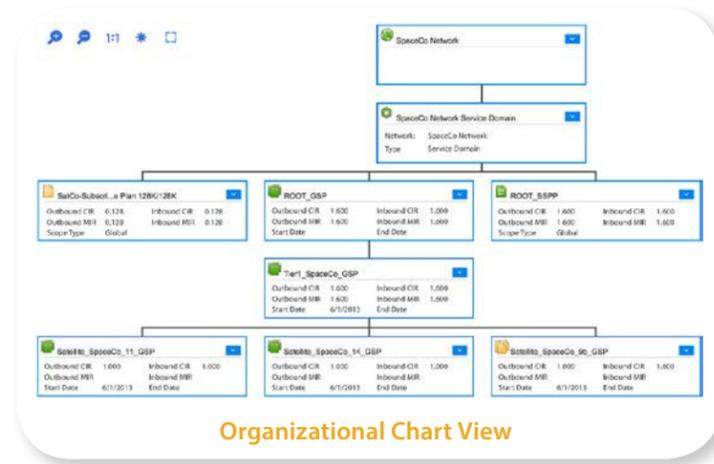
Configuration Rollback offers a simple method to undo previous changes. With one click, an automated process checks all interdependencies, then creates a new version of the element that reverts to the earlier configuration.

Advanced Global Search

The search box is the primary navigation tool within iDirect Pulse and the fastest way to locate a particular terminal, line card or other element. This is particularly useful when a technician is searching for an item in response to a support call, but only has partial identification for the equipment or site in question. Various filters make it easy to refine the search results, narrowing the list to a specific type of element or by operational and configuration status.

Group QoS Organizational Chart

Both iDirect Velocity™ and Evolution® offer sophisticated Quality of Service engines based upon hierarchical bandwidth allocation across groups and subgroups. The resulting Group QoS structure can be challenging to understand, especially in large networks. So iDirect Pulse introduces a Group QoS Organizational Chart to visualize all the relationships in a simple and interactive way. Users can pan across the chart and zoom in or out, with more levels and detail revealed the deeper the user zooms. You instantly gain a more intuitive grasp of Group QoS and the division of bandwidth between customers and sites.



Organizational Chart View

Remote Update Manager

Updating thousands of remotes can be a labor intensive and error prone process, so iDirect Pulse offers an Update Manager tool to automate software updates. The tool delivers the appropriate configuration information to a group of network elements — providing option files, software and firmware packages, OS images, and licenses as required. It then queries and tracks the status for those elements as it sends commands applying the configurations in an orderly process.

Device Independence

Today's workforce shouldn't be constrained by an office or a thick-client application. iDirect Pulse can be accessed from anywhere on smart devices, offering immediate visibility and control of your network. A NOC manager can keep an eye on the critical state of his networks, evening and weekends, while traveling across the world. An on-call service specialist can offer proactive customer service late at night from her home. A technician can pull up the NMS on his tablet while visiting a customer site. All of this contributes to better responsiveness and higher quality customer care.



Deeper Insight, Better Decisions

“I work with Diego on one of our largest accounts, and when he noticed that a few sites were exhibiting consistently lower MODCODs, I was able to look into the details right away. We have to deal with rapidly shifting demands, changing weather patterns and other incidents, but iDirect Pulse reporting and fault management helped us catch the issue before it turned into a major problem.”

– Service Management Specialist

Improve management through deep reporting of network statistics

Satellite capacity is a critical asset that needs to be managed as efficiently as possible.

That's why iDirect Pulse® is equipped with extensive metrics and powerful visibility tools that enable you to peer deeply into your network. With iDirect Pulse, you view the real-time status of every remote and study historical trends across your entire network. You can uncover unused bandwidth and leverage that bandwidth to sell additional service. You can identify how customers are using capacity to anticipate shortfalls and recommend increased service levels. And you can preemptively identify and resolve performance degradation before they escalate. It's all about making the right decision with the right data in hand.

Key Information Panel

Clicking on a terminal icon produces a pop-up Key Information Panel that summarizes the most relevant information about that object, including status, location, IP address, position on map, weather at the site, and vital statistics. Uniting all this information in one place gives convenient, once glance understanding about a remote's function and status without running detailed reports.

Real-Time Monitoring

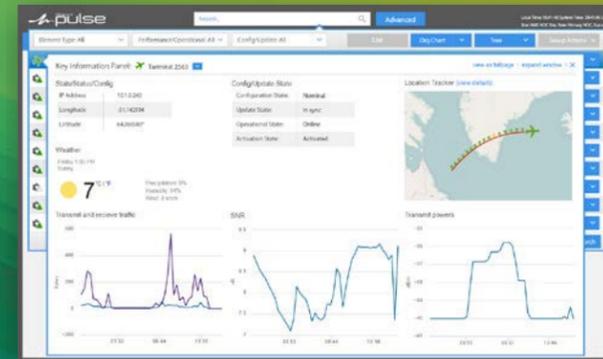
Visibility of system operations is critical to maintain service quality by preemptively identifying network challenges. That's why iDirect Pulse provides a rich set of functionality that offers real-time views of the health of servers and remotes, as well as access to hundreds of variables continuously generated by iDirect Velocity™ and Evolution®.

Statistical tools provide network operators with detailed performance data about the satellite network. Users can stream charts displaying key indicators such as bandwidth usage, IP traffic, link quality, and latency.

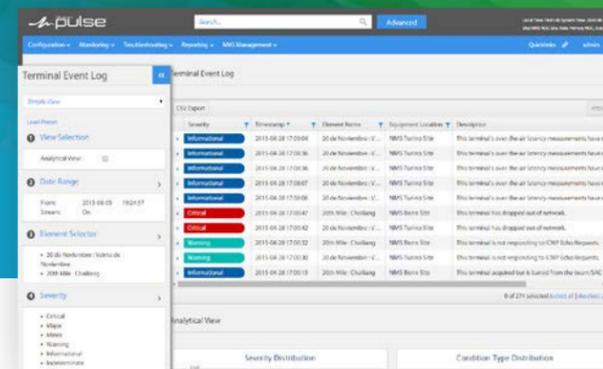
iDirect Pulse provides notification of system variances collected from NMS processes, hub processes, network components, and external systems. Users can monitor these events through a real-time listing, with the significance of the events ranging from informational messages to critical warnings. An analytical view groups the events by severity and displays on bar and pie charts, offering a quick assessment of the health of a network based on the events being triggered.

Alarms signal a condition that could possibly result in a future interruption in service if not handled in a timely fashion. A system administrator can customize the metric thresholds that trigger an alarm to focus attention on truly important variables. An alarm maintains a record of the current state of the problem, tracking if has been acknowledged by a technician and any ticketing number to make it easier to integrate with third-party ticketing systems.

Key Information Panel



Real-Time Monitoring



Customizable Reporting

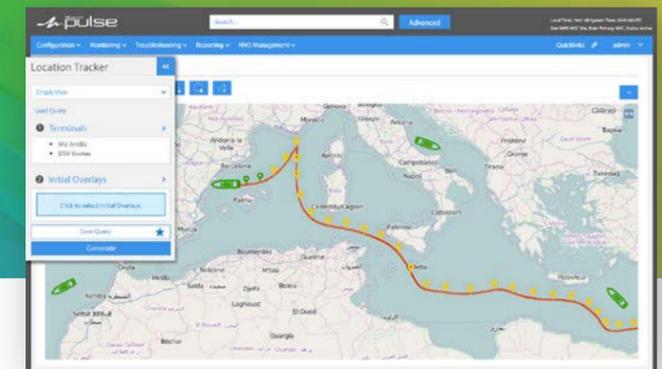
iDirect Pulse enables operators to conduct long-term trending analysis through assessment of historic statistics and events. Metrics are saved for periods as long as a year, although the length of time can be increased through extended storage and archival methods.

The flexible report builder only requires a few details to run a search on the archived data and users can save these parameters as a Quicklink on the menu bar so they can automatically run a standard set of daily reports. Retrieved statistics are viewable in a variety of forms, such as analytical views and trends using pie charts, bar graphs, and line charts. Users can also choose to output CSV files for conducting their own analysis in a spreadsheet.

Customizable Reporting



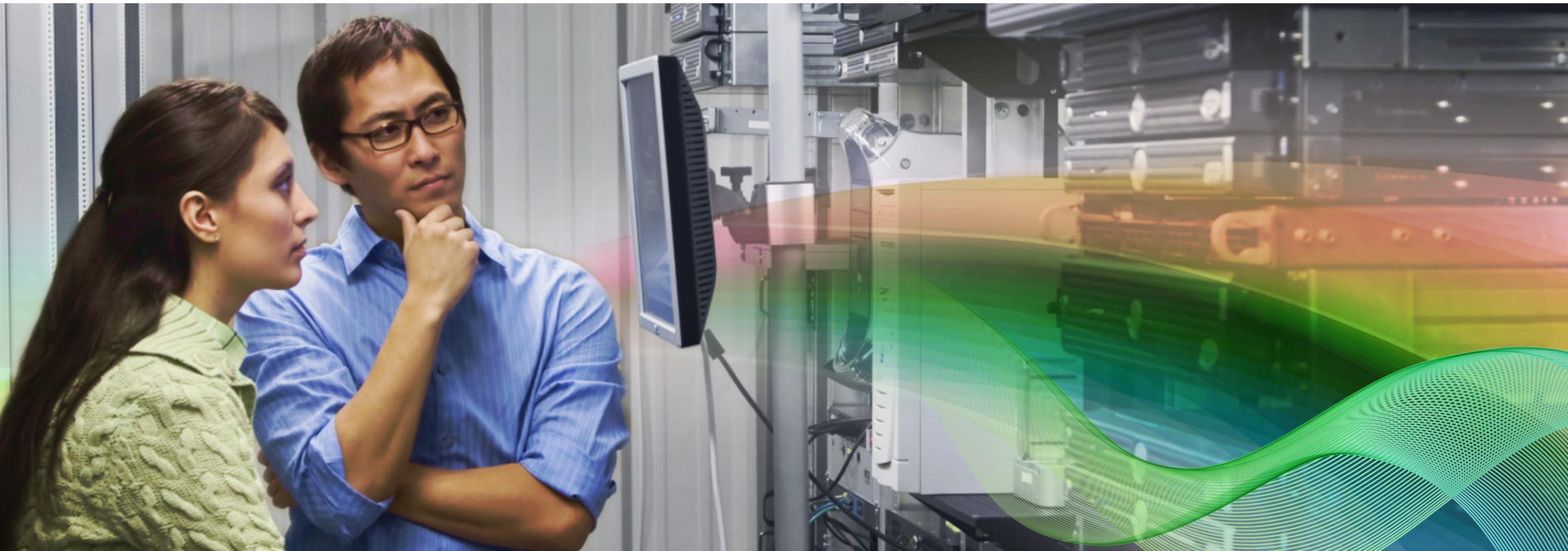
Location Tracker



Location Tracker

The larger the network, the more difficult it is to be aware of every remote location. And this is compounded in mobile networks where terminals are continuously moving. The iDirect Pulse Location Tracker displays real-time tracking of terminals worldwide through a powerful graphical mapping system. The exact location and heading of every terminal can be checked at regular intervals.

Clicking on a mobile terminal icon provides a quick snapshot of the health, status, and exact coordinates. Satellite beam footprints can be overlaid to provide a correlation of remote status as it moves across the patterns. The Location Tracker allows for additional overlays from external data sources, such as weather, radar, roadmap, and imagery to provide better understanding of the operational context.



Withstand Any Challenge

“A bad storm was coming, but we weren’t concerned that it would shut down operations. We had built multiple layers of redundancy through iDirect Pulse virtualization, so all the data that we collected at the teleport was safely stored at other sites, and we had a back up teleport ready to turn online if a catastrophe hit. We could continue working, able to withstand any challenge.”

– Hub Infrastructure Specialist

Operate securely and preserve continuity **even during a disaster**

Your NMS must be highly resilient to withstand any challenge that might threaten the network.

That's why iDirect Pulse® supports multi-site distributed architectures, as well as virtualization to implement hub redundancy and data backup. This forms a strong foundation for high availability services.

With iDirect Pulse, network security is a major priority. Any external access into the NMS is managed through an External Access Portal that protects the core operation with a firewall. Interception of information or sabotage is prevented through encryption of all iDirect Pulse administrative communication. And a permissions engine allows administrators to tightly control and monitor access. It's a whole security model that protects your entire network.

Strong System Security

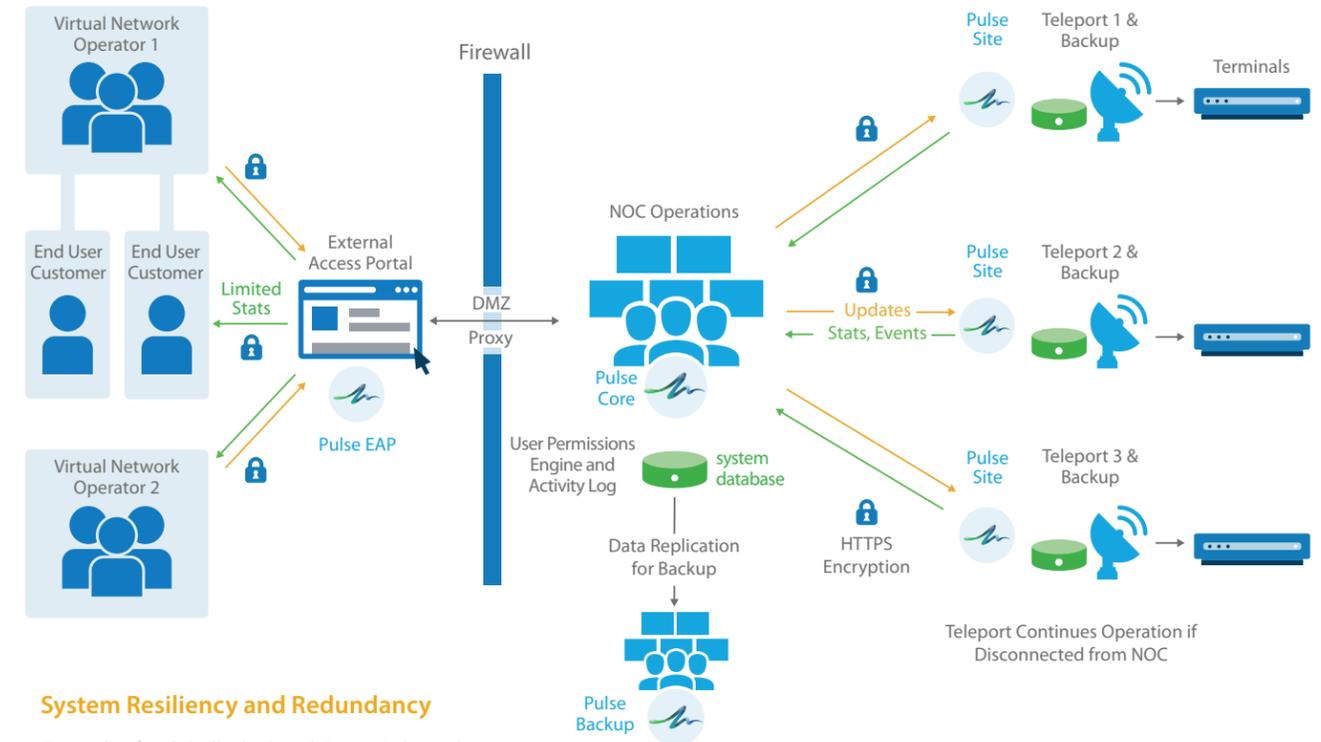
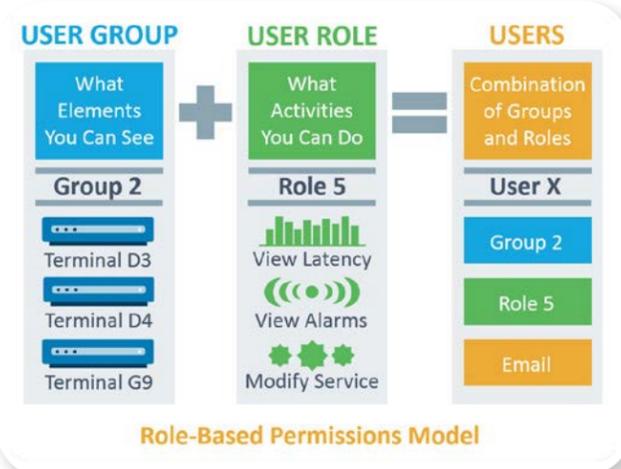
Security must never be an afterthought. That's why iDirect Pulse incorporates a thorough security philosophy at the core of its design. All communication is encrypted using HTTPS. This includes external to internal communication through the Internet, as well as machine-to-machine communication within iDirect Pulse itself.

By default, the system implements an internal authentication process that enforces password rules and validates users into the system through a login process. If a partner desires an additional layer of security, the NMS also offers support for two-factor authentication by using an external authentication service via LDAP.

Once a user is within the system, iDirect Pulse restricts each user's access on a "need to know" basis through a highly customizable role-based mechanism. Each user is granted visibility only to certain network elements, and within those network elements, only authorized for the functions they need to perform their duties. The NMS logs all user activity, with logs retained for at least one month.

Redundancy and Continuity

iDirect Pulse utilizes industry recognized virtualization solutions to deliver different levels of availability, depending on the investment the partner desires to make. For smaller deployments, a complete NMS is provided through one virtualized NOC cluster and one virtualized teleport cluster. If either of these virtual clusters should fail, there are optional High Availability functions in the hypervisor that allows iDirect Pulse to automatically restart on another host with minimal delay to NMS operation.



System Resiliency and Redundancy

Example of a globally deployed iDirect Pulse architecture with high availability and secure infrastructure.

Another optional feature is Virtualized Replication, which is available to preserve all configuration and transactional data so partners can maintain continuity in case of disaster recovery. Replication automatically duplicates the virtual clusters and data sets into either local or remote backup storage on a regular basis.

For complex operations requiring extensive redundancy, iDirect Pulse supports multi-site distributed architectures with dedicated virtual clusters at the NOC, each teleport, each backup site, and an External Access Portal. Under normal operations, all the NOC and teleport clusters continuously exchange data and work as one united system. But if NOC communication becomes severed from a teleport, the teleport virtual cluster continues independent operation until communication is restored. And if a primary facility goes down, a replicated iDirect Pulse virtual cluster located at a backup NOC or teleport site can quickly assume operation through a manual failover process.

Protected External Access

It is essential to guard essential core operations from accidental changes or willful intrusion, so iDirect Pulse passes Virtual Network Operator and end-user access through an External Access Portal (EAP). The EAP interface is essentially a full instance of the NMS running under a special configuration, offering a secure proxy between external users and the primary core running for a location such as the NOC.

When this outward-facing component of the NMS is installed in a DMZ, the firewall creates a strict separation from the iDirect Pulse core. The EAP takes a feed of data from the NMS core and stores it locally and passes any commands through the firewall, so exposure through the Internet can be carefully controlled. User accounts and permissions determine how to restrict functionality. To the user, it will appear as if they were accessing a normal iDirect Pulse interface, but the menu of options is smaller.

Automate Business Growth

“I help customers find the right upgrades for their service, and resolve any problems they might be experiencing. Our customer base is growing, but iDirect Pulse integrates with and feeds data into our operational and business support software. I can find the right information and stat reports quickly, which means I can help more people.”

– Customer Service Operator

Web Services API

A critical tool for iDirect Pulse® extensibility is the powerful Web services API. The API is built on RESTful Web design principles, the industry-leading way that Web interfaces are built today, and relies on HTTPS and JSON messaging as the means for encoding. The Web API includes read and write capabilities with securely authorized access to all the functions of the NMS, so it's possible to design scripts and machine-to-machine routines that automate common processes and improve productivity.

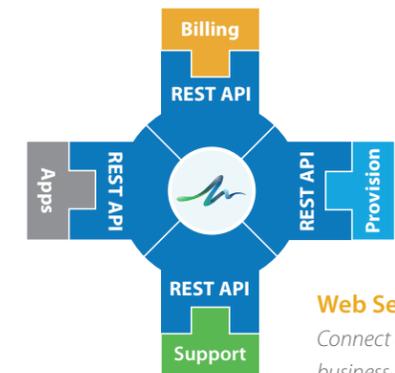
OSS/BSS Integration

The Web API allows iDirect Pulse to be part of a best-of-breed collection of software products, where a company can choose third-party applications to fulfill the various functions and then link everything together.

You can fully integrate enterprise operations by connecting the NMS with crucial business applications such as billing, inventory, ticket tracking, and SLA management. And you can extract data from the

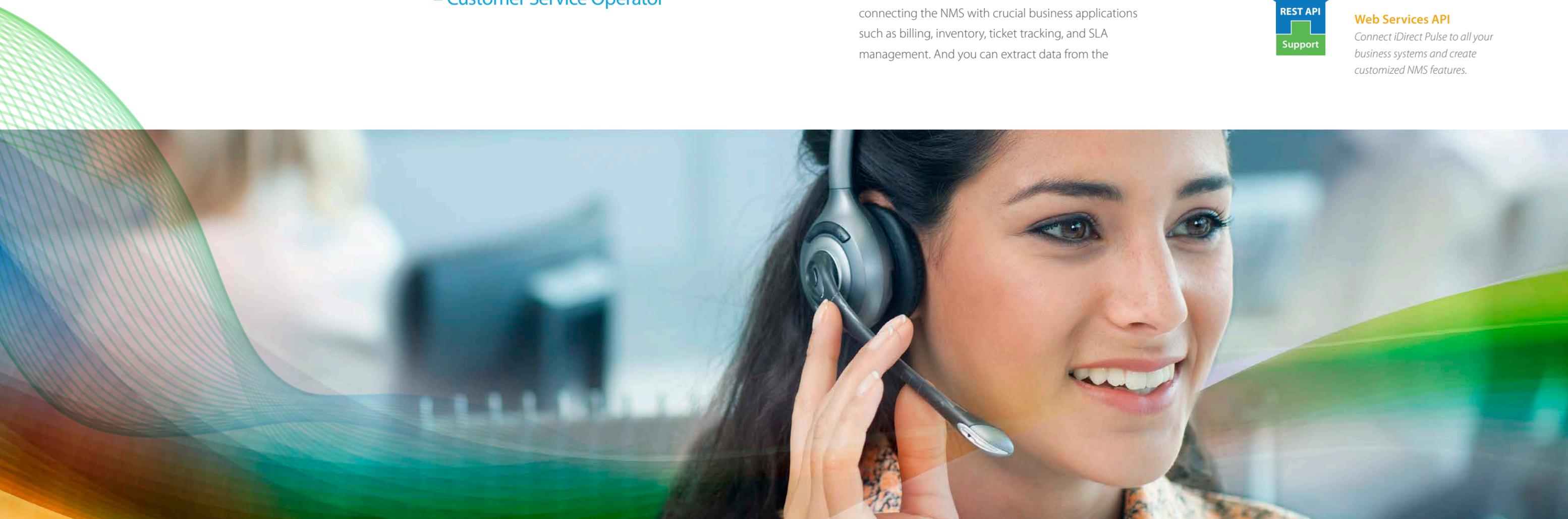
NMS for analysis in custom-built tools, such as satisfying particular reporting obligations to government agencies. You can also create customized apps that improve internal operations and workflows, such as site equipment installation and activation.

iDirect's Management Systems Technical Services team is available as a resource to provide training and a Software Development Kit (SDK) to facilitate the initial introduction to the iDirect Pulse API. The team can offer contracted integration services as seems appropriate on a case-by-case basis.



Web Services API

Connect iDirect Pulse to all your business systems and create customized NMS features.



A **Vibrant** Customer Experience

“As CTO of a large shipping company, my job is to keep everyone connected around the clock and around the world. But with the new dedicated HTS satellite network, my job just got a whole lot easier. The iDirect Pulse customer portal gives me incredible visibility into my network, and the service provider even lets me optimize certain settings.”

– Chief Technology Officer

Tailored Services

iDirect Pulse® is designed to service a wide range of users, giving everyone the access and information they need to run their networks. That includes satellite operators partitioning bandwidth or data rates, network operators creating a hierarchy of virtual networks, and service providers selling to enterprise clients or a large consumer base. It also includes end users who want to keep a vigilant eye on performance and administer basic changes to their service plans.

Flexible Permissions Structure

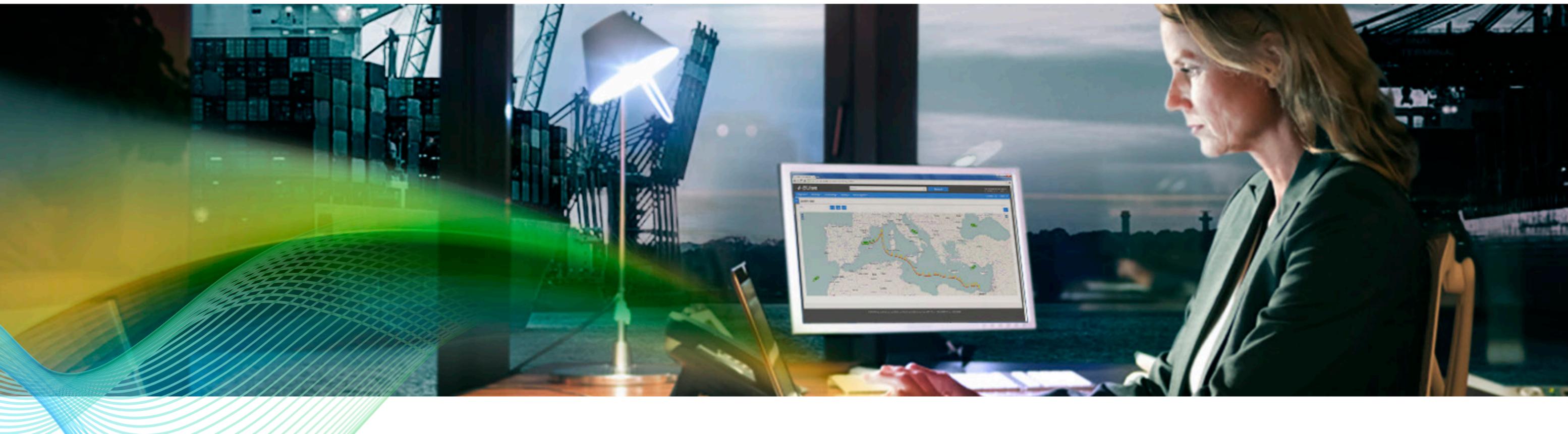
The iDirect Pulse permissions structure is highly flexible, with detailed granularity. A satellite operator can ensure that a VNO only sees their own network elements, and that their activities are restricted in whatever way desired by the satellite operator. Likewise, that VNO may create their own set of user permissions for their own operations, and may also create sub-VNO accounts for their customers to view reports and perform other actions.

Customer Portals

iDirect Pulse supports all levels and types of customers through an External Access Portal (EAP) framework. A customer portal facilitates access, improves visibility and control, and provides ability to differentiate services to customers.

Customer Apps

Nobody knows your customers better than you, so why not use that knowledge to create tailored apps that meet the specific needs of your customer base? iDirect Pulse includes baseline utility apps that offer system reporting you can build upon to create your own apps that deliver unique value. For example, you can provide a ship's captain with a sophisticated dashboard so he can view real-time status about his remote communication, the location of the ship in relation to beam coverage, and even notifications from you customized to display in his own language. Apps quickly become a key differentiator for self-service that improves the customer experience.



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