



Network Planning Guide



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Introduction

Maritime, Energy and Mining companies know that strategic investment in their corporate communications network is critical to operational and business success. Yet this is often a decision that many companies don't fully plan. While VSAT-based networks are helping these markets solve core communication challenges, many don't understand how to properly design a network to maximize its effectiveness and help them grow their business. ITC helps these companies find the right networking solution to support their unique challenges within their market.

IP-based satellite communications provide a powerful solution. Strategically designed VSAT networks enable companies to address all their core communications challenges. Companies need to design a reliable network that can handle dynamic applications while delivering a consistent, high-quality user experience to all remote locations. Failing to plan and invest adequately in a high-performance communications strategy can put people, business and overall reputations at risk. This is critically important today, especially as companies continue to expand operations into some of the most remote and harsh environments in the world.

When planning a communications network, companies should follow five fundamental principles of financial planning and network design. Ultimately, these five principles will help companies stand out in a highly competitive market by enhancing their infrastructure, protecting employees and operations, and seamlessly connecting remote sites to headquarters for strategic growth. You can ensure that your operations remain best in class in a highly competitive industry.

5 Fundamental Principles

.....of Financial Planning and Network Design

- 1 CUSTOMIZED, FULLY ENGINEERED NETWORK
- 2 BANDWIDTH UTILIZATION PLAN
- 3 NETWORK INTEGRATION
- 4 ACCOUNTABILITY
- 5 GLOBAL SCALE AND COVERAGE

1 Customized, Fully Engineered Network

FINANCIAL PRINCIPLE:

A financial plan must be tailored to unique business goals

NETWORK DESIGN PRINCIPLE:

A network design should meet unique applications and operational requirements

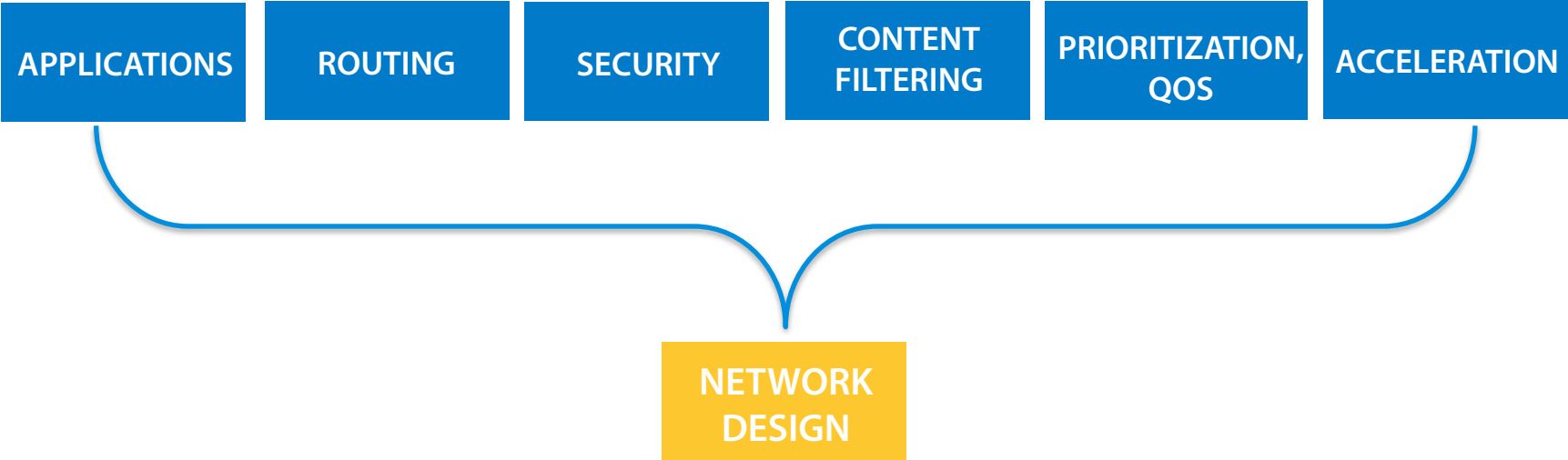
When planning the design of your network, it's important to understand the unique requirements of each site. You need to tailor the network to meet multiple, distinct needs while ensuring a consistent user experience across every location.

Every site requires access to the corporate network and basic telephony service. Certain sites may also require dedicated bandwidth for control and automation of SCADA, as well as for "second users" such as contractors, and Internet access for crew welfare. Security and content filtering are also important elements of a network and require certain bandwidth requirements. As you run corporate applications across the network, each site will have a distinct bandwidth profile and usage pattern and therefore must have unique quality of service properties.

A properly designed and engineered network will address most unique issues associated with VSAT technology. customized network design should always include:

- **Per-site technical plan** to deliver required service levels and availability
- **Capacity plan** to allocate bandwidth per traffic volume requirements for the overall network
- **WAN optimization plan** to address dynamic bandwidth needs of each application
- **IP address and routing plan** to govern the flow of traffic types and establish a failover plan

Profile Each Site to Determine Unique Technology Requirements And Capacity Plan



2 Bandwidth Utilization Plan

FINANCIAL PRINCIPLE:

Diversify your investment portfolio without risking your financial security

NETWORK DESIGN PRINCIPLE:

Spread bandwidth efficiently while preserving priority traffic

Bandwidth is an expensive resource and oil & gas companies try to use it as sparingly as possible while protecting the priority of their critical applications. Purchasing too much bandwidth can be costly. Yet, if companies do not secure enough capacity, it can result in network congestion and lead to application degradation, or even failure.

Since multiple applications dynamically share the same bandwidth pool, you need rules in place to govern prioritization. Examine your workflow and usage patterns to effectively create a prioritization plan across the entire network. Design your network to account for overall activity and then layer bandwidth based on user and application profiles with finely tuned priority settings to manage real-time allocation.

By establishing prioritization levels, you can effectively segment your capacity investment at the right levels to avoid any unnecessary cost without jeopardizing the performance of key applications when it matters most.

Allocate Bandwidth as Efficiently as Possible While Protecting Application Reliability

	Traffic Type	Prioritization	Applications
Bandwidth	Real Time Network	Significant sensitivity to delay, loss and jitter	Voice Calls Video Conferencing
	Business Network	Moderate tolerance for delay; Priority over best effort	Citrix Routing Protocols
	Backup/Control Systems	Prioritization	Historian Database Replication
	Second Users	Prioritization	Contractor & Transient Worker Internet Access
	Casual Users	Prioritization	Worker Welfare Internet Access Entertainment

3 Network Integration

FINANCIAL PRINCIPLE:

An integrated investment portfolio working toward a common goal

NETWORK DESIGN PRINCIPLE:

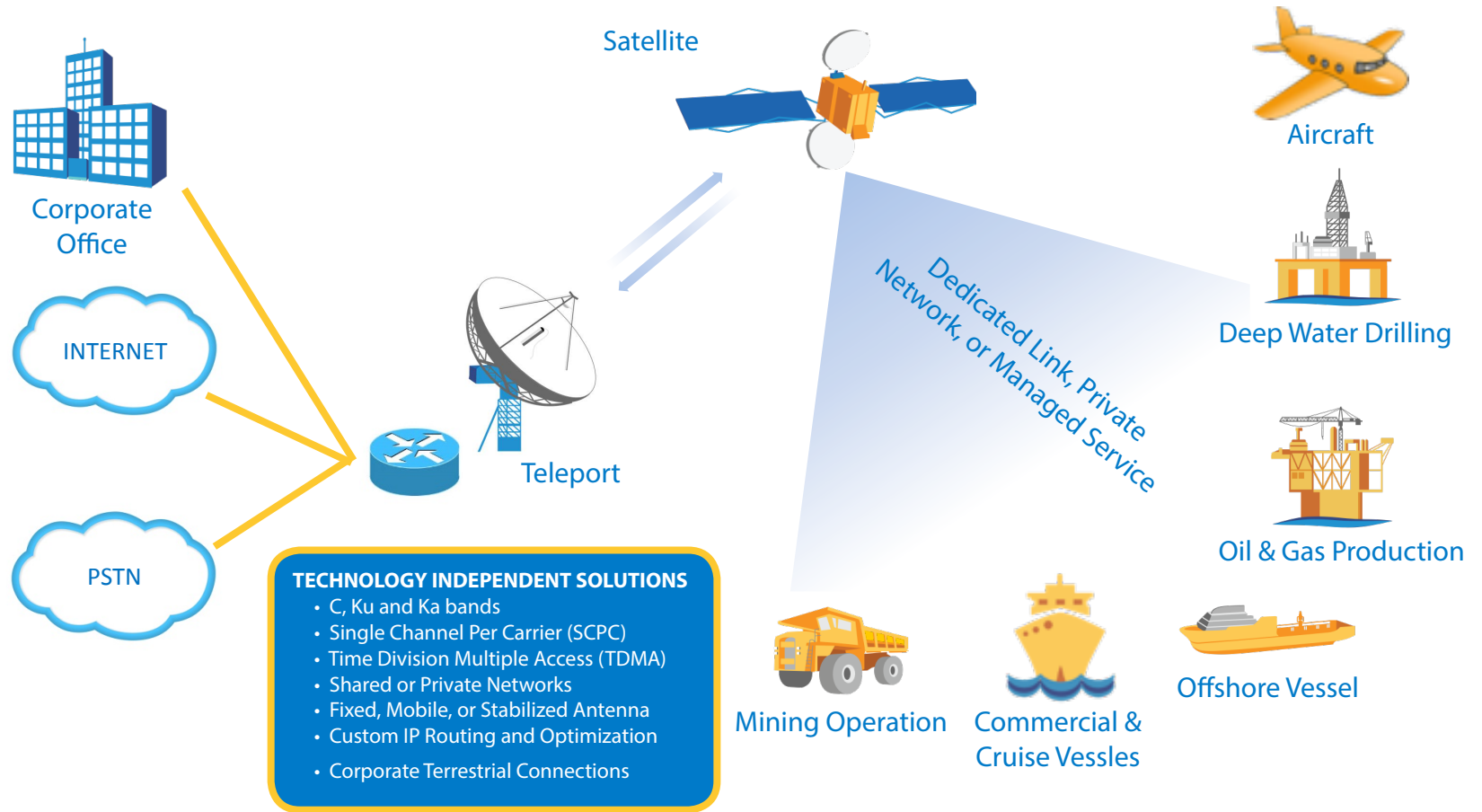
Integrated communications over a single IP network

The growth of IP communications is enabling more technologies to run simultaneously on the same network. The results include greater simplicity, consistency and accountability, as well as significant cost savings. Designing the right network involves dedicated planning, though, to ensure all these technologies can work together seamlessly.

When it comes to satellite networks, you need to consider an IP-based network. This creates an IP backbone that can also support SCADA and DCS serial connections, deliver IP-based voice and video traffic, and trunk hand-held radio traffic.

An integrated network is best managed by a single service provider. It establishes a single point of contact for a broad range of communications needs. And it better ensures a seamless performance across an entire network.

Establish an IP Framework for Unified Communications Under a Single Service Plan



4 Accountability

FINANCIAL PRINCIPLE:

A vigilant eye on the markets to mitigate risk and capitalize on new opportunities

NETWORK DESIGN PRINCIPLE:

A team to monitor, manage, optimize and scale a network

Once a communications network is implemented, it must be continually managed to ensure maximum availability and reliability. The goal is total control to ensure operations are never jeopardized. At remote sites, this means ensuring constant access to the network through real-time monitoring, remote trouble shooting and local support. It also requires an out-of-band backup network, as well as access to multiple teleports to handle critical operations should an outage threaten service availability.

At headquarters, visibility and access are just as critical. An IT director is accountable for how the network supports business requirements and measures up to Service Level Agreements. Oil & gas companies must have access to a portal that tracks performance across every location on the network and includes both real-time metrics and historical data analysis.

Across the entire network, you need regular IT advisory, planning and support. Your operations are dynamic and growing globally so you need a partner that can readily adapt the network as requirements change. A network should have the flexibility to allow for changes in bandwidth and services at a particular site, and be able to grow to accommodate additional sites without significant redesign.

Manage Daily Operations and Adjust to New Requirements

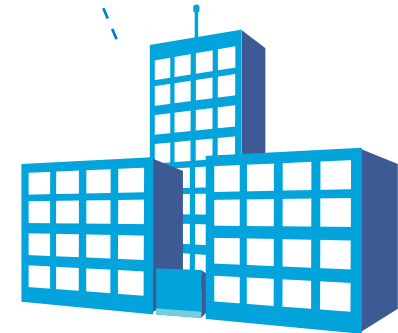
Remote Site

- Committed Information Rate
- Minimum Information Rate
- Back-up network
- Real-time network monitoring
- Local support
- Real-time remote troubleshooting



HQ Office

- Visibility to network at remote locations
- SLA monitoring and reporting
- Historical data analysis
- Network optimization
- IT advisory, planning and support



5 Global Scale and Coverage

FINANCIAL PRINCIPLE:

Broad options no matter how your needs grow and change

NETWORK DESIGN PRINCIPLE:

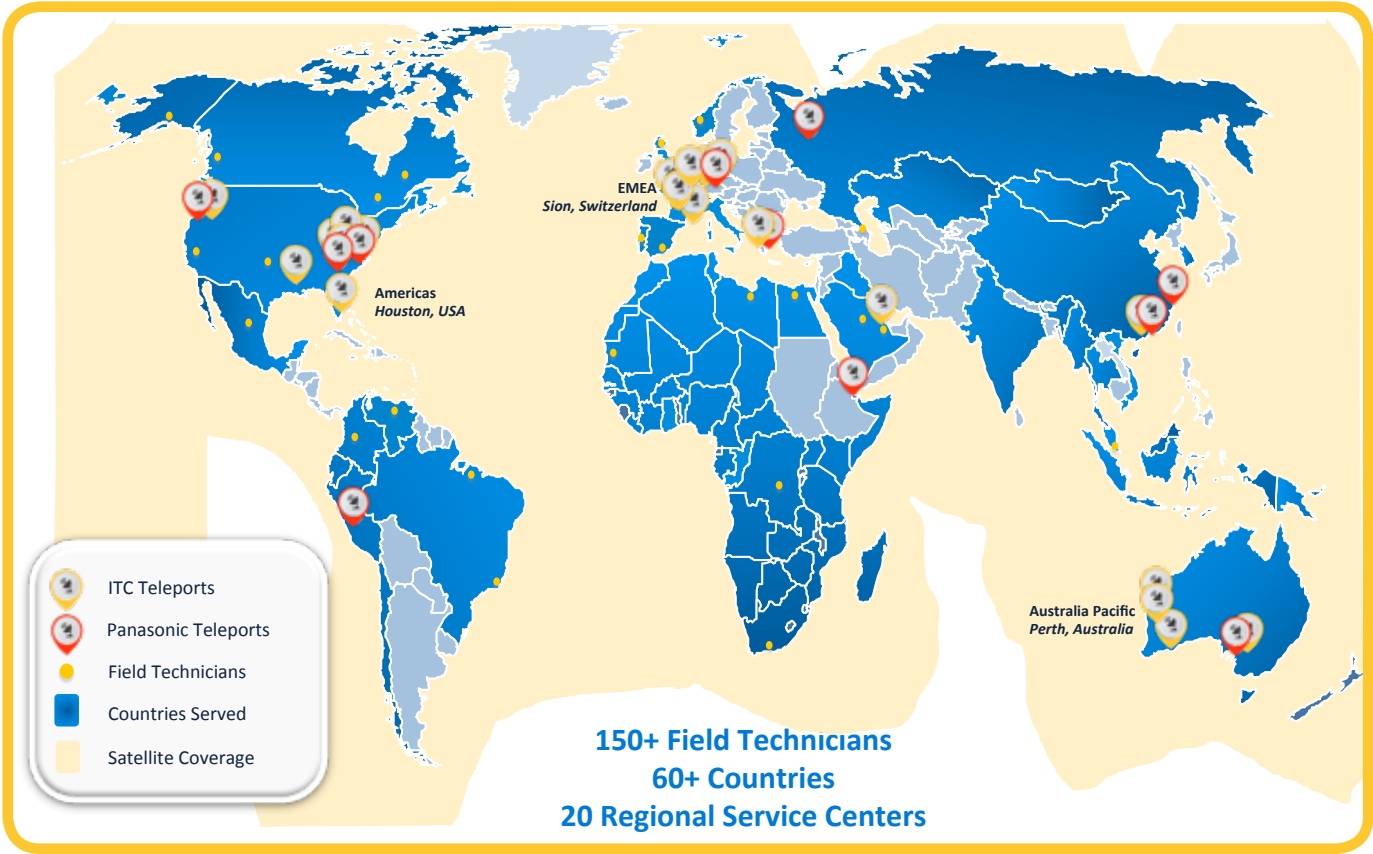
Ability to easily expand geographically as new opportunities arise

As remote operations move into new areas, companies need a unified global network that can scale with their businesses. It quickly becomes costly and complex to contract with multiple service providers across multiple geographies while operating disparate networks.

You should incorporate features into your network to enable a seamless service experience as your operations move globally. First, make sure you have a network of integrated satellite beams. Second, make sure you have a single network interface where your assets can maintain a single, global IP address and you can track them from a common system.

These features will allow you to scale the network quickly, easily and with consistency, and maintain predictability wherever your operations take you.

Access a Single Network That Can Span Any Geography



What to Look for in a Service Provider

When selecting partners to help design, build and manage a strategic communications plan for your business, it's important they have the necessary experience and global resources to meet your unique requirements and enable business growth. They must be able to provide:

1. Customized approach to ensure core operations and future requirements drive decisions
2. Managed service that includes all hardware, network services, engineering and support
3. Integrated networking technologies and services in a complete service offering
4. Comprehensive reporting on Key Performance Indicators, including service and capacity utilization, availability, latency and response times
5. Business continuity solutions, including alternate teleport locations and out-of-band network capabilities
6. IT advisory to ensure service continually adapts to changing operational requirements
7. Best of breed technologies that are continually reviewed to optimize network performance
8. Seamless global bandwidth coverage that can scale with your operations

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